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Prepared by the Friends of the Chair on Integrated Economic Statistics

GUIDELINES ON INTEGRATED ECONOMIC STATISTICS

Final draft circulated for comments

Prepared by
Friends of the Chair on Integrated Economic Statistics

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GUIDELINES ON INTEGRATED ECONOMIC STATISTICS

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GUIDELINES ON INTEGRATED ECONOMIC STATISTICS

Chapter 1. Executive summary

Integrated economic statistics are comprehensive sets of statistics that use common concepts, definitions, estimation methods, and data sources to produce a consistent and harmonized picture of economic activity for policy, business, investor, household and other users of economic data.

1. In the last two decades, the international statistical system has made great progress in harmonising economic statistics through internationally accepted guidelines including the System of National Accounts 2008, the Balance of Payments Manual, Sixth Edition (BPM6), and more specialised guidelines ranging from the measurement of prices to the measurement foreign direct investment. The motivating source of this work has been the need for and the huge benefits of integrated economic statistics for internationally-coordinated economic policy requirements in the interconnected global economy.

2. This volume builds on these guidelines and their emphasis on policy-relevant data by describing principles and detailed practices for integrated economic statistics. These principles relate to the consistency and coherence of economic data within countries, over time, and across countries and include the design of strategic plans for integration and the reliance on international guidelines and economic theory as the organising principles for integration of micro and macro data.

3. The recommended practices vary across countries. Countries with centralised systems may be better positioned to achieve consistency through "bottom-up" practices such as the development of common business, common definitions, and common surveys to assure consistency in the micro data used as inputs into national accounts and other macro data. Countries with more decentralised system also need to work with data suppliers to improve consistency, but are likely to better positioned to achieve consistency through "top-down" adjustment procedures to adjust input data to national accounts definitions and concepts, the use of common source data and methods, and through the use of consistent balancing techniques.

4. **Chapter 2** discusses the benefits and principles of integrated economic statistics and the strategic planning processing for achieving integration. The chapter concludes with case studies on the benefits from integration from the United States and the Euro Area Accounts.

5. Macroeconomic accounts, as exemplified by national and balance of payments accounts, along with associated macro price and employment data, are the cornerstones of economic policy, business strategy, and of investor and household expectations. These data are used by governments around the world to guide monetary and fiscal policy, develop tax, spending and budget plans, allocate taxes and grants and aid, develop tax incentives, direct trade and investment policies, and monitor and regulate financial markets and contribute to a wide range of other government policies. The macroeconomic data are also used by

businesses and households, along with information about their own businesses, investments, and personal finances, to develop the plans and expectations that form the basis for economic decisions.

6. To be useful to these users, macroeconomic data need to be consistent with the constant stream of other economic indicators that comes to these users on a regular basis, including retail sales, construction spending, profits, employment, wages and salaries, and inflation. These statistics are important in their own right, and are used for many policy and business decisions, as well as inputs for macro statistics. Comprehensive integration begins with the organising framework of the national accounts. Moreover, integration must also encompass harmonising the economic indicators that form the foundation for the national accounts. Macroeconomic statistics also need to be integrated, coherent, and consistent. National accounts were borne out of the Great Depression and developed as a consistent and comprehensive measure of economic activity for policymakers. The need for a consistent and integrated framework for users remains of great importance. The recent financial crisis is an important reminder of the need for integration, and in particular between the real and financial accounts.

7. These user needs for integrated and consistent economic data should remain the foundation for countries plans for developing better integrated and relevant economic accounts and associated economic data. The central role of these users also underlines the importance of ensuring that better integrated accounts should be designed to be consistent with macroeconomic concepts and models, including macroeconomic growth, productivity, and forecasting models used by governments, business, investors, and researchers.

8. The benefits of such integration not only accrue to users of the data. For countries able to redesign collection systems from the "bottom up," the use of common questionnaires, business lists, and definitions improve consistency and reduces respondent burden and statistical agency costs, allowing agencies to better direct their scarce resources to answering users' demands for updating and extending the accounts. Such integration in data collection also facilitates the introduction of consistent, automated edits and other best practices that reduce the likelihood of errors and improve accuracy, while at the same time increasing consistency. For countries more reliant on top-down procedures, the ability to share micro data and reconcile major differences in business lists, and the use of common concepts, definitions, classifications, source data, seasonal adjustments, balancing techniques, extrapolation and other methods can produce large gains in consistency, accuracy, and efficiency.

9. The chapter emphasises the importance of an integrated statistical system based on economic theory and points to the System of National Accounts as a central tool for ensuring that economic statistics are conceptually consistent with economic theory. The SNA also serves as a coordinating framework for economic statistics in at least two other ways. First, it serves as a conceptual framework for assuring the consistency of the definitions and classifications used in different, but related, fields of statistics. Second, it

serves as an accounting framework for ensuring the numerical consistency of data drawn from different sources, such as business indicators, household surveys, merchandise trade, tax and other administrative data. The SNA's double-entry comprehensive framework is a powerful tool for integration, identifying gaps, harmonising concepts, and setting priorities. A former Under Secretary of the U.S. Commerce Department used to describe the national accounts as the "*mine shaft canary of the decentralised U.S. statistical syste*m", and can serve an important role in ensuring consistency and integration in both centralised and decentralised systems.

10. The guidelines on principles and practices from chapter 2 are the following:

- The integration of economic statistics should be mainly driven by users needs for relevant, timely, consistent, and coherent data;
- An integrated system of economic statistics should have a sound foundation in economic theory;
- National accounts, as exemplified by the harmonised System of National Accounts and the Balance of Payments manuals, should be the central organizing framework for integrated accounts, in ensuring consistency with economic theory, consistency in definitions and classifications and in identifying gaps and inconsistencies and setting priorities;
- User needs for the economic indicators that feed into macroeconomic statistics must also be taken into account;
- Integration should be consistent with the conceptual and theoretical models employed by users: macroeconomic forecasting, Total Factor Productivity, and EU KLEMS (EU level analysis of capital (K), labour (L), energy (E), materials (M) and service (S) inputs) models; and
- Outreach to users is essential in identifying the largest benefits to users and developing a strategic plan for integration.

11. The trade-offs between accuracy, timeliness, consistency, coherence, credibility, and relevance have to be considered. Users should also be informed of the trade-offs between developing new macro data series and opportunities for improving the consistency and level of detail in the existing data through common sample frames, definitions, data sharing, and other tools and users need to be consulted about the scope of integration beyond macroeconomic statistics.

12. **Chapter 3** discusses the general guiding principles and building blocks of integrated economic statistics-ranging from integrated data collection systems and the use of harmonised international guidelines to the use of common source data, classifications, seasonal adjustment and other estimation methods, and cross-system coordination. The chapter goes on to discuss the role of national and balance of payments accounts in defining the scope of integration and provides references to UN and UNECE classification systems. The

discussion also encompasses various strategies for achieving integration including centralised data collections systems – with common business registers, questionnaires, and classifications—and the use of common source data, balancing techniques, seasonal adjustment, extrapolation, and other methods. The usefulness of these integration tools within centralised and decentralised systems is discussed. The Chapter includes good practices in integrating economic statistics in case studies: including Agriculture in the national statistical system, integrating monetary and financial statistics in the euro area financial accounts and the SNA 2008 update project.

13. Chapter 3 guidelines include:

- Countries should place a high priority on the goal of harmonised data collections. For highly centralised systems this may mean common business registers and common surveys. For more decentralised systems this may mean sharing micro data to resolve major inconsistencies across business registers, the use of consistent classification systems, and common questions; and
- Countries should also place a high priority on the coordinated use of common source data, definitions, and methods across statistical units to achieve greater consistency and integration for users. Inconsistencies are often driven by historical decisions on source data and methods that are unrelated to accuracy in today's economy or current user needs. In these instances, large gains can be made in consistency through agreement on common definitions, seasonal adjustments, source data, extrapolation, and other techniques.

14. **Chapter 4** discusses strategic issues for integrating economic statistics and provides references to more detailed materials including those from the United Nations, the European Union, the Netherlands, New Zealand and the United Kingdom. The chapter emphasises the need for the development of a set of principles and protocols for integrating statistics which specify the scope of integration and the means for achieving that integration. The adoption of a set of common principles on integration by statistical agencies in a decentralised system and by the functional departments in centralised systems is key step in achieving integration. Successful implementation is more likely where there is support at the highest levels within and across statistical agencies and by user agencies.

15. The chapter provides a practical step-by-step guide for developing a strategic plan for integrating statistics. Special attention is paid to management culture and the need for flexibility in developing integration plans across different types of statistical systems. Useful tips are given regarding advisory committees, memorandums of understandings between users and producers, in providing incentives for integration to producers of existing statistics, and in initiating projects to demonstrate the feasibility and benefits of integration.

16. Chapter 4 guidelines include:

- Statistical agencies should work with users to develop set of principles and protocols for integration;
- Enlisting high level support by users and within the statistical system is critical to successful; integration. Such support is important in obtaining resources, in developing priorities, and in providing incentives to individual statistical units for integration with other units;
- Integration goals and plans need to be integrated with existing strategic plans and balanced against other competing demands for resources including quality standards, updating the statistics, and improving timeliness and relevance;
- Coordinating mechanisms should be evaluated and revised to reflect integration goals. Most countries do not have highly centralised statistical offices, although they do have mechanisms for coordination. Even countries with highly centralised systems should evaluate and revise their coordination mechanisms as appropriate to reflect integration goals and plans; and
- Incentives should be developed to help "sell" integration; monetary authorities, finance ministries, and other key users can play an important role in this process.

17. **Chapter 5** presents the specific tools that countries can use for increasing consistency at each stage in the statistical production process of integrated economic statistics. The discussion and the New Zealand, Canada and Netherlands case studies in this chapter focus on the full range of management tools that can be used to achieve integration in centralised and decentralised systems. The guidelines for this chapter are more numerous and less generic, but the broader principles are as follows:

- Integration should address all stages of the production process from design of the collection system to the compilation and dissemination of data;
- Countries, should however, focus their efforts on those aspects of the process over which they have the most control and which will produce the biggest bang for the buck. Defining this focus will require balancing costs and benefits and will vary across statistical systems, centralised and decentralised; and
- Integration and change in statistical systems requires strong support and clearly defined leadership.

18. This chapter also describes the characteristics and requirements for integration in data collection and processing systems. This detailed chapter discusses understanding the impact of user needs on integrated data collections, the design of integrated data collections, the importance of common terminology and units of measurement, the definition of business units, the essential role of comprehensive and up-to-date business register, the design of questionnaires, integrating administrative with survey data, and tools for data processing and storage than increase integration and consistency.

19. Chapter 5 guidelines include:

National Statistical Offices should focus on four elements in developing their infrastructure and processing environment: consistency, coherence, breadth and depth:

- Consistency requires the use of common concepts, terminology, standards and defining statistical units uniformly;
- Coherence requires that inter-related data should be internally consistent;
- Integrated systems should provide sufficient overall coverage and level of detail to meet user needs for breadth and depth;
- A transparent process is required to evaluate the needs of users and to prioritise them in the statistical system. Priority settings should translate into a medium-term plan. This will assess the capacity to capture new information and to maintain the current statistical system. This will go a long way to explain the direction of the statistical system;
- A strong governance structure is fundamental to the design of an integrated statistical collection system. Adopting measures that will minimise conceptual, classification and statistical issues require a significant amount of coordination;
- National statistical offices should develop a common and comprehensive business register and a means of reconciling multiple business registers, to ensure that all entities can be identified and can be measured in an unduplicated way;
- The application of consistent classifications to appropriately defined statistical units is essential for the coherence of economic statistics;
- Integrated systems require the use of common concepts, definitions and classifications. This will ensure consistency in the content of questionnaires and of the statistics of all programmes of the statistical system;
- The use of administrative data should complement survey-taking activities. Relying exclusively on surveys to increase breadth and depth of the statistical system is costly and imposes a large burden on respondents;
- Clear arrangements should be put in place between the statistical office and administrative authorities, to ensure that statistical needs are considered in designing or changing administrative information collections in a coherent manner within the statistical system;

- Metadata are an important prerequisite in developing an integrated questionnaire/statistical system. The metadata will provide the necessary coherence between the various estimates and tools leading to the production of the statistical information. Metadata should cover concepts, variables and classifications as well as quality;
- National Statistical Offices should put a high priority on developing a system relying on standardised statistical processes with the goal of making optimum use of statistical methodologies and information technology. The goal should be to develop generic tools to process the data and standard approaches to resolve issues at various stages of the production process, recognizing that it could take several years before the system reach a mature stage; and
- A flexible IT infrastructure is critical to adapting to changes in the economy, concepts, methods, and in information technology. This will help optimise operational integration, data coherence, consistency as well as analytical capacity and knowledge retention.

20. Chapter 6 **describes how** good practices and examples on communication demonstrate the practical utility and relevance of enhancing the story the statistics contain for a broad range of users that meets their analytical needs and enables conclusions to be drawn about the quality of the disseminated data. The production of integrated economic statistics is complemented with strong statistical dissemination practices. The IMF's data dissemination initiatives have provided some structure to enhance user capacity to evaluate the comparability of data across datasets within a single country and across countries. Building a nexus to the SDMX initiative and providing capacity building in countries to implement good dissemination practices should be an important part of a future agenda to making integrated economic statistics a reality. The central theme in constructing such an agenda is to keep the focus on users' needs, especially those users involved in economic analysis and policy work.

21. Chapter 6 guidelines include:

- An analytical quality framework will provide good dissemination practices for integrated economic statistics;
- Efficient access to and presentation of data and metadata;
- The use of SDMX to promote the sharing of statistical information; and
- Data warehouses can play an effective role in the integration of economic statistics.

22. **Chapter 7** introduces practical issues related to the compilation of an integrated set of accounts. It begins with national accounts and then discusses more focused accounts such as international accounts, industry accounts, sector accounts, and financial accounts. Regional statistics—relevant for those countries that have well-defined sub-aggregates—are discussed. Finally, other accounts, including satellite accounts—

which may be linked to the core accounts but incorporate alternative definitions and conventions—are also introduced. The discussion focuses on practical compilation problems that might arise during implementation and on potential solutions for both centralised and decentralised systems. Examples from the economic accounts of the Netherlands and the United States are provided.

23. Chapter 7 guidelines include:

- Integration is a desirable goal because it allows for comparisons within the various accounts and across accounts;
- In practice, source data is unlikely to satisfy all purposes and will need to be adjusted and harmonised to support a system of integrated accounts and considerations should be made for the frequency and timeliness of source data;
- Input-output or supply and use tables may be used as the integration framework for economic statistics; input-output accounting may be used to benchmark the core national accounts;
- Industry accounts should be used to provide information about production and the goods and services produced; consistent industry and product classification systems are important;
- International accounts are an important part of any country's economic accounting with the rest of the world. International accounts should be harmonised with the domestic accounts—for both goods and services and financial flows and positions—and, to the extent possible, with the accounts of other countries. Bilateral comparisons, including those conducted under the auspices of the IMF and the OECD can be useful in this regard;
- Regional accounts may be used to provide a detailed view of geographically related portions of the economy. Related economic activity should be localised in an area that is appropriate given the relative ease of labor and capital mobility; and
- Linkages between the core accounts and other accounts—such as labor accounts, monetary statistics, and satellite accounts, that provide additional information on specific areas of interest or an alternative framework for analysing certain aspects of the economy—should be examined to encourage harmonisation to the extent feasible.

Chapter 2. Benefits and principles for the integration of economic statistics

Introduction

1 Integrated economic statistics are comprehensive sets of statistics that use common concepts, definitions, estimation methods, and data sources to produce a consistent and harmonised picture of economic activity for policy, business, investor, household and other users of economic data. Such data provide huge benefits for these users of the data. Integration of economic statistics is about statistical reconciliation and ensuring that the story statistics deliver is consistent and coherent. The motivation for integrated economic statistics is the need for and the benefits of consistent and coherent messages from official statistics in support of formulating, monitoring and evaluating coordinated policy initiatives in an increasing interconnected global economy. This motivation is relevant for all countries independent of the level of development of the national economy. The practices to achieve integration of economic statistics may vary depending on the degree of centralisation or decentralisation of their national statistical system. National statistical systems that are less advanced and complex should take the principles of integration of economic statistics into the design of statistical production at an early stage, while more advanced statistical systems should incorporate the principles in the re-engineering of statistical production process including the institutional arrangements and management culture.

2. It should be recognised that one single and detailed implementation approach towards integrated economic statistics is neither possible nor desirable because national statistical systems are different. There are, however, general guiding principles and good practices that will be set out in this manual. Furthering integration requires a broad and comprehensive system-wide approach dealing with the adoption of one conceptual framework for economic statistics and reviewing the statistical production process including its institutional arrangements and management culture.

3. Integrated economic statistics deliver a consistent and coherent story over time and across countries. These statistics are mainly driven by users in their demand for data consistency and coherence at national and international level.

4. The leading examples of integrated accounts are national and balance of payments accounts. These macro-eceonomic accounts, along with associated macro price and employment data, are the cornerstones of economic policy, business strategy, and of investor and household expectations. These data are used by governments around the world to guide monetary and fiscal policy, develop tax, spending and budget plans, allocate taxes and grants and aid, develop tax incentives, direct trade and investment policies, and monitor and regulate financial markets and contribute to a wide range of other government policies. The macroeconomic data are also used by businesses and households, along with information about their own

businesses, investments, and personal finances, to develop the plans and expectations that form the basis for economic decisions.

5. To be useful to these users, macroeconomic data need to be consistent with the constant stream of other economic indicators that comes to these users on a regular basis, including retail sales, construction spending, profits, employment, wages and salaries, and inflation. These statistics are important in their own right, and are used for many policy and business decisions, as well as inputs for macro statistics. Comprehensive integration begins with the organising framework of the national accounts. Moreover, integration must also encompass harmonising the economic indicators that form the foundation for the national accounts. Macroeconomic statistics also need to be integrated, coherent, and consistent. National accounts were borne out of the Great Depression and developed as a consistent and comprehensive measure of economic activity for policymakers. The need for a consistent and integrated framework for users remains of great importance. The recent financial crisis is an important reminder of the need for integration, and in particular between the real and financial accounts.

6. These user needs for integrated and consistent economic data should remain the foundation for countries plans for developing better integrated and relevant economic accounts and associated economic data. The central role of these users also underlines the importance of ensuring that better integrated accounts should be designed to be consistent with macroeconomic concepts and models, including macroeconomic growth, productivity, and forecasting models used by governments, business, investors, and researchers.

7. The benefits of such integration not only accrue to users of the data. For countries able to redesign collection systems from the "bottom up," the use of common questionnaires, business lists, and definitions improve consistency and reduces respondent burden and statistical agency costs, allowing agencies to better direct their scarce resources to answering users' demands for updating and extending the accounts. Such integration in data collection also facilitates the introduction of consistent, automated edits and other best practices that reduce the likelihood of errors and improve accuracy, while at the same time increasing consistency. For countries more reliant on top-down procedures, the ability to share micro data and reconcile major differences in business lists, and the use of common concepts, definitions, classifications, source data, seasonal adjustments, balancing techniques, extrapolation and other methods can produce large gains in consistency, accuracy, and efficiency.

8. This chapter emphasises the importance of an integrated statistical system based on economic theory and points to the System of National Accounts as a central tool for ensuring that economic statistics are conceptually consistent with economic theory. The SNA also serves as a coordinating framework for economic statistics in at least two other ways. First, it serves as a conceptual framework for assuring the consistency of the definitions and classifications used in different, but related, fields of statistics. Second, it

serves as an accounting framework for ensuring the numerical consistency of data drawn from different sources, such as business indicators, household surveys, merchandise trade, tax and other administrative data. The SNA's double-entry comprehensive framework is a powerful tool for integration, identifying gaps, harmonising concepts, and setting priorities. A former Under Secretary of the U.S. Commerce Department used to describe the national accounts as the "*mine shaft canary of the decentralised U.S. statistical syste*m", and can serve an important role in ensuring consistency and integration in both centralised and decentralised systems.

Benefits of integrated economic statistics

9. There are many good reasons to treat the different domains of economic statistics not only as meaningful statistics in their own right, but also as interrelated set of statistics of which the component data are mutually consistent and coherent. At any point in time, users expect the statistical information on a particular aspect of segment of the economy to relate to a broader context, namely the overall economy. Moreover, consistency and coherence of statistical time series should be delivered throughout the business cycle, albeit with increasing details, ranging from early estimates to structural statistics. Any shortcomings in providing the consistent and coherent information users require may lead to misinterpretations and policy mistakes that could be costly for the economy in terms of output, employment and price stability, as well as financial and monetary objectives.

10. Integrated economic statistics bring many benefits for data users, producers and providers such as:

- A common conceptual framework that governs the statistical production and interpretation of aggregate and component data over time and across countries;
- Mutually reinforcing stories and the descriptions of the sequence of events that are obtained from statistical data;
- Statistical production processes of collection compilation and dissemination that are integrated, including their institutional arrangements and management, and are explained in a transparent manner to the data user and data provider;
- The integration of the data collection procedures that reduce response burden on respondents;
- The release of consistent and coherent set of macroeconomic and component data that are obtained through data aggregation of the disparate sets of detailed short term, annual and benchmark component data in national accounts aggregates;
- Collections and releases of data that are linked to legal mandates and user interactions are established through advisory committees; and
- Management culture that uses a strategic framework and is based on a system wide consultative process.

11. The integration of economic statistics also comes at a cost. Resources have to be invested in harmonising the concepts and definitions to internationally agreed statistical standards and in re-engineering statistical production processes including changing the institutional arrangements and management culture. A strategic analysis of the benefits and cost is paramount before embarking on an integration program. This cost-benefit analysis should go through a system wide consultation taking into account the interest of data users, data providers and data producers. A vision should be formulated to govern the reform program, in which the objectives and outcomes of integration are defined and prioritised. The implementation program should be appropriately phased taking into account the country's institutional arrangements and human and financial resources. Critical to the integration of economic statistics are the elements of conceptual framework and statistical production, including its institutional arrangements and management culture.

Policy and other user requirements for integrated economic statistics

12. Monetary, fiscal, and other policy needs integrated economic statistics to provide a clear consistent and comprehensive picture of economic activity. Resolution of inconsistencies allows policymakers to more clearly focus on the appropriate policy rather than trying to determine the "true" state of the economy including the sources of growth or weakness in the economy in order to best target their efforts. Internationally coordinated monetary, regulatory, and trade policy requires consistent and comparable data on the state of the economy across countries and regions. Consistent estimates of income and population are essential to public trust in the fair and equitable allocation of funds across regions by Federal governments. Businesses, investors, and planners require a consistent picture of growth across industries, products, and regions.

13. All of these users require that a coherent message be communicated from Statisticians. The message writer should know the story and the sources of data. These messages should comply with the criteria of accuracy and consistency, data quality, reality and comparability across countries. Their main preference is for a coherent message during a business cycle. Users prefer to assess "signals" on economic, financial and monetary phenomena which are first given by short-term statistics and subsequently within the release of quarterly and annual national accounts.

14. The framework within which statistics are aggregated, adjusted, revised and released allow Users to identify new financial flows, prices and economic production and productivity as major inputs to their economic and monetary analysis. Policy and other decision makers require such a framework because it allows a disaggregation of macroeconomic developments by institutional sectors and a detailed analysis of the interactions among institutional sectors and between them and the rest of the world.

15. There are other specific benefits in the analysis of integrated economic statistics which include: i) an explicit and transparent revisions policy in which major revisions are coordinated globally, ii) harmonised

methods and practices for seasonal adjustment for short-term statistics and quarterly national accounts, iii) consistency in summing monthly and quarterly data to annual data, iv) the elimination of inconsistencies in the balancing process and v) a sufficient length of time series which should cover at least one or two business cycles for the main aggregates.

16. The benefits to Users, therefore, include consistency:

- Between business indicators and macroeconomic accounts;
- Across geography, industries, products, and sectors;
- Over time and across countries;
- Between financial and non-financial statistics; in data methodology by following international statistical standards;
- In the conceptual and numerical linkage of accounts;
- In summing monthly and quarterly data to annual data; and
- The elimination of inconsistencies in the balancing process

17. This framework allows not only an assessment of the quality of high-frequency data, but also an assessment of the impact of innovation, including financial intermediation, within the economy and an assessment of substitution in financing sources within complex markets. Moreover, integrated accounts provide a significant amount of new data, predominantly data relating to the non-financial transactions of the non-financial corporations and household sectors, as well as complete information on the asset side of these sectors in the financial accounts.

18. The framework of integrated economic statistics offers a comprehensive view of the economy and analysis of the financial and non-financial transactions by sectors of the economy. These statistics can enhance policy analysis and enrich economic analysis and provide a framework to analyse macro-prudential issues. The benefits lie, moreover, in a comprehensive set of data and indicators which are available – at a higher frequency - in one single framework.

19. Integrated economic statistics are of key importance for ensuring that the correct monetary, fiscal and other policy decisions are taken. In monetary policy, for example, this framework covers a bank-based system of financial intermediation and provides information on the financial structure of the economy, as well as providing monetary variables (the financial investment of the money-holding sectors and the liquidity of the non-financial sectors and their sources of funds) and a summary view of financial markets including credit conditions and prices. Policy mistakes due to incomplete or unreliable statistical basis can be very costly for the economy in terms of price stability, output and employment.

20. Successful economic policy depends on having good integrated economic statistics about the whole economy - statistics on manufacturing and services - to observe key macroeconomic variables such as aggregate demand and capital formation and to identify the importance of sectors of the economy in responding to structural changes.

21. The recent financial crisis has highlighted the importance of bridging banks' balance sheet behavior in funding and financing and the interaction of financial transactions and real variables and asset prices, which allows a more detailed economic analysis which draws on the consistent framework of economic sectors. Integrated economic statistics allows the identification of risks and vulnerabilities in the various sectors of the economy (for example, the health of the non-financial, household and financial sector balance sheets can act as a possible constraint on borrowing and lending as well as agents' capacity to spend) and in the linkages (in financial exposures) between economic sectors of the economy. It provides also macro-economic indicators on corporate borrowing, profitability, household wealth and savings and leverage ratios and estimates of debt service burden.

22. Over time, the process of integrating economic statistics has been driven by user needs for a comprehensive and consistent statistical framework for analyzing changes in production, consumption and accumulation. For instance, for the analysis of growth in the real economy, it provides a consistent data set for output, productivity, inflation and incomes. Integrated statistics enable observation of key variables and their responses to changes in policy and to changes in the structure of the economy. National Accounts offer a comprehensive framework for policy analysis by providing consistent information that forces policy makers to examine the impact of changes on all aspects of the economy in a multiple entry set of accounts. Through the interrelationships, it allows for the analysis of changes in the real and financial economy and their relative magnitudes of the impact on different sectors of the economy. For example, national accounts can help assess a given policy change on growth by examining its impact on the determinants of growth (labor, capital, energy, and materials, and in an extended system human capital, and natural resources), its impacts on specific goods and services producing industries, its impact on consumption and accumulation, its effects across regions of the country and effects on size classes of enterprises and ownership.

23. Absent the accounts and the normative umbrella function of the national accounts for other economic, financial and monetary statistics, policy makers would be adrift in a sea of disorganised and sometimes contradictory data. "The GDP and related data are like beacons that help policymakers steer the economy toward the key economic objectives.[1]"

[1] Samuelson and Nordhaus, Economics, 15th edition, Chapter 22, p402.

Conceptual framework for principles of integration of economic statistics

24. The starting point for integrated economic statistics is the use of the internationally accepted standard for macroeconomic accounts, the System of National Accounts 2008 (2008 SNA) as the overarching conceptual framework. The use of the 2008 SNA as the conceptual framework implies that by extension integrated economic statistics are consistent and coherent with other internationally accepted standards and international recommendations like the Balance of Payments Manual, 6th Edition (BPM6) and other specialised manuals ranging from international classifications, the measurement of sector statistics (e.g. industry, distributive trade, etc.) and prices to the measurement of foreign direct investment. This mutual consistency and coherence between the internationally accepted standards and international recommendations are the outcome of the harmonisation efforts by the international statistical community. Building upon international standards manuals renders policy-relevant and integrated micro and macro data that is consistent and coherent within countries, over time, and across countries.

25. Using the 2008 SNA as the comprehensive conceptual framework allows for statistical reconciliation. This statistical reconciliation covers basic statistics from primary and secondary sources and macroeconomic accounts, short term and structural statistics, national and international statistics. Using national accounts concepts and methods produce a coherent and consistent description of the economic activity at different levels of aggregation. In national accounts, the task of statistical reconciliation is fundamental to ensuring that the macroeconomic story told is comprehensive, consistent and coherent. Moreover, reconciling primary and secondary data sources for their own purpose, will allow the short term and structural component data of the national accounts to tell a complementary story on a certain aspect of the economy based on most accurate, consistent and timely statistics. National accounts statistics are possible because of the availability of a wide variety of data sources from public data collected from economic surveys to administrative and private sector data that is needed to provide comprehensive detail on numerous aspects of the economy that is just not measurable using one type of data source.

26. National accounts framework is based on the fundamentals of economic theory and used to support macroeconomic policies and a range of policies such as those related to employment, inflation, international trade, money and finance. Among the various theoretical models employed by the users, the national accounts support the understanding and forecasting of the determinants of growth and productivity of the economy by providing a consistent and coherent data set for output, prices, inputs of material and services, energy use and labor and capital as factors of production. Similarly, national accounts and the properties of their component data support the monitoring and prediction of turning points of the level, the change and the growth of the aggregate economic activity in the business cycle. Users prefer to obtain signals on economic, financial and monetary phenomena that give a coherent story during a business cycle. These signals are first

given by a coherent set of short-term statistics and subsequently by the release of quarterly and annual national accounts.

27. The national accounts framework do not allow only consistent and coherent short term and annual statistics for macroeconomic aggregates including quarterly and annual national accounts for the real sector. It also renders integrated economic accounts, which provide an integrated presentation of macroeconomic aggregates relating the financial, government, non-financial, and household sectors of the economy, and their relationship with the external sector. This integrated presentation is of key importance for ensuring that the policy decisions are taken by bringing the whole economy into view. A presentation that allows observing key macroeconomic aggregated from the real and financial economy by integrating component data on portfolio behavior in funding and financing of the real economy.

28. Integrated economic statistics are also of use in financial stability analysis. This allows the identification of risks and vulnerabilities in the various sectors of the economy (for example, the impact of the health of the non-financial, household and financial sector balance sheets on overall borrowing and lending as well as sectors' capacity to produce and spend) and in the linkages (in financial exposures) between economic sectors of the economy. These macroeconomic and sectoral data allow for key macroeconomic indicators to be derived on corporate borrowing, profitability, household wealth and savings, leverage ratios and estimates of debt service burden.

The integrated statistical production, including its institutional arrangements and management culture

29. Inconsistencies and incoherence of data are caused by a lack of a common set of concepts, definitions and classifications based on international acceptable standards. This statistical deficiency is mainly cause by the separate and independent operations of department responsible for a subset national data. At the early stages of statistical development it is not uncommon to produce uncoordinated set of national and sub-national data. Moreover, progressively over time the users will demand a consistent and coherent set of national accounts and component data on the diverse aspects of the economy. It is only a matter of time that a common glossary of terms and definitions are introduced with the increasing alignment with the internationally accepted standards for the different domains of economic statistics.

30. The application of consistent classifications to appropriately defined statistical units is essential for the coherence of economic statistics. The challenge lies in ensuring that statistical units and their classifications are applied consistently across all statistical measures. One way to ensure consistency of units and classifications is to use a comprehensive business register as the vehicle for structuring units and assigning their classifications. If all survey populations are drawn from the business register and all administrative data are matched to it, all data records can take the classifications that they have already had assigned to them on

the business register. That ensures that information from different data sources is classified consistently and the problem of a statistical units being classified differently in different surveys is avoided.

31. Another major cause of incoherence among economic statistics is that collections of basic data through surveys and administrative sources for different industries or activities are designed independently of each other. The traditional approach to the collection of economic statistics has been to cover different topics and industries in a rolling programme of surveys and censuses spread over several years. The resulting inconsistencies in survey and questionnaire designs can make the integration of economic statistics difficult. The integration of economic statistics creates pressure for all economic data collections to change the objectives of statistical design and development. The objective of accurately measuring the industry or sector remains, but an equally important objective is designing statistics that are consistent with those for other industries and sectors. When designing a collection for a particular industry, it should be considered how it will integrate with other statistical outputs. For example, questionnaires cannot be designed in isolation but must use concepts, definitions and classifications that are used in other economic surveys and administrative collections.

32. Integrated statistical production can be described in summary by its components or building blocks in terms of the recommended use of common definitions and classifications; the use of statistical registers and frames,; the introduction of integrated survey and sampling design and the reliance of administrative source data; the application of statistical integration frameworks and the techniques linking the macroeconomic and component data; and the communication for and dissemination of a coherent set of macroeconomic and component data. This integrated statistical production is governed by the institutional arrangements to the principles of official statistics and supported by a modern IT infrastructure; and led by a system-wide management culture for integrated economic statistics for the national statistical system covering human resource management and training, management of IT and financial resources, and management of quality of statistics.

33. Following the presentation of the benefits in combination with the conceptual framework of the 2008 SNA and building blocks of the statistical production of integration of economic statistics, the following three principles of integration of economic statistics can be formulated:

- The use of the internationally accepted international standard, the 2008SNA as the overarching conceptual framework for economic statistics;
- The promotion of an integrated data collection for the source data; and
- The release of an integrated set of macroeconomic and detailed component data for evidence-based policy and decision making.

Benefits of achieving integration in the economic statistics production process

34. Integration provides a more credible comparison of sectoral data with the total economy, coherence between macro and micro economic statistics, a better understanding of the relationship of aggregate and detailed levels across space and time. Harmonization of concepts for macro and micro data can reduce duplicate requests for similar information, reduce confusion and misreporting, reduce respondent burden, reduce survey costs, and improve the accuracy and consistency of information presented to users. Moreover, the coherence of sub annual and annual statistics is essential for planners and policymakers. The following case studies for the euro area and the United States provide illustrative examples.

35. Harmonisation of sample frames, collections, and estimating methods help produce consistency between macro data and the input data collected at the micro level. This consistency is important for integrated micro and macro business decisions and economic policy. The micro statistics are of importance in their own right, and used for many policy and business decisions, as well as inputs for macro statistics.

36. Effective integration exploits the role of macroeconomic accounts, using them as a double-entry accounting system for identifying discrepancies; providing a statistical framework for their resolution in a manner that both increases accuracy and consistency. Basic statistics that can be balanced in this framework include employment, prices, production, consumption and accumulation, etc, which feed into national accounts. Harmonisation can produce efficiency gains throughout the stages of the statistical production process from collection through dissemination.

Case study 1: A core set of consistent and timely economic statistics: integrated economic accounts for the euro area

1. The euro area accounts are based on, but are not the simple sum of the national accounts of the concerned European Union Member States and the data conform to accounting conventions, international standards and integration techniques. The Euro Area Accounts are integrated in three dimensions. First, total uses equal total resources, or total financial assets equal total liabilities, for each (non-financial or financial) transaction category and each financial balance sheet category, when summed over all institutional sectors and the rest of the world (horizontal consistency). Second, for each sector and the rest of the world, the balance of all current and capital transactions is equal to the balance of all financial transactions (vertical consistency). Third, the change in financial balance sheets is for each financial asset category equal to the financial flows (stock-flow consistency).

2. The integrated accounting framework in the compilation and the integration of "building blocks" and national source data offers valuable opportunities for: i) identifying weaknesses and inconsistencies in the source data, ii) improving their quality over time and iii) improving user understanding for their analytical purposes. The Euro Area Accounts present and reconcile in one consistent framework different data sources of euro area statistics.

3. Euro Area Accounts can be considered as "national accounts" for the euro area; this process is consistent with the derivation of one GDP estimate and its breakdowns from the underlying source data. The result is the most reliable and consistent representation of the development of the economy as a whole. They link financial and non-financial statistics, thereby allowing for an integrated analysis of non-financial economic activities (such as gross fixed capital formation) and financial transactions (such as the issuance of debt). The euro area accounts also contain consistent financial balance sheets, with the result that quarterly changes in the financial wealth of each euro area sector can now be integrated into business cycle analysis. By recording all "transactions" between economic agents grouped by sector, they allow for a comprehensive analysis of the interrelationships among the different sectors of the economy (households, non-financial corporations, financial corporations and government) and between these sectors and the rest of the world. They thus provide a coherent description of economic developments at the sector level, provide structural information on the European economy and give a better insight into the business cycle.

Case Study 2. Negative effects of lack of integration: U.S. Great Depression

1. By 1932, the Great Depression in the United States had been deepening for over two long years. This crisis, which is commonly dated from the 1929 stock market collapse in the U.S. quickly spread overseas with banking failures and financial crises followed by the collapse of production and international trade around the world. It was clear that the economy was collapsing, but policymakers had no comprehensive or consistent view of what was happening to total output and employment in the economy and what was happening in specific sectors outside of manufacturing, mining, and agriculture, or to the overall stock of assets and credit. In short, policy makers at the time found themselves in the middle of an economic crisis with few consistent or comprehensive tools to guide their policy: "One reads with dismay of Presidents Hoover and then Roosevelt designing policies to combat the Great Depression of the 1930's on the basis of such sketchy data as stock price indices, and incomplete indices of industrial production. The fact was that comprehensive measures of national income and output did not exist at the time". The Depression, and with it the growing role of government in the economy, emphasised the need for such measures and lead to the development of a set of comprehensive national income accounts (Froyen, 2005).

2. To address the issue of incomplete economic indicators during this time, a resolution was introduced in the U.S. Senate that stipulated that the Secretary of Commerce report statistics on the economy wide income of the U.S. from 1929-1931. In 1934, the Commerce Department and under the direction of Simon Kuznets delivered a report National Income, 1929-1932 to the Congress. This report marked the first official Federal report on National Income (Duncan, 1978). From then on more integrated and comprehensive measures of economic activity continued to be developed.

3. Some years later, parallel development of national accounts was taking place in Great Britain by Sir Richard Stone as World War II planning needs intensified. As a staff member of the Central Economic Information Service of the Offices of the War Cabinet and under the advisory of John Maynard Kaynes, he and James Meade completed a set of national income and expenditure estimates. While the U.S. and Canada had for some time been producing detailed estimates of national income and expenditures they were not yet in the balanced framework presented in the work of Sir Richard Stone. At the core of Sir Richard's balanced framework was the goal of full integration of economic statistics. "Stone's ideas on the design of national accounts were from the beginning aimed at full integration of national accounts for the various sub-sectors which between them represented the entire national management of resources." Stone expanded his notion of integrated and balance accounts to an international level as he went on to father the development of the most of the most recognised and implemented tool in harmonizing economic statistics, the System of National accounts.

4. Today, GDP, and a host of other economic indicators are key inputs into the nation's economic decision-making. The U.S. national accounts, GDP and other data are the baseline for U.S. Federal Reserve Board projections and monetary policy. From a great economic crisis grew a need to create, expand and integrate economic statistics to provide a comprehensive picture of economy and its actors. Further integration with other parts of the real economy will only continue to add focus and detail to that picture of economic relationships.

Chapter 3. General guiding principles and building blocks of integrated economic statistics

The adoption of a set of guiding principles regarding integration for all statistical agencies in a decentralised system, and all functional departments in a centralised one, is an important step for a statistical office. It can form the basis for a policy of integrating economic statistics, if the principles go hand in hand with a set of guidelines and policies, or protocols, for their implementation. A protocol sets out the procedures they should follow in order to achieve statistical integration. The advantage of a code of practice is a clear set of rulings that functional departments and agencies can refer to in order to support moves towards integration. Important to the successful adoption of the principles and its protocol is its high-level endorsement and the mechanisms to assess and ensure implementation. Responsibility should lie with the chief statistician or an independent statistical council, and have as its authority the explicit confirmation of a legislative enactment. Other desirable dimensions include user needs, impartiality, objectivity, integrity, sound methods and assured quality, confidentiality, proportionate burden, resources, frankness and accessibility.[2] If principles and protocols are developed to meet multiple needs, integration can compete with the needs of these other principles and protocols, though there will be some commonality. If a new general code of practice regarding the integration of economic statistics is adopted for the statistical office, such a code should be the responsibility of the chief statistician or independent statistical council, and have as its authority the explicit confirmation of the prime minister or a legislative enactment. The originating document may encompass fundamental principles to include relevance, integrity, quality, accessibility, protecting confidentiality, balancing the needs of users against the burden on providers, enhancement through integration, accumulation and innovation, efficiency in costs, fairness in dissemination, but should also include the mechanisms for attaining such aims.

Scope of integration and selected domains as primary targets for integration

1. One of the main reasons to treat the different domains of economic statistics not only as statistics in their own right, but rather as interrelated statistics is that they can form a consistent and coherent statistical information system. Another important reason is that users demand such an integrated approach. At any point in time, users expect statistical information on a particular segment of the economy that fits into the broader context of the overall economy. Moreover, users expect the statistical information delivered over the business cycle to be consistent and increasingly detailed. Any shortcomings in providing such consistent and coherent information may lead to misinterpretations and policy mistakes that can be costly for the economy, in terms of output, employment, price stability, as well as financial and monetary objectives. These requirements call for a coherent, integrated statistical information system for which the scope and domains targeted by integration need to be outlined and selected.

[2] These are the eight principles adopted by The UK Statistics Authority (2009).

2. Integrating economic statistics is about statistical reconciliation of the various primary statistics on production, trade, labour, consumption, etc. before they enter the macroeconomic accounts such as national accounts and balance of payments. While countries will take the ultimate decision to select from the various domains of statistics those they wish to consider as primary targets for integration, it is desirable that this should be done on a broad basis of economic and related statistics. The targeted domains might include the economic source data used in the national accounts, for example business, sectoral, prices, labor, consumption and income statistics and, extending to domain areas such as statistics of the environment with the link to economic statistics (for further details, please see Annex 2.).

3. These guidelines present a concept of integrated economic statistics that is already embedded in the *Classification of International Statistical Activities*[3]. This document includes a listing of domains that provides a structured presentation of a broad type of statistical activities and subject areas. It classifies statistical activities aimed at collecting, processing and disseminating data, developing standards and covering strategic and managerial issues in official statistics.

4. The Classification of International Statistical Activities organises the broad types of statistical activities in five statistical domains. Domains 1-3 constitute subject areas dealing with the outputs of the statistical process. Domains 4 and 5 cover substantive issues that are more process and organization-oriented and also deal with the managerial aspects of official statistics.

5. The three main areas that constitute statistical domains are 1. Demographic and social statistics; 2. Economic statistics; and 3. Environment and multi-domain statistics.

6. Regarding the scope of integration, among the subject areas of statistical activities these guidelines concern primarily with the following statistical domains in the context of describing the implementation of the integrated economic statistics process.

1. Demographic and social statistics

   1.2 Labour

   1.5 Income and consumption

2. Economic statistics

   2.1 Macroeconomic statistics

   2.2 Economic accounts

   2.3 Business statistics

   2.4 Sectoral statistics

[3] (Conference of European Statisticians document ECE/CES/BUR/2005/5, Annex 2, 26 September 2005 version

2.4.1 Agriculture, forestry, fisheries

2.4.2 Energy

2.4.3 Mining, manufacturing, construction

2.4.4 Transport

2.4.5 Tourism

2.4.6 Banking, insurance, financial statistics

2.5 Government finance, fiscal and public sector statistics

2.6 International trade and balance of payments

2.7 Prices

2.8 Labour costs

2.9 Science and technology

3. Environment and multi-domain statistics

3.1 Environment

7. Unlike the domains on social statistics, economic statistics or environment statistics (domains1-3), which focus on statistical outputs and their conceptual basis, Domain 4 *Methodology of data collection, processing, dissemination and analysis* covers activities that focus on the various processes that ultimately lead to statistical outputs. It covers cross-functional methodology and activities that are used for producing official statistics. The activities under this domain are described among the components of the integrated statistical production process such as common concepts and metadata, classifications, business registers and frames, surveys, use of administrative sources, dissemination and communication.

8. Domain 5 *Strategic and managerial issues of official statistics* covers areas that address institutional and managerial concerns, dealing with the organisational side of national and international statistical agencies. It includes the management, coordination of the statistical system, including relationship with users, organisation of the statistical office, promotion of official statistics, setting up national statistical programmes, dealing with capacity building, human resources management and training. Moreover, it extends to quality management and the management of ICT for statistical offices. The activities under this domain are reflected and described among the components of the integrated statistical production process such as institutional arrangements and management culture.

9. A selected list of statistical domains originating from the document Classification of International Statistical Activities that deserve the most attention in the context of these guidelines is presented in the

Annex. These are the domains that can be related to the main building blocks of the integrated statistical production process. Case study 1 “Integrating agriculture into the national statistical system” underlines the selection of agriculture among the domains of economic statistics to be considered as primary target for integration. Case study 2 “Integration of of monetary financial statistics in the euro area financial accounts” provides a regional example of the integrated production process.

Main building blocks of integration

10. The integration of economic statistics covers all aspects of the statistical production process based on the fundamentals of a modern national statistical system and IT environment. There are a wide range of institutional, statistical, strategic and managerial building blocks of integration, each contributing to and increasing the consistency of economic statistics. The building blocks for the national statistical system range from adapting the institutional and legal arrangements to the principles of official statistics, introducing a system-wide management culture of integration for the statistical system, and adopting a modern IT environment. The statistical production process further include the blocks of the use of recommended methods for data collection, processing and dissemination through common concepts, metadata, classifications, data editing and data exchanges; the use of registers and frames; the introduction of integrated survey and sampling design, the reliance on administrative data sources; the application of statistical integration frameworks and techniques for the compilation of coherent sectoral and macroeconomic statistics; and common integrated dissemination procedures.

Institutional arrangements

11. The institutional setting has an important role to play in the building blocks of the integrated statistical production process. The functions and responsibilities of the lead statistical agency in the country can be carried out more efficiently if it is supported in this role by institutional arrangements such as advisory committees, relationship meetings, memorandums of understanding, service level agreements and through technical cooperation.

12. Institutional arrangements are essential for the management of integrated economic statistics. In every statistical system, statistics are produced outside the national statistical organization, by government departments and other administrative agencies. Those statistics have to be integrated with the statistics produced by the national statistical organization. Moreover, as the use of administrative data increases, arrangements are necessary to ensure that data from sources such as administrative data are collected in a way that is consistent with the need of the statisticians. Multi-sectoral statistical coordination and strategic planning help to establish in the national statistical system formalised institutional arrangements to delegate responsibility from collection to data exchange, to compilation and dissemination for an efficient statistical programme. The institutional, organisational and legal conditions of the various countries can be very

different. These various conditions may be reflected in different legislative frameworks and codes of practice. Countries with different conditions will adopt national frameworks for statistical integration suitable for their individual circumstances. Due to their different institutional arrangements countries with centralised and decentralised statistical systems may face different challenges in developing their approach to the modalities of implementation.

Countries with centralised systems

13. A national statistical service is referred to as centralised if the management and operations of the statistical programmes are predominantly the responsibility of a single autonomous government agency. The advantage of a centralised national statistical service, from the point of view of statistical outputs, is that it usually is better equipped than a decentralised system to plan and to implement the integration of economic statistics. Centralisation makes it easier to develop and implement uniform standards, definitions, classifications, and set up and maintain the production process framework. Countries with centralised systems have a greater ability to apply consistent designs to al statistical inputs because they have greater control over statistical designs. In view of the growing awareness that policies and programmes of various government departments are interdependent, both macroeconomic analysis and many kinds of socio-demographic analysis require a system of statistics in which concepts and classifications are not only precisely defined and standardised, but harmonised, with exact relationships established between many of the definitions. As a further advantage, statistical outputs obtained through integration have substantive importance for economic analysis.

14. It should be noted, however, that a centralised system offers no guarantees for successful integration. A centralized service may have a disadvantage if it does not have an appropriate organizational set-up, strong and able leadership and institutional arrangements for the implementation of integrating economic statistics. Moreover, countries with centralised systems will not have perfectly coherent data and they will need to use the same analytical and balancing tools during the compilation phase to maximise the coherence of their statistics.

Countries with decentralised systems

15. A national statistical service is commonly referred to as decentralised if the statistical programmes are managed and operated under the authority of several government departments. Under this arrangement, a particular agency is usually charged with the responsibility of coordinating the statistical activities of the various departments. One of the advantages that countries with decentralised systems can benefit from integrated economic statistics is that the various organisations responsible at the domains involved where the data are collected have specialised expertise that can facilitate and increase the efficiency of integration.

Countries with a decentralised system may focus more in achieving coherence in the compilation stage because they have greater control over those processes.

16. The outputs of a decentralised service with a strong coordinating agency can be more efficient than that of a centralised system's institution. In a strongly led decentralised service there would be awareness of the need for maintaining contacts designed to influence, coordinate and harmonise the outputs of the various autonomous departments and to exercise leadership to counteract the departments to go their own way. The institution with decentralised system may have stronger, better arranged institutional contacts in place with its data suppliers than an institution in a centralised system which may rely on its established network of institutional arrangements.

17. Countries with a decentralised system may need to put more effort into the compilation stage to achieve coherence. Coordination among the decentralised institutions is needed to overcome inconsistencies of their classifications. They also need to detect and to eliminate a lack of coherency between concepts. Countries with decentralised systems also need to work with their data suppliers to improve consistency between input series, even if it means they have less ability to control the design process; they must manage what they can control and try to influence what they can not control.

Centralisation versus decentralisation

18. Centralisation and decentralisation are the subjects of intensive discussion in the statistical community. Some of the characteristics of the two systems are relevant in the context of statistical integration. Integration can be successfully achieved in countries with centralised or with decentralised systems. Certain conditions may help the implementation of integration in some countries with different institutional arrangements. For example, strong powers of coordination at the centre of the system support the integration of statistics. If the office in charge of coordination is backed by the legal power to apply the tools of project implementation, its capacity to coordinate is correspondingly greater than that of an office lacking such powers.

19. Whether the institutional arrangements are centralised or decentralised, policy analysts and decision makers, particularly in the more specialised activities, must feel they can involve statisticians directly in their quest for more relevant and reliable quantitative information. Physical proximity to policy analysts in decentralized systems can be important to statisticians in determining policy needs. Moreover, examples exist of centralised systems that are responsive to the policy requirements.

Management culture

20. Integration should be consciously introduced in the management culture of the statistical system, and consistently implemented from the start of the statistical production process. An organisational culture needs to adapt integration in all phases of the statistical production process. This requires a vision and strategic planning on the part of the management for setting up a flexible and adaptable integrated statistical system.

21. It is useful to have a multi-year strategic plan for the implementation of the integrated statistical production process to ensure the success and stability of the long-term programme. The funding aspect is also critical for the managers of the integration project. To build constituencies and managing advocacy activities to generate support has to be on their agenda.

22. High-level management support is crucial for adopting integration as an objective for the statistical system as a whole. It demonstrates the level of commitment and will increase the willingness of management teams at all levels in the rest of the organisation for cooperation and implementation of the changes in accordance with the initiatives related to the integrated economic statistics programme.

23. Senior managers need to create and promote a management culture by mobilising agency-wide support for the new and high-priority task of integration and ensuring contributions of the stakeholders. As part of building a strong system of management culture of values, norms and shared beliefs, senior management should manage labour-management relations, human resources, issues of recruitment of professionals, provision of training to all classes of staff, development of training material and a range of related issues.

24. Managers of statistical organisations increasingly rely on the application of quality assessment frameworks and the use of quality management tools for monitoring quality and performance indicators. Because the quality of official statistics is a central concern of the national statistical organisation, setting up and maintaining an efficient quality assessment framework has clear benefits for the statistical system.

25. Another area where long-term management support and commitment for change is indispensable is the development of information technology resources. It includes developing an ICT infrastructure and ICT strategies for the statistical system that becomes part of the integrated statistical production process.

Common concepts, definitions and classifications

26. It is crucial for integration to apply uniform terminology and definitions. The use of harmonised terminology, definitions, concepts, standards and classifications is necessary in a national statistical system so that the various data collections are comparable and can be related to each other. In all phases of the integrated statistical production process, common concepts are recommended. To ensure the use of consistent terminology and definitions, statistical agencies should establish a terminology management strategy to reduce in the different areas in the organisation the use of inconsistent terminology applied in questionnaires and in dissemination. For this purpose, the appropriate tools, including thesaurus, glossary of concepts should be developed and adopted across the organisation. The glossaries, as a minimum, should contain a concept label, definition, detailed source information and related terms.

27. Inconsistent terminology is a major source of such inaccuracies when databases and publications may contain different definitions for the same concept which cause misunderstandings and misinterpretations. Recognising the negative impact of having ambiguous and unclear terminology, the national statistical

organisations and international agencies have developed common concepts, definitions based on statistical standards and have compiled glossaries, to promote the collection and dissemination of consistent and comparable statistics.

28. Integrated statistics obtained through the use of harmonised classification devices are immensely more powerful than statistics collected without harmonisation. Harmonisation has been achieved, for example, through coordination of standards such as the North American Industry Classification System (NAICS). It should be noted that integration is a broader concept than harmonisation as it goes beyond harmonising classifications or standards. The harmonisation of standards is only one dimension of integration.

Business registers and frames

29. Business registers have a central role in integrated economic statistics in providing a central sampling frame for all business surveys. The establishment of such a register is essential for the full co-ordination of source data that use the same basic information about business units. Countries with a high proportion of small and micro enterprises complement the business register with non-overlapping area frames based on agricultural, economic and population censuses. The central frame, consisting of a business register and, where applicable, in combination with area frames, represents the backbone of the collection processes of source data that interface with businesses through direct profiling, surveys, feedbacks and use of administrative records. The central frame contains data about the firms, name, address, and a code identifying activity, variables about size and information about the life cycle of the firm. For operational reasons, a unique identifier should be assigned to each entity in the central register. Ideally, this identifier should be selected taking into consideration the business number used by the administrative authorities to ensure that administrative data are correctly applied to the various entities on the register.

30. The creation of a unified, comprehensive statistical register is the medium-term objective. Common universe for sampling and consistent classification of firms promote consistency on collected data across surveys. As a result of a single business register, timeliness in producing statistics can be improved and respondent burden reduced.

Surveys and questionnaire design

31. In designing integrated data collections, it has become an important objective to achieve consistency with statistics of the different industries and sectors. Standardisation of surveys and questions across the questionnaires of different industries contributes to consistency and facilitates the integrated statistical production process. Integration should be comprehensive and encompass survey design, sample frame, and questionnaire design. Survey design may need to compensate for a lack of willingness among data providers of business statistics programmes. Respondents are increasingly reluctant to complete the many separate survey requests sent to them each year through traditional survey questionnaires. A coordination modular

approach through annual continuous data collection instruments with infra-annual collection rounds instead of separate specific purpose surveys has proven to reduce response burden and cost, in terms of human and financial resources.

32. Consultation with business respondents before survey and questionnaire design and updates is an essential requirement. The choice of the survey data collection method (mail, telephone, electronic, interview, etc.) would depend on the country's resources, preferences and characteristics. The use of a modular approach with an annual continuous survey instrument may be preferable to facilitate flexibility for updates and harmonization.

Use of administrative sources

33. Increased reliance on administrative data requires tools for adapting administrative data for statistical purposes. Administrative source data can be integrated for statistical purposes; concepts need to be matched with statistical records. The advantage of using administrative records and various government data is to promote a more efficient use of data collections, and reduce the burden of the respondents.

34. Administrative information can be used for the production of statistical data, for verifying already compiled data, as well as for filling gaps of missing data in statistical surveys. The use of administrative data for statistical purposes does not imply that these should replace traditional statistical techniques, but rather that it should be used to supplement and reinforce them.

35. Agreements need to be reached about effective and efficient data collections, including the use of administrative records and various government data files to avoid duplication of data collections and an undue burdening of respondents. Legislation on data sharing arrangements and access can be set up between the statistical office, other government departments or public bodies. If administrative data sources are used, the confidentiality of the data sources must be treated with the utmost care and adequate methodology needs to be guaranteed.

Data editing, linkage and integration

36. The aspect of data editing is an integral part of the statistical production process and needs to be addressed already at the collection phase. Methodological, organisational and legal issues related to data editing, linkage and integration have to be resolved. Documentation of the editing process and transparency are indispensable to ensure that the resulting data will be widely accepted and understood by users. Data editing is a resource intensive process but it has a far-reaching impact on data quality as it affects data accuracy, interpretability, relevance and coherence. The statistical service can learn in the editing process about the data, that the survey processes can be improved in a systematic way.

37. Data linkages and integration needs to focus – consistent with the SNA and other standards for economic, financial and monetary statistics – on the appropriate source information to be obtained and the output variables to be compiled and disseminated. Through the application of integrated frameworks, statistical agencies monitor and improve data quality. Data linkages and integration support the harmonisation of economic statistics, facilitates the aggregation and comparison among disparate data sets, and promote the compilation of coherent macroeconomic statistics such as national accounts, balance of payments statistics and environmental-economic accounts. National and environmental-economic accountants and other key users of economic and environmental statistics can play an important role in harmonisation. Arrangements have to be developed for data exchanges between the statistical office and other government agencies producing statistics for introducing common concepts in the administrative system, reconciling data, in general, establishing partnerships with other departments and associations to improve data. For example, service level agreements can be used to implement these exchanges of source data between producers of sectoral business statistics and national and environmental-economic accounts.

38. In addition to conceptual integration, the temporal dimension of integration aims at reconciling and harmonizing short-term and structural economic statistics produced at different points in time but referring to the same phase in the business cycle. The coherence of sub-annual and annual statistics has key importance for planners and policymakers. Users of data have a preference for integrated economic statistics that comply with the criteria of accuracy and consistency of data quality and provide coherent short-term statistics subsequently with the release of quarterly and annual data.

39. For the integration of economic statistics, periodicity and timeliness are relevant requirements. Economic statistics for which economic analysis demands concurrent estimates would be affected and, therefore, benefits from integration. Users require an integrated economic statistics framework to facilitate conceptual and numerical consistency of sub-annual and annual data, consistency in summing quarterly data to annual data and a transparent revision policy.

Dissemination and communication

40. Dissemination enhances accessibility of statistical information and constitutes an indispensable building block of the integrated statistical production process. Integration may facilitate providing user-friendly presentations of data, explanations of concepts, ensure consistent format across publications, electronic sources and websites. Dissemination and communication of statistics is a complex area of the statistical production process, building, managing and promoting outreach and customer relationships with the media and a broad circle of other data users. It is aiming at explaining data to users, improving statistical literacy, making metadata available. The development of data warehouses efficiently supports the integration of economic statistics.

41. A number of statistical organisations at the national and international level publicly disseminate the schedule of release of their data in the form of an advance release calendar. Such information may be provided for the forthcoming period on a weekly, monthly, quarterly or annual basis. This advance release calendar provides prior notice of the release dates on which the statistical agency undertakes to release specific statistical information to the public.

42. In the dissemination of statistics, good practices require giving credit to the original source of statistics and following widely accepted quotation/citation policies when the data used had been originally collected by others. Citations facilitate assessment of the reliability and verify the authenticity of the original data sources for the users. The source of data always need to be documented and made transparent for the users.

43. The dissemination and communication efforts of the statistical organisation benefit from collecting and analysing feedback from the customers. Prior to establishing the revisions policy of data series for statistical domains, it is important to consult the main users of official statistics to identify their needs and priorities. The customers' views about their particular needs for timeliness for data can be evaluated by the statistical agency when balancing timeliness with accuracy and consistency.

Case study 1. Integrating agriculture into the national statistical system

1. This case study[4] underlines the selection of agriculture among the domains of economic statistics to be considered as primary target for integration. It presents as an example the views and recommendations made by the Statistical Commission at its fortieth session in 2009 on how to integrate agriculture into the national statistical system.

2. The basis for the integration starts by defining the sampling frame(s). The situation faced by each country should determine the subset of steps below and implement them in a priority order best suited to their needs:

- Population censuses will obtain sufficient information about agriculture to create a register of agricultural and rural households. All households, urban and rural/agricultural could be geo-referenced, for example, by village;
- Remote-sensing products could be used to create an area frame consisting of a digitized data layer divided into land cover or land use data layers, such as cropland, pastureland, forests, built-up areas, villages and other agreed upon classifications;
- This information could be used to create an area frame sample of the country identifying the different types of agricultural and meteorological conditions to ensure that the sample survey provides an overall picture of agricultural and rural conditions. The first stage sampling unit could be the village, where the population census could be used to establish the linkage between the farm household and the agricultural holding, which are then also geo-referenced;
- Some countries may be able to extend the village level population data to a master household register with households classified as urban, urban with agriculture, rural, rural with household plot, or rural with agricultural holdings;
- The geo-referenced area frame will be the basis for all household surveys and small farm surveys required by the national statistical system;
- A register of farms that are above a size threshold and which produce mainly for the markets will need to be established. These are generally specialty farms or those so large that it is difficult to establish a linkage with households;
- The area frame containing the geo-referenced master household register and the commercial farm register will be the basis for all data collections for use in estimating agricultural production; and
- A business register will be established and geo-referenced. The commercial farm register will be a subset. Another subset of this register will be enterprises involved in servicing agriculture, such as storage facilities and firms that process meat, poultry, milk, eggs, cotton, wool and other products.

3. The vision for the data collection starts with the goal that is sustainable and provides an annual work programme that

[4] Source: Report on Global Initiatives to Improve Agricultural and Rural Statistics, Statistical Commission Fortieth session, 2009, E/CN.3/2009/3, section VI. Paragraph 45-47. [Extract.]

is consistent from year to year so that the statistical staff is fully utilised over time. While an agricultural census is the gold standard for agricultural statistics, more and more countries are having difficulties because of the large peak in funding and workload required and on an infrequent basis. The agricultural census is not included in the vision for the future of agricultural statistics. Instead, agriculture will be embedded in the sampling frames and survey programme conducted as part of the national statistical system, as follows:

- A core set of data requirements will have been established for agriculture and rural statistics and a set of core data classified for the remaining sectors of its statistical system;
- Once the core statistical system has been defined, the basic data collections for household and enterprise surveys should be defined; and
- Official statistics should be disseminated in a timely manner and made readily available to all data users. Microdata should be made available for analysis, in a controlled environment using procedures consistent with country confidentiality requirements.

Case study 2. Integration of monetary and financial statistics in the euro area financial accounts

1. Integration is built on data which are sufficiently homogenous to permit aggregation in the euro area monetary and financial statistics and balance of payments statistics and within the framework of the euro area economic and financial accounts. Integration is further built on the consistency between financial and non-financial statistics. Financial statistics, balance of payments and international investment positions, balance sheets – and interest rates - of monetary financial institutions (MFIs) and non-monetary financial corporations and securities issues are integrated and reconciled into integrated economic and financial accounts, by institutional sectors of the economy..

2. The foundations of euro area financial statistics were built on: i) the definition of the money issuing sector and consistency to the ESA / SNA, ii) the financial corporations sector split into MFIs (banks), insurance corporations and pension funds and "other", iii) the counterparties to MFIs (banks), iv) the application of the ESA / SNA financial asset categories, v) valuation rules and time of recording following business accounting for timely monthly data and vi) transactions derived from stocks or by collecting transactions.

3. The euro area monetary financial institutions (MFI) and other financial institutions' (including insurance companies and pension funds) balance sheets and securities issues statistics are important building blocks for the financial accounts. This process facilitates the analysis of households' and non-financial corporations' financial transactions and - using the non-financial accounts - their property income outlays and receipts can be related to their financial assets and liabilities and also to their disposable income. Furthermore, this enables estimates to be made of the holdings by the money-holding sectors of the money supply aggregate (M3). These information sets are relevant to the estimation of the underlying rate of monetary expansion which provides policy-relevant signals for risks to price stability.

4. The financial accounts of general government also provide information on counterpart sectors in national financial accounts. The euro area balance of payment and international investment position statistics are integrated into the rest of the world account for the financial accounts of the euro area.

5. Combining the data from the MFI balance sheet and the euro area financial statistics with national financial accounts and with the data on non-financial transactions of institutional sectors, the ECB compiles quarterly integrated economic and financial institutional sector accounts for the euro area which includes financial balance sheets and reconciliations between cumulative transactions and balance sheet changes.

6. Furthermore, the integration of euro area financial statistics has been achieved in the monetary presentation of the balance of payments and in the presentation of holdings of money across various holding sectors. Monetary union financial accounts and now European institutional sector accounts had provided a powerful instrument for financial statistics as "building blocks" in the integration and consistency with the non-financial statistics.

The role and usefulness of standards in integrating economic statistics

Standards as agreed concepts, definitions, and classifications

44. The integration of statistics and the improvement of the quality of the data require the application of standard definitions, concepts and classifications. The successful implementation of standards will contribute to achieving the integration of statistics. Case study 3 illustrates this in the updating project of the System of National Accounts 2008.

45. Standards provide agreed concepts, definitions, and classifications at the national, regional and international levels. Descriptions of definitions need to be provided for the clear and accurate interpretation of the various concepts. Unless concepts and classifications applying to several subject-matter areas of statistics are standardized within a coherent logical system, statistical data cannot be structured to meet the needs of users for aggregated data or for compatible data from various fields.

46. Compliance with international standards is an important tool to harmonise and strengthen the national statistical systems. There are many challenges of adopting international statistical standards at the national level. Among the challenges, practical considerations, such as user needs, conflicting priorities, scarce resources, respondent burden and other factors play a role, determining the extent of national compliance with the international standard.

47. Also there are many challenges of developing and implementing international statistical standards. The global statistical community has agreed on the principles of promoting the development of standards and made significant investment in the development, dissemination, maintenance, harmonisation, updating, revision and implementation of standards. The international agencies continue to play a leading role in developing international standards and are committed to provide technical support in the form of training, operational guides, collection and dissemination of best practices and various other forms of knowledge base tools to assist adopting international standards by the countries.

Main objectives and good practices of developing standards

48. The usefulness of international standard frameworks as tools for integration depends on the degree to which national agencies preparing primary data adapt their definitions and classifications to fit into them. Steps need to be taken to involve and motivate all data producers of relevant economic statistics and keep them engaged in the process.

49. The main objectives of developing standards are to diminish the major causes of differences in statistics arising from the use of different concepts (e.g. units, transactions etc.), valuation and time of recording rules,

accounting structure, key aggregates and balances. Their harmonisation and their greater consistency could diminish differences and result in more coherent data outputs.

50. Standards should be developed with broad involvement of stakeholders and technical expert group. Because standards are to enjoy general acceptance, they should be formulated in consultation with specialists in the respective fields. Technical committees are the most appropriate instruments for this kind of work. The development has to take place in a consultation process, maintaining transparency, with attention to consistency with related conceptual frameworks and standards. It is important to reach consensus on all main outstanding issues before finalisation.

51. The high significance attributed to the establishment of standards for the integration of statistics is underlined in the United Nations document Fundamental principles of Official Statistics that states:

"*The use by statistical agencies in each country of international concepts, classifications and methods promotes the consistency and efficiency of statistical systems at all official levels.*"

F*undamental principles of Official Statistics (1994)*, Principle 9.

52. The adoption of the Fundamental principles of Official Statistics was followed by the endorsement of the Declaration of Good Practices in Technical Cooperation in Statistics in 1999, which included relevant principles underlining the role of standards in the integration process.

53. The Declaration in Principle 4 states: " *Concepts, definitions, classifications, sources, methods and procedures employed in the production of international statistics are chosen to meet professional scientific standards and are made transparent for the users*". Good practices related to this principle include:

- Documenting the concepts, definitions, classifications, and making this information publicly accessible;
- Documenting how data are collected, how editing mechanisms are applied to country data; and
- Making officially agreed standards publicly available.

54. The Declaration in Principle 8 states that "*Standards for national and international statistics are to be developed on the basis of sound professional criteria, while also meeting the test of practical utility and feasibility.*" Good practices related to this principle include:

- Systematically involving national statistical offices and other national organizations for official statistics in the development of international statistical programmes including the development and promulgation of methods, standards and good practices;
- Ensuring that decisions on such standards are free from conflicts of interest;

- Advising countries on implementation issues concerning international standards; and
- Monitoring the implementation of agreed standards.

55. Through international cooperation a large number of standards have been developed in the past decades. These international standards can be viewed as recommendations providing methodological concepts and compilation guidelines. Many of these international standards served as the basis for the development of related national standards.

56. The adoption of the standard should take place by the respective authoritative body followed by publication and dissemination. The formal adoption of the standard conveys support for the forthcoming implementation process. The publication and broad dissemination provides accessibility for data providers and users to the standards and facilitates its understanding as well as the necessary adaptation and changes to the new methodology.

57. The implementation phase includes providing technical advice to users, preparation of compilation guides, organizing training courses, exchange of best practices, monitoring the need for updates including future research. Case study 3. "Good practices in international standards development" presents the project management approach used in the *System of National Accounts 2008* update process.

Harmonisation among macroeconomic statistics frameworks and with international classifications

58. Harmonisation of standards is the most important instrument for increasing consistency at the international level. A significant degree of harmonisation has already been achieved among macroeconomic statistics frameworks, the System of National Accounts (SNA), Balance of Payments Manual (BPM), Government Finance Statistics Manual (GFSM) etc. that has further improved with the development and adoption of the System of National Accounts 2008 (2008 SNA). Consistency with international classifications like the International Standard Industrial Classification of All Economic Activities (ISIC) has been achieved in that the definitions of kinds of activities and statistical units are the same. The major harmonisation of the systems occurred in the following areas:

- Residence. All systems distinguish the domestic economy from the rest of the world on the same basis - residence of institutional units - assigning to the rest of the world those institutional units whose main centre of economic interest is outside the geographic territory of the country;
- Domestic economy and institutional sectors. All systems define the domestic economy as all resident institutional units, adopting a common breakdown of the economy into sectors and sub-sectors;

- Stocks and flows. All systems use the same distinction between stocks - economic magnitudes measured at a point in time - and flows - economic magnitudes measured with regard to a period of time. Also, all systems use the same definitions for transactions and other economic flows;
- Accounting rules. All systems use the accrual basis for identifying and timing transactions. All systems use market prices as the valuation principle;
- Boundary issues. For all systems, the production and asset boundaries are the same; and
- Integrated accounts. In all systems, an integrated set of accounts explains all changes between an opening and a closing balance sheet by transactions, holding gains/losses, and other changes in the volume of assets. This fosters analysts' ability to reconcile stocks and flows within balance sheets. In addition, the systems reflect harmonization in similar accounting frameworks, although substantial differences exist in classification to meet specific needs.

Harmonisation of business and sectoral statistics standards with macroeconomic standards

59. In recent years important harmonisation of concepts and definitions across sectoral and business statistics of the various domains of economic statistics has been undertaken with the concepts and definitions used in macroeconomic frameworks. Various harmonisation activities in this process have taken place at the same time as several major macroeconomic standards were revised and updated. This allowed the institutions responsible for the development and updating of their standards to conduct the necessary consultations to ensure the increasing of methodological consistency, achieve harmonisation of concepts and definitions with related structural statistics and the underlying macroeconomic frameworks.

60. Some of the recently updated business and sectoral statistics standards provide examples of harmonisation across standards of the various domains of economic statistics and with the standards of macroeconomic frameworks. These intermediate output frameworks of business statistics are based on common methodological principles and common definitions of data items that allow for a coordinated compilation of harmonised statistics with reliability and flexibility to the level of detail required to meet the needs of national, regional and international agencies and business users.

61. The 2008 revision of the *International Recommendations for Industrial Statistics* (IRIS 2008) has some common elements, like definition and delineation of units that could be used as a tool in an integrated statistical system in the most cost efficient way for compiling basic economic data across sectors, consistent with macro-economic statistics. These International Recommendations on Industrial Statistics together with similar international recommendations on other economic activities articulate a common integrated framework encompassing both the structural and short-term business statistics for goods and services producing industries with the System of National Accounts as the overarching macroeconomic framework.

62. The revised *International Recommendations for Distributive Trade Statistics 2008* (IRDTS 2008) is built on concepts, definitions, classifications, data sources, metadata, data compilation methods, approaches to data quality assessment and dissemination policies that are consistent with the International Recommendations on Industrial Statistics 2008. The IRDTS 2008 methodology is harmonised with other fields of economic statistics such as, construction statistics and other related domains of structural and short-term statistics, index numbers compilations, performance indicators, and last but not least it is harmonised with the System of National Accounts 2008.

63. The conceptual framework of the revised *Manual on Statistics of International Trade in Services* (MSITS 2010) is built on the concepts (e.g. residents, non-residents) defined in the *System of National Accounts (SNA)* and the *Balance of Payments Manual (BPM)* and related classifications such as the *Central Product Classification (CPC)* and *ISIC.*

64. The above examples of statistical standards and recommendations in the economic statistics domain are provided to indicate that there has been significant progress in updating, revising and developing methodology in related statistical areas while keeping their harmonisation in focus. As these selected examples illustrate, the coordinated approach of the revision of the related business and structural statistics recommendations with macroeconomic frameworks, and with standards and recommendations in other economic statistics domains such as trade, tourism etc. and classifications has resulted in harmonised conceptual systems of these standards and classifications. In the countries that implement the standards with the harmonized concepts it would open up the possibility for considering the introduction of highly integrated data collection and estimation programmes.

Accessibility of normative recommendations for the various statistics domains

65. Existing recommendations are accessible and future recommendations will be added as they become available through the web-based tool Knowledge Base on Economic Statistics maintained by the United Nations Statistics Division. The Knowledge Base is a repository of documents that organizes standards and recommendations as well as country practices by Statistical Domain and by the components of the Statistical Production Process Framework at http://unstats.un.org/unsd/EconStatKB/Knowledgebase.aspx

66. Documents containing recommendations on Economic statistics (Domain 2) and Environmental-economic accounting (Domain 3.1) are available at this reference source, providing normative guidance in the form of handbooks and material sharing country practices.

67. In addition, the Knowledge Base under the Statistical Production Process Framework includes the Methodology of data collection and processing including metadata, data editing, data linking and statistical confidentiality, registers and frames, administrative sources and surveys, and dissemination and

communication that are components of, *Methodology of data collection, processing, dissemination and analysis* (Domain 4).

68. Normative guidance on Strategic and managerial issues of official statistics (Domain 5) is included under the Institutional setting component of the Statistical Production Process Framework of the Knowledge Base. This component provides methodological material and country practices on institutional frameworks and principles, quality frameworks, ICT management, and technical cooperation.

Case study 3. Good practices in the development of international statistical standards

1. When the Statistical Commission at its thirty-seventh session evaluated the multi-year updating project of the System of National Accounts 2008, in its report[5] it attributed the commendable progress:

"*to the adoption of the project management approach[6] and the extensive use of a transparent interactive website, and recommended that approach and technology in similar statistical projects and programmes*."

2. The update's Work Programme emphasized the basic approach as a transparent review process that has a broad support in the international statistical community. For this to happen, national statistical organizations were engaged and consulted in all phases and at all levels. The work programme called for active involvement of the senior management in national, regional and international organizations. The outreach was not limited to national statistical offices but engaged other producers of statistics like central banks that produce national accounts and other macroeconomic statistics.

3. The SNA update Work Programme included the following main components:

- The criteria for the issues to be updated in the standards were defined. The list of issues adopted by the Statistical Commission ensured that the selection of issues was kept feasible, manageable and corresponded to the needs of the community of statisticians that initiated the update;
- The Governance structure was operational and built on continuous collaboration at many levels: The Intersecretariat Working Group on National Accounts (ISWGNA) consisting of Eurostat, the IMF, the OECD, United Nations and the World Bank was responsible for managing and coordinating the updating process assisted by an SNA subject-matter technical editor. Ensuring smooth progress of the overall process was the task of a project manager. The United Nations Statistics Division, as the secretariat of the ISWGNA, provided secretarial support including setting up and maintaining the project website. The senior management of the five ISWGNA agencies provided collective oversight and liaised with senior-level representatives of countries and international organisations;
- To resolve technical issues and reach consensus, a 20-member Advisory Expert Group (AEG) supported the ISWGNA in its deliberations on conceptual issues in six meetings and in many electronic forum discussions and papers, producing a substantial body of research. Topical (standing and ad hoc) expert groups carried out additional research; and.
- To ensure country involvement all documents for discussion and recommendations were publicly accessible through the update web site for commenting with a 60-day response period and their responses were posted. Countries were consulted on every substantive step and decision in the

[5] See, E/CN.3/2006/32.
[6] See, Work Programme for the updating of the 1993 SNA, by ISWGNA, 21 November 2003, http://unstats.un.org/unsd/nationalaccount/Workprogram1993SNAupdate%2021Nov2003final.pdf

update process, and their replies provide a rich source of information why they support or object to certain proposals. These replies can be useful input also in the implementation phase of the standard after its adoption, as well as a source about the needs of certain countries for indication of technical assistance in one or another area.

4. The project's successful and timely completion can be attributed to the efficient collaboration of its many contributors representing a broad-based group of stakeholders joining their efforts in a closely coordinated undertaking in the framework of the adoption of a project management approach.

Chapter 4. Institutional Arrangements and management culture to achieve integration of economic statistics

Arrangements at national level

1. Appropriate institutional arrangements are essential for developing and managing an integrated system of economic statistics. The integration of economic statistics depends upon legal, institutional, organizational and statistical conditions, all of which differ widely across countries. For that reason, it is neither possible nor desirable to propagate a single institutional approach towards integrated economic statistics. There is no "right" institutional setting for integrating economic statistics, in the sense that the goal can be achieved in both centralised and decentralised statistical systems. However, variety of activities and arrangements can be put in place to support the integration of economic statistics.

2. The approach taken for integration of economic statistics will vary depending on the way the official statistics system is organised. Each country will need to develop an approach that fits their legal structure and statistical system. Efforts to enhance the integration of official statistics must take account of the institutional arrangement that prevail in each country, so there can be no "one size fits all" solution. Institutional, organisational and statistical arrangements will differ widely across countries. Many economies have a national statistical office with responsibility for the production and dissemination of official statistics as a core task. In a completely centralised system, the national statistics office would hold the authority and the funding to produce the required economic statistics. Most countries have one or more national statistical organisations (NSOs), carrying the responsibility of maintaining a national statistical system. Core tasks of NSOs are to collect, process, and organise statistical data, and subsequently put them at the disposal of various communities of users, often termed as dissemination of the statistics. Obviously, some of the main obligations of NSOs are to make the necessary strategy decisions on what should be measured and how, and to manage and document the statistical system. A widespread problem is lack of harmonisation across different fields of statistics in a country, even within the same national organisation. This is often related to the statistics production being organised in so-called stove-pipes, or independent production lines. This makes it difficult to use statistics for different subjects in a coherent way, thus impairing the quality of statistics as seen from the user perspective. It also reduces efficiency in the production process. To overcome these problems, there has been a strong tendency in NSOs towards standardisation and integration and to, breaking down "stove-pipes". This leads to the creation of corporate statistical data warehouses, bringing together statistics on different subjects under one system. In this endeavor, the creation of statistical metadata plays an important part. The changes required towards such integrated systems are not only technical, but also organisational. The statistical work in international organisations resembles the work in national statistical organisations. It consists of the same work phases, but an important characteristic is that data collection most frequently has the national organisations as respondents. And, normally the data collected are

aggregate data on a national or regional level, as distinct from micro data on individual persons, households or companies.

3. In practice, most statistical systems are decentralised to some degree. The decentralisation can occur across a variety of dimensions and to different degrees:

- Even in the most centralised statistical system, some important statistics are produced outside the national statistical office (NSO) by other government departments and quasi-government organizations. These statistics must nevertheless be integrated with the statistics produced by the national statistical agency;
- Other government organisations will provide some of the input data that is used by the agency or agencies responsible for the production of official statistics. For example, the national accounts will use data from numerous sources. Improving the coherence of input statistics can contribute significantly to the quality of the national accounts;
- Many government agencies collect statistical information as part of their management of statistical processes. This administrative data can be an important input into the production of national economic statistics. For example, international trade data will often be collected by the agency responsible for collecting customs duties;
- As the use of administrative data increases, national statistical agencies will become more dependent on data from sources outside its direct control. Arrangements to ensure that administrative data are collected in a way that is consistent with the needs of statisticians will be important. Even if a centralised statistical system, the national statistics office will have to work with other government agencies to ensure that administrative data can be integrated with data from other collections;
- The national statistics office may have responsible for coordination and dissemination of economic statistics, but much of the funding for statistical production may be contestable by other government departments. In this situation, the national statistics office will have to work with other agencies that produce statistics to ensure the coherence of all economic statistics by encouraging consistent frameworks, standards, definitions and classifications;
- In some countries, especially those with federal structure, the collection and production of statistics occurs at regional, district and municipal levels. Economic statistics are compiled at the national level by aggregating up statistics produced by district and regional offices. The national office will have to negotiate with regional counterparts to ensure data is collected consistently across the economy;

- At the extreme decentralised end, there may be no national statistics office and responsibility and funding for the production of economic statistics may be spread between various government agencies. In this situation, the agency responsible for producing national accounts will be a user of the economic statistics produced by other collection agencies, so it will be a strong advocate for the integration;
- In some statistical systems, responsibility for the production of different parts of the national accounts might be spread across more than one agency. For example, one agency might be responsible for GDP from the production side with different agency compiling expenditure-based estimates. Statistical best practice is to have one agency responsible for the compensation of national accounts, but where the statistical system has evolved in a different way, this might not be practical. Strong cooperation will be required to ensure that different estimates are consistent with each other; and
- The role and function of the central bank, which is often a quasi-government agency, will also be relevant to the structure of statistical production. In most countries, the central bank will be responsible for using information collected from banks and other financial institutions to produce a range of range of monetary and financial statistics, such as interest rates and credit aggregates. In a few countries, the central bank will have responsibility for the production of National Accounts, Balance of Payments and/or Price Indices. In this situation, the Central Bank will have an important role in supporting the integration of statistical collections. Ensuring effective co-operation between the national central bank, as a producer of statistics, and other statistical authorities is very important for the quality and cost-effectiveness of statistics. Depending on national circumstances, this must be pursued through different institutional settings. Whatever the general institutional setting, the specific arrangements should aim to optimise the quality and availability of official statistics, while preserving in all respects the independence of the central bank.

4. Some countries will participate in a regional organisation with a responsibility for coordinating the production of the statistics of member countries. Implementing the standards and practices agreed by the regional organisation will play an important role in the integration of economic statistics within each country and between countries.

Institutional arrangements for the integration of economic statistics

5. Elements of institutional arrangements to achieve integration of economic statistics are presented in the following paragraphs.

Legislative framework

6. Statistical leadership will be more effective if the mandate for integration is established by law or other binding instrument, and its role acknowledged in day-to-day business by other users and producers of statistics. A Statistics act that applies to all the statistics collected and produced by government departments and agencies is a valuable tool for the integration of economic statistics. The stronger the powers of coordination at the centre of the system, the greater the chance of integrating statistics effectively. Integrated statistics (definitional, conceptually, through the use of harmonised nomenclatures and classification devices) are immensely more powerful than statistics collected without harmonisation. If the office in charge of coordination is backed by numbers, the legal power to apply the tools of coordination and a healthy budget, its capacity to coordinate is correspondingly greater than that of an office lacking these assets (*UN Handbook of Statistical Organisation, Third Edition*, p.23). A Statistics act may provide a national statistical office with authority to:

- Provide leadership to the national statistical system;
- Advise other government agencies on statistical projects initiated by them;
- Develop approved statistical standards for government agencies;
- Define, lay down, and promote standard concepts, procedures, definitions, and classifications for use in official statistics;
- Provide authority for the compulsory collection of data;
- Provide for protection of confidential information; and
- Approve the design of all statistical surveys operated by government agencies.

7. According to the *UN Handbook of Statistical Organisation*,

In the case of decentralised systems, the statistical act should apply to all the members of the statistical system…. The act should contain provisions acknowledging the need for, and definition of, statistical coordination, as well as guidelines on how it is carried out (*UN Handbook of Statistical Organisation, Third Edition,* p.41).Each of the agencies in decentralised system may have their own enabling legislation. Ideally, the legislation for at least one of these agencies would acknowledge the need for integration and specify how it will be achieved.

Codes of Practice

8. Codes of Practice can play an important role in supporting the drive towards the integration of economic statistics. The advantage of a code of practice is a clear set of rulings that functional departments and agencies can refer to in order to support moves towards integration, and higher officials can refer to in order

to push for such moves, as required. Important to the successful adoption of the principles and its protocol is its high-level endorsement and mechanisms to assess and ensure implementation. Responsibility should lie with the chief statistician or an independent statistical council, but have as its authority the explicit confirmation of the prime minister or a legislative enactment.

9. The first step for a statistical office is to develop a document that outlines what it means by integrated economic statistics, its principles and a protocol for its implementation. The achievement of common standards across agencies and functional units requires a clear statement or code of practice as what is to be covered by the integrative process and the means by which this is to be achieved. Such a code may be part of a system of codes for other dimensions of a statistical office's work, including quality, confidentiality, response burden, meeting user needs, or the integrative code may stand alone. If a code of practice exists for these other operating dimensions, then the inclusion of a further one regarding the integration of economic statistics can be readily incorporated integration into this system. If such principles and protocols do not exist, the statistical office may wish to consider whether it adopts integrative principles and an associated protocol in a piece-meal way, or whether its needs would be better served by a major policy initiative of adopting several principles and protocols that include integration. This would ensure planning systems are not distorted to favour integrative aspects at the cost of other considerations. The statistical office is advised that this would be no small task.

10. If a new general code of practice is adopted for the statistical office as a whole, such a code should be the responsibility of the chief statistician or independent statistical council, but have as its authority the explicit confirmation of the cabinet or a legislative enactment. The originating document may encompass fundamental principles to include relevance, integrity, quality, accessibility, protecting confidentiality, meeting needs of users, reducing load on providers, enhancement through integration, accumulation and innovation, efficiency in costs, fairness in dissemination, but should also include the mechanisms for attaining such aims.

11. The limitation of a code of practice is that it has no mechanism for evaluating the costs and benefits associated with each of the courses of action promulgated in the interests of integration. For example, the adoption of common geographical codes and industry classifications is admirable course of action, but with limited resources, this might not be the highest priority for the NSO. This does not mean that a code would be unhelpful. As a set of principles and means of implementation, the code sets the agenda for integration. For further details, please see Case study 1.

Principles and protocols

12. Over the last few years, many NSOs have developed principles and protocols for official statistics, often as part of a Code of Practice. These are designed to provide assurance that official statistics are adequate for

the uses that they were designed to meet and to facilitate improvements in the overall coherence of official statistics. Principles and protocols are a useful tool for fostering the integration of economic statistics. They are usually based on the *UN Fundamental Principles of Official Statistic*s. Many countries adopt a principle of coherence, usually based on UN Principle 8- National Coordination: *Coordination among statistical agencies within countries is essential to achieve consistency and efficiency in the statistical system.*

13. Official statistics are broad in scope and are produced by many different government agencies in a country. In many countries, there is a central or national statistical office that produces the greater share of official statistics, whereas in other countries there is more than one statistical agency handling different areas of statistics. In all cases, many official statistics are produced by government departments as a by-product of their activities, sometimes by statistical units separately organized within them. Co-ordination of statistical activities should be undertaken to avoid duplication of work, to minimise reporting burden of respondents, to facilitate the integration of data from different sources through the use of statistical standards and to participate in international initiatives (http://unstats.un.org/unsd/dnss/gp/fundprinciples.aspx).

14. The rationale for the coherence principle is that frameworks and classifications used in statistics must be relevant for their use in economic research and decision-making. Data can be more readily interpreted when it is grouped or classified within a structured and understandable picture of the real world. A key aspect of the coherence principle is that the value of statistical data is maximised by using adoption of common standards for statistics across the vast pool of data available from administrative and survey databases allows separate datasets to be related, and enables more comprehensive statistics to be produced.

Protocols for the integration of Statistics

15. The adoption of a coherence principle covering integration for all statistical agencies in a decentralised system, and all functional departments in a centralised one, is an important step for a statistical office. It can form the basis for a policy of integrating economic statistics, more so if the principle goes hand in hand with a set of guidelines and policies, or protocols, for their implementation. A protocol sets out the procedures that should be followed in order to achieve statistical integration.

16. Protocols for integration of statistics should cover common frameworks, standards and classifications and specify that common statistical frames, definitions and classifications are used in all statistical surveys and sources to provide consistency over time and between datasets. These should align wherever possible with national and international frameworks and classifications. Principles and protocols should ideally be developed for a range of dimensions in order to prevent excessive emphasis on integration at the expense of other important dimensions, such as user needs, objectivity, integrity, sound methods, quality assurance, confidentiality and accessibility. If principles and protocols are developed to meet multiple needs,

integration may compete with the needs of these other principles and protocols, though often there will be commonality.

Quality assurance frameworks

17. Many organisations may have an operating standard for managing quality. ISO 9000 is a family of standards for quality management systems maintained by ISO, the International Organization for Standardisation[7] and is administered by accreditation and certification bodies. The requirements in ISO 9001:2008 (which are one of the standards in the ISO 9000 family) include:

- A set of procedures that cover all key processes in the business;
- Monitoring processes to ensure they are effective;
- Keeping adequate records;
- Checking output for defects, with appropriate and corrective action where necessary;
- Regularly reviewing individual processes and the quality system itself for effectiveness; and
- Facilitating continual improvement. [8]

18. There are commonalities between a quality management system and the process for introducing an integrative framework. Where feasible, the national statistical office should enhance existing, effectively functioning quality assurance frameworks to incorporate an integrative dimension, rather than set up a competing integrative system. However, there will remain a need to identify a code of practice, including principles and a protocol for their implementation, for the integration of economic statistics and the task of incorporating the code into the existing framework.

19. The quality of official statistics is a central concern for all national statistical offices. A number of countries and international organizations have developed detailed concepts and procedures of quality control. Of particular note is the IMF's Data Quality Assessment Framework (DQAF).[9] The DQAF was designed to assess the quality of specific types of national datasets, presently covering the national accounts, consumer price index, producer price index, government financial statistics, monetary statistics, balance of payments, and external debt. The DQAF provides a structure for comparing existing practices against best practices using five dimensions of data quality—methodological soundness, accuracy and reliability, serviceability,

[7] Details available at: http://www.iso.org/iso/home.htm.

[8] The non-market orientation of national statistical offices and the essentially public nature of the informational product offered makes ISO 20252:2006 Market, Opinion, Social Research, Vocabulary and Service Requirements, published in 2006, better suited to NSOs than the ISO 9000 series. Details of ISO 20252:2006 are available at: http://www.bsigroup.com/en/Assessment-and-certification-services/management-systems/Standards-and-Schemes/ISO-20252/.

[9] Available at: http://dsbb.imf.org/Applications/web/dqrs/dqrsdqaf.

and accessibility—as well as institutional prerequisites for data quality that may be cross-cutting and have an integrative dimension.

20. While there is considerable overlap in these various quality frameworks, international agreement has not been reached on a generic quality assurance framework for statistical systems, which could be utilised by a country to introduce to incorporate integrating economic statistics as a quality dimension.[10] One way to stamp the acceptance of national standards on statistical products is the use of a logo indicating that the product has been inspected and approved by the relevant central body. The aim would be for such a body to be seen as a coordinating friend, rather than as a controlling enemy.

Management culture

22. The success of efforts to integrate economic statistics depends in part on the development of an organizational culture that will support it. Cultural change cannot just be seen as a top-down process. A culture of integration for economic statistics can be systematically fostered by a variety activities related to human resources. In much the same way that organizations can promote a focus on quality as part of their culture, so too a similar focus can be instigated for the related area of integration. There is a substantial literature on the management of change in organizational culture. For example, Cummings & Worley (2005, p. 491 – 492) provide the following six guidelines for cultural change:

- Formulate a clear strategic vision: in order to make a cultural change effective a clear vision of the firm's new strategy, shared values and behaviours is needed. This vision provides the intention and direction for the culture change;
- Display Top-management commitment: culture change must be managed from the top of the organization. Senior management must demonstrate support for change;
- Model culture change at the highest level: in order to show that the management team is in favour of the change, the change has to be notable at first at this level. Senior management should model the kinds of values and behaviours that they want to see in the rest of the organisation;
- Modify the organization to support organizational change;
- Select and socialize newcomers to fit with the new culture; and

[10] As a first step in the direction of developing a generic NQAF, the UN Statistical Commission has put the issue of developing an internationally agreed national quality assurance framework on its agenda for the 2010 session. A paper, Statistics Canada (2009), has been drafted to facilitate the discussion. The web site in the reference to Statistics Canada (2009) also contains documentation on some national approaches to quality assurance frameworks (Australia, Netherlands, New Zealand, Norway, and the United States) as well as international approaches (European Central Bank, Eurostat, and the International Monetary Fund). These approaches may usefully be adapted to incorporate an integrative dimension into statistical planning not in isolation, but as part of a more general NQAF.

- Develop ethical and legal sensitivity: Changes in culture can lead to tensions between organizational and individual interests, which can result in ethical and legal problems for practitioners. This is particularly relevant for changes in employee integrity, control, equitable treatment and job security.

Strategic Planning

Time horizons

23. A strategic approach to planning that involves multi-level planning activities is an important tool for advancing the integration of economic statistics. The long-term objectives should be decided first. Once these are clear, plans that move towards these goals can be put in place. Activities to integrate economic statistics need to be approached on three different time horizons. First, the strategic level where the objectives that the statistical agency wants to achieve are specified. The importance of statistical integration should be established a key policy that shapes all planning decisions. Secondly, the tactical level at which the design of an output for the next production cycle is decided. The objective is to ensure that each statistical design contributes to the coherence of related statistics. It includes coordination of population, variables and methodology across all economic statistics. Thirdly, at the operational level at which decisions that arise out daily production activities emerge. Operational decisions should not be taken in isolation, but should take into account their impact on the overall coherence of the statistical system. A quality assurance framework can support integration at the operational level.

24. Each of these levels is important. The following sections will focus on the strategic level. The implications for tactical and operational decisions will be covered in chapters IV and V.

Incorporating integration into a strategic framework

25. Strategic planning is the process by which an organisation defines its strategy, or direction, and makes decisions that allocate resources to pursue this strategy. To determine its strategic direction, the NSO needs to know exactly where it stands, then determine where it wants to go, and how it will get there. The strategic plan of an NSO will identify and prioritise user needs and describes processes and mechanisms by which these needs will be progressively met given limited resources. To ensure that integration of economic statistics has a high priority, it should be an integral part of this strategic plan.

26. Most national statistics offices will already have a strategic planning process. If one does not exist, a plan may need to be developed using existing consultation and consensus-reaching mechanisms, but this could slow the progress towards statistical integration. If a framework exists for strategic planning, then the objective will be to evaluate how integrative practices can be incorporated into it. This assumes the strategic planning approach works well for the organization. A statistical office embarking on the incorporation of the integration of economic statistics into their overall strategic framework needs to first consider the suitability

of their existing strategic plan. Incorporating a policy to achieve integration into a strategic framework that is considered to be unsatisfactory does not further the goal of integration.

27. The strategic planning system should be evaluated to determine if it is meeting existing needs and to identify any modifications that would better facilitate the integration of economic statistics. United Nations (2003) provides guidance on reviewing the suitability of a statistical office's existing strategic framework. Strategic frameworks take time to evolve to meet the planning needs of individual statistical offices and, indeed, such needs themselves change over time. Therefore, the suitability of the existing framework needs to be adjudicated before the incorporation of what may be considered as being yet another, perhaps perfunctory, possibly competing, objective into an already overburdened framework. Moreover, strategic planning systems benefit from stability, so any evaluation exercise should not just incorporate statistical integration as one of the objectives and include mechanisms for achieve this objective. To pre-empt the need for further changes down the road, the opportunity should be taken to review the other objectives and decide if they are still appropriate and whether mechanisms for achieving them are effective.

Contents of the Strategic Plan

28. The strategic plan for integration of statistics does not have to be fleshed out in great detail, but it must spell out the objectives of integration and how they can be achieved.

The contents of the plan should address the following issues:

- The objective will be the coherence of economic statistics across the entire national statistical system;
- The establishment and maintenance of the statistical infrastructure needed to support integration of economic statistics;
- The broad steps that must be undertaken to achieve integration;
- Allocation of responsibilities to relevant agencies; and
- The sources of finance and other resources that need to be secured and allocated.

29. The strategic plan provides a road map to guide the organisation into the future. It summarises the organisation's role and purpose, operating environment and challenges, and long-term direction. The strategic plan is a key input into decision-making processes and will guide longer-term workforce planning, and annual business planning and budgeting.

Identifying integration projects

30. Identification of potential projects may commence with senior management requesting middle and line managers to identify integrative projects with a brief listing of costs and benefits. The initial aim is to look for the low hanging fruit, relatively easy to instigate with low costs and, if possible, cost savings. A relatively small number of projects that can be undertaken within a fixed timeframe should serve the statistical office well as a platform of examples that will build support for funding of new integration projects. As agencies or functional departments put up plans for projects promoting integration, given limited resources and competing projects, there is a need for a mechanism for appraising these projects not only against themselves, but against projects whose core aim is not the integration of economic statistics. For a statistical office to be effective it needs to be able to ascertain user requirements and ensure that they are met in as effective a manner possible given available resources.

31. Statistical information should meets user needs and quality standards including technical needs, ease of access, usefulness and credibility. They must also be produced in a resource-efficient, least-intrusive manner and have internal, and external feedback and evaluation mechanisms to ensure adaptability and uniformity of the products of the statistical process. UN (2003) Chapter IV considers the setting of priorities in detail. Prerequisites include:

- Authoritative information about what various constituencies perceive as gaps in the existing range of statistical products available and an understanding of why the filling of those gaps is important to users;
- Information about emergent issues of public concern that may require statistical information;
- Information about the cost of alterations to the existing program, including possible additions in light of the two elements noted above; and
- A mechanism to sort out possible requirements. The mechanism should be a strategic framework rather than giving piecemeal consideration to alternative priorities.

32. Annual operational plans should be nested within longer term, say 5 year, frameworks. The plans should include objectives, steps to be taken, requirements, and fall back options. Plans should be open, flexible, participative, responsibility for their operation devolved, and subject to review and formal evaluation. Integration should be an important aspect of strategic planning, but too much focus on integration does not accord with its inclusion in strategic planning as part of a holistic venture at what must be at the cost of other projects that may be feasible and resource efficient and meet user/producer needs without much by way of an integrative dimension. The main need is for a one-off to increase awareness of the benefits of integration

that will introduce integration into the strategic planning system without compromising other objectives and distorting the process.

33. The strategic planning system should be changed so that the integrative dimension is an important aspect of project appraisal, but this should not unduly bias projects in this direction. The range of projects that can support integration of statistics is very broad. Projects intended to meet specific user or producer need may contribute to the integration of processes, methods, or outputs, even if they are not explicitly formulated just in terms of integrating economic statistics. Projects that are proposed specifically to enable compliance with international standards will contribute to integration, if the standards themselves have been devised with the needs of integration in mind. For example, compliance with the SNA serves the needs of integration as it leads to an integrated, consistent set of macroeconomic statistics. The implications for integration should always be part of the assessment criteria and, other things being equal, methods that meet the needs of an integrated system are preferred to those that do not. This more holistic view of project appraisal seeks to identify changes in the statistical system not just in terms of meeting specific needs, but also in terms of their implications and merits for the system as a whole.

34. While greater benefits would be expected from statistics that are more frequent, timely, accurate, detailed and relevant to users, most of these features would also be likely to increase the costs of providing those data. The trade-offs between such costs and benefits would vary with each project. For example, for some projects the marginal costs of further adherence to integrative standards may increase gently at first and then, at some threshold, rise quite sharply, while the marginal benefits may be plummeting just before the threshold. Projects should be undertaken for which such marginal costs equal marginal benefits, that is, just before the threshold. Projects should be evaluated against each other by the extent to which total benefits exceed total costs (Bank of England, 2006, pages 9–11). Such formal analysis is difficult to implement for statistical offices given the inherent difficulties of putting monetary values to benefits. One approach to evaluating benefits is to devise a benefit assessment form on which scores are sought on each criterion from major users. This form would not just evaluate the benefits of a proposal on the grounds of integration and meeting international standards, but would also take into account dimensions such as relevance, accuracy, timeliness and accessibility. In essence, the approach must utilize subjective assessments, but the aim is to capture this information in a formal structure.

35. A strategic plan describes what will be achieved in the future. To achieve these objectives, changes may have to be made. Change management is a particularly important subject for ensuring success when plans are put to implementation. During the implementation of a strategic plan, there is often the need to make adjustments to cater for circumstances not visualised during the planning stage. These changes should be made when necessary, if circumstances have changed significantly and deviation from the original plan is essential. Plans may be well made and well-promulgated, but key players may intentionally, or

unintentionally, not follow the plan. Hence, a monitoring and control mechanism has to be invoked to ensure that actions are taken in accordance with the plan.

Organisational structure

36. "Stovepipes" within statistical agencies can be a serious obstacle to integrated and coherent information. For example, the compilation of example short-term statistics, annual structural statistics and national accounts are often treated as "stand alone" activities, rather than as a chain of related statistical processes. Operating in stovepipes makes it more difficult to ensure that methodological issues and changes in the way data is collected are dealt with in the same way by all statistical processes in the chain. In some NSOs, each statistical output is managed from beginning to end within a separate division, with its own sampling frame, classifications, survey design and collection system. This structure makes consistent sampling frames, population boundaries, classifications difficult to achieve. Resolving this problem may require a redesign of the entire statistical programme into an integrated system using common classifications and methodologies.

37. One practical approach is a reorganisation of the agency towards a more functional structure. A separate division with responsibility for developing and maintaining classifications and standard it can lead a program to apply consistent definitions and classifications to all statistical outputs. Creating a division with responsibility for developing a business register to be used for the production of all economic statistics is an effective way to ensure that units are selected and classified in a consistently across all statistical outputs. Establishing an independent statistical methods division can help to ensure that all surveys are designed in a coherent way.

38. The length of time that will be needed to complete full integration of economic statistics is long, so any programme will need to be carefully led to avoid losing momentum. In a centralised system, the lead agency will be a national statistical office with a clearly specified responsibility for the integration of economic statistics within a national statistical system. Coordinating mechanisms will vary depending on the size of the statistics office. In a small office, this may be as simple as a coordinating committee of business unit managers. In a larger organisation, more complex arrangements will be needed, including staff appointed to coordination and integration role and a range of formal decision-making bodies through all levels of the organisation. A co-ordination or integration branch might be needed to develop the programme and ensure that integration needs are taken into account whenever existing statistics are being redesigned or new statistics are being developed.

Process management

39. The production of a statistical output can be viewed as a series of business processes, beginning with sample selection and ending with dissemination of outputs. One way to manage the integration of economics statistics is be treating the statistical production process as a sequence of statistical processes to be managed

using the tools of Process Management. In the context of economic statistics, the sequence of processes might cover all activities from survey design to dissemination. For example, a production sequence might begin with the design of a quarterly business survey and continue right through to the outputs of the survey being included in quarterly GDP estimates, which are subsequently reconciled with the annual national accounts.

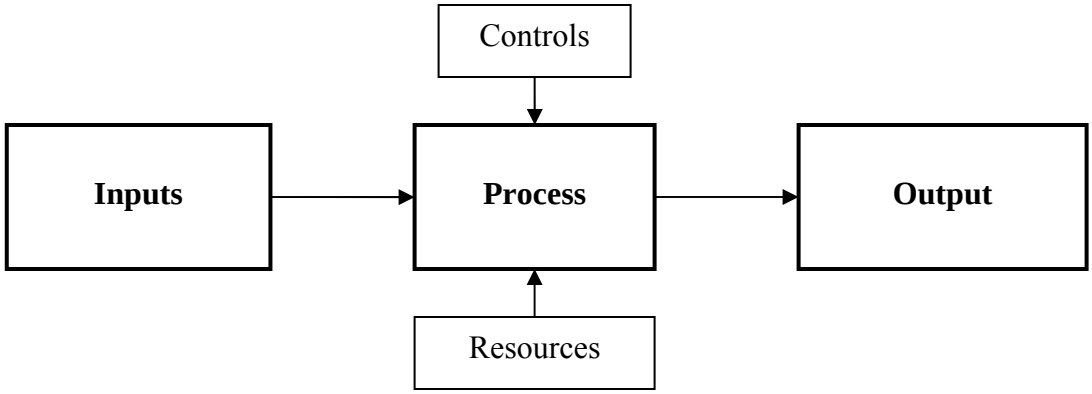
40. A variety of the methodologies and tools are available for statistical agencies attempting to improve the way that manage statistical production processes. Many of these techniques were developed and refined in the manufacturing industries in the 1980s, but most have now been adapted to function in service activities as well. Examples are Business Process Management, Total Quality Management, Continuous Improvement, Six Sigma and ISO 2009.The common feature of all these methodologies is an emphasis on managing processes effectively to achieve a desired objective. In contrast with the traditional hierarchical management approaches, process management focuses on optimising each process in the production sequence to ensure that the quality of the final product meets the requirements of users.

41. The process management literature provides a number of insights that are important for the integration of economic statistics.

- Designing the processes in the production sequence to achieve the required standard of quality is more effective than mass inspection and repair of final products. Investment in the design of processes usually brings the greatest return;
- Breaking the production of a complex product into a number of clearly defined processes, allows a quality standard to be designed for each process. If this is done correctly, the quality of the final statistical product can be controlled by ensuring that every process complies with the relevant standard;
- All statistical processes should be designed to ensure that they work together to contribute to the quality of the final product. A single process should not be optimised in isolation, without considering the impact on the various uses of the final output. For example, a business survey will be designed to meet the users of business statistics, but the design should also take into account the way that business statistics feed into the compilation of the national accounts;
- For any process to be controllable there must be clarity about who is the process owner The accountability for each statistical process must be clearly understood; and
- User requirements should be defined as precisely as possible, with care being taken not to create unrealistic expectations.

42. Implementation of process management involves the following steps.

All processes undertaken to produce the final statistical output must be clearly documented. At the most basic level, a process is an activity in which resources and controls are applied to inputs to produce a specified output. This is illustrated by the following diagram.



Statistical production is often sequential with the output of one process becomes the input into the next after being modified or refined. In practice, the sequence of statistical processes will be more complicated than just a linear transfer from one process to the next, as the output of one process may feed into several statistical processes and main input of a statistical process may be used as auxiliary information somewhere during subsequent stages in the production cycle. These interdependencies form a network of statistical production. Ideally, the terminology used in the description of each process should be standardised across all statistical outputs. A useful starting approach for standardisation of business processes is the General Statistical Business Processing Model (UNECE, 2009).The documentation should record the business unit or agency that is responsible for controlling each statistical process. The owner of each process and the points of transfer between owners should be clearly identified. Each owner will have different objectives, but they still have to communicate with each other on the products and quality to be achieved. All the users of the output from each process should be identified and their quality requirements should be clearly specified. Every instance where a statistical output is used in the compilation of another statistic would be identified. Identifying and recording the requirements of the national accountant should be a natural part of the development process. All processes should be designed systematically to ensure that the output of the process is of sufficient quality to support the requirements other processes further down the production sequence. This would mean taking the requirements for quarterly GDP into account when designing a monthly retail trade survey. Standard operating procedures should provide a clear definition of what constitutes the success or failure of the process. These success or failure levels must be designed to enable the process owner to decide if the output from the process will meet the requirements of all the users of the final product. When the sequence of statistical processes requires data to be handed from one business unit to

another, an appropriate handover mechanism should be developed. If data flows from one agency to another, as a Service Level Agreements might be used to define that standard that must be achieved before hand over is completed. For examples, an agreement might specify that administrative data is in a form that is appropriate for compilation into a statistical output. A standard methodology might be adopted for a particular type of process, with all outputs being required to use the standard unless there are good reasons for deviating from it. For example, a standard sample selection method might be adopted for industry surveys to increase the coherence between various industry statistics. Standard IT tools might be developed and used in all production sequences that pass data through a particular process. For example, a generic edit and imputation tool might be used for all administrative and survey datasets. This standardisation of systems is easier to achieve if a standard set of methodologies have been agreed for that particular process, e.g. limiting non-response to three different methods. The management of statistical processes should be reviewed regularly and updated when necessary. The best time for a review might be when external circumstances change or shifts in the availability of data affect user requirements. Process descriptions and the various delivery agreements should be revised frequently to keep them up-to-date and relevant.

43. Process management can be used as a tool for gradual improvement to the sequence of production processes. Some NSOs will be to start on a small scale and introduce process management for core statistical processes. Quick gains can often made by identifying weakest the processes and strengthening them. At a later stage, additional processes can be integrated a network of statistical process management. For further details, please see Case study 3.

44. Statistics Netherlands has developed a process management technique called Chain Management and applied it to the production of all official statistics. This Statistics Netherlands' approach is described further in the case study. They use the concept of a “steady state” to describe the end of a data processing phase in which value is added to the data, for example by editing the data, querying outliers, comparing with data from other sources, or balancing. Their business architecture distinguishes ten different steady states, each with specific quality requirements indicating the data are suitable for re-use in other statistical processes. Each steady state consists of a dataset (including metadata) in a state of processing of well-described quality. Defining steady states and specifying the processing stage between each two steady states is a transparent way for providing an overview of the complete statistical chain. (See Case study 2 for more on Chain Management).

Human resource issues

45. Integration of economic statistics will change the roles and responsibilities of many of the people involved in the production of economic statistics.

46. The development of an understanding of the importance of statistical integration should be built into all relevant training activities. Staff responsible for compiling national accounts will need a sound understanding of issues round classifications, population coverage, and business registers that affect their ability to integrate statistics from different sources. On the other hand staff responsible for the operation of statistical surveys will need an understanding of how their data is used in the compilation of national accounts. Training courses should provide and understanding of how data issues affect the use of statistical outputs in the SNA. For example, staff responsible for producing retail trade statistics should know how their statistics feed into estimates household consumption expenditure. They should be able to give advice about changes to their time series that would affect the use of retail trade information for this purpose

47. One way to foster the understanding of the way that statistical surveys are used in the compilation of national accounts is to encourage staff rotations between relevant divisions and departments. In a centralized system, rotations of staff between survey divisions and the national accounts division will foster an understanding of the way that decisions about these design and production of statistics can influence their use for SNA purposes. If staff in these divisions understands each other's roles, they will be better placed to take actions that will enhance the integration of their statistics. In a decentralised system staff rotations between departments will provide support for the integration of statistics. For example, staff from the agency responsible for the production of the national accounts might be seconded to an agency responsible for conducting economic surveys to work on the development and implementation of a new industrial classification or redeveloping a business survey.

48. Another way to foster integration of statistics is to specify a contribution to integration of statistics into the performance criteria or standards for relevant staff. Rewarding staff for their contribution to activities that improve the integration of statistics will help foster these activities. Staff with responsibility for coordinating activities between various agencies or divisions should have clearly defined roles and responsibilities. Senior management can recognise the importance of integration by acknowledging achievements in the direction through existing reward and recognition schemes. Such actions reinforce the message that integration activities are important for the organisation.

Coordination of statistical activities

49. Statistical coordination is essential for the development of an integrated national statistical system. This coordination role will be particularly important in a decentralised statistical system. Institutional arrangements should foster structured communication and coordination between all statistics producers and suppliers of data at the national level.

Coordination across agencies

50. The integration of economic statistics in a decentralised system will more effective if one agency has responsibility for leading the national statistical system. Ideally, this role should be established by law, but regardless of the legal framework, the lead statistical agency must demonstrate statistical leadership to ensure that its role is acknowledged in day-to-day business by other producers of statistics. The lead agency in the statistical system will need to evaluate the processes for coordinating activities. If there is a strong tradition of informal mechanisms or a separate formal structure for coordinating activity that works sufficiently well, then the integrative responsibility can be built into these mechanisms. However, if existing mechanisms are deemed to be inadequate, new mechanisms for statistical coordination may need to be developed. This lead agency or coordinating body would work with other departments and organisations to map out a long-term strategic plan and program of work that will achieve the desired objectives. Responsibility for specific tasks and activities could then be negotiated with the different agencies that have a role the statistical system. Once responsibilities have been delegated, the timetable for key deliverables can be negotiated and agreed by all participants in the program.

51. The coordinating agency should monitor progress on the integration program, and where participating agencies are unable to meet the agreed timetables due to other pressures of work, adjustments to the program might be required. In a highly decentralised system, responsibilities for various economic statistics may be spread among several government agencies, with no one agency having responsibility for leadership of the statistics system. In this situation, a lead might need to be taken by the agency responsible for the compilation of the national accounts, as it will have the greatest interest in achieving integration. In other situations, the agency responsible for budgetary allocations may have a role in leading coordination activities.

52. In some countries, the central bank is responsible for some economic statistics by the pragmatic virtue of it having to step into an area devoid of adequate economic statistics by virtue of a statistical office's resource constraints. In such cases, informal arrangements have to be established to ensure the necessary consistency in economic statistics and benefits from integration.

53. Countries have a variety of mechanisms that provide coordination. What is important in this context is to ensure that a workable system of coordination exists and if it does, that it is feasible to incorporate an integrative dimension into it. If the system works badly, or overburdening it with an integrative function is not feasible, then a statistical coordination process may need to be developed before integration of statistics can be achieved.

Advisory committees

54. A strong system of advisory committees is important for the integration of economic statistics. These groups will support sound decision-making by ensuring that the interests of all stakeholders are taken into

account in the development of official statistics. Users of statistics represented on advisory committees are more likely to be strong advocates for integration of economics statistics. Advisory committees should represent a broad range of economic and statistical interests, including users, producers, and suppliers of official statistics. Members should be selected for their knowledge of economic and statistical issues, their interest in the development of economic statistics as a coherent system and their standing in the statistical/economic community. Advisory committees can contribute to the integration of economic statistics by:

- Advocating the integration of economics statistics;
- Advising on relevance and quality of economic statistics to ensure that they meet the needs of users;
- Countering sectional interest groups advocating statistical outputs that are inconsistent with other economic statistics;
- Supporting the adoptions of international statistical frameworks;
- Encouraging other producers of economic statistics to adopt standard frameworks and classifications;
- Improving the coherence and integration of economic statistics;
- Identifying shortcomings in the concepts, sources and methods used in official economic statistics; and
- Coordinating survey activity to achieve efficient and effective data collection.

55. Advisory committees on statistical standards can play an important role in the development, promotion and implementation of statistical standards. Users and producers of statistics can ensure that their needs have been addressed by participating in the process for developing national statistical standards. For example, if consultation makes the redeveloped classifications more relevant to the producers of statistics, they are more likely to be adopted widely. The role of an advisory committee on statistical standards can include:

- Promoting the use of common standards for official statistics;
- Advising on the development of standards, protocols and policies for development and production of statistics;
- Ensuring that all producers of statistics participate in the development and review of classifications and standards;
- Endorsing the development, implementation, promulgation of statistical frameworks and standards;
- Ensuring that standards and classifications are documented carefully and are available in a form that can be readily accessed;

- Encouraging other producers of economic statistics to adopt standard frameworks and classifications;
- Ensuring that code files and dictionaries are made available to assist producers of statistics in the use of standard classifications;
- Training about the use of standard frameworks and classifications is provided to other producers of statistics;
- Monitoring official statistics and reporting on the adoption of standards, policies and protocols; and
- Identifying shortcomings in the concepts, sources and methods used in official statistics and in the application of accepted international standards;

56. Committees on statistical standards support the coherence of economic statistics by promoting the use of national and international statistical frameworks and. They can encourage the development, promotion and implementation of standard questions, definitions, classifications and terminology.

Relationship management

57. The institutional arrangements that support the integration of economic statistics work at two levels. At the lower level are the working groups and practical relationships where statistical work is done and practical problems are resolved. This must be supported by higher-level contacts to build a widespread commitment to integrating the statistics system and dealing with strategic problems. Both types of contact are essential for the integration of economic statistics.

58. Regular relationship meetings with government departments and organizations that use and produce statistics should have a number of objectives, including:

- Coordination between the producers and users of statistics;
- Monitoring of progress on bilateral projects;
- Coordination of the planning of joint work between organizations;
- Forums for the discussion of new ideas and resolution of problems;
- Resolution of data issues relevant to participating organizations.

59. The integration of economic statistics relies on information about user needs. One formal mechanism for identifying such needs is a system of user committees. The membership of user committees should be drawn from major users, including the central bank and other government departments, private sector, education, media, emerging interest groups, and those with specialized knowledge. There should also be facilities on the statistical office's website for feedback from users and surveys of users of the websites as to deficiencies in information available. There should be regular "relationship" meetings with major users, such as central

banks, and producers of statistics, such as the tax and customs authorities, whose administrative data are used by the statistical office. Relationship meetings should work at two levels to support the integration of economic statistics. At the expert level, working groups and practical relationship meetings develop statistical work and resolve practical problems. That must be supported by management-level relationship meetings that build a widespread commitment to integrating the national statistical system and deal with strategic problems. Both types of meetings are essential for the integration of economic statistics.

60. National statistical agencies are making increasing use of administrative data. Relationships with supplier organizations are very important, because disruptions in supply can seriously impact the quality of economic statistics. An important benefit of memorandums of understanding and service level agreements is that they can consolidate and make cooperation with supplier organizations more predictable.

Regular relationship meetings can achieve a number of objectives, including:

- Facilitating co-ordination and manage relationships between the organizations;
- Monitoring progress on bilateral projects;
- Coordinating the planning of joint work between organisations;
- Providing a forum for discussion of new ideas and resolution of problems; and
- Considering data issues relevant to both organisations.

61. Relationship managers can support the integration of economic statistics by supporting interaction between government departments and agencies that use and produce statistics. Having a person in each agency with an awareness of the importance of official statistics will support the coherence of statistics.

The role of the relationship manager includes:

- Regular meeting with relevant staff in other agencies;
- Identifying issues that need to be resolved; and
- Ensuring that the appropriate staff are involved in finding a solution.

Memorandum of Understanding

62. Increasing use of administrative data supplied by other government departments increases the importance of the relationships between supplier organisations and producers of statistics, because disruptions to supply can seriously impact the quality of the economic statistics. In decentralised statistical systems, the statistical aggregates that feed into the national accounts may be supplied by several government agencies The greatest risk in the short term is that data might not be delivered on time to meet the timetable for production of regular statistical outputs. In the longer term, the greater risks are around the quality of that data being supplied. The ideal is that definitions and classifications be consistent with those used in other economic statistics. Agreeing to a Memorandum of Understanding (MOU) with each supplying organisations is an excellent tool for managing these risks.

63. A Memorandum of Understanding is a legal document that outlines the terms and details of an agreement between agencies, including each party's requirements and responsibilities. An important benefit of these Memoranda of Understanding is early warning of changes to administrative procedures or statistical processes that could affect the quality data used for the production of statistics. These agreements make cooperation with supplier organizations more predictable by consolidating all information about all decisions and processes in one document. In particular, they can deal with the following issues:

- Conditions for the supply of administrative data;
- Timetable for the supply of data;
- Confidentiality and security of data;
- Consultation about new uses of administrative data;
- A process for resolution of disputes;
- Consultation before making changes that will affect the variables supplied;
- Taking into account statistical needs before making changes; and
- Consultation before changing administrative forms.

Service Level Agreements

64. The compilation of statistics often requires exchanges of data been different units or departments within a government agency. A service level agreement covering the conditions for exchange of data between the administrative unit and the business statistics units or the national accounts unit can be extremely important for ensuring a smooth data exchange. A Service Level Agreement is a contractual agreement between a supplier and a customer specifying the timing and quality of the service that will be provided. They are usually negotiated by operational staff with an understanding the production process and the way the data

will be used. If the supplier and the customer business units belong to different agencies, a service level agreement may need to be backed by a more general MOU developed by the corporate staff in the cooperating agencies. Service level agreements describe the responsibilities of the supplier and customer, by defining precisely the nature of the product to be delivered, the relevant quality standards, and the frequency, format and timing of delivery. A process for dealing with data problems should be specified. The agreement may include various fallback options that will apply if the supplier is unable to comply with quality or timeliness due to factors beyond its control.

65. Each service level agreement should be reviewed frequently to ensure that quality standards and timetables are appropriate. Most will include a formal change management procedure to ensure that both parties agree with any proposed changes before they are implemented. Special consideration should be given to suppliers of administrative data, such as the tax authorities and central banks. More formal agreements or enabling legislation may be needed to formalise data delivery to the statistical office.

Cross-agency teams

66. In a decentralised statistical system, communication between the staff of the different agencies responsible for producing statistics is important for integration of statistics. If they do not understand how their statistics are used by other agencies, they will tend to pursue the needs of their own agency at the expense of the requirements of other agencies. Anything activities that can get staff out of their stovepipes will facilitate the overall coherence of the statistical system. Cross-agency teams are a useful tool for building understanding of the way that the entire statistical system coheres together. By participating in a cross agency project team, agency staff will develop a better understanding of how staff in other agencies produce or use their statistics. Forming a cross-agency team to develop a new classification may be a good way to begin this type of cooperation. Joint efforts to develop productivity measures or financial accounts can also be good opportunities for the development of cross-agency project teams.

67. The success of a cross agency team will depend on a number of factors. Leadership “buy in” is essential. The senior management of each of the participating agencies must be strongly committed to the project. The scope and objectives of the project must be clearly defined and agreed at the beginning of the process. If this is not done, the project can be captured by one of the agencies. The resources needed to complete the project must be clearly specified. The participating agencies will need to reach agreement on the source of funding and which agencies will be providing the necessary resources. An experienced project leader should be appointed. The project leader will need a clearly defined role and authority, because they often have to deal with a number of competing constituencies. Regular meetings of the project team will be essential for good communication and resolution of issues. A steering group with representation from all the participating agencies should exercise oversight over the projects. This group should act quickly to remove any

bottlenecks that may hold it up. A clearly defined set of deliverables should be agreed at the beginning of the project. This may include:

- A research report;
- A commitment to work on an ongoing basis; and
- A joint publication on the internet.

68. Data needs will need to be prioritised and the importance of the project should be communicated to other staff in the participating agencies that may need to contribute data or expertise from time to time. Groups of relevant experts who understand data linkages and quality may need to be called together on an ad hoc basis to sort out differences in source data and classifications. Statistical agencies should ensure that contributions to cross-cutting projects are recognised in awards and performance assessments and salary reviews. A key benefit of successful joint projects is that they demonstrate the possibility of integration projects taking place in decentralised systems. The Bureau of Economic Analysis case study provides an example of successful joint project undertaken by a cross agency team.

Financial resources

69. The funding arrangement for an integration program will vary depending on the institutional arrangements in each country. In some situations, the agencies will be able to make the changes needed as part of their ongoing work programs. In other situations, the agency needing to undertake essential integration activities might not have sufficient budget to support these additional tasks. The agency responsible for leading the program for integration of statistics should work with other agencies to assist them to obtain sufficient funding. This could range from the national statistics office making funding available to be another government agency by fiscal transfer, or supporting the other agency to go through the existing budgeting channels to obtain the funding needed. In some situations, funding may be available from international agencies, if the correct approaches are made.

70. The aim is to develop and agreed work program, with funding established for each aspect of the program. Establishing long-term funding streams is important, as agencies will be unwilling to commit to program of statistical integration, if the stability of funding is uncertain. The will be resistance to starting on a long-term program, if the work may never be finished. Ensuring that funding is available would strengthen the commitment of participants in the program for integration of economic statistics.

Cost and Benefits

71. Users with specific data methods that are being met by existing statistical outputs will not always be supportive of efforts to integrate these outputs with other statistics. If the changes being implemented will disrupt existing time series, existing users of the statistics might oppose the changes. For example, changing the definition of a data item in a survey to make it consistent with other collections might make it less appropriate for some users. The need for integration will have to be balanced against the more specific needs of particular statistical outputs. Integration of economic statistics will come at a cost. Resources will have to be invested in harmonizing definitions and classifications with international statistical standards and applying these across all economic collections. Statistical production processes may need to be reengineered and institutional arrangements might also need changing. The agency leading the integration program might need to develop a case for additional funding to support the program. A costs/benefits analysis can assess integration of economic statistics as an investment with substantial long-term returns. The objective should be a phased and realistic or optimum integration that takes into account countries' circumstances, not a theoretical or maximum integration. If the agency leading the program of integration program has funding available, this can be useful for building constituencies for integration processes. Agencies that are reluctant to support the project may come on board, if funding is available.

Case study 1. UK Code of Practice

1. The U.K. experience provides an example of the detail of a code for the principles and practice of implementation, but also of the high-level institutional support. The U.K. National Statistics' Code of Practice is set out in two parts. National Statistics (2002) sets out key principles and standards. This is supported by a series of protocols that provide practical frameworks for the implementation of the principles and standards of the Code across all significant areas of activity relevant to National Statistics. The Code is consistent with the United Nations' Fundamental Principles of Official Statistics (1994) and the European Statistics Code of Practice (2005) (with which all producers of European Statistics are expected to comply). The Code then moved to one supported by an independent authority responsible for such principles and practices

2. The principle on integration was derived from the compliance guidelines for Principle 7 of the National Statistics (2008) [1] code: "Enhancement through integration, accumulation and Innovation." Integration was one of several principles within a framework each of which had attached to it a protocol for implementation.

3. The UK Statistics Authority, which was established on commencement of the Statistics and Registration Service Act 2007, was given a statutory duty to prepare, adopt, publish, and assess compliance with a Code of Practice for Statistics that sets out the professional standards which official statistics are expected to meet. The UK Statistics Authority's Code of Practice for Official Statistics (2009) built on, and superseded, the National Statistics (2002) Code.

Case study 2. Statistics Netherlands - Chain Management

1. Starting point of chain management at Statistics Netherlands (SN) is the development of business architecture. Central to this business architecture is the use of so called ´steady states.´ A steady state is a dataset in a well-defined state of processing (see Renssen and Van Delden, 2009). Steady states can be used to structure the outcomes of the statistical process: they may be the starting point, the end point or half-products of the production process. SN distinguishes four basic types of steady states:

Input base: Data set at record level, which contains the unit types and variables as they are present in the source data;

Micro base: Dataset at record level that use standardised statistical unit types and variables;

Stat base: Dataset with parameter values of aggregates of populations of statistical unit types;

Output base: Dataset with parameter values at the level of the output tables. Some values of aggregates may be suppressed because of "disclosure control".

2. The datasets within each Base are stored in a central data warehouse in order to make the data available for re-use in other processes. Within the chain of economic statistics we have further refined the four basic types of steady states as part of a large redesign programme on economic statistics (see Braaksma, 2007).

3. For each steady state the dataset and its quality are defined by means of quality indicators; the further towards the end of the process, the more demanding these quality requirements are. The necessary quality requirements are determined by the various users of a specific dataset. These steady states as well as the related metadata like quality reports and the data source design are stored in the central data warehouse. The data source design declares the variables that should be produced as well as some ex ante agreements on quality of the data with respect to for instance turnover coverage, accuracy, level of detail and punctuality. Not all data sets are broadly re-used within other processes. Some data sets are just transferred from a single supplier to a single user within one production line (stove pipe) and stored locally. Even in those cases, ex ante quality requirements between supplier and user are laid down in, so called, Service Level Agreements.

Case study 3. Statistics New Zealand – Using Business Process Modelling to Enhance Integration

1. Statistics New Zealand began a serious move towards process-oriented approach to the production of statistics with the gradual introduction of business process modeling methods. The key outcome is the adoption of a disciplined business process approach to describing how the organisation functions and how changes to the organisation and new projects are planned and managed. Critical business processes are abstracted from existing processing systems and their underlying data structures and database systems. The seven top-level processes identify of activities where value can be added. A long-term objective is to devote less resources to Design and Develop, Build and Collect phases by adopting standard tools and methodologies. This will allow more resources to be applied to the Need, Analyse and Disseminate phases where value can be added for users of the national statistical system. (Please see Annex 3. for further details)

2. The Business Process Model influences the way that Statistics NZ is organised. For example and Integrated Data Collection division has been established with responsibility for all data collections for both economic and social surveys. This ensures that consistent collection processes are applied to all surveys. The business processes that pose the greatest risk to the organisation can be identified and decisions about investments to mitigate them are made from the corporate level.

3. Standard methodologies have been have been adopted for many of the core processes that are common to the production of most statistics. The samples for all business surveys are selected off a comprehensive business register use an approved set of sampling methods (sub-process 4.1). This ensures that all business data is classified consistently. All administrative data records for businesses are matched to the business register to obtain their classifications. This ensures that data from survey and administrative sources are classified consistently (5.1).Editing and Imputation Standards and Guidelines have been adopted. This standard ensures that editing and imputation processes are undertaken consistently for all economic statistics (sub-processes 5.2 5.3 5.7).

4. The appropriate statistical methods are applied consistently across each subject area, whether the data is collected through a collection instrument or from an administrative data source. A Business Process Model facilitates the identification of opportunities to standardise common processes for the benefit of the organisation. Standard, generic tools have been acquired or developed for some of the critical processes. The aim is for all non-response imputation to be done using CANCEIS or BANFF, tools produced by Statistics Canada. This ensures that a standard set of imputation methods is used across all surveys and that decisions about which method to use are made consistently (sub-process 5.3).

5. A new platform has been developed internally that will be used to store and edit all business surveys and administrative unit record data. This means that consistent parameter driven automated edits can be applied to all records regardless of their source (sub-processes 4.5 and 5.2). All statistical outputs are published using the same dissemination tools (sub processes 7.2,7.3). In addition to reducing costs and minimising risk, standardising processes across the organisation supports the integration of economics statistics. Standardisation also simplifies the data integration and analysis that is necessary for meeting the increasingly complex policy and research needs of government and the wider research community. Using standard processes, methods and systems facilitates the rotation of staff by allowing them adapt more quickly to a new subject matter areas. Statistics New Zealand has adopted a process-oriented approach to the production of statistics. A focus on standardisation of business processes should gradually become part of our organisational culture.

International arrangements for the integration of economic statistics.

72. International institutional frameworks emphasise comparability and consistency of datasets across countries. Strong institutional coordination at the international level is essential to developing integrated economic statistics. Integration of economic statistics encompasses a key set of activities that must be well coordinated, supported and, if possible, fully formalised to achieve the desired goal. They include the development of: (i) international statistical standards (methodologies) i.e., the concepts, definitions, classifications and inter-related tables or accounts integrating a broad set of statistics; (ii) compilation guidelines and implementation programs, (iii) integrated economic databases, and (iv) universal quality assurance frameworks to assess the quality of output produced, and (v) technical assistance and capacity building. This section reviews a number of international arrangements for the integration of economic statistics and develops a framework that can be used to classify these arrangements.

73. The development of international statistical standards or recommendations is the necessary first step and requires wide international consultation to ensure universality in terms of relevance, applicability and feasibility of implementation. Given the goal is to realise international comparability for a broad domain of statistics, there is an expectation that national authorities will aim to implement the standards in their process of developing comparable and accessible data sets. Similarly, there is an expectation that international stakeholders will endeavor to promulgate the standards through various supporting systems. Examples of international arrangements international arrangements for the integration of economic statistics are provided in the following case studies, 1-5.

Case study 1. The Inter-Secretariat Working Group on National Accounts

1. The System of National Accounts (SNA) is the recognized international framework for statistical systems worldwide and is, therefore, the basis for international statistical standards for both developing and developed countries. The planning, organisation and coordination of the SNA review and revision process is overseen by the Inter-Secretariat Working Group on National Accounts (ISWGNA) which was created in 1983 through a mandate of the United Nations Statistical Commission (UNSC). The ISWGNA constitutes five member organizations (European Union, IMF, OECD, UN and World Bank). The five agencies coordinated the development of the conceptual framework of the 1993 SNA through a programme of international cooperation and burden-sharing. Following adoption of the 1993 SNA[1], the ISWGNA was tasked with the work of assisting countries to implement the system through cooperative and collaborative frameworks. To facilitate its work, it was agreed to develop a coordinating and support system including training, compilation of manual and guides, research, and technical cooperation.

2. Most recently the ISWGNA coordinated the production of the 2008 SNA and is now in the process of developing compilation guidance and implementation programs. The governance structure of the ISWGNA includes a rotating annual chairmanship with a permanent secretariat assigned to United Nations Statistics Division (UNSD). The mandate of ISWGNA, however, does not extend to other equally important aspects of integrated economic statistics, in particular development of integrated economic databases and supporting quality assurance frameworks.

Case study 2. The Task Force on Finance Statistics

1. The Task Force on Finance Statistics (TFFS)[1] was created in 1992 under the auspices of the UNSC to take stock of the activities of the international organizations involved in finance statistics and to make recommendations aimed at avoiding duplication. Its mandate was broadened in 1998 and currently involves development of methodological standards for statistics on debt; promotion of data availability on financial stocks including international reserves; encouragement of internationally accepted statistical practices to enhance data quality; and fostering of inter-agency collaboration in statistical capacity building. Its key outputs include the production of External Debt Statistics: Guide for Compilers and Users, the External Debt Data Quality Assessment Framework and the Joint External Debt Hub (JEDH) initiative.

2. Specifically JEDH disseminates a broad range of creditor/market data series on the external debt and selected foreign assets of developed, developing and transition countries and territories. The creditor/market data are complemented in the JEDH by series from the World Bank's Quarterly External Debt Database which disseminates detailed external debt data that are published individually by countries that subscribe to the IMF's Special Data Dissemination Standard or participates in the General Data Dissemination System (GDDS).

3. The JEDH also features creditor/market- and national-based data comparisons of countries' external debt, and provides users with access to metadata. Data are updated by contributing agencies on a quarterly basis and each agency is responsible for the quality of data series they provide. As a pilot project of the Statistical Data and Metadata exchange (SDMX), JEDH applies technological innovation to the context and content of information being exchanged with the aim of generating efficiencies through the convergence of data flows into a common framework.

4. The TFFS is chaired by the Statistics Department of the IMF and meets annually to consider its work program. It reports every four years to the UNSC, and annually to the IMF's Committee on Balance of Payments Statistics. The TFFS work on the JEDH is fully formalized through a Service Level Agreement signed by the four data contributing agencies and coordinated by its Secretariat at the IMF.

Case study 3.The International Comparison Programme

The International Comparison Programme (ICP) is a worldwide statistical operation involving some 160 countries. It produces internationally comparable price and volume measures for gross domestic product and its component expenditures. The ICP is organized by regions (six of them) all but one overseen by the ICP Global Office in the World Bank. The remaining region is covered by the Eurostat-OECD Purchasing Power Parity program. Eurostat and the OECD work closely with the Global Office to ensure that their 46 or 47 countries can be combined in a single comparison with the 110 or so countries of other regions. The responsibility for the ICP within regions is shared between national and regional agencies. National statistical offices carry out data collection. Regional agencies provide guidance and coordinate data collection and data validation. They also put together and finalize the regional comparison. Responsibility for ensuring that the regional comparison can be integrated in a world comparison rests with the Global Office. Results of regional comparisons are disseminated by regional agencies. Results of the world comparisons are disseminated by the Global Office.

Case study 4. The Harmonised Index of Consumer Prices

1.At the time of the Maastricht Treaty on European Union, in 1992, each European Union (EU) Member State compiled its own consumer price index (CPI) often using different methods largely with the objective of measuring changes in the cost of living. Simple international comparisons of these national CPIs did not necessarily give accurate inter-national comparisons of consumer price inflation. The harmonized index of consumer prices (HICP) was developed by the EU as a response to the need for comparable CPIs to measure the convergence of inflation of EU Member States as a criterion for entry to monetary union, and as the basis for assessing price stability. The ECB has defined price stability as a year-on-year increase in the HICP for the euro area of below 2%. In the pursuit of price stability, The ECB aims at maintaining inflation rates below, but close to, 2% over the medium term.

2. The development of harmonised standards was in close collaboration with price experts from the EU national statistical offices. The process has been described as involving a high level of collaboration with much time spent discussing technical and practical issues to obtain results by consensus, reinforced where necessary, by legal acts. The approach taken was, after much discussion, to adopt legislation setting out the broad principles and scope for the HICP. The first milestone in the development of HICPs, in October 1995, was the adoption of a Council regulation, which set the legal framework for the harmonized methodology. This has been built on over the years using a series of legally binding implementation regulations, each addressing one or more specific areas of methodology.[1] Given the importance accorded to the accuracy, reliability and comparability of the HICPs in the EU, Eurostat operates a system of compliance monitoring to ensure that the legal framework is adhered to.

3. The degree of coordination of international arrangements is intensive, in terms of the (ongoing) meetings and tasks forces aiming at a arriving at compromises on best practice, and there is a high degree of formalisation in the form of the legislative regulations.

Case study 5. Euro Area Accounts

1. The Euro Area Accounts provide a comprehensive overview of the euro area/European Union as a single economy and allow for a wide-ranging analysis of the interactions among households, non-financial corporations, financial corporations and government. Transactions with non-residents and the financial claims of residents on non-residents, or vice versa, are recorded in the "rest of the world" account. The sector accounts thus show the interactions among the different sectors of the resident economy and between the resident economy and the rest of the world.

2. The accounts for the institutional sectors follow the methodology of the European System of Accounts 1995 (ESA 95). All transactions between institutional sectors have been grouped into economically meaningful categories, such as compensation of employees, interest payments, taxes on income, and consumption expenditure, as well as transactions in financial assets and liabilities such as deposits, loans and shares. In turn, these transaction categories have been grouped into a coherent and comprehensive system of interlinked accounts.. Transactions are classified in two categories of accounts: current accounts and accumulation accounts.

3. Euro Area Accounts record, in principle, every transaction between economic agents during a certain period and show the opening and closing stocks of financial assets and liabilities in financial balance sheets. These transactions are grouped into a sequence of accounts, each of which covers a specific economic process, ranging from production, income generation and income distribution, through the use of income for consumption and investment, to financial transactions such as borrowing and lending. The Euro Area Accounts record stocks of assets and liabilities in balance sheets for the institutional sectors, including their claims on and liabilities to non-residents of the euro area. These balance sheets record for each sector the non-financial and financial assets and liabilities valued at market prices on the date to which the baklalnce sheet relates and broken down by financial instrument. The changes in financial balance sheets in the course of a year stem from the acquisition of financial assets and the incurrence of liabilities (deposits, loans, shares) and other changes-mainly revaluations due to changes in the market prices of financial instruments. The resulting net financial wealth (financial assets minus liabilities) of households, non-financial corporations, financial corporations and government is also shown. The external account corresponds to the euro area international investment position and the balance of payments.

4. Completeness and consistency lead to:

- A consistent derivation of key economic indicators (for example, Money, government debt and deficits); and
- A consistent framework for the analysis of economic and financial developments by sectors.

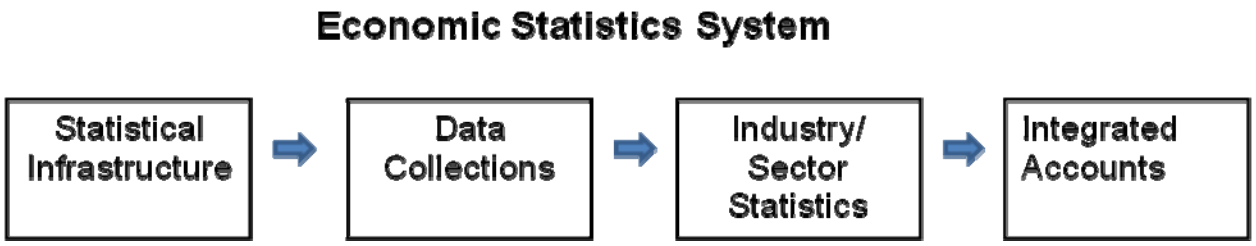
Chapter 5. The statistical production process of integrated economic statistics

National statistical programmes for the integration of economic statistics

1. In countries that have not implemented an integrated system of economic statistics, the different kinds of statistics like the national accounts and balance of payments are compiled from various data sources that are the output of "stand alone" processes. The traditional rolling program of industry surveys and economic censuses that feed into the national accounts are designed independently of each other. In such countries, responsibility and funding for measuring the performance of different industries are often assigned to different statistical agencies. Short-term statistics and annual structural statistics are often developed in complete isolation within different agencies.

2. The resulting lack of coordination makes it very difficult to ensure that methodological issues and changes in methods of data collection are dealt within a coherent way in all statistical outputs. The resulting inconsistencies can make the use and interpretation of economic statistics difficult. Any attempt to integrate these diverse statistical activities must recognise that they are part of a comprehensive economic statistics system that begins with survey design and proceeds through collection and compilation to dissemination. Each part of the system depends to a greater or lesser degree on other parts of the system, so no one part of the statistical system can be changed without affecting or being influenced by the others. This means that any program to improve the integration of the economic statistics system must take a holistic approach and organise and design changes in a way that will benefit the entire system.

3. The relationships between the different parts of the economic statistics system are illustrated in the following diagram.



Statistical infrastructure contains the classifications, definitions and standards that are available for use by any agency that produces economics statistics. One or several business registers might be part of this infrastructure. Data collection includes the design and operation of a broad range of survey and censuses. Often these will be undertaken by different agencies for different purposes. Significant amounts of the data collected may come from administrative sources.

4. The data collected within the economic statistics system are used to produce huge range of statistics that measure the shape and performance of different parts of the economy, including industries, institutional

sectors and particular types of transactions, like international trade or prices. All these will be published separately and will often have a unique set of users. Integrated accounts, such as national accounts and balance of payments, are the final product of the economic statistics system. They bring and use data and statistics from a huge range of sources to compile an integrated set of accounts that monitor the performance and position of the entire economy.

5. In an integrated system, a broad range of actions can be taken to improve the coherence of the entire economic system, ranging from the development of classification to better compilation methods. Each country will have to decide where it should focus its efforts. A long-term programme of integration should address all stages and all aspects of the economic statistics system from statistical infrastructure and the design of the collection of data to the compilation and dissemination of statistics. In the short-term, particular agencies will need to focus their efforts on those aspects of the system over which they have the most control and where their efforts will have the greatest effect. Defining this focus will require balancing benefits against costs and will vary depending on whether the statistical system is centralised and decentralised. Statistical leadership will be important whichever option is chosen.

6. The coherence of all aspects of the statistics system is enhanced by using a common business register, standard population definitions, classifications, questionnaires, editing, and imputation and estimation methods. The most effective means of ensuring integration and consistency is through a holistic redesign of data collections (surveys and administrative data) that would minimise inconsistencies through the use of common concepts, integrated surveys, and one central business register. Under this approach, all economic data collections gradually change their objectives and statistical designs and enhance the coherence of statistical outputs. When designing a collection for manufacturing industries, methodologists will need to think beyond their current work to how it will integrate with other statistical outputs. Likewise, questionnaires apply standards and definitions that are consistent with those used in other surveys and administrative collections.

7. The “bottom up approach” to integration is easier to apply in a centralised system. A national statistical office with a legally-mandated responsibility for the quality of all official economic statistics will be able to influence design at the lowest level. Responsibility for leading statistical developments and for coordination of government agencies will provide many opportunities to strengthen the integration of official statistics system. It gives the national statistics office the ability to minimize inconsistencies and increase coherence.

8. In more decentralised systems, the statistical development and production processes will be spread across a number of government agencies. For, example, the agency responsible for producing national accounts will be a user of statistics produced by other collection agencies, so they will have less influence over the design of statistical collections. The agency that is concerned about integration statistics will need to work

with all agencies that supply data to ensure that as far as possible, consistent standards and definitions are adopted for all data collections. Where possible they should develop contacts with tax authorities, customs agency and other government agencies to ensure access to data that meets with their needs. Memorandum of understanding with agencies involved in the data collection process can foster collaboration and be vehicle for the promotion of an integrated approach. Where the central bank has a strong role in the production of statistics, a high level of cooperation between statistical agencies and bank will also be beneficial.Statistical agencies without out a legal mandate for leading the integration of the statistics system, will have much less ability to influence the designs adopted by the suppliers of their data. In a decentralised statistical system, the benefits to be gained from a"bottom-up approach" may be far more limited.

9. Even if the coherence of the statistical system is given a high priority, the diverse range of needs that have to be met means that a perfectly integrated system of economic statistics is unlikely to be achieved. Even with an integrated economy-wide economic data collection, the statisticians responsible for compiling the national accounts in a centralised system will always have to deal with some inconsistencies between various data sources that they use. A programme to develop an integrated and coordinated statistical system of statistics should improve the quality and timeliness of economic statistics. The experiences of countries that have adopted integration collection processes shows that integration should be more operationally effective and capable of responding to the existing and foreseeable future needs for official statistics. For further details, please see Case studies 1. and 2.

Case Study 1. Statistics New Zealand - Integration in a centralised economic system

1. The tax-based business register (called the Business Frame) records a core set of information for all economically significant private and public sector businesses and organisations engaged in the production of goods and services in New Zealand. (Please see Annex 3. for further details) All units are coded to a range of classifications, including institutional sector and industry (5-digit ANZSIC). Information from the tax system is supplemented wherever possible with data from other administrative sources, such as business directories, land registries, government actuary, etc. Name changes and group structures are kept up to data with information from the Companies office. Several size indicators, including annual turnover and number of employees, are updated monthly from administrative sources for use in selecting survey populations, stratifying samples, and defining imputation groups. The development of a comprehensive business register has several benefits for the integration of economic statistics.

- All business survey populations are drawn from the same register, so their target populations complete and consistent. Sample selection, stratification, imputation and estimation use the same information, so standard methods can be applied; and
- All sample surveys of are selected from the business register and all administrative data is matched to it, so all business records take the classifications that have already been assigned to them on the register. This contributes to the coherence of economic statistics by ensuring that unit models and classifications are applied consistently to all business data that feeds into the national accounts, regardless of the source.

3. Statistics New Zealand has established a Classifications and Standards division to take the responsibility for developing standard classifications, sometimes in joint projects with the Australian Bureau of Statistics. A Standards Governance Board was established to ensure that standard classifications are used in as many data collections as possible.

8. While building statistical infrastructure and developing integrated data collections, Statistics New Zealand has continued to apply best practice principles to the compilation of National Accounts and Balance of Payments statistics. Current price annual accounts are compiled within a supply and use framework in which estimates from supply and demand sides of the economy are confronted and reconciled at the commodity level. This approach improves the coherence of key national accounts measures, such as gross national product, gross national expenditure, national disposable income, and their components. The combination of a comprehensive business register and economy wide economy survey has eliminated the need for benchmarking to five-yearly economic censuses, as the aggregates from the Annual Enterprise Survey are of sufficient quality to be incorporated directly into the national accounts. The next challenge is to expand the range of accounts being produced. (Please see Annex 3. for further details)

Case Study 2. Statistics Netherlands - Centralised integration system for national accounts

1. The organisation of the Economic Division of Statistics Netherlands was originally by branches of industry. Departments were in place for agricultural statistics, for manufacturing industries, etc. The National Accounts Department was responsible for the integration of the economic statistics. IT automation and an improvement in the timeliness of statistics lead to the reorganisation of the bureau, in 1991. A new organisation chart came in place in which the CBS was structured according to 8 divisions. Although some processes were (more) centralised, like the automation and the R & D-activities, the basic principle of the organisation remained the branches of industry.

2. In 2000, the next reorganisation was from a product-organisation to a process-organisation. The production of statistics for separate branches of industry (the "stove-pipes") was no longer the basic principle of the organisation. In the Economic Division departments were established for the successive phases of the statistical production process. Starting with the department for the General Business Register, a department for the logistics of the questionnaires was set up, followed by a department for judgement and analysis of the data and ending with the department for National Accounts (Further details are found in Annex 4.). The process of economic statistics could be characterised as a chain process, starting with the General Business Register and ending with the National Accounts.

3. In this new organisation, the National Accounts Department is organised to conform to a process orientation. Before 2000, sub-departments were responsible for products, like the supply and use table and the quarterly accounts. After 2000, the sub-departments play a role only in a part of the production process, but they play that role for all products of the National Accounts department. Sub-departments are in place for estimates of goods' producers, services industries, government activities and financial institutions and on households. One sub-department is responsible for the integration of the data in all integration frameworks.

4. In this new, chain-orientated organisation, the whole process of compiling economic statistics is redesigned. This project began in 2008 and is still running in 2010. One of the leading principles of the redesign is to make optimal use of administrative information. Thus, the information of the tax authorities e.g. on VAT is used. For necessary information that is not administratively available, additional surveys are possible, but these should be reduced, to the minimum. Furthermore, a special sub-project is set up to cover the information from the largest enterprises in the Netherlands. For these 300 largest enterprises, the aim is to get a consistent picture by the micro-integration of the data.

5. This programme makes a number of moves in the direction of the "Integration by Design" approach. For example, the statistical units according to the GBR are not always appropriate for linking the information from the different administrative sources. A new statistical unit (below the largest units) was introduced for the linking procedures although statistical units are less homogeneous than production processes and their organisation.

6. A main conclusion is that reorganisations in the statistical processes (and corresponding reorganisations in the organisational structures) are less complicated in a central environment.

Designing the integrated statistical production process

10. Integration of economic statistics is about statistical reconciliation and ensuring that the messages statistics deliver are consistent and coherent. Statistical reconciliation in economic statistics is a task that has traditionally been performed within the national accounts and other macro-accounting and classification frameworks. Macro adjustments made within these frameworks provide more consistent and coherent set of statistics. Adopting measures that would minimise conceptual issues and provide better information about statistical issues from the beginning of the statistical process would undoubtedly help analysts working in national accounts as well as external users that make use of survey data and national accounts data. The implementation of these measures requires a significant amount of coordination between staff involved at the various stages of the statistical processes. While it is necessary to manage each stage of the statistical processes, it is also necessary to manage the overall process.

11. A strong governance presence is among the first conditions that must be met prior the design of the statistical collection process can effectively begin. That presence is a condition to ensure the principles of integration are adhered to in all areas involved in the statistical system. That presence is necessary in order to ensure the needs of the statistical system supersedes individual programme needs. That presence is not only required during the implementation phase but also on an on-going basis when reviewing and prioritising content of questionnaires or making decisions regarding frequency at which statistical information will be collected.

12. The implementation of an effective collection system requires giving particular attention to two pillars of the statistical system. The two pillars are basic infrastructure components and deal with what will be measured. The first one is undoubtedly related to the frame of entities to be measured. The frame is the backbone of the statistical system. It represents what must be regularly measured by the statistical system. Its coverage must be as complete as possible and reflect the organizational structure of all entities of the economy. Where it is not possible to implement a central frame, efforts must be made to put in place an environment that has the characteristics of a central frame. The second pillar has to do with concepts and definitions. It requires adhering to the use of common concepts, definitions and classifications. It includes mappings between concepts, definitions and classifications used by the statistical system and those commonly used outside of the statistical system. That pillar deals as much with data to be collected than data to be derived. The second pillar is essentially to ensure the presence of a common language among the various areas that compose the statistical system. The ultimate goal is to ensure consistency in the content of questionnaires of all programs.

13. Before the collection stage can begin, there is a need to prioritise; making a choice between what is required for users that are only focusing on a segment of the economy and the needs of those focusing on the

overall economy. Because of the importance to produce a complete set of integrated sets of statistics for the whole economy, the priority should be to collect, at a minimum, aggregate statistics for the economy. These statistics would be collected at a high frequency. Many of these statistics would be available from administrative data sources in order to minimize costs and response burden. Because of the need to use administrative data sources in the production of economic statistics, administrative data concepts, definitions and classifications should be incorporated and aligned to those already in place into the statistical system, adding to the common language.

14. Lower level data could be collected less frequently. The frequency would depend on factors such size or the use of the statistics to administer governments programs. The pace of structural changes in economic activity or the need to understand emerging issues are, among other factors that would influence the frequency of collection.

15. The content of questionnaires should be integrated across all surveys. It should be from programme to programme. The focus of some questionnaires could be to collect data from enterprises while others would be focusing on establishments. The questions should be metadata-driven to ensure a specific topic is treated the same way throughout the programs. Depending of the frequency at which some information is collected, the questionnaires would contain modules that can be added or removed rapidly. The questions would be aligned with accounting records of enterprises and enterprise and the survey results would easily transformed into economic variables required by the statistical system.

16. The approach for sending questionnaires to respondents should take into account their preferences. Respondents do not like to receive a myriad of questionnaires in a staggered way. They prefer a unique questionnaire, often an electronic but printable questionnaire, which covers all the information they must provide. Since many firms have difficulty providing information for the lowest of their production entities, survey should be able to get that information directly from the enterprises.

17. In order to ensure enough flexibility within the statistical system and a capacity to react quickly in covering new areas, it is crucial to design processes that can be reused. This includes all survey-taking processes such as sampling, questionnaires design as well as editing, imputation and estimation processes.

18. In summary, a first step towards ensuring statistical consistency and coherency is to develop an integrated economic collection that first covers the entire economy. Once a comprehensive business register is in place, an economy-wide annual economic collection interspersed with infra-annual collections will mature develop with the following benefits:

- A collection that covers the entire economy and capable of providing all the information that is needed for both national accounts and other economic statistics;

- Consistent data collected from across the economy with a core set of variables being collected from all units in the annual and infra-annual collections;
- Survey questionnaires designed to collect both standard accounting variables and the additional information needed to calculate core national accounts variables;
- Survey variables aggregated to national accounts variables prior to data editing, which allows analysts to check and explain unusual movements in both national accounts variables and accounting aggregates as a normal part of data checking, and consequently keeping to a minimum the need for the national accountants to check unit record data;
- The combination of a comprehensive business register and an annual economy-wide economic survey would reduce the need of conducting frequent economic censuses required to recalibrate the level of macroeconomic statistics, notably in the national accounts; and
- Consistency between the annual and infra-annual collections.

For further details, please see Case studies 3. and 4.

Case study 3. Statistics for the harmonised revenue allocation formula in Canada

1. In 1996 the Government of Canada and the provincial governments of New Brunswick, Nova Scotia and Newfoundland announced formal agreement on an arrangement to harmonise sales taxes. The goal was to implement a single harmonised sales tax (HST) rate of 15% in the three provinces, instead of three separate sales taxes and a distinct federal Goods and Services Tax (GST). The revenues from the combined tax were to be collected by Revenue Canada and divided among the four governments by means of a specified revenue allocation formula. The formula was to be based on aggregate statistics compiled by Statistics Canada. The Government of Canada undertook to substantially improve the quality of the available provincial economic statistics.

2. The main elements of the plan were towards a more integrated statistical system, in which data collection from businesses would be treated in an enterprise-centric fashion. The data originating from a particular enterprise, whether collected from the headquarters, from one of its establishments or from one of its legal entities, would be kept together and treated as a single interrelated set of information. This enabled a reduction of duplication in questionnaires and an increase in the use of administrative data as an alternative information source which permitted more varied types of aggregations and analyses, facilitated the enforcement of confidentiality restrictions and the prevention of residual disclosure, and assisted in managing and controlling the response burden on individual enterprises. Instead of collecting data by means of multiple distinct business surveys, there would be an integrated corporate survey of all statistical enterprises. (Further details are found in Annex 5.)

3. The integrated surveys of enterprises operating in several regions and/or industries or single enterprises would be stratified to realise: (a) equal reliability across provinces and territories, and (b) highest relative data quality for those industries with the greatest priority. The priorities would depend particularly on the needs of existing data users (including cost-recovery clients) and the HST revenue allocation formula requirements for this project. Instead of many non-integrated survey questionnaires, there would be a single, consolidated enterprise questionnaire, consisting of a main module directed to the enterprise and a number of additional schedules directed at the component establishments of the enterprise. The consolidated questionnaire would be managed within a relational database system to permit customised questionnaires to be generated for individual enterprises. The North American Industrial Classification System (NAICS) would be implemented in the new Unified Enterprise Statistics Program. Revenue Canada's "General Index of Financial Information" (an administrative database) would be used - instead of survey vehicles - to obtain balance sheet and income statement statistics. Other administrative data from the GST and payroll deduction systems would also be incorporated. Using these administrative sources instead of more lengthy surveys, would produce reliable data with lower respondent burden.

4. All data collected from Canadian businesses would be warehoused in a standardised and interconnected set of relational microcomputer databases, where they could be accessed by authorised data compilers or analysts in Statistics Canada and, the raw data collected from Canadian businesses became a corporate resource. This brought increased flexibility in developing new cross-cutting statistical products and in responding to requests for customised tables. All business survey samples would be drawn from the central business register. The company contact database and monitoring system would be enhanced to keep track of the total response burden put upon each Canadian enterprise. Policies and procedures would ensure that all business survey contacts would be recorded in this database. It took ten years for the system to mature. In 2009, Statistics Canada decided to launch a series of initiatives with the goal of integrating further its statistical system, based on its experience dealing with enterprise-establishment statistics, administrative data as well as various survey processes.

Case Study 4: New Zealand economy-wide economic survey

The Annual Enterprise Survey (AES) approach has several benefits for the integration of economic statistics:

- Consistent data is collected from across the economy. All the AES questionnaires ask the same core questions and collect a core set of variables. The differences in the questionnaires are to capture items that are specific to a particular industry or to obtain relevant commodity breakdowns;
- The AES was designed as the principal collection vehicle for data used in the compilation of New Zealand's National Accounts. The survey questionnaires are designed to collect both standard accounting variables and the additional information needed to calculate all core national accounting variables. For example, the questionnaire collect wages and salaries paid. They also collect the other components of compensation of employees as defined in the SNA. This means that compensation of employees can be derived by aggregating the appropriate line codes for each unit, rather than "adjusting" wages and salaries" at the aggregate level to take account of the estimated difference. This approach ensures coherence between the national accounts and other business statistics;
- As much as possible, the information needed for all the annual accounts is collected in one survey: the AES collects information about production, but also about interest and dividend flows and capital formation which contributes to coherence in national accounts;
- The AES line codes are aggregated to National Accounts variables prior to data editing. Analysts working on the AES check and explain unusual movements in both SNA variables and accounting aggregates as a normal part of data checking. This minimises the need for the compilers of national accounts to check unit record data;
- The AES data feeds into the calculation of the National Accounts through the current price annual industry accounts, which are compiled within an input-output framework. When compilers are confronting data from supply and demand sides of the economy, differences should be the result of different survey designs, rather than inconsistencies between sample frames or classification of units;
- The combination of a comprehensive business register and economy wide economy survey eliminates the need for benchmarking to five-yearly economic censuses. The national aggregates from AES are of sufficient quality to be incorporated directly into the national accounts;
- Detailed commodity breakdowns are collected in a survey that covers all industries over a rolling, four-year cycle. This survey asks respondent to provide detailed breakdowns of sales and expenses variables they recorded in the AES. This approach ensures that the commodity breakdowns that feed into the National Accounts and the Producers Price Index are consistent with other information from the AES; and
- The surveys that feed into Quarterly GDP are also selected from the Business Frame. This ensures that survey coverage and classification of units is consistent with the Annual Enterprise Survey. Differences still exist due to sampling and information coming from management accounts, but coverage differences are eliminated. Where appropriate, variables of interest are defined in the same way.

Please see Annex 3. for further details.

Common concepts, definitions and classifications

19. Economic statistics describe the activities of economic transactors and the transactions that occur between them. The integration of statistics will be facilitated, if the definition and classification of both transactors and transactions are standardised.

Defining and classifying statistical units

20. Statistical units may be defined according to many different criteria: legal, accounting or organizational; geographical; and production. The relative degrees of importance of these criteria depend on the purpose from a statistical perspective of compilation and dissemination. A legal or institutional criterion helps define units in the economy that are identifiable and recognizable. In some cases, legally separate units need to be grouped together if they are not sufficiently autonomous in their organization. In order to define an institutional unit, accounting or financial criteria also have to be applied. Accounting criteria require that an institutional unit keep a complete set of accounts of its transactions. Organisational criteria state that enterprises are organizational units that have a certain degree of autonomy.

21. A *statistical unit* is an entity about which information is sought and for which statistics are ultimately compiled. It is the unit that provides the basis for statistical aggregates and to which tabulated data refer. They can be observable such as a legal entity or created by splitting, the observed entity, using statistical estimation methods, for the provision of a detailed and homogeneous set of statistics. For operational purposes, a distinction must be made between collection, reporting and statistical units. The *collection unit* is the contact unit from which data are obtained for the questionnaire survey forms. A *reporting unit* is the unit for which data are reported. Reporting units are those entities for which information is collected by means of questionnaires or interviews. Reporting units are the units for which statistics are compiled. In the case of a complex operating structure, the unit at the highest level of the operating structure may make a separate return for units at a lower level of the operating structure.

22. The application of consistent classifications to define statistical units is essential for the coherence of economic statistics. The challenge is ensuring that unit models and classifications are applied consistently across all statistical measures. One way to ensure consistency of units and classifications is to use a comprehensive business register as the vehicle for structuring units and assigning their classifications. If all survey populations are drawn from the business register and all administrative data are matched to it, all data records can take the classifications that they have already had assigned to them on the business register. This ensures that information from different data sources is classified consistently.

23. For data collection purposes, the most convenient way to obtain statistics would be to collect from entities capable of reporting complete sets of required records. This would allow statisticians to take advantage of information available from the accounting records of the producing entities and similar or complementary information these producing entities provide to administrative authorities. In such a context,

this would result in statistics that, to a certain degree, serve best the interests of users since it makes it possible to relate administrative records to statistical surveys. For the respondents, the link with administrative data sources represents a first condition towards the use of administrative information in the compilation of statistics and the potential reduction in response burden.

24. The legal and operational structures of economic entities as well as their record keeping practices are not developed to suit statistical purposes and it is important to have guidelines about collection, reporting and statistical units to be used for the purpose of data collection and dissemination.

Types of statistical units

Institutional units

25. Institutional units are the core units of the System of National Accounts. All subsequent definitions embody the definition of this basic unit. An institutional unit may be defined as an economic entity that is capable, in its own right, of owning assets, incurring liabilities and engaging in economic activities and in transactions with other entities.

26. An institutional unit has the following main attributes: (a) it is entitled to own goods or assets in its own right and is therefore able to exchange the ownership of goods or assets in transactions with other institutional units; (b) it is able to take economic decisions and engage in economic activities for which it is itself held to be directly responsible and accountable at law; (c) it is able to incur liabilities on its own behalf, to take on other obligations or future commitments and to enter into contracts; and (d) either the institutional unit has a complete set of accounts, including a balance sheet of assets and liabilities, or it would be possible and meaningful, from both an economic and a legal viewpoint, to compile for it a complete set of accounts, if required.

Enterprise

27. An institutional unit in its capacity as a producer of goods and services is known as an enterprise. An enterprise is an economic transactor with autonomy in respect of financial and investment decision-making, as well as authority and responsibility for allocating resources for the production of goods and services. It may be engaged in one or more economic activities at one or more locations.

28. The enterprise is the basic statistical unit at which all information relating to its production activities and transactions, including financial and balance-sheet accounts, are maintained and from which international transactions, an international investment position (when applicable), a consolidated financial position and the net worth can be derived. It is also used for institutional sector classification in the 2008 System of National Accounts.

Establishment

29. An establishment is defined as an enterprise or part of an enterprise that is situated in a single location and in which only a single productive activity is carried out or in which the principal productive activity accounts for

most of the value added. In the case of most small and medium-sized businesses, the enterprise and the establishment will be identical. Some enterprises are large and complex with different kinds of economic activities undertaken at different locations.

30. The establishment is particularly useful as a statistical unit for compilation and dissemination of information related to its production activities which would include (a) production of goods and services, revenues from sales of goods and services, all associated costs including employee remuneration, taxes on production and imports, subsidies, depreciation and a meaningful operating surplus; (b) employment information such as numbers of employees, types of employees and hours worked; (c) stock of non-financial capital used; and (d) changes in inventories and gross fixed capital formation undertaken[11].

Types of organisation of statistical units

31. Institutional units can be broken down into persons or groups of persons in the form of households, and legal or social entities. They should be classified as either part of non-financial or the financial sectors. It is necessary to define two separate institutional units, for an entity engaged in non-financial and financial activities as long as the necessary financial accounts and balance sheets are available for each of them. Institutional units can take the form of:

Sole proprietorship business

32. A sole proprietorship is an unincorporated business that is wholly owned, control and operated by one person who receives all the profits and takes all the risk. All assets and all liabilities of the business are separated from the other assets and liabilities of the person. The business becomes a separate accounting entity from the individual. The personal activity of the individual, owning the business, is also an accounting entity with personal assets (private house), personal debts (house mortgage), personal income (salary income) and personal expenses (household expenses). The accounting entity related to the business activity is normally recognized as an institutional unit on the statistical business register. The accounting entity related to personal activity of the individual (owner) must be excluded from the business register.

Partnership business

33. A partnership is a business relationship that exists between two or more legal persons. Each partner owns a share of the business and is entitled to a portion of the profit (loss) and is liable to all or a limited portion of the debts. The accounting entity related to the partnership business must be recognized as an institutional unit on the business register. However, procedures should be developed to remove partnership income or loss corporate partners when using income tax records.

[11] For more details on statistical units reference may be made to the source *Statistical Units*, United Nations Statistics Division (2007), available at: http://unstats.un.org/unsd/isdts/docs/StatisticalUnits.pdf and further information is included in the publication United Nations (2009).

Corporate business

34. Corporations are “economic entities” that are incorporated under business laws. Shareholders own and control the corporation through a Board of Directors elected by the assembly of shareholders. Shareholders risk is limited to the capital invested in the corporation. The vast majority of corporations have no controlling shareholders that are corporations and they in return are not the controlling shareholder of another corporation. For these corporations, the boundaries of the corporation are also the boundaries of the accounting entity. The managerial decisions are reflected in the financial statements of the corporation. Also, all the other economic entities are making decisions based on the information provided by these financial statements.

35. For some corporations, the controlling shareholder is another corporation. For these corporate families, the delineation of the accounting entity or entities depends on whether all the corporations in the family operate only as one economic entity or each of the corporations or small grouping of corporations operate separately. The accounting entities are mutually exclusive with the exception of corporate joint ventures. A corporate joint venture is a corporation that has been established for a specific business undertaking by two or more corporate parties, where control and contribution of resources are shared on an agreed basis. Normally a corporate joint venture terminates upon completion of the objectives of the undertaking.

36. Corporate joint ventures are treated as an accounting entity separate from the corporate owners. Each corporate owner should consolidate, on a proportionate basis, the activities of the corporate joint venture. This accounting treatment leads to duplication as transactions are recorded once in the financial statements of the corporate joint venture and, the same transactions are also recorded, line by line, on a proportionate basis, in each of the financial statements of the participative corporate owners. Joint venture should be considered as institutional units. Consequently, this will require taking measures to avoid duplication between the joint venture unit and the owning corporations’ statistics.

37. There may be businesses that carry out a substantial portion of their activities outside of the country as a branch operation. The accounting entity representing the business will not treat the branch operation as a separate accounting entity. This is a problem that must be addressed during the statistical process.

Quasi-corporate business

38. Quasi-corporations are economic entities that are created under national jurisdictions for special purposes. Even though the economic behaviour is the same as corporation, these entities provide special legal and/or taxation benefits to their owners. Examples of these entities are Limited Partnership (LP), Limited Liability Partnership (LLP), Real Estate Investment Trust (REIT) and Royalty Income Trust (RIT). Control of these entities is exercised through ownership of “units issued” and risk is limited to invested capital. Many of these quasi-corporations operate independently. For these independent entities, the legal boundaries of

each entity are also the same as the accounting entity. The managerial decisions are reflected in the financial statements of the entity.

39. Many corporations use these quasi-corporations as special purpose enterprises (SPE) to isolate risks, streamline their balance sheet or to acquire new financing. For these entities that are part of a corporate family, the delineation of the accounting entity or entities is the same as for the corporate family.

Government

40. Governments prepare financial statements. Government entities operate many economic entities such as boards, commissions and agencies. Some of these economic entities are integrated with the general government activities; others work independently and at arms length. The transactions of government economic entities that are integrated with the general government are included in the combined/consolidated financial statements of the respective governments. These economic entities are not separate accounting entities and do not represent a separate institutional unit.

41. The government-owned economic entities that are excluded from the combined/consolidated financial statements may represent a separate institutional unit, for example crown-corporations in which the same rules as for corporations apply, to identify the boundaries of the accounting entity.

Non-profit institutions

42. Non-profit institutions also need financial information to operate and for that purpose they prepare financial statements. Many not-for profit entities operate independently without any association with other organisations. Each entity is an accounting entity and consequently each institution is also an institutional unit. For those institutions that operate within an association, the association is normally based on membership rather than ownership. Each institution is an independent accounting entity and consequently each institution is also an institutional unit. Examples of such organisations are charitable, religious and professional organisations. These organizations have regional entities and a national one. Each regional and national is a separate accounting entity and consequently each entity is also an institutional unit.

Others

43. It is possible that some production units do not keep a complete set of accounts while making decisions in an autonomous way. These units are defined as *unincorporated household enterprises*. They produce goods and services for their own final use or for sale and are not legally separate from the households owning the unit.

Statistical units' attributes

44. In order to prepare industry statistics, the statistical unit should be the establishment since it is the most detailed unit for which the range of data required are normally available. For analytical and sampling reasons, information about size of establishments should be available. Information about where the establishment is located is also required for analytical purposes as well as for producing detail unduplicated regional sets of accounts. Statistical units should be assigned a unique number in order to facilitate the matching process with administrative sources. Identification code must not change throughout the life of the unit, although some of the other unit's characteristics may change.

45. Enterprises and establishments are performing various activities. They should be classified to the industry that contributes most to the value added of the unit, or the activity the value added of which exceeds that of any other activity undertaken by the unit is called its principal activity. The principal activity of producer units may change from one statistical period to the next, either because of seasonal factors or the management decision to vary the pattern of output. This necessitates the change of classification of the unit. Frequent change needs to be avoided as it may distort the statistics rendering the interpretation difficult. Countries are encouraged to develop a "stability rule" or "resistance rule". Without such rules, there would be changes in the economic demography of the business population which would be no more than statistical artefacts.

46. For the purpose of accurate measurement of production and all other flows of goods, services and capital in the economy, it is desirable to have the links between individual establishments and their parent enterprise are clearly defined. More importantly, these links are fundamental for the efficient sampling design because one survey might gather information on value added, employment and production statistics usually available at establishment level, while another may collect data from consolidated financial statements compiled mainly at the enterprise level. One of the attributes attached to a statistical unit should be the period of economic activity of a given unit and include the date of commencement and cessation of its activity. This is an important piece of information when establishing the sample for a given survey.

47. Data from administrative databases are an important source of statistical information. The units recorded in administrative systems are usually defined to meet administrative and legal objectives which can be different from those needed for economic statistics, so compromise between conceptual purity and practicality may be necessary. For example, it is necessary to draw on tax records for the required data or if survey data needs to be supplemented with tax data, statistical agencies will have to decide whether: (a) they can map the legal and statistical structure of the enterprise, or (b) they use the legal structure selectively as a proxy for the statistical structure (ISIC Rev 4, 1998).

48. As national statistics offices become more dependent on administrative data for updating their business registers and as a core data source, the statistical unit is closely linked with the legal/administrative unit. Administrative units are close proxies to the economic concepts that statisticians are trying to measure and the alignment of statistical units to administrative units has not affected the quality of the statistics.

49. Where administrative units differ significantly from the enterprises or establishments that are the basis of other statistical collections, a record of the mapping between the two sets of units will assist with the integration of data. A Business Register is an effective tool for recording these mappings.

50.The transactions of multi-national corporations do not align well with the economic behaviour that is measured by national economic statistics of each of the countries in which they operate. Some multinational global enterprises keep integrated accounting records at the global or the regional levels only. To separate and extract complete accounts for all the activities taking place within each domestic economy, data should be obtained from the main or regional head office of the global enterprise.(ISIC Rev 4 99).

51. Statistical information will be collected for geographic regions. Public organisations that collect statistics may sometimes adopt adminstrative regions that reflect the nature of their activities. Government departments may often be responsible for administering different sets of geographic regions. For example, a department of agriculture may adopt different regions to a department responsible for unemployment benefits. This presents challenges when integrating statistics from a variety of sources.

52. The adoption of a standard data definitions and terminology will assist with the integration of data. Organisations that collect data with a regional dimension should map their administrative regions to a standard geographic classification. If records are classified at the lowest level of disaggregation, data from different sources can be aggregated into coherent areas and regions. Each regional area should be defined in a way that is consistent with all other areas.

Defining and classifying transactions

53. The integration of statistics will be enhanced, if the definition and classification of transactions is standardised. Different standards and classifications can have different definitions for similar variables. For example, SNA variables are often defined differently to the variables stored in business accounting systems. Responses to questionnaires will be more accurate, if the data items in survey questions are specified in terms of accounting definitions that are understood by respondents. If the additional information needed for the derivation can also be collected, the SNA variables can be derived at the unit record level. This approach ensures coherence between the national accounts and other business statistics. If the additional data needed to derive SNA variables cannot be collected, an adjustment will have to be made at the aggregate level to take account of any differences in definitions.

54. The general principle in national and business accounting is that transactions should be recorded as claims and obligations occur, that is on an accrual basis, not on a cash basis. If discrepancies occur in recording, these inconsistencies may be eliminated by ex-post adjustments.

Business accounting standards

55. National accounting information for companies must be drawn from data compiled and recorded according to relevant local accounting standards. Business survey respondents are usually asked to apply either the relevant national Generally-Accepted Accounting Principles (GAAP) or International Financial Reporting Standards (IFRS). This may cause several problems for the coherence and consistency of accounting information being collected:

- Where accounting standards do not prescribe a particular treatment or allow some latitude, there may still be problems of consistency (between units or over time) for some transactions, if businesses report similar transactions in different ways;
- In most cases, the principles underlying the relevant accounting standard will be consistent with the principles of the SNA. In particular, both standards are based on the principle that economic substance should take precedence over legal form. Two areas where the IFRS adopts a different approach to the SNA are in the area of the recognition of holding gains and losses as income, and in the recording of provisions and contingent liabilities. Where the accounting standards conflict with SNA principles, survey data have to be adjusted;
- Many countries have adopted the IFRS. The change from GAAP to IFRS will result in a change in the definition, valuation and time of recording for some transactions. If adjustments cannot be made, these changes may lead to breaks in time series for the accounting period when the changes occur. These breaks should be identified and explanations provided, without breaching confidentiality rules and
- For multinational enterprises, IFRS and other accounting standards usually require transactions between enterprises in different countries to be consolidated for the whole group. The non-consolidated data needed for the compilation of the national accounts will have to be obtained from other sources.

XBRL Reporting

56. XBRL (Extensible Business Reporting Language) is an XML-based computer language developed for the electronic transmission of business and financial reports. Some regulatory agencies have established processes for business to fulfil their mandatory reporting requirements using XBRL standards. XBRL tools have also been developed for reporting of financial information to taxation and statistical agencies. These tools reduce the cost of compliance for business by building reporting requirements into standard accounting software packages in a way that automates the process of reporting to government agencies.

57. The core methodology is an XBRL taxonomy that defines all the data items that the relevant agencies require from business. An essential step in developing a taxonomy is harmonising the data items collected by different government agencies. If two agencies require the same definition of a data item, it is given the same name. If the different agencies establish that they need different definitions, then they are specified with different names. This harmonisation process simplifies reporting by businesses by standardising definitions, but it also assists with integration of statistics, because different collection agencies have consistent and coherent data definitions.

Business registers and frames

58. Business registers have a central role in integrated economic statistics. They provide a common universe for sampling and consistent classification of firms promote consistency in collected data across surveys. This allows the integration of data from administrative sources and surveys. As a result, timeliness in producing statistics can be improved and respondent burden reduced. A business register combines different sources, such as tax records, administration records etc.using unique identifiers. The business register coverage should be as complete as possible. In most countries, in order to carry on a business it is necessary to have a legal status. The legal status represents the ideal starting point to identify economic players. The accounting records represent the information the statistical system need to measure economic activities. Where countries do not have single business registers, the use of data sharing, bridge tables, and other means of reconciliation is recommended.

59. The rregular updating of business registers to "clean" it for "births" and "deaths" of businesses ensures reliability of the data collected. There is a need for a sample frame whether the country uses business register or economic census for the survey sample design. The practice used to derive sample frames raises various issues such as area samples and updates of list frames. In countries where "snap shots" of business registers serve as sample frame, one might need to adjust survey results considering business registers lags (post-stratification and probabilistic models).

Surveys and questionnaire design

60. This section deals with the concept of integrated questionnaires and to some extent questionnaire design. Questionnaires play a central role in the data collection process. They have a major impact on respondent behavior, interviewer performance, collection cost and respondent relations and therefore on data quality. These impacts are especially critical for on-going and longitudinal surveys.

61. The development of a questionnaire pre-supposes that in the period leading to the development of the questionnaire, a thorough process was followed to evaluate and prioritise the need to collect or not the data. It also assumes that the data to be collected will have an economic significance of their own but also will, in the context of other data within the statistical system, add to the coherence and the completeness of the global macroeconomic statistical system.

62. Before collection can occur, a sample must first be identified and a series of questions must be established. To the extent the sample is representative and the questions adapted to the capacity of respondents to answer the questions, assuming a sound methodology, the quality of the survey results should be adequate, particularly response accuracy. It does not necessarily mean the data will be coherent with other data of the statistical system.

63. A questionnaire is often defined as a set of questions that is designed to collect information from a respondent. With the increase of administrative data, questionnaires should be developed with the possibility that part of the survey results will be provided by respondents while another part will originate from administrative sources. A new questionnaire may not be required if the data to be collected were available from administrative sources.

64. The collection of statistical information needs to be very well organized. In a stovepipe model where programs collect information on its own and for its own purposes, an entity surveyed may be asked the same questions with different definitions. This could be the case of a manufacturing survey asking questions about the number of workers and a labour survey asking similar questions but using different definitions. This, not only increase survey burden, but most likely produce labour statistics that are difficult to align.

Key principles

65. There is a need to use common concepts, terminology and classifications in designing questionnaires. Without uniformity, comparability is not possible. Major causes of differences in statistics come from the use of different basic concepts such as on units and transactions. Their harmonization is valuable as it will reduce these differences and result in a more coherent and consistent set of data outputs.

66. The questionnaire can greatly contribute to the overall efficiency of the statistical system. A well-designed questionnaire will impact the statistical system in many ways. It helps minimise response burden and make collection more efficient by ensuring a minimum number of response and non response errors. A well-designed questionnaire should facilitate the coding and capture of data and minimize the amount of edits and imputation. Finally, the questionnaire should minimize costs and time associated with data collection and processing. Preference should be given to electronic data reporting, due to the potential cost saving. An instruction guide should always be provided to respondents. For complex enterprises, special arrangements could be put in place. Dedicated staff could be asked to conduct data collection for that entity on a wide range of topics. That staff would also be responsible for regularly reviewing the profile of the entity.

67. National Statistical Organisations should allocate resources to test questionnaires before they are put in the field. The testing should provide insights into how respondents react to a questionnaire. The testing can be done via a focus group, one-on-one interviews, with the focus on testing and evaluating the wording of the questions, sequencing format and to assess alternate questions wording. Wording and concepts should be aligned to those already in use within the organisation. This should be reflected in both the questions and the reporting guide which should be short and clear.

68. Cognitive methods can also be used to examine respondents thought process as they answer the survey questions and ascertain whether or not respondents understand the meaning of the questions. In countries

where there are many official languages, testing should be conducted in all official languages before implementation. Ideally, a pilot test would be conducted to observe all survey operations working together, including the administration of the questionnaire.

Questionnaire database

69. The integrated questionnaire should be viewed as a database containing all questions about financial and operating variables or other characteristics which might be asked to the various entities under scope, the enterprises and/or establishments. A strategic goal should be to eliminate duplicate data requests through a strategy centered on enterprises and a series of questionnaires with a common look and feel. The questions need to be grouped in "modules" covering the major categories of information normally requested on business surveys; revenues, expenses, balance sheet items, capital expenditures, employment, commodity inputs and outputs, class of customers, destination of shipments (turnovers)/sales, etc. The questions should contain a flag indicating if the questions are aimed at the enterprise or the establishment. Ideally, the questions would indicate whether they are best answered by the comptroller, the payroll manager, the production manager or some other officer. The production manager most likely knows about the material inputs in his unit but may not have all the information about services inputs which are often under the responsibility of another unit within that enterprise. Since the business register contain information about enterprises or complex units and establishments or simple units, the database should be constructed so that variables can be associated with these types of entities.

Metadata

70. The implementation of a metadata system is an important prerequisite in developing an integrated questionnaire/statistical system. The metadata will eventually provide the necessary coherence between the various estimates and tools leading to the production of the statistical information. For ultimate users, metadata are not only about concepts related to units, variables and classifications. Metadata are also about quality. The SDMX metadata structure covers the following items: statistical description, unit of reference, reference period, institutional mandate, confidentiality, release policy, frequency of dissemination, dissemination format, accessibility of documentation, quality management, relevance, data accuracy, accuracy and reliability, timeliness, comparability, coherence, cost and burden, data revision and statistical processing.

71. Metadata, have a central role in the infrastructure that will greatly enhance the efficiency of the statistical system. That role must take place at the very beginning of the statistical process. The metadata is to support collection as well post-collection processing. Metadata are required to support activities until the collection stage can be sub-divided into four categories.

72. The first category consist of a series of identifiers such as the name of the survey, industry codes, questionnaires identifiers and the publication the data will eventually be released.

73. The second category deals with survey content or rules:

- All questions for all surveys are to be stored using reference numbers;
- Each reference number would outline one single concept;
- Each single concept can only be represented by one reference number;
- Reference numbers are to be shared by surveys to collect and process data, thus facilitating sharing of information and coherence analysis for large enterprises receiving multiple questionnaires from various surveys;
- A generic description for every reference number defining the concept to be measured; and
- Survey specific descriptions if the wording differs from the generic description

74. The third category deals with the values collected. Questionnaires cells should be assign a domain value when they are created. They could be of many types. The cell type could be numerical or character. The expected length of the numbers could be pre-specified. May be the cell would indicate an expected range of value.

75. The fourth category would provide edit collection specifications such as:

- The edit number and its description;
- Edit failure formulas;
- Edit messages;
- Severity of the edits;
- Type of edits i.e. based on historical or collected data; and
- Edit action flag indicating suspicious data have been confirmed with respondents

Questionnaire grouping

76. There are many ways to categorise the questions in the database. For example, they could be grouped according to four categories of questions. The first questionnaire would be targeted to enterprises and would include a set of standard questions on consolidated income, expenses (including purchased services), balance sheet items, investment and employment for the whole enterprise. The second questionnaire would in fact be a portrait of the enterprise showing the structure of the enterprise as generated by the business register. It would show the legal and the operating structure of the enterprise to be confirmed or updated by the

respondent. The third questionnaire would still be enterprise-driven but would be only collecting few basic variables for each establishments needed to calculate value added. The value of theses variables would be reconciled with the statistics obtained from a fourth questionnaire which would be establishment-based. On that questionnaire, in additions to some basic questions on revenue and expenses at a fairly aggregate level, the questionnaire would contain modules to collect more detail data such as on commodities destination of production or employment.

77. In countries where survey data can be substituted by administrative data sources, a strategy focussing on mainly two questionnaires could be envisaged. The first questionnaire would be dedicated to collecting data at the enterprise or establishment level from the very complex businesses for which financial data cannot be obtained from administrative data or some key information is not available such as information by region. It would be a collection vehicle containing all questions on financial as well as characteristics information. The second questionnaire would be a simplified version of the first, dedicated to the collection of industry-specific commodity or characteristics data at the establishment level. This questionnaire would be targeted to the majority of businesses that have simple structures with their financial information coming from administrative tax data and made up of a number of modules, each dedicated to collecting a specific type of characteristic (e.g. input or output commodities, destination of production, qualitative type of information).

78. Both questionnaire types would be customised in the following ways. For complex businesses, specialists in subject matter divisions would be able to customize the questionnaire in order to capture data for the entire enterprise. The module dedicated to the capture of characteristic information could be customized by industry or activity. For collecting characteristics information for a simple business, the respondent would only receive the characteristics modules applying to its industry/activity.

79. All the variables need to be aligned to statistical information from administrative sources, to the extent they exist in the administrative database. Administrative data sources may not offer the required detail concerning expenses related professional business services but could provide a value at that level. Despite the potential difficulties of aligning business accounting data and variables required for the statistical programs, the strategy requires building mappings, often referred to “chart of accounts”, between these data,. The chart of accounts is a tool linking business accounting statistics with various statistical accounting frameworks supported by the statistical agencies. It greatly facilitates linkages between business accounts - balance sheets and income statements - economic variables and national accounts statistics. Building a chart of accounts will require the help of staff very knowledgeable of accounting practices.

80. Special attention should be given to surveys conducted outside the scope of the National Statistical Office (NSO). In many countries, even where the statistical system is centralised, many surveys are conducted in departments specialised in specific industry field. For example, the department of natural resources could

conduct surveys on the mining sector. This type of situation could also occur when the subject matter falls under the jurisdiction of another level of government. Formal agreement should be developed between these organizations and the NSO to ensure compatibility of the questions. In order to determine questionnaire content, consultations with the various subject matter areas are required. To ensure that response burden is kept to a minimum, the SNA must be an active participant in determining the content and prioritising the information. Studies of response rates for the variables can be an important input into this process. This would ensure that questionnaires are relevant and that data requirements can be met by respondents.

Use of administrative sources

81. The use of administrative data has become a cornerstone of many business survey programs in several countries. The reliance on administrative sources has increased considerably to the point where they now play a major role in the production of sub-annual and annual statistics while representing a reliable source of information to update frame registers. First, they represent a relatively inexpensive source of information compared to surveys and censuses, an important factor for NSO dealing with tightening budgets. Administrative records allow reducing burden of statistical inquiries. Finally, with the increasing demand to produce statistics for small area where sample surveys may be difficult to implement, administrative records represent an interesting alternative.

Dealings with administrative authorities

82. In many countries, the reliance on administrative data is now such that the statistical system would significantly be affected if administrative records were to disappear. With the increasing role of administrative data in the overall statistical system, clear arrangements between statistical offices and administrative authorities must be in place and reviewed regularly to ensure continuity of the statistical system. Some form of agreements should exist between these organizations and the NSO setting out the rights and responsibilities of both parties. The agreements should contain clauses about confidentiality, coding, data transfers and their frequency and the content of the administrative database. Strict measures should be taken within the NSO to ensure the administrative data records remains confidential, like for survey micro data. In fact, they should be treated as survey micro data. Access to micro records should only be given to staff involved in survey-taking activities. Staff in the various programmes of the NSO will be demanding access to the data because of the great potential of the data for various compilation purposes or analytical purposes. Consequently, staff responsible for the administrative data should be mandated to compile aggregate information, vetted for confidentiality, so the data can be used in a broader context elsewhere in the NSO. There will always be cases where in order to perform a study, research or record linkages, it will be necessary to give access to the micro administrative data to non-survey staff. A protocol should exist to evaluate this type of requests.

83. NSOs should always be in a position to demonstrate to administrative authorities that strict measures are in place to protect the confidentiality of the data. Protocols describing specific processes to transmit the data to the NSO, the storage of the data, their use and reasons for their use and steps to ensure the confidentiality or any residual disclosure related to the micro data as well as aggregates compiled from administrative sources need to be in place

84. Ideally, access to the administrative sources should be guaranteed by legislation. Legislation is not a sufficient condition for the productive use of administrative records. A co-operative approach to the development and utilisation of administrative records for statistical purposes is likely to be far more effective in obtaining access to administrative records than an approach involving legal arguments. Managers in organisations gathering administrative information must be sensitive to the importance of the data and contribution to the overall statistical system. The development of a good working relationship with these managers will facilitate exchange of information about data quality, making easier to identify and solve problems as they arise.

85. The expertise of the NSO in managing data processes may be beneficial to organizations responsible for collecting and maintaining administrative databases. Efforts should be made to share that experience in order to help administrative departments streamline their operations and improve the quality of their data and coding. As for survey data, the NSO should deal cautiously with the confidentiality of administrative records. The purpose of administrative database is normally to monitor or control actions of individuals or entities. The purpose of statistical information is quite different. It is to learn about levels, trends and relationships. In the statistical system the micro records that compose the aggregates are held confidential and are never used to determine any action that would affect an individual or an entity. Since statistical and administrative records should be treated the same, NSO should make it clear to organisations providing administrative data that the NSO will refrain from providing feedback that would translate into administrative actions vis-à-vis an individual or entity.

Advantages and limitations of administrative records

86. Administrative data exists in response to legislation and regulation. As for survey data, administrative data cover specific segments of the economic activity and are defined specifically to administer government programmes. Consequently, administrative data may not always fit the exact needs of NSO.

87. One of the main advantages of administrative data is that it allows NSO to acquire statistical information at a relatively low cost and to reduce respondent's burden significantly. They also have the advantage of covering a complete segment of the economy, often the whole economy. Due to the administrative character of the data, non-response is normally negligible and subject to substantial scrutiny, which should make them accurate. They are not subject to sampling errors.

88. Administrative records have limitations. Individuals and/or entities may not be required to report at common intervals. Some may be allowed to report monthly while others quarterly, even annually. Annual data may be presented on a calendar year basis, or on a fiscal year basis. Their availability may not align well with released deadlines of the NSO. There may be delays before the data can be used and procedures may be required to allocate the records in the proper period. The intended coverage of administrative data may not align well with the needs of the NSO. The quality of some of the characteristics of the data are reported and processed in the organisations assembling administrative data may be difficult to establish.

89. It is necessary to examine the quality characteristics of individual sets of administrative records. The coverage and content of administrative records can be subject to discontinuities resulting from changes in regulations or administrative practices. Also, variables from administrative sources may not all receive the same attention. For example, revenues may be examined closely but less effort may be devoted ensuring the industry codes are correct. Discrepancies may arise between administrative concepts and statistical concepts. As the administrative processes are not under statistical office control, concepts regarding variables and units in respect of data coverage, content, quality and consistency may not comply with the needs of the statistical system, limiting the use of administrative data for statistical estimation and analysis purposes. The difficulty of matching administrative and statistical records will also limit the use of administrative records. NSO should investigate all these issues thoroughly before they start using administrative records on a large scale. It is possible that administrative sources arrive at the NSO in an aggregated form. For example, statistics about education, say primary schools may be available at an aggregate level only. In such a case, NSO should get the data and information about how the data were assembled.

Uses of administrative records

90. There are five main type of usage of administrative records: i) external trade tables, ii) as a substitute to surveys, iii) to record linkages, iv) in maintaining a central register and v) to evaluate survey results i.e. checking, validating or evaluating survey-derived data.Administrative records can be adapted and used in several steps of the overall survey process. The can be used for validation purposes by comparing them against collected data. In the absence of information such as a non-response, administrative data can be of great use in the imputation process. They can be used to replace survey data and can be used as distributors.

Harmonisation of concepts and definitions of administrative sources with their use in the statistical system

91. In order to make administrative records useful to statisticians, it is necessary to build mappings showing how the concepts, definitions and classifications of administrative data can approximate the economic variables required by the statistical system. For example, chart of accounts or mappings should be established between the business accounting type data reported to administrative authorities and economic variables of

the NSO. Aligning concepts and definitions of administrative sources to those of the NSO is not a sufficient criterion to guarantee their use in the statistical system. The definition of units covered in administrative sources often does not align well with the definition used in the statistical system. The legal entity is often the concept used by administrative authorities while the concept of enterprise and establishment is used by NSO. More, entities are identified differently in the various administrative databases. Consequently, one of the prerequisites in using administrative data is to establish rigorous mappings between the various structures of entities maintained by administrative departments and the NSO. This mapping is necessary to ensure that there is no duplication in coverage and that it will be possible to match up information from various sources. In countries where a unique identifier is used by all administrative authorities to identify a firm, the use of a unique identifier will greatly facilitate the integration of the administrative records into the statistical system.

Other type of administrative data

92. Administrative databases represent excellent sources of information. However, other similar sources of information should also be considered in building the statistical system. For example, in the cases of public enterprises and public quasi-corporations, government reports such as income statements may be a basic source of information about the production and financial status of these entities. Statistical offices may be able to obtain some data from the private sector. For example, information related to credit cards may be an interesting source of information to estimate consumer spending and room vacancy could be a good indicator of accommodation services. Private sector data suppliers operate on a commercial basis so the transfer of data from them to the statistical offices may take the form of a contract with a payment of a fee. The data collected by private sector data suppliers can serve as an important supplement to the official statistics. Such data, however, should be carefully examined for its scope and coverage and considered for use only when found to be of acceptable quality.

Tools of data processing including central metadata warehousing

93. Specific considerations apply to the important issue of integrating administrative source for statistical purposes. Integrating survey source data with administrative source for statistical purposes can be problematic. Administrative source data can be of exceptional use to statistical offices possibly having, as with tax-based data, a coverage that surveys could not achieve, Indeed, many countries use the address list from establishments reporting their taxes as their sampling frame. Moreover, administrative source data are, by definition, designed for purposes other than those required by the statistical office and there will be instances in which classification and definitional changes might be desired in order that the administrative data can integrate with data from surveys or other administrative sources. There are likely to be legal restrictions on accessing, using and sharing data from administrative sources. In such cases, new legislation could enable bilateral data sharing arrangements to be set up between the statistical office and other

government departments or public bodies. If administrative data sources are to be used then there must be a guarantee of the confidentiality of the data.

6. Dissemination and communication

1. Critical to the statistical production of integrated economic statistics is the component of "dissemination and communication" of statistics. It is a critical component, because it is at this final stage that the users ultimately benefit from the information services provided by statistical agencies.

2. Dissemination and communication are different but intertwined aspects of the ultimate output of the statistical production process. Dissemination is about accessibility of statistical data and metadata through hard copy publications, web-based databases and other means and about the transparent and impartial release of consistent and coherent data to all users at the same time according to pre-announced release calendars. Moreover, in considering data dissemination, the underlying technology should be kept in view. Good practices in adopting data warehousing and data exchange techniques such the Statistical Data and Metadata eXchange (SDMX) could significantly improve the usefulness of the disseminated information in its presentation and in its data sharing.

3. Traditionally, dissemination is seen as a technical production element of the accessibility and release of data as numbers to the more specialised and literate users. Moreover, it is assumed that the users have the ability to apply analytical techniques to extract and interpret the information the statistics contain. Therefore, dissemination was mainly focused on a one-way communication of numbers to the users without much narrative or visualisation.

4. With the widespread use of internet and accessibility of low cost communication and visualisation tools, many statistical agencies are introducing an active two-way statistical communication with a much broader spectrum of users using the internet-based tools. This statistical communication goes beyond accessibility of numbers and introduces a continuous dialogue about how the practical utility and relevance of the information the statistics contain can best be presented. There will be no statistical communication without dissemination of data and metadata, but good practices demonstrate that an increased number and diversity of end-users can be reached by informing the user about the story the statistics contain.

5. In the remainder of this Chapter, dissemination and communication sub-component are presented.

Dissemination

6. The ultimate purpose of producing integrated economic statistics is that users will benefit from comprehensive, consistent, accurate, and reliable dissemination of information on a timely basis, at a minimum cost to those involved in the process (especially data source providers and compilers). Integration of the production of economic statistics adds value to users in the dissemination of information in an understandable and convenient manner that meets their analytical needs and enables conclusions to be drawn about the quality of the disseminated data. An integrated dissemination in the presentation of an integrated

set of macroeconomic and detailed component structural and short-term statistics will benefit the users, in a better understanding of the story the statistics contain and of reinforcing messages for evidence-based policy and decision making

7. Dissemination is about accessibility of statistical information in user-friendly and consistent presentations of data across publications, electronic sources and websites. It is also to explain data to users, by making metadata available and to announce the schedule of releases of data in the form of an advance release calendar. Such information may be provided for the forthcoming period on a weekly, monthly, quarterly or annual basis. This advance release calendar provides prior notice of the release dates on which the statistical agency undertakes to release specific statistical information to the public.

8. Accessibility relates to the need for data and metadata to be presented in a clear and understandable manner on an easily-available and impartial basis. Metadata are up-to-date and relevant, and a prompt and knowledgeable support service is available. Specifically, this dimension is composed of the following three elements: data accessibility, metadata accessibility, and assistance to users. These are discussed in turn.

9. Data accessibility for integrated economic statistics should have data formats that are consistent to enable navigation across sources of dissemination. Integrated economic statistics should be presented in a way that facilitates proper interpretation and meaningful comparisons. The layout should be clear and well structured, following internationally standardised methodologies (see the next paragraph). Descriptive text should also be clear, and should accompany tables and charts containing data and perhaps be augmented by analytically-useful applications of the data. Moreover, the statistics should be released in a pre-announced schedule. The statistics also should be made available to all users at the same time, but statistics that are not routinely disseminated can be made available on request. The data should be available in electronic format.

10. Metadata accessibility provides for documentation on, concepts, scope, classifications, basis of recording, data sources, and statistical techniques which are available and noting differences from internationally accepted statistical methodologies, standards, guidelines, and good practices. For integrated economic statistics, these metadata should include references and links to the data, as well as cross-references and links across datasets. Ideally the metadata should be available in electronic format. Metadata should be available in a number of user-friendly formats (for example, as “Frequently-Asked Questions”) at different levels of technical detail to meet different user needs.

11. Prompt and knowledgeable support services should be provided to assist users. Contact points for each data set should be adequately publicised. Catalogues of publications, documents, and websites, as well as other services that are available to users, including information on changes to data, metadata, and dissemination practices should be widely available. Users should be fully informed of any data that are made available on request. Users would benefit from explanations and examples in integrated economic statistics,

to note the coherence in concepts. Such clarifications can provide data reconciliations, bridge tables, or distinguish differences in coverage, time of recording, and in other factors that may lead to statistical discrepancies.

12. Good dissemination practices also require the identification of user needs for the release of data with the appropriate periodicity (daily, weekly, monthly, quarterly, or annually, etc.) and with the adequate timeliness. By definition, such data should be internally consistent within a dataset and across major data sets. This means that the data should be reconcilable (through horizontal and vertical consistency checks) within a reasonable period of time. The data should also be comparable among alternative macroeconomic datasets. Data revisions should follow regular, well-announced, and transparent schedules. Preliminary data should be distinguished clearly for users from any subsequent revisions or final data. Good practices for serviceability of the data suggests that revision studies that compare changes in released data over time should be released to the public in a transparent and equitable manner.

13. To further enhance the accessibility and presentation of data and metadata to users, the next logical step to enhance these data and metadata is the adoption of the internationally endorsed SDMX[12]. Specifically, users need to easily and cheaply share, exchange, understand, and be able to reuse the data and metadata for their own purposes. Making the data more useful will help reinforce the demand for such information, thereby strengthening arguments for adequate and reliable budgetary support for these efforts. Some of these aspects concern presentation of the information, the length of historical data, and electronic access.

14. In March 2007, seven sponsoring international organisations signed a Memorandum of Understanding, which explicitly excludes the formation of any legal entity or common budget for SDMX; each sponsoring institution and its member countries will continue to use existing procedures to agree on arrangements for the transmission and publication of statistics. Moreover at the conclusion of the 39th Session of the UN Statistical Commission (New York, February 2008), the SDMX was recognized and supported as "the preferred standard for exchange and sharing of data and metadata in the global statistical community"[13]. This acceptance of SDMX at UN level was a major step forward towards the broader use of SDMX at world-wide level.

15. The SDMX standards are designed for exchange or sharing of statistical information between two or more partners. The SDMX standards have been developed by the sponsoring organisations in order to

[12] SDMX is an initiative to foster standards for the exchange of statistical information sponsored by IMF, BIS, ECB, EUROSTAT, OECD, UN and World Bank. Its goal is to explore e-standards that could enhance efficiency and avoid duplication of effort across agencies when sharing statistical information. The SDMX website (http://sdmx.org/) provides access to the SDMX Users' Guide, which contains useful background information and provides explanations and guidance for SDMX users and potential users.

[13] See documents E/2008/24, E/CN.3/2008/34 and E/CN.3/2008/13 which are linked from this page: http://unstats.un.org/unsd/statcom/sc2008.htm

accommodate national statistical offices, central banks, ministries and other agencies. The standards are intended for reporting or sharing statistical data and metadata in the most efficient way, within and across these agencies. SDMX standards can also be used within a national system for transmitting or sharing statistical data and metadata. This is particularly interesting for countries with a federal structure or a fairly decentralized statistical system. In such cases, a close link can be established between the national system for data sharing and international ones, allowing for additional efficiency gains.

16. The use of SDMX for data exchange can easily evolve towards open SDMX-based dissemination; such dissemination may respond well to user demands for well-structured data and metadata in reusable formats, and should be considered as an option for national authorities as well as international organizations. It is also an interesting option for private data providers, such as re-sellers of statistical databases.

17. SDMX can also be used for data and metadata management within statistical organizations, since its information model is applicable for much of the information stored and processed within statistical organizations, and such organizations can make use of the SDMX information technology (IT) tools to reduce the costs of developing their data management systems. Further details are found in Annex 6.

18. Another aspect that has to be kept in view is the data processing technology used for dissemination. Users seek to cheaply and efficiently access data and metadata. Well-designed data warehouses for economic statistics can make an important contribution to the dissemination of integrated economic statistics. The access to data and metadata is just the data mining aspect of the data warehouse. With well-designed data warehouses, the dissemination of data and metadata becomes integrated with the collection and integration components of the statistical production process.

19, Statistical agencies have traditionally developed a separate database for each statistical output. While this simplifies development processes, this practice can be a hindrance to integration of statistics, especially if there is no effort to standardise variable definitions, labels and formats. As better IT tools have become available, many statistical agencies are moving towards the development and population of output data warehouses. This approach to the storage of statistical data has many advantages, including:

- Efficient search capability;
- Consistency in terminology and definition of variables;
- Standardized statistical methodologies;
- Easier access with common tools and processes;
- Increased coherence through standard classifications and definitions;
- Relevant metadata available in a standard consistent format; and

- Easier data integration.

20. To support the integration of economic statistics, an output data warehouse should provide:

- A simple and efficient process for accessing data;
- Comprehensive metadata to facilitate understanding and analysis;
- Consistent and coherent long-term time series;
- Reliable information about the availability of data;
- Information about the availability of updated versions of published series; and
- Contact details for the people who can provide more information about a statistical output.

21. For some agencies, the goal may be the development of a generic suite of processing tools that improve data quality and simply integration, while reducing costs. Data processing represents a very expensive step in data collection. Processing systems should be integrated not only with the dissemination aspects of the production process, but also with the other components of the statistical production process. Such integration in a data warehouse will reduce the costs of collection, integrating and dissemination of data and metadata. Several centralised tools can be considered for development by statistical agencies using a data warehousing system:

- A compressive business register;
- Standard sample selection tools;
- A generic collection system;
- A data repository, which makes data more easily accessible to users;
- A metadata system for all statistical inputs; and
- Standard edit, imputation and estimation tools.

22. A centralised business register contributes to harmonisation by ensuring that populations are coherent and classified consistently. If a standard sample selection tool operates with the business register, coherence is further enhanced. The centralised metadata system helps to harmonise all methodology concepts. It facilitates the creation of modular questionnaires sharing common revenue and expense questions. Storing data in a central repository simplifies post-processing and supports the operation of common edit, imputation and estimation tools, and facilitates the integration of data from different datasets. Implementing a generic processing system reinforces the use of common methods, such as edit and imputation methodologies. It also promotes the use of a centralised data and metadata repository to enhance analytical activities. The

centralisation of operational systems requires a structure that reflects this integrated approach. As decisions to modify any aspect of the statistical processing stems will have repercussions on many activities outputs from the system. Consequently, generic standard processing systems will be easier to implement in systems of official statistics that are relatively centralised.

Communication

23. Statistical communication has evolved considerably over recent years. Traditionally, statistical organisations focused on dissemination as a one-way communication of information through few media channels (e.g. newspapers, radio and television). It was not until the 1990s that they acknowledged the need to do more than just disseminate data and hesitantly began employing communication professionals. Widespread use of the Internet has since significantly changed methods of communication and dissemination, as well as increased numbers and diversity of end-users.

24. Statistical systems of individual countries have a range of approaches when it comes to managing communication functions. The placement of these functions within the organisational structure will impact on their effectiveness. Governance processes should ensure that communication of statistical data receives the same level of attention from management as dissemination activities and the associated technological infrastructure. Improving communication should be a priority of the statistical organisations. More effort is needed to reach mainstream users, such as media and policy makers, not just hard-to-reach groups. Increasing competition from other data producers means that there is an increasing need to professionalise communication of statistical organisations.

25. Most of the statistical organisations use the traditional way of disseminating their statistics through publications, websites and other means. On their own, statistics are just numbers. Statistical story telling is a tool to convey the 'information' from the 'statistics' to the users in a more effective manner. The principal aim of statistical communication is of statistical story telling to reveal more of the information contained in statistical data, and to make easy to interpret. A statistical story[14] is one that does not just recite data in words. It tells a story about the data. Readers tend to recall ideas more easily than they do data. Statistical story-telling is about catching the reader's attention with a headline or image, providing the story behind the numbers in an easily understood, interesting and entertaining fashion; and encouraging journalists and others to consider how statistics might add impact to just about every story they have to tell.

26. A statistical story conveys a message that tells readers what happened, who did it, when and where it happened, and hopefully, why and how it happened. Statistical story helps statistical organisations to demonstrate the relevance of its data to government and the public. In such a way, it can anticipate greater

[14] UNECE (2009): Making Data Meaningful Part 1: A guide to writing stories about numbers. Available at http://www.unece.org/stats/documents/writing/MDM_Part1_English.pdf

public support for its programs, as well as improved respondent relations and greater visibility of its products.

27. The value added of statistical storytelling lies in presenting statistical indicators in a coherent and structured fashion. If done right, it consists of two parts; constructing indicator sets and designing visualisations. The complexity of statistical story telling depends on the aspiration level of the statistical agency to interpret the information or knowledge the statistics contain. The most basic form is presenting the statistics in a traditional tabular format without any narrative. In this case, it is left to the user to apply techniques to transform the data and establish relationships between the data to distil the information from the statistics for a certain object of study based on theoretical considerations and using statistical techniques with different levels of sophistication. At an intermediate level, the SNA framework is used to make certain macroeconomic and sectoral relationships on primary or disposable income versus consumption, investment, trade or debt explicit in macroeconomic indicators. For instance, those indicators might be represented as deviations from the long term trend for analytical purposes. Alternatively, individual macroeconomic and sectoral indicators can be analytically grouped with individual component short term statistics based on the established properties of the component data in the past. Therefore, component data on production, turnover, new orders, income, employment, prices, trade, money and financial indictors are grouped with macroeconomic and sectoral indicators to demonstrate the analytical value of the indicators for a certain subject like the housing sector and financial markets. Specifically, the general user might be interested in this kind of analytical presentations to better understand and be educated about the information in the statistics. In the most advanced applications, the individual and composite indicators sets are used to perform some type of sophisticated economic analysis. Advanced statistical and econometric techniques are used to transform and select the individual component data to trace long term and cyclical trends, detect turning points and explain growth.

28.Visualisation tools[15] and statistical narratives can enhance the presentation of data and metadata, especially when they are available in electronic format. Good practices for the dissemination of integrated economic statistics involve ample use of attractive and informative graphs and charts (in colour) accompanied by explanatory text, with well documented sources, including corresponding links to the underlying data and metadata. Demonstrating to users how the information can be used may assist them to create and build new applications of the data and metadata.

[15] Good practices in to use of visualizations can be found on the website of the Statistics Netherlands (http://www.cbs.nl/en-GB/menu/publicaties/webpublicaties/interactief/default.htm?Languageswitch=on)

Examples of international dissemination and communication practices

29. The dissemination of integrated economic statistics benefits from an analytic framework. The IMF's Data Quality Assessment Framework (DQAF)[16] provides such an analytical structure and contains specifics on the dimensions of accessibility and serviceability which are directly related to dissemination.

30. The Special Data Dissemination Standard (SDDS) and the General Data Dissemination System (GDDS) support good statistical dissemination practices by countries. SDDS prescribes that subscribers disseminate 21 data categories[17] on National Summary Data Pages (NSDPs, posted on national websites) which have a standardised format to disseminate the latest two observations for each category. These NSDPs also may contain additional data and hyperlinks to longer time series and more complete datasets. The SDDS also requires subscribers to disseminate a standardised Advance Release Calendar (ARC) covering all the data categories. Links to NSDPs and ARCs are available through the DSBB. The implementation of NSDPs and ARCs enhances both data and metadata accessibility, through uniform formatting (both), the pre-announcement of data releases (ARCs), and simultaneous data releases (NSDPs). For further details of how the SDDS and GDDS support good statistical practices, please see Annex 7.

31. At the international level, the IMF and other international agencies[18] have collaborated to create a Principal Global Indicators website (http://www.principalglobalindicators.org/default.aspx) as a central international hub for dissemination purposes based on good statistical dissemination practices. This website presents cross-country comparisons of data for the G-20, with convenient data mapping facilities and links to other databases.

32. In a recent joint UNSD and Eurostat initiative in response to the economic and financial crisis, an updated data template and meta structure with 12 data categories was moderated to encourage countries to make further progress in establishing national central data hubs for a minimum core set of high frequency economic and financial indicators (HFI data and metadata template) for early warning and macroeconomic surveillance purposes. Apart from the inspiration from the SDDS programme, this initiative benefited in addition from the work done by Eurostat during the last decade in the creation of Principal European Economic Indicators (PEEI) data set[19]. The PEEI are an integrated presentation of quarterly and flash estimates of national accounts with supporting high frequency statistics, in a single location for effective monitoring of the business cycle and for macroeconomic surveillance. The HFI template further extends the

[16] Information on the DQAF and the data dissemination initiatives is posted on the Fund's Dissemination Standards Bulletin Board (DSBB) website (http://dsbb.imf.org/Default.aspx).
[17] The SDDS allows flexibility options and "as relevant" features, so that not all data categories are disseminated by every subscriber.
[18] In addition to the IMF, these organizations are the BIS, ECB, Eurostat, OECD, and World Bank.
[19] Information on the PEEI can be obtained from the statistical guide. Please see: http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-81-08-398/EN/KS-81-08-398-EN.PDF and Eurostat's website at, http://epp.eurostat.ec.europa.eu/portal/page/portal/euroindicators/peeis/

PEEI with national accounts-based indicators for the measurement of sectoral exposures and vulnerabilities, for those countries that compile institutional sector accounts.

7. Principles into practice: examples of integrated economic statistics

1. Integrated accounts present a unified picture of all of the aspects of the economy that are measured in the separate accounts. They have shared conventions, definitions, and values. They allow measures in one account to be directly compared to the same or other measures in other accounts.

2. A unified set of accounts might start, notionally, with an input-output (I-O) account. From the I-O account, one can produce both a production account that incorporates all the components of gross domestic product—personal consumption, investment, imports and exports, and government expenditures. Similarly, one can produce an income account that incorporates all the components of gross domestic income. Investment from the production account and consumption of capital from the income account may be used as parts of an account that shows the changes that lead from an opening balance sheet to a closing balance sheet. Imports and exports from the production account may be incorporated into balance of payments accounts.

3. Other accounts—such as satellite accounts—may be linked to the core accounts, but incorporate definitional and conventional changes that improve the accounts' abilities to examine specific areas of the economy. Examples are provided by travel accounts and labour accounts. Satellite accounts are internally integrated, but are not in complete accord with the integrated core accounts. For example, an account for research and development might define those activities as investment, even though they are treated as intermediate consumption in the core accounts.

4. Selected examples are shown in case studies. They are from the economic accounts of the Netherlands and the United States. The Netherlands have a centralised statistical system. The United States, for historical reasons, has a decentralised statistical system. The differences between the two sets of accounts are chosen to illustrate the range of variety in accounts and in their preparation.

Concepts, definitions, methods

5. The development of new integrated accounts or the continued improvement or integration of existing accounts should be undertaken with a mind to adopting the concepts, definitions, and methods provided by international guidelines. These guidelines, detailed in the manuals described below, serve to harmonize economic accounts across countries, facilitating international comparisons.

6. The manual for the 2008 System of National Accounts (SNA) is a comprehensive guide to national economic accounts. It comprises accounts for economic stocks and flows, as well as I-O and other industry accounts. The *2008 SNA* is an updated version of the 1993 SNA.

7. The *sixth edition of the IMF Balance of Payments and International Investment Position Manual (BPM6)* presents the standard accounting framework for transactions and positions between an economy and the rest of the world.

8. More specialised manuals address statistics related to the balance of payments accounts. For example, the *Fourth edition of the OECD Benchmark Definition of Foreign Direct Investment* provides guidelines for how foreign direct investment activity should be measured. It addresses the transactions and positions that enter into the international accounts as well as broader statistics on the overall activities of multinational enterprises. In addition, there are manuals on merchandise trade statistics, trade in services statistics, and globalisation indicators, as described below.

9. The compilation of price indexes is addressed in several manuals. *Consumer Price Index Manual: Theory and Practice (2004)* and *Export and Import Price Index Manual: Theory and Practice (2009)* were produced by a collaborative group made up of the International Labour Office (ILO), the OECD, the Statistical Office of the European Communities, the UN, the World Bank, and the IMF. *Producer Price Index Manual: Theory and Practice (2004)* was produced by the IMF. Eurostat produced the *Handbook on Price and Volume Measures in National Accounts (1991).*

10. Guidance for compiling and using statistics on productivity is provided in the OECD manual *Measuring Productivity: Measurement of Aggregate and Industry-Level Productivity.* This manual covers single factor productivity measures, such as labour and capital productivity, as well as multi-factor productivity (MFP) measures such as capital-labour MFP and capital-labour-energy-materials MFP.

Source data

11. Comprehensive and consistent source data are essential to developing accurate and reliable, national, balance of payments, financial, and other derived accounts. The source data for each component of an integrated set of accounts should correspond exactly to the concepts and structure of the accounts. Moreover, these data would be accurate, would have the needed coverage, would have the appropriate time of recording and valuation, and would be available quickly.

12. Source data may be generated in part to support economic accounts, such as economic surveys and censuses of sales and other business data, including business reports of retail sales, shipments, and new orders. However, much of the overall body of source data is likely to be generated for other purposes, such as tax collections, customs and border control, and financial regulation. These types of source data are generally referred to as secondary or mixed use sources. Secondary sources include data from public authorities, often referred to as administrative data, as well as data from private sources. Administrative data are often tabulated by government entities as a byproduct of administering their programs – such as processing corporate tax returns, regulating public utilities, and issuing building permits. These latter types

of source data must be adjusted and harmonized for use in the estimation of economic accounts, and may need further adjustment to support a fully integrated system of accounts in which all of the components are fully compatible with all of the accounts that make up the system.

13. Adjustments must be used to correct for a variety of source data. These include inconsistencies among aggregates and sub-aggregates from national samples, incomplete or biased source data, differences in the availability or gaps in the timing of source data, and differences in the classification of establishments by agencies gathering data. There are likely to be differences in methodologies and source data used in producing estimates for the various accounts, and systems where the responsibility for the various accounts is divided.

14. The frequency with which source data are available is an important consideration in the development of measures of economic activity. One factor affecting availability is the speed with which the source data are collected, compiled, and released. Another factor is whether the source data are part of a statistical programme that provides more complete or otherwise better coverage; for example, when more detailed information is collected for a benchmark or annual survey than for quarterly or monthly surveys.

15. In the latter case, source data for the earliest estimates are typically incomplete, preliminary, or missing, and trend-based projections are used to fill in the missing pieces. Subsequent revisions incorporate later-available source data that are usually more comprehensive and from increasingly reliable sources. The best source data may be obtained from economic censuses that are likely to be undertaken only every several years. This ultimate data set will be annual in frequency; the earliest data may be of monthly or quarterly frequency.

16. As an example, Table 1 illustrates the changing nature of the source data that supports the current quarterly estimates of U.S. gross domestic product (GDP). For the "advance" estimate of GDP, components that are based on survey data for all three months of the quarter account for 45 percent of the estimate; components that are based on a mix of survey data and extrapolations account for about 30 percent of the estimate. Trend-based data accounts for the remaining 25 percent. For the "second" estimate, 70 percent of GDP is based on revised monthly survey data and 7 percent is based on new monthly data. For the "third" estimate of GDP, the proportion of GDP that is accounted for by trend-based data drops to 13 percent. [20]

[20] More detailed descriptions of the data underlying the current quarterly estimates of U.S. gross domestic product and gross domestic income may be found in Bruce T. Grimm and Teresa L. Weadock, "Gross Domestic Product: Revisions and Source Data," *Survey of Current Business* 86 (February 2006): 11-15, and Alyssa E. Holdren and Bruce T. Grimm, "Gross Domestic Income: Revisions and Source Data," *Survey of Current Business* 88 (December 2008): 14-20, available at http://www.bea.gov/scb/index.htm.

Table 1. Shares of source data for the U.S. quarterly GDP estimates

[Percent]

Data Source	Current Quarterly Estimates			Annual Estimate
	Advance	Second	Third	First
Trend-based data	25.1	22.6	12.7	5.6
Monthly and trend-based data	29.7	1.7	1.2	- - -
Initial monthly or quarterly data	45.3	6.6	16.6	- - -
Revised monthly or quarterly data	- - -	69.2	69.5	47.2
Newly available annual data	- - -	- - -	- - -	47.2

Source: Grimm and Weadock (2006).

17. The most comprehensive data are collected only periodically—at 10-, 5-, or 1-year intervals. Such data incorporate larger samples and more data verification, and, as a result, are of a higher quality. Data collected quarterly or monthly are based on a smaller sample with more limited coverage, and are of a less robust quality.

Nominal data

18. Frequent benchmarking of GDP statistics through I-O accounts that are based on economic censuses and other comprehensive data sources allow for the incorporation of new and emerging economic activity and capture changes in levels that are often missed by higher frequency, less-detailed datasets. Annual source data are not as comprehensive or as reliable as the data used to benchmark the GDP statistics, which often come from an economic census. Monthly or quarterly source data are not as comprehensive or reliable as annual source data. Frequent but less comprehensive source data may be used as an indicator of the movements of the component series, rather than as a measure of the levels of the series.

19. Time-series data from diverse and partial indicators are used as extrapolators and interpolators to capture changes in growth over time. For example, when annual data are available and the quarterly estimates average to these annual totals, the quarterly pattern is estimated by interpolation. For the periods not yet covered by annual estimates (such as the current quarter), the quarterly estimates are derived by extrapolation.

20. Adjustments are used to smooth seasonal fluctuations in these time-series indicators. Quarterly and monthly estimates are seasonally adjusted at the detailed series level when the series demonstrate statistically significant seasonal patterns. Seasonal adjustment removes from the time series the average effect of variations that normally occur at about the same time and in about the same magnitude each year—for example, the effect of weather and holidays. After seasonal adjustment, trends, business cycles, and other movements in the time series stand out more clearly.

21. Additivity constraints such as those imposed through the annual balancing of I-O accounts ensure that comprehensive but often distinct annual datasets on expenditures, incomes, and production are in agreement. For further details, please see Case studies 1. and 2.

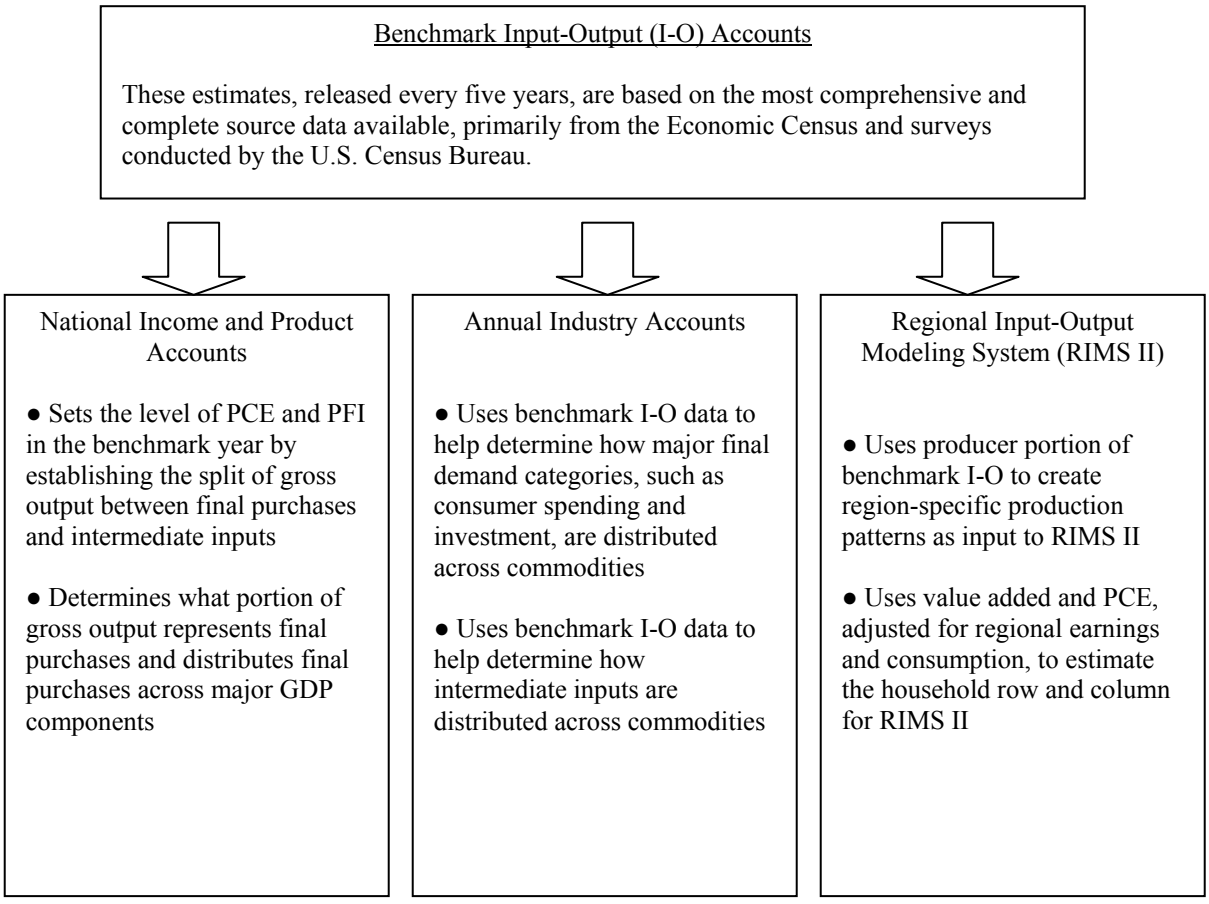
Case study 1: Using the input-output accounts to benchmark U.S. GDP statistics

1. The U.S. Bureau of Economic Analysis (BEA) uses the benchmark input-output (I-O) accounts as the foundation for several other accounts (Figure 1). The benchmark I-O accounts are in fact the most important statistical source for the comprehensive revision of the national income and product accounts (NIPAs). They are used to establish the benchmark year level for consumer spending, private fixed investment, and to provide information on the composition of final demand. This in turn provides the basis for the estimates for gross domestic product (GDP) for the non-benchmark years.

2. Also, the benchmark I-O accounts provide the framework and the basis for the quantity index for the GDP by industry statistics. The benchmark I-O accounts also provide the foundation for the annual I-O accounts.

3. BEA's regional program uses data from the benchmark I-O accounts to generate the Regional Input-Output Modeling System (RIMS II), which can be used to analyze the impact of various projects or changes in economic programs on state or local economies. For example, state and local government planners can use the model to assess the economic impact of a military base closing, the closing of a major industrial plant, or a new development project.

Figure 1. The relationship between the benchmark input-output accounts and other BEA accounts



Case study 2. The development of quarterly national accounts in the Netherlands

1. The development of the quarterly national accounts in the Netherlands started in 1982. Traditionally, the supply and use table (SUT) is used as an integration framework for the economic statistics. So, also for the derivation of the macro-economic totals on a quarterly basis, quarterly SUTs were used. The first step, in 1982, was the breakdown of the table for the reporting year 1977 into four quarterly tables. The method adopted in the Netherlands was to extrapolate these tables to the corresponding quarter of next year. A wealth of data were available for this extrapolation process, including volume or value changes for reporting months or quarters, and comparisons to the same month or quarter of the year before. The advantage of this representation is of course that no explicit procedure for seasonal adjustment is necessary. The next step in the development of the quarterly national accounts was a simulation to estimate tables for the quarters of 1978. In this simulation for each quarter the difference between the supply and the demand each commodity was calculated. The elimination of these differences took place in the balancing process to reach consistent SUTs for each quarter of 1978. The sum of the four quarterly tables was used to make a confrontation with the final annual 1978 table. The differences were broken down by the quarterly tables of 1978, which were used as the basis for the extrapolation to the quarters of 1979 and so on.

2. The process of extrapolation uses several assumptions. One is the assumption of constant I-O ratios. Of course, no short term information is available for the intermediate structure of the SUT. So, volume indicators on output of the branches of industry are used in the extrapolation process to arrive at a table in constant prices. Price information for each commodity separately is used for the inflation of the rows of the table to get the SUT in current prices. In the balancing process the balancing is done both in constant and current prices simultaneously.

22. Data on incomes are available in tax and financial accounting records. A number of challenges arise from using these data sources. The tax and financial data must be adjusted to match the economic concepts of national income. Audit studies that measure the amount of underreporting or non-reporting are often used to derive adjustments for the misreporting of incomes. For further details, please see Case study 3.

Case study 3. U.S. measures of compensation

1. U.S. measures of compensation are comprised of wages and salaries and supplements to wages and salaries. Wage and salary estimates for the most recent quarter are based on U.S. Bureau of Labor Statistics' (BLS) monthly Current Employment Statistics (CES) program, which surveys about 140,000 businesses and government agencies, representing approximately 410,000 individual worksites, and covers the employment, hours, and earnings for all employees. The CES data do not cover certain types of irregular pay such as bonuses and stock options. Because coverage of both the number and types of employees has varied in the past, the initial wage and salary estimates have been subject to large revisions when more complete data become available, despite efforts to adjust for systematic bias.

2. The Quarterly Census of Employment and Wages (QCEW), which is compiled by BLS from state information as reported by employers covering 98 percent of U.S. jobs, is the ultimate primary source of wages and salaries by industry for the national accounts, the industry accounts, and the regional accounts (for regions, states, and counties), and provides consistent and integrated statistics to analyze the U.S. economy. These data comprise a nearly complete census of wages and salaries, including overtime, bonuses, stock options, and other irregular forms of compensation for virtually all workers, and are incorporated into all but the most recent quarter's estimates.

3. Benchmark and annual estimates of supplements to wages and salaries are comprehensive measures of all such income. These supplements include employer contributions for U.S. government social insurance (mostly Social Security, Medicare, and unemployment insurance) and contributions for pensions and private insurance (mostly health insurance) and are developed using a variety of information. Estimates of government social insurance are primarily based on data from the U.S. Social Security Administration. Estimates of contributions for private health insurance and for state and local government health insurance are based on data from the Medical Expenditure Panel Survey (Centers for Medicare and Medicaid Services). Estimates of contributions for federal health insurance are based on data from the U.S. Office of Personnel Management. Estimates of contributions for private pensions and for supplemental unemployment benefits are based on Form 5500 tabulations from the U.S. Department of Labor. (The Form 5500 is a tax return filed by administrators of private pension and supplemental insurance plans.) Estimates of contributions for federal pension plans are based on data from the Monthly Treasury Statement, and estimates of contributions for state and local government pensions are based on U.S. Census Bureau annual surveys of state and local government retirement funds. Estimates for workers' compensation are based on data from the National Academy of Social Insurance and A.M. Best (a private trade source).

Sectoral data

23. In a number of countries the sector accounts are linked to the I-O table or to the supply and use table (SUT). The sector accounts – just like the SUT – start with the production process. In the sector accounts there is no need for detailed information on goods and services. The sector accounts are characterised by the types of money flows: output, taxes, subsidies, property income and social contributions. The description of the production process (the production account) is followed by the process of distribution of income (the income account, primary distribution of income) and the process of redistribution of income (the income account, secondary distribution of income). The process of expenditure (income account, use of income account) is described. It is followed by the capital account (capital transfers and capital accumulation) and the financial accounts.

24. The sector accounts describe the total economy. The break-down into institutional sectors is the main topic. The process of statistical integration of the source data is a process for each separate sector. The main sectors distinguished are the following (the codes are from the European System of Accounts (ESA)):

S11. Non-financial corporations;

S12. Financial corporations;

S13. General government;

S14. Households;

S15 Non-profit institutions serving households; and

S2. The rest of the world.

25. Sector accounts present a coherent review of all economic processes and the role played by various sectors. Each economic process is described in a separate account. The accounts register economic transactions, distinguishing between uses and resources, with a special item to balance the two sides of each account. By passing on the balancing item from one account to the next, a connection is created between subsequent accounts. These accounts do not only exist for the total economy, but they are also compiled for separate domestic sectors. In this way, the sector accounts describe: (1) for each economic process, the role of each sector, for instance, general government in the income redistribution and credit institutions in financing, and (2) for each sector, all economic transactions and their relation with other domestic sectors and the rest of the world.

26. Transactions of the rest of the world are the mirror image of the accounts for the national economy. They are presented from the point of view of the rest of the world and contain only a current account, a capital account and a financial account. The current account includes imports, exports and income transactions.

27. An important indicator for the quality of sector accounts is the difference between the balancing item "net lending/net borrowing" resulting from the capital accounts and the same balancing item resulting from the financial accounts[21]. In theory, the outcomes of the two balancing items should coincide for each (sub) sector in the system of sector accounts. In practice, it turns out to be very difficult to attain this ideal situation and statistical discrepancies arise. It follows that statistical discrepancies can only be calculated when a full set of both non-financial and financial accounts is available. In many countries, financial accounts form a new part of the system of national accounts, and the statistical discrepancies can be calculated, to judge and to improve the quality of the sector accounts. For further details, please see Case study 4.

[21] This text is from Hans Wouters, "Treatment of statistical discrepancies," internal paper of Statistics Netherlands, 2008.

Case study 4. The sector accounts in the Netherlands

The successive accounts of the Netherlands sector accounts are the following:

- Production account;
- Income account: generation of income;
- Income account: primary income distribution;
- Income account: secondary income distribution;
- Income account: use of income;
- Capital account: capital transfers;
- Capital account: capital accumulation;
- Financial account; and
- Statistical discrepancies

The sector accounts can give a complete and fully consistent description of the total economy. Consistency implies that:

- A transaction that is recorded as a use in one sector is recorded as a resource in another sector and vice versa. Consequently, for each transaction the total of uses equals the total of resources. This is called the transaction-identity. A special case is the identity of total supply (output and imports) and total use (intermediate consumption, final consumption expenditure, capital formation and exports); and
- All available means of a sector are used by that sector. This is called the budget identity. This identity implies that, theoretically, for each sector total resources and change in liabilities equals total uses and change in assets.

In the sector accounts the transaction-identity is fully satisfied. It is not yet possible to meet the budget-identity. Maintaining this identity would require adjustments of the estimates, which cannot be justified by the available data sources. For this reason, statistical discrepancies will be allocated to the financial accounts.

28. A consistent classification system for household expenditures facilitates inter-country comparisons. The classification of individual consumption by purpose (COICOP) system is recommended by the SNA to categorise household expenditures, in part because it identifies spending on such items as food, health, and education services, which are important indicators of national wellbeing.

29. To integrate sectoral accounts with other statistics, source data from surveys and administrative records, including tax data, can be adjusted and reconciled through the use of I-O accounts. These unique datasets may be best suited for measuring some but not all aspects of outputs, inputs, value added and expenditure statistics by sector. Where possible, these datasets are used to provide a first estimate that is later reconciled and adjusted by applying the accounting identities of an I-O framework.

Price data

30. The SNA recommends using superlative price indexes to measure price movements of aggregate measures of economic activity (flows of goods and services, gross value added, and gross domestic product). Superlative price indexes are symmetrical, provide reasonable approximations to the underlying economic theoretical ideal (cost of living and output price indexes), and treat prices and quantities equally across periods. As a result, superlative price indexes provide more consistent measures of aggregate prices over periods experiencing appreciable price changes.

31. A common type of superlative price index is the Fisher chain price index. With a chained price index, the weights are changed each successive period. To calculate a price index for period 2, two individual price indexes are calculated. One uses weights from period 1 (a Laspeyres price index), and one uses weights from period 2 (a Paasche price index). Changes in prices from period 1 to period 2 for each component are weighted together using the two sets of weights. The resulting two changes in prices are then multiplied together, and the square root of this product yields the change in the Fisher chain price index from period 1 to period 2. To calculate the change in the index from period 2 to period 3, the process is repeated, but using weights from periods 2 and 3 for the calculations. The process is repeated with each successive period.

32. Given the emergence of inflation as an economic problem in many countries, most measures of economic activity are adjusted for inflation. Measures of economic activity are “deflated” at a detailed level of economic activity and aggregated using some form of index. Consumer price indexes are primarily used to deflate personal consumption expenditures, certain components of the change in private inventories, and state and local government purchases. Producer price indexes are primarily used to deflate private investment in equipment and software and in structures, certain components of the change in private inventories, government purchases, and, on occasion, exports and imports (when an item does not have a satisfactory international price index). International price indexes are primarily used to deflate imports and exports.

They are also used to deflate the imported items included in private investment and in the change in private inventories.

33. The source data for the calculation of price indexes may vary both from category of products and over time. The source data will come either from official surveys of prices or from other mixed use sources, including private sources. The principle underlying the selection of price-related source data is to use the best-available data at the finest level of detail that can be managed. As a result, either the available detail for price source data, or the available detail for the nominal values of products may determine the level of detail that is deflated. If the detailed quantity adjustments are chained together, the totals will not sum to the chained totals. This methodology preserves growth rates when base periods for real calculations are changed, but at the cost of additivity.

34. In some cases, compilers may have more than one set of price estimates available. However, these price estimates may exhibit somewhat different patterns. It may be necessary to select either the best price series or a suitable methodology for incorporating information from all of them in some fashion. For further details, please see Case study 5.

Case study 5. Price indexes in the U.S. national accounts

1. The price source data underlying the bulk of U.S. gross domestic product (GDP) comes from three sets of prices compiled by the U.S. Bureau of Labor Statistics (BLS). Fine-level components of the consumer price index (CPI) are used to deflate most of the detailed components of personal consumption expenditures. Some components have been deflated using other price data, including components of the producer price index (PPI). Because of this, and because the CPI is a fixed-weight index and the personal consumption expenditures deflator is a chain price index, the two are not identical. BLS and the U.S. Bureau of Economic Analysis (BEA) have published reconciliations.

2. Components of the PPI are used to deflate much of investment. Similarly, estimates of most import and export prices are provided by price estimates from the international price project (IPP). The three sets of price indexes also underlie the deflation of most government purchases of goods and services, for both the federal government, and for state and local governments. Estimates of prices for the compensation of government employees at all levels are calculated by BEA using compensation rates for government employees and making the assumption that there are never any changes in the productivity of the employees.

3. Some other components of GDP, however, are deflated using other price estimates. For example, observations of prices charged are used to deflate imports of electricity from Canada. As another example, the Census Bureau's hedonics-based price index for single-family houses is used to deflate investment in these structures.

4. The price indexes for nonresidential structures provide examples of the changing data sources and estimation methodologies that underlie estimates that have not been deflated using CPI, PPI, or IPP data. Until 1997, the price index for these structures is calculated using an un-weighted average of movements in the Census price index for single-family structures and a private construction cost index generated by a large, multi-city construction company. From 1997 to 2010, BEA calculates the prices using hedonics-based price indexes based on private, published costs of construction for a variety of types of nonresidential structures. Going forward, BEA plans to use PPIs for nonresidential structures that BLS recently began publishing. BEA's hedonic price indexes were developed to serve as stopgaps until BLS' work on PPIs became available (it takes a lot longer to develop PPIs—based on much more comprehensive data—than it does to estimate hedonic regressions).

Industry data

35. Consistent source data on outputs, inputs, and value added by industry are essential for identifying the sources of productivity and the industry breakout of GDP growth. Industry and product classification systems establish the framework for defining production and the goods and services produced. Examples of such frameworks include the *International Standard Industrial Classification (ISIC)* and the *Central Product Classification (CPC)* systems used for international comparisons, the *North American Industry Classification System (NAICS)* and *North American Product Classification Systems (NAPCS)* used by Canada, Mexico, and the United States. Within a statistical system, adjustments may be required to treat consistently industry and product classifications. For example, different source-data providers can have their own interpretation of industry and product definitions, which would result in inconsistencies across datasets used to construct industry accounts. It is important that suppliers and users of industry and product data eliminate inconsistencies to provide an accurate and reliable description of production.

36. The unit of measurement should tell a consistent story about industries and production. For example, source data collected from tax records may be on an enterprise, or company, basis rather than an establishment, or plant, basis that is more often used on surveys and that is more suitable for economic accounts. As a result, consistency among output, inputs, and value added may require a translation from an enterprise to an establishment basis, or vice versa. Moreover, differences in methodologies and sampling procedures across source-data providers may require the development of a method that reconciles these datasets based on the relative reliability of the data. This is particularly important when source-data providers use different methods to measure the same, or similar, concepts.

37. Measures of industry activity are more consistent in definition and scope the more frequently the activity is measured. In contrast, benchmark or annual industry surveys are likely to be more comprehensive, based on a larger sample and better data verification, but there is also a greater chance that the industry has changed markedly. In other words, there are trade-offs between the frequency of a series and the quality of a series. For further details, please see Case study 6.

Case study 6. Adjustments to industry source data to improve consistency: the U.S. enterprise-establishment adjustment process

1. The unit of measurement for the U.S. industry accounts is the establishment. Many source-data providers in the U.S. statistical system do not collect all data on an establishment basis. The U.S. Census Bureau prepares quinquennial economic censuses, annual, and quarterly surveys primarily on an establishment basis. These Census statistics are used to construct measures of outputs, inputs, and expenditures in the U.S. input-output (I-O) accounts. The U.S. Department of the Treasury's Internal Revenue Service (IRS) collects consolidated tax return data on an enterprise basis. These data are used to construct Gross Domestic Income measures in the national income and product accounts (NIPAs) and to directly construct measure of value-added by industry in the annual I-O accounts.

2. More specifically in the annual industry accounts, several subcomponents of gross operating surplus—such as corporate profits before tax, corporate net interest, and corporate capital consumption allowance—are based on corporate tax return data from the IRS. Because these enterprise- or company-based data may account for activities by several establishments classified in different industries, the U.S. Bureau of Economic Analysis (BEA) must convert them to an establishment, or plant, basis. The conversion is based on employment data for establishments from the quinquennial economic census that is cross-classified by enterprise; this matrix breaks out the consolidated tax return data separately for each corporate component of gross operating surplus. Corporate business income on an establishment basis is then combined with establishment-based data on outputs, inputs, and expenditures within the I-O framework. Inconsistencies that remain between these datasets are reconciled and harmonized through balancing the I-O "use" table.

38. The I-O framework is a useful framework for data-harmonisation, reconciliation, and integration. The primary strength of the I-O accounts is the balanced row-and-column framework that tracks all of the detailed input and output flows in the economy and guarantees that each product produced is either consumed by industries or by final users. An imbalance in the "use" table may indicate a problem with the measures of gross output or intermediate inputs by industry, so the framework provides a consistency check on all of the data used to measure outputs, inputs, value added and expenditures. One approach is to account for differences in source-data quality through the use of reliability, or quality, weighting during balancing. For example, data on the coefficients of variation for point estimates from surveys can be used to determine how much an initial estimate is allowed to change during balancing. If statistical quality measures are unavailable, subjective quality measures, based on industry experts' judgment, can be used. In other cases, data that are considered of highest quality can be made 'unadjustable' or 'locked' during a row-and-column scaling procedure. Expenditure statistics based on different sources and methods can be made consistent by forcing one distribution to match 'control totals' of the higher quality source. "Feedback" from the balancing process can also identify additional gains from integration. For example, notable differences in final expenditure statistics based on separate sources and methods can be identified and reconciled to improve the accuracy of final expenditures in the calculation of GDP. For further details, please see Case study 7.

Case study 7. The input-output framework as a data-harmonisation and integration tool: The U.S. integration of the annual industry accounts

1. The U.S. integration of the annual industry accounts is a case study in using the input-output (I-O) framework as a data-harmonisation and integration tool. Prior to 2004, the United States prepared two sets of national industry statistics: the I-O accounts, which consisted of the benchmark I-O accounts and the annual I-O accounts, and the GDP by industry accounts. Both the I-O accounts and the GDP by industry accounts presented measures of gross output, intermediate inputs, and value added by industry. These measures were often inconsistent because of the use of different methodologies, classification frameworks, and source data.

2. The U.S. Bureau of Economic Analysis (BEA) developed its integration methodology to take advantage of the richness of the source data that are available in the United States. BEA's methodology ranks the available source data by quality and estimates a balanced set of annual I-O and GDP by industry accounts that incorporate a weighted-average of these source data on the basis of their reliability, or relative quality. Combining the strengths of the two methods provides a more consistent and more accurate set of statistics. The primary strength of the annual I-O model is the balanced row-and-column framework in which the detailed statistics are prepared. The framework provides a simultaneous look at industries and products in the economy. This framework provides a "consistency check" between production and consumption.

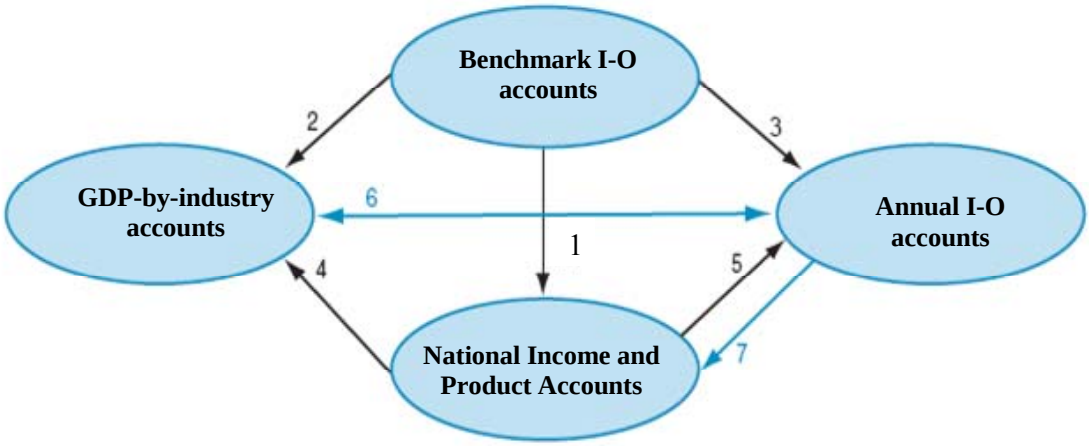
3. The GDP by industry methodology directly estimates value added by industry from high-quality source data. Several factors, can affect the quality of the GDP by industry statistics for particular industries. For example, corporate tax data must be translated from an enterprise to an establishment basis. In addition, distribution of proprietors' income by industry can introduce errors because of incomplete source data.

4. Thus, the GDP by industry value-added statistics can be of higher or lower quality than those constructed from the I-O accounts, depending on source data. For an industry with high-quality data on gross output and intermediate inputs, the measure of value added from the I-O accounts is superior. Alternatively, the GDP-by-industry measure of value added for an industry that incorporates only small enterprise-establishment adjustments and a small amount of proprietors' income is superior. The final combined value added for an industry is an average of the measures from the two sets of accounts, with weights determined by criteria that reflected the relative quality from the two sets of accounts.

5. A further benefit of integrating the annual I-O accounts and the GDP by industry accounts is a "feedback loop" to the NIPAs. The integration resulted in more than an exchange of information between the annual I-O and GDP by industry accounts. It also provided a feedback loop to the NIPAs by providing annual estimates of the commodity composition of GDP in non-benchmark years. Fully integrated accounts would, of course, include the benchmark I-O accounts. The figure below illustrates the relationships among the various U.S. national economic accounts. The benchmark I-O accounts provide the best-level estimates and commodity splits of GDP to the National Income and Products accounts (NIPAs) (arrow 1), the best-level estimates of gross output to the GDP by industry accounts (2) and the starting point for updating the annual I-O accounts (3). The NIPAs provide estimates of gross domestic income by industry to the

GDP by industry accounts (4) and information on the annual composition of GDP to the annual I-O accounts (5). The integration results in an exchange of information between the annual I-O accounts and the GDP by industry accounts (6), and it also provides a feedback loop to the NIPAS (7).

Figure: Relationships amongst the U.S. national economic accounts



39. Integration of statistics on output, inputs, and value added with other national account statistics can identify the sources of growth and productivity by industry. For example, integrating KLEMS statistics with statistics from production accounts as well as productivity statistics provides a full accounting of GDP that equals Gross Domestic Factor Outlays. A by-industry breakout of these statistics shows the sources of growth by industry within the domestic economy. For further details, please see Case study 8.

Case study 8. Integration of industry statistics: KLEMS statistics for the United States

1. The KLEMS statistics for the United States, which BEA updates annually, provide greater detail on the types of inputs that are consumed by industries in the production of goods and services. They aggregate the rich product detail underlying the industry statistics of intermediate inputs into three cost categories—energy, materials, and purchased services.

2. These aggregates are prepared by applying a KLEMS production framework[22] to BEA's statistics of industry production. The availability of these statistics was made possible by the integration of the U.S. annual input-output (I-O) accounts and GDP by industry accounts. The result is a set of KLEMS statistics that are derived from and consistent with the published U.S. annual I-O and GDP by industry accounts since 1998. BEA developed this set of statistics in response to demand from data users. The goal was to facilitate research into a wide array of economic issues. With the release of the KLEMS statistics, BEA provides more analytically useful aggregations of intermediate inputs in current dollars and in chain-type quantity and price indexes. For example, in recent years, studies on U.S. industries have explored the relationship among gross output, value added, and intermediate inputs using BEA's industry accounts. Such studies have examined the substitution between primary, or value-added, factors of production (labor and capital) and secondary, or intermediate, factors of production (energy, materials, and purchased services), the sources of economic growth for industries, and the impact of input prices on aggregate price change.

3. The KLEMS statistics also facilitate other types of analyses. BEA and other U.S. statistical agencies, as well as academic researchers, have conducted analytical studies using the KLEMS statistics and the integrated annual I-O and GDP by industry accounts to measure the effects of domestic outsourcing and imported intermediate inputs on the U.S. economy. The KLEMS statistics on energy, materials and purchased services have also been incorporated into the Bureau of Labor Statistics' measures of multi-factor productivity for the United States.

[22] See Dale W. Jorgenson, Frank M. Gallop, and Barbara M. Fraumeni, *Productivity and U.S. Economic Growth,* (Massachusetts: Harvard University Press, 1987).

Regional data

40. Regional statistics must be consistent with those used in national and industry programs, and the regional areas that form the basis of such statistics should be consistently defined across programs and over time. Such consistency not only mitigates possible confusion relating to what the regional statistics measure, but also allows regional statistics to be used in unison with national and industry data. Access to measures of a region's contribution to a nation's growth may deepen our understanding of business cycle behavior and provide information on potential sources of recovery. The importance of consistent definitions of regional areas across programs and over time is also illustrated by efforts to use historical trends or the experience of similar geographic areas to understand local economic developments.

41. It would be useful for national surveys to include information on geographic location so that regional estimates can be derived from the same source data as national estimates. There are difficulties associated with the use of administrative records at the sub-national level because programs and reporting requirements may differ across geographic regions. For example, a primary source of data on wages and salaries in the United States is the Quarterly Census on Employment and Wages, which is constructed from the administrative records, related to state-administered unemployment insurance programs. As the reporting requirements and definitions of wages and salaries differ across states, much effort is expended in the United States to adjust the administrative records data to derive regional wage and salary measures that can be meaningfully compared to those of the nation and to other regions.

42. The surveys that are employed to collect regional economic data should be designed for a fine level of detail because different-sized regional units are appropriate for different types of economic analyses. Related economic activity may be localised within a relatively small or relatively large area depending on many factors, such as labor mobility and the ease with which goods can be transported. Even though statistics related to economic activity may bear little relation to sub-national political boundaries, statistics for sub-national political sub-divisions may also be useful because national programs may distribute funds to sub-national governments based on economic measures for each political jurisdiction. For example, in the United States, billions of dollars in federal assistance are distributed across states based on state-level measures of economic activity.

43. Whenever possible, data on income flows should be collected and maintained in a manner that accounts for the differences between the location of work and the location of residents of households. Tracking this information is important because measures of current production, such as GDP, are based on where production occurs and measures of income, such as personal income, are based on the location of residence. Thus, a regional area may be growing in terms of the final goods and services that it produces, but the

income of the local residents may not, if many of the employees in the geographic area reside in different location. Such a distinction may have important policy implications.

International data

44. Updates to the SNA and the BPM6 were closely coordinated to increase consistency between the two sets of international guidelines. Efforts to implement the standards should be done in an equally concerted manner. Given this consistency, adherence to the guidelines in BPM6 will facilitate further integration of the international accounts with the national accounts and related industry and regional statistics. Following the recommended concepts, methods, and definitions will also improve the comparability of the international accounts with the accounts of other nations.

45. The update of the *BPM6* was also coordinated with the fourth edition of the *OECD Benchmark Definition of Foreign Direct Investment*, which provides additional guidelines for measuring foreign direct investment (FDI). In addition, there are linkages between BPM6 and other manuals that address, in more detail, specific components of the international accounts, including the *Manual on Statistics of International Trade in Services, UN International Merchandise Trade Statistics: Concepts and Definition*s, and the *OECD Handbook on Economic Globalisation Indicators.*

46. To create an integrated set of accounts, source data should be adjusted where concepts and definitions used in the international accounts differ from those used in the national accounts. The accounts may use different definitions of the economic territory; for example, the national accounts may be compiled on the basis of a narrowly defined "nation," while the international accounts may include as part of the nation outlying territories that are under its jurisdiction.

47. Data on exports and imports of goods are most often collected from customs documents and therefore provide a virtual census of all transactions.[23] As a result, benchmark, annual, and quarterly estimates can be derived with no need for extrapolations from other sources. However, adjustments for coverage, valuation, and timing must often be made to customs data to align trade statistics with the balance of payments guidelines.

48. Customs data will likely need to be adjusted to include in the balance of payments goods that have changed ownership but have not been recorded in the customs data because they have not physically crossed borders. These include goods such as offshore fish catches, goods procured in ports by carriers, and goods purchased by the military for use abroad. Other goods need to be added because they are not processed through customs. These include goods transported through parcel post as well as electricity, gas, and water.

[23] Merchandise trade statistics generally include estimates for transactions valued below a specified exemption level.

49. Source data on cross-border trade in goods should ideally be collected on a consistent valuation basis. The valuation recommended in BPM6 is the FOB (free on board) value, based on the transaction price including inland freight, insurance, and other charges incurred in placing the merchandise on board the carrier at the port of exportation. This valuation may differ materially from the change of ownership principle employed by the BPM6 and the SNA, because the valuation is at the border, not necessarily where the change of ownership actually occurs. Moreover, it is generally the best estimate given data sources and is the valuation recommended by the SNA.

50. In practice, source data collection generally follows the International Merchandise Trade Statistics[24] definitions, which value goods exports according to FOB but value imports according to CIF (cost, insurance, and freight); that is, the value at the point of entry into the importing economy. For international accounts purposes, the CIF value must be converted to FOB by deducting the value of the freight and insurance charges incurred from the frontier of the exporting country to the border of the importing country.

51. Bilateral comparisons with major trading partners can be a useful tool for monitoring data quality and identifying gaps in current account statistics. In some cases, data substitution might even be considered. For example, it is more difficult for a country to identify its exports than it is to identify imports. The major trading partners may benefit from data-sharing by using their partner's import data as their export data. For further details, please see Case study 9.

[24] United Nations, *International Merchandise Trade Statistics: Concepts and Definitions,* 1998.

Case study 9. The U.S.-Canadian current-account reconciliation and data exchange

1. The U.S.-Canadian current-account reconciliation, conducted regularly since 1970, provides an excellent example of the benefits of bilateral comparisons. The reconciliation, which explains the differences between the estimates of the bilateral current account published by the U.S. Bureau of Economic Analysis and those published by Statistics Canada, is undertaken because of the extensive economic links between Canada and the United States. The reconciled estimates are intended to assist analysts who use both countries' statistics and to show how the current-account estimates would appear if both countries used common definitions, methodologies, and data sources. In principle, the bilateral current account of one country should mirror the bilateral current account of the other country. Differences occur in the published estimates of the U.S. and Canadian current accounts because of variations in the definitions, methodologies, and statistical sources that are used by each country.

2. The longstanding U.S.-Canadian current-account reconciliation is among the leading examples of the benefits of international data exchanges. As a part of the reconciliation process, Canada and the United States have evaluated the accuracy of each other's estimates, and as a result, each country now includes in its published estimates some data that are provided by the other country. The exchange of data between Canada and the United States for transactions such as trade in goods, travel, passenger fares, Canadian and U.S. government transactions, and some large transportation transactions covers a substantial portion of the value of the Canadian and U.S. current account and has eliminated some of the differences in the U.S. and Canadian-published estimates. In addition, the reconciliation process has highlighted areas where errors and omissions may exist in each country's estimates, which has helped in targeting data improvement efforts. Other benefits of the data exchange include the elimination of some duplication of effort, a reduction in some government processing costs, and reductions in respondent burden.

3. The U.S. and Canadian-published estimates are reconciled and there is extensive exchange of data between Canada and the United States, differences in the published estimates remain. Complete substitution of the reconciled estimates for published estimates and complete exchange of data are not feasible for several reasons. For trade in goods, imports in the U.S. accounts would be affected because the United States attributes Canadian re-exports to the country of origin rather than to Canada, the last country of shipment. For some accounts, the protection of confidentiality of the source data bars the exchange of data. Finally, a few differences are attributable to different requirements for integrating the international and national (domestic) accounts in each country.

52. In order to produce an integrated set of economic statistics, the financial and capital accounts from the international accounts need to be produced in a manner that is consistent with how the domestic financial sector statistics are produced. This requires parallel presentations of the domestic and international financial accounts by institutional sector and by financial instrument. The *SNA 2009* and *BPM6* provide sector and instrument classifications that have been harmonised for this purpose. Surveys need to be examined to ensure that information is collected in a way that enables compilers to produce statistics at this level of detail.

53. In the international accounts, financial transactions are classified into five functional categories—direct investment, portfolio investment, financial derivatives (other than reserves) and employee stock options, other investment, and reserve assets—that group transactions in financial instruments according to the economic motivation of the investment. Direct investment, portfolio investment, and other investment transactions are often collected on separate surveys, and in some countries, these surveys are conducted by different agencies. Agencies must be careful to avoid overlap and duplication. To do so, it may be necessary to compare individual company reports. In countries with highly-decentralised systems, this may require some form of data-sharing agreement.

54. It is important to properly classify a transaction by type of investment (direct investment, portfolio investment, or other investment) during the data collection process. To do so, the data collection program must employ clear definitions of the different types of investment. Respondent education is vital to ensure that the information collected is accurately classified, particularly when companies may be required to report different types of transactions to different agencies. Where one agency may collect data on both direct investment and portfolio investment, for example, because of reasons of convenience (such as greater access to and familiarity with potential respondents), it may be necessary to adjust data to reclassify certain transactions from one type of investment to another.

55. Financial asset positions and the related income flows are often collected independently. When this is the case, a rate of return can be calculated and compared to comparable rates of return (such as a market interest rate) to test the consistency of the income and position estimates.

56. Positions may be collected using a variety of different valuations, including book value, historical cost, market value, or fair value. The *BPM6* and the *SNA 2009* recommend the use of market values for traded securities, and the use of nominal values for loans, deposits, and other accounts receivable or payable. However, data may not be collected using those valuation methods, and might then need to be adjusted.

57. Data collected from enterprises are often based on tax or accounting standards and may not reflect market values. For example, direct investment positions are often collected at the historical cost or book value. This value can be converted to a current-period price basis by valuing capital equipment, land, and inventories at their current- period price or replacement cost. Direct investment positions can also be adjusted to a market

value basis by valuing the equity portion of the position using indexes of stock market prices. One shortcoming of these methods is that it may be difficult to make these adjustments beyond the aggregate level.

58. Cross-country comparisons can be undertaken through initiatives organised by international institutions. Examples include the IMF's Coordinated Portfolio Investment Survey and its Coordinated Direct Investment Survey and the Bank for International Settlement's international banking statistics.

59. Asymmetries in bilateral statistics can arise from the attribution of transactions to the "ultimate" or the "immediate" country of ownership or destination. In theory, transactions in goods should be attributed to the residence of the seller/purchaser of a good, in accordance with the change of ownership principle. In practice, trade in goods is usually attributed to the country of origin for imports, and the country of final destination for exports. This can lead to asymmetries in the attribution by partner economies, particularly when goods are routed through an intermediate country.

60. Analogous problems may result where financial flows are collected on an immediate counterparty basis while financial positions are collected on the basis of the issuer or holder. In order to facilitate comparisons with partner countries, statistics can be compiled on both bases. This is recommended for direct investment transactions and positions. The *OECD Benchmark Definition of Foreign Direct Investment* describes a method for allocating inward investment to the ultimate investing country, but allocating outward investment to the ultimate host country is a topic that remains on the research agenda.

61. Statistics on the Activities of Multinational Enterprises (AMNE) provide information on the operations of a multinational enterprise (MNE), including variables such as employment, sales, value added, employee compensation, R&D expenditures, and total imports and exports. Unlike FDI statistics, which focus on cross-border relationships between parent companies and their affiliates, AMNE statistics cover the full operations of the entire MNE. AMNE statistics are based on the idea of control, or majority ownership, whereas FDI statistics are based on relationships that exhibit influence, or ownership of 10 percent or more.

62. Both FDI statistics and AMNE statistics are important for assessing the economic impact of MNEs and for understanding globalisation. The *OECD Handbook on Economic Globalisation Indicators (OECD Handbook)* and the *Manual on Statistics of International Trade in Services* provide recommendations for the compilation of key indicators based on FDI data and data on AMNE to address questions related to globalisation.

63. Although FDI and AMNE statistics are related, it can be difficult to establish linkages between the two data sets because of differences in methodology. For example, statistics on AMNE should be presented on a directional basis (i.e. inward and outward investment) and should be classified according to the country of the entities covered. Statistics on foreign-owned affiliates in the compiling economy (inward investment)

should be attributed to the country of the ultimate investor. In order to reconcile these statistics with FDI statistics that are classified according to the country of the immediate counterparty, compilers will need to collect AMNE data based on the country of the immediate investor as well.

64. The enterprise populations for FDI and AMNE statistics are not equal; AMNE statistics cover a sub-set of the enterprises involved in FDI. In some countries, where FDI and AMNE data are compiled by the same agency, the data collection for the two data sets is largely consistent. However, in many cases the data are compiled by different agencies and collected on different surveys. This can make it difficult to integrate the two sets of statistics. Two OECD groups, the Investment Committee's Working Group on International Investment Statistics and the Committee on Industry, Innovation and Entrepreneurship's Working Party on Globalisation of Industry, have been working jointly on efforts to further integrate FDI and AMNE statistics.

65. The economic globalisation indicators presented in the OECD Handbook were developed from the concepts in the SNA. One of the "basic" AMNE variables is value added, a multinational firm's contribution to gross domestic product (GDP). Value added of a multinational enterprise should be estimated in a way that is comparable to the method for calculating GDP. This allows the statistics to be used together to analyze a firm's impact on a host economy.

66. AMNE statistics are also presented by activity or industry. Industry classification can be difficult because enterprises are often engaged in several activities. Ideally, the enterprise should be classified according to the primary economic activity, for example, the one that contributes most to value added or to employment. To facilitate cross-country analysis, by industry statistics should be compiled using standard industry classification codes. This may be challenging because while some countries use the ISIC, other countries use their own national classification systems, for example, the NAICS adopted by Canada, Mexico, and the United States. Reconciliations between national classification systems and ISIC are important to enable international comparability.

Financial data

67. The surveys that are employed to collect financial data should, to the extent possible, use accounting concepts that firms already use for financial reporting. This will reduce respondent burden and increase compliance. Survey instructions should provide linkages to the accounting standards that should be used. In cases where companies follow different accounting principles than those used by the compilers—as in the case of the United States, which currently follows *U.S. Generally Accepted Accounting Principles* but has some foreign-owned companies that report using the International Financial Reporting System—companies should identify the accounting principles that they use. Compilers may need to make adjustments to reported data where the accounting principles used by reporters differ materially from the principles used in statistical production.

68. Surveys that collect financial data should treat bank holding companies, offshore entities, and other complex company structures in a uniform manner in order to maintain consistency across the accounts. Compilers may want to treat certain special purpose entities as any other enterprise, or they may want to "look through" them to the ultimate origin or destination of the investment. This may require additional information on these entities.

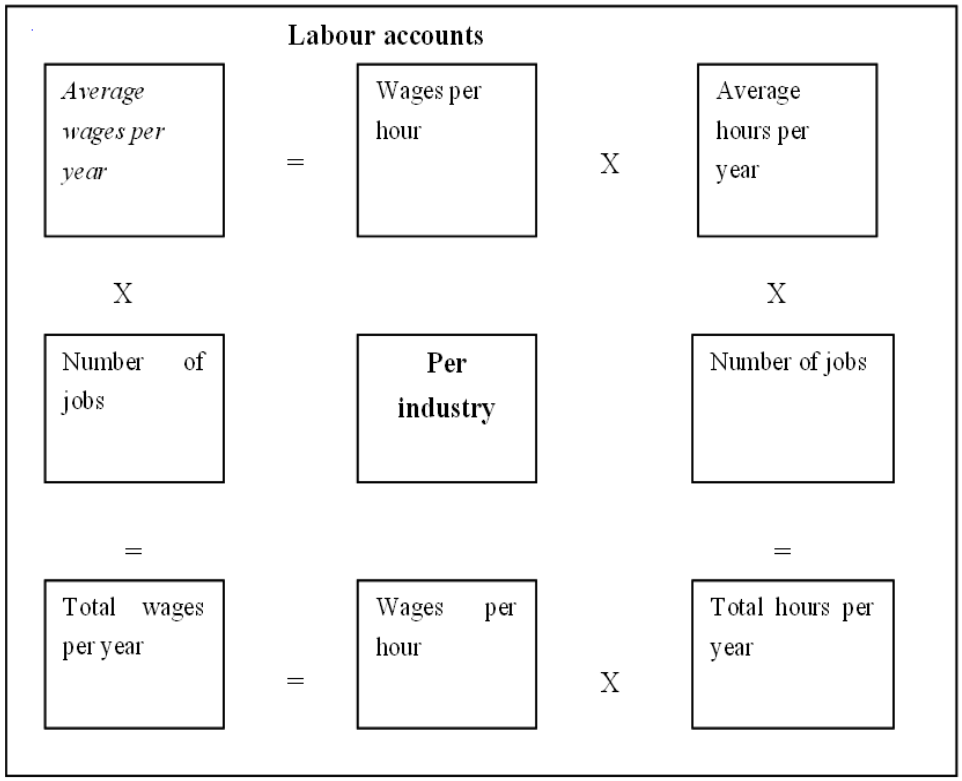
Labour accounts

69. Labour statistics have their own character depending on their use in the economic or social context. And there are possibilities for statistical integration. Labour is far from homogeneous as a production factor. Education level, particular skills, sex and age are important variables in the statistical description of labour.

70. The development of a system of labour statistics link with the national accounts. The production statistics and the short term statistics (e.g. on sales) have information about the number of employees available. The information on productivity is necessary in the source statistics and in the national accounts, for economic policy reasons and for plausibility reasons. Information on self-employed people is necessary for the same reasons, but the sources for this information is scarcer.

71. Dynamic data are surveyed in the field of labour statistics. Entering the labour force (coming out of education or social benefits) and leaving the labour force are followed with the help of data from different institutions, such as social security funds. The same is true for unemployment variables like age, sex, education. Together with detailed data from the population statistics, there are possibilities of statistical integration. Some countries have started to develop a system of labour statistics which was not linked to the national accounts. For further details, please see Figure 1. which shows some important relations within the labour accounts and Case study 10.

Figure 1. Labour accounts



Case study 10. The development of labour accounts in the Netherlands

1. The development of the labour accounts in the Netherlands started in the mid-1980s. This development is described in a publication of Statistics Netherlands and took place near the labour source statistics and with many conflicting data sources. Each source statistic has restrictions according its own nature. Registration information is not gathered for use in a statistical system, but for the registration concerned. Information sampled from enterprises is restricted to what is available in the enterprise registration. Surveys of individuals are not always reliable in the information about formal variables such as contractual working hours. So, the harmonisation of definitions, populations, variables, reference periods and classifications is a difficult job. Part of the solution is to create intermediary concepts in the relevant sources and translate these concepts into those to be published – after reconciliation.

2. After the harmonisation comes the problem of conflicting data. A separate treatment is necessary to reach consistency: the integration process. This process is described in four steps in the labour accounts. In the first and the second step – harmonisation and completing – the data are treated in such a way that all data are related to the same definitions and populations. Remaining discrepancies may point to measurement errors. In the third step – minimizing measurement errors – causes for these errors are traced and removed. The fourth and last step of the integration process is the statistical balancing of the data.

3. After these four steps are carried out, there should be a consistent picture of the labour statistics. In this sense, consistency is restricted to the statistical information available in the many different source statistics for the labour accounts. No consistency is guaranteed with other (integrated) statistics. In particular, there may be differences between the labour accounts and the national accounts and in the Netherlands this was the case. At the time the labour accounts were developed, the next benchmark revision year of the national accounts was 1987 and this major revision was completed in 1992. The new information of the labour accounts could only play a partial role in this revision. The full consistency between the two statistical systems was reached in the benchmark revision of the year 1995, first published in 1999.

Satellite Accounts

Travel and Tourism Accounts

72. Statistics on tourism in most countries include the number of visitors, the socioeconomic characteristics of visitors, duration of stay, hotel capacity, and occupancy rate. These statistics are not related to macroeconomic statistics. Tourism is included in the estimates in the core system of the national accounts, but it is not made explicit. There is no separate tourism industry: tourism is nested in many industries. The TSA has been developed to identify the phenomena of tourism in each of the industries in the national accounts, and to express the importance of tourism for the national economy.

73. Tourism satellite accounting is the result of much effort and many international discussions since the 1970s. In 1983 the first proposal from the World Tourism Organisation (WTO) stressed the need for a "uniform and comprehensive means of measurement and comparison with other sectors of the economy" following the recommendations of the SNA of that time. The OECD contributed to the discussion in 1991 with the development of its Manual on Tourism Economic Accounts. After the adoption of the recommendations on definitions and classifications (Ottawa conference, 1993), the WTO and the OECD started to develop the conceptual framework of a TSA. This resulted in 2001 in the manual, *Tourism Satellite Account: Recommended Methodological Framework.* For further details, please see Case studies 11. and 12.

Case study 11. Netherlands tourism satellite accounts

1. The national accounts are an important data source for the Netherlands tourism satellite accounts (TSA), which determines what can be called the "borders" of the TSA. The TSA distinguishes inbound, outbound and domestic tourism on daytrips and overnight stays with a recreational motive and business travel, consumer durables and social transfers in kind. Different kinds of surveys are available to supply detailed data on each of these types of tourism expenditure. A survey on daytrips is undertaken once every 5 to 6 years and is aimed at collecting information on the kind of activity, destination and expenditure of daytrips of Dutch persons. The 'continual holiday survey' takes place every quarter of a year and is aimed at gathering data on activities and expenditure of Dutch people on vacation or on business trips in the Netherlands or abroad. A mobility survey is aimed at collecting information on all aspects of mobility of the Dutch population, ranging from the mode of transportation and time of departure to destination and motive of travel. A sample of accommodations and lodgings are asked for information on the number of visitors and overnight stays of Dutch and foreign visitors. The survey 'accommodations and lodgings' takes place on an annual basis. Finally, the survey 'inbound tourism' is undertaken once in every 5 years. This survey includes information on motive and characteristics of the visit, country of origin of the visitor, mode of transportation and expenditures per category.

2. To facilitate the integration process in specific areas, separate modules have been developed. In these modules different kinds of data are grouped together and analysed, after which the information is returned to the main framework. The ratios and other different computations need to have a plausible value before the integration process is completed.

Case study 12. U.S. travel and tourism satellite accounts

1. The U.S. travel and tourism satellite accounts (TTSAs) present a detailed picture of travel and tourism activity and its role in the U.S. economy since 1998. They are based on the detailed benchmark input-output (I-O) accounts and are consistent with the integrated annual industry accounts. The methods that are used to prepare the TTSAs are also consistent with the methods used to estimate gross domestic product, national income, and other national economic measures. These accounts are developed with the support of the Office of Travel and Tourism Industries, International Trade Administration, U.S. Department of Commerce, in order to more accurately measure the contribution of travel and tourism to the economy.

2. There is no explicit "travel and tourism" industry in the U.S. industry accounts. Rather, travel and tourism is distributed across many industries, including food and accommodation, transportation, recreation, entertainment, and retail. They present estimates of current and real expenditures by tourists, or visitors, on 24 types of goods and services for 1998 forward. The accounts also present estimates of the income generated by travel and tourism and estimates of output (current and real) and employment generated by travel and tourism-related industries. The accounts are updated annually and have been expanded to provide quarterly estimates of the sales of goods and services to travelers and employment attributable to those tourism sales. The TTSAs can be used to determine the size of tourism and the components of travel and tourism. Specifically, these accounts can be used to determine the shares of the goods and services that were sold to visitors and the shares that were sold to local residents, to assess the effects of travel and tourism on the U.S. economy, to examine the relationship among the travel and tourism industries, to determine the expenditures of tourists, and to compare travel and tourism industries to other manufacturing and services industries.

Environmental Accounting

74. Environmental accounting integrates environmental data with the national accounts. Many data sources provide information on environmental aspects, including emissions, the use of water, land, and so on. Other data sources are available on biological variables, such as the number of species, the quality of the woods or connected uncultivated land. Although a lot of statistical information is available to describe the state of the environment, the information is not coordinated and is also not consistent. There is a link to the statistical information on the production process (e.g. given the technical relationship between the use of energy and the emission of CO_2). Where the production boundary as defined in the SNA may be too restrictive, a satellite account can be used. For further details, please see Case study 13.

Case study 13: Environmental accounting in the Netherlands

In 1991 an illustrative national accounting matrix including the environmental accounts (NAMEA) was presented for the first time. However, insufficient data were available for an immediate operationalisation of this conceptual framework. So it was decided to compile a more modest pilot-NAMEA, making use of a so-called national environment policy plan, in which a number of environmental themes were distinguished. A single indicator had been designed for each of these themes. In 1993, this first NAMEA became available and the present NAMEAs basically maintained this format. These NAMEAs focus on the following themes: the greenhouse effect, ozone layer depletion, acidification, solid waste, wastewater and the exploration of crude oil and natural gas. During the 1990s and the early 2000s, a number of pilot projects were performed to extend the system of environmental accounts. Following a pilot project in 1997, the Nertherlands' system of environmental accounts was extended in 2002 with the national accounting matrix including water accounts (NAMWA). Other pilot projects focused on energy, land use, subsoil accounts and environmental taxes. Between 2004 and 2007 subsystems based on these pilots were developed and implemented, while the air emission accounts and the water emission accounts were further extended. In 2009, a program for advancing new statistics on sustainable development was initiated. In cooperation with other institutes, new statistics will be developed to answer all kinds of relevant social, economic and environmental questions. Within this scope new projects in the area of environmental accounting were started.

Annex 1. Glossary

AMNE. Statistics on the Activities of Multinational Enterprises

ARC. Advance Release Calendar

Business process modeling. To document all major business processes using a "best practice" methodology.

Business register. Play a central role in integrated economic statistics in providing a central sampling frame for all business surveys and a co-ordination of source data that use the same basic information about business units.

Centralised statistical system and **"bottom-up" practices.** The management and operations of the statistical programmes are predominantly the responsibility of a single autonomous government agency which would hold the authority and the funding to produce the required economic statistics.

Chain management. A process management technique applied to the production of all official statistics. It describes the end of a data processing phase in which value is added to the data.

Code of practice. A clear set of rulings that functional departments and agencies can refer to in order to support moves towards integration,

Data warehousing. A collection of a large amount of electronically stored data, designed to facilitate dissemination and analysis.

Decentralised statistical system and **"top-down" practices.** The statistical programmes are managed and operated under the authority of several government departments.

DQAF. IMF's Data Quality Assessment Framework

DSBB. IMF's Dissemination Standards Bulletin Board

Economic statistics system. To produce a range of statistics that measure the shape and performance of different parts of the economy, including industries, institutional sectors and particular types of transactions, like international trade or prices and which are published separately and have a unique set of users. Integrated accounts, such as national accounts and balance of payments, are the final product of the economic statistics system.

EU KLEMS. EU level analysis of capital (K), labour (L), energy (E), materials (M) and service (S) inputs models.

GAAP. Generally-Accepted Accounting Principles

IFRS. International Financial Reporting Standards

GDDS. General Data Dissemination System

Input-output framework. Consists of supply and use tables by industry, tables linking the supply and use tables to the sector accounts and symmetric input-output tables by homogeneous branch (product).

Integrated economic accounts. Based on, but are not the simple sum of the national accounts and the data conform to accounting conventions, international standards and integration techniques. The accounts include the value of goods and services each institutional sector produced, how its income was earned, whether the income was spent or saved, whether the sector was in deficit or surplus, how its borrowing needs were met and which financial assets it acquired. They explain all changes between an opening and a closing balance sheet by transactions, holding gains/losses, and other changes in the volume of assets. This fosters analysts' ability to reconcile stocks and flows within balance sheets.

Integrated economic statistics. Statistics within one conceptual framework which offers a comprehensive view of the economy and analysis of the financial and non-financial transactions by sectors of the economy and which is free of statistical discrepancies.

Integrated statistical production process. Covers all aspects of the statistical production process based on the fundamentals of a modern national statistical system and IT environment. There are a wide range of institutional, statistical, strategic and managerial building blocks of integration, each contributing to and increasing the consistency of economic statistics.

Macroeconomic statistics, National and balance of payments accounts, along with associated macro price and employment data.

Memorandum of Understanding. A legal document that outlines the terms and details of an agreement between agencies, including each party's requirements and responsibilities.

Metadata (concepts, variables and classifications as well as quality) warehousing.

MNE. Multinational enterprise

NAMEA. National Accounting Matrix including the Environmental Accounts

NSDPs. National Summary Data Pages

Protocols. Set out the procedures that should be followed in order to achieve statistical integration and should cover common frameworks, standards and classifications and specify that common statistical frames,

definitions and classifications which are used in all statistical surveys and sources to provide consistency over time and between datasets.

PGI. Principal Global Indicators

Quality assurance frameworks. A programme for the systematic monitoring and evaluation of the various aspects of a project, service, or facility to ensure that standards of quality are being met.

Double-entry or **quadruple entry accounting.** National and business accounting is based on the principle of double entry. Each transaction must be recorded twice, once as a resource and once as a use. Quadruple entry accounting is the recording of the consequences of an action involving two institutional sectors: each transaction is recorded twice by each of the transactors involved.

Stove-pipes. Independent production lines for statistics production.

SDDS. Special Data Dissemination Standard

SDMX. Statistical Data and Metadata eXchange

Total Factor Productivity. A variable which accounts for effects in total output not caused by inputs

XBRL (**eXtensible Business Reporting Language**). A freely available, market-driven, open, and global standard for exchanging business information.

Annex 2. List of domains considered as primary targets for integrated economic statistics

Classification of International Statistical Activities. Conference of European Statisticians document ECE/CES/BUR/2005/5, Annex 2, 26 September 2005 version. See: http://www.unece.org/stats/documents/ece/ces/bur/2005/5.e.pdf

The descriptions of the original document are reproduced here in an abbreviated form, for the full description see the reference source document.

1. Demographic and social statistics

1.2 Labour

Covers labour force, labour market, employment and unemployment.

1.5 Income and consumption

Covers statistics on household income and expenditures, consumption patterns.

2. Economic statistics

2.1. Macroeconomic statistics;

All activities that are dealing with economy-wide statistics at macro level that go beyond or are different from national accounts, whether annual, quarterly or monthly.

2.2. Economic accounts;

Covers work on national accounts in current and constant prices, Excludes agricultural accounts (in 2.4.1), tourism satellite accounts (in 2.4.5), government accounts, financial accounts (in 2.5).

2.3. Business statistics;

Economy-wide statistics on the activities of enterprises. Covers work on economic statistics, business services, enterprises across different sectors. Excludes statistics of specific individual sectors (in 2.4).

2.4. Sectoral statistics;

Statistical activities dealing with one of the specific branches of industry or services.

2.4.1 Agriculture, forestry, fisheries;

All agriculture, forestry, fishery related statistics, agricultural farm structures, crop and animal production, commodities.

2.4.2 Energy;

Energy supply, energy use, energy balances, energy markets, energy efficiency. Excludes energy prices (in 2.7).

2.4.3 Mining, manufacturing, construction;

Statistics on specific industrial activities related to mining, manufacturing and construction.

2.4.4 Transport;

Covers passenger and freight transport on all modes of transport, equipment, transport infrastructure, traffic accidents.

2.4.5 Tourism;

Tourism products, expenditures, international arrivals and departures, tourism destinations.

2.4.6 Banking, insurance, financial statistics;

Money, banking and financial market statistics, interest rates, exchange rates, stock market indicators, pension fund statistics.

2.5. Government finance, fiscal and public sector statistics;

All statistics related to the government sector, including debt, deficit, revenue, expenditure, accounts of the government sector, tax and benefit systems.

2.6. International trade and balance of payments;

Statistics on all cross-border transactions recorded in the balance of payments, including foreign direct investment, foreign aid.

2.7. Prices;

Any statistics dealing with prices, includes consumer price indices, producer price indices, price indexes of specific products and services, purchasing product parities.

2.8. Labour costs;

Statistics on labour costs, earnings, wages, both for structural and short-term statistics.

2.9. Science and technology.

Covers activities on science, technology and innovation, research and development (R&D), patents, knowledge based services.

3. Environment and multi-domain statistics

3.1 Environment

Includes climate, climate change, biodiversity, natural resources, soil, water, air, waste, pollution, environmental accounts.

4. Methodology of data collection, processing, dissemination and analysis

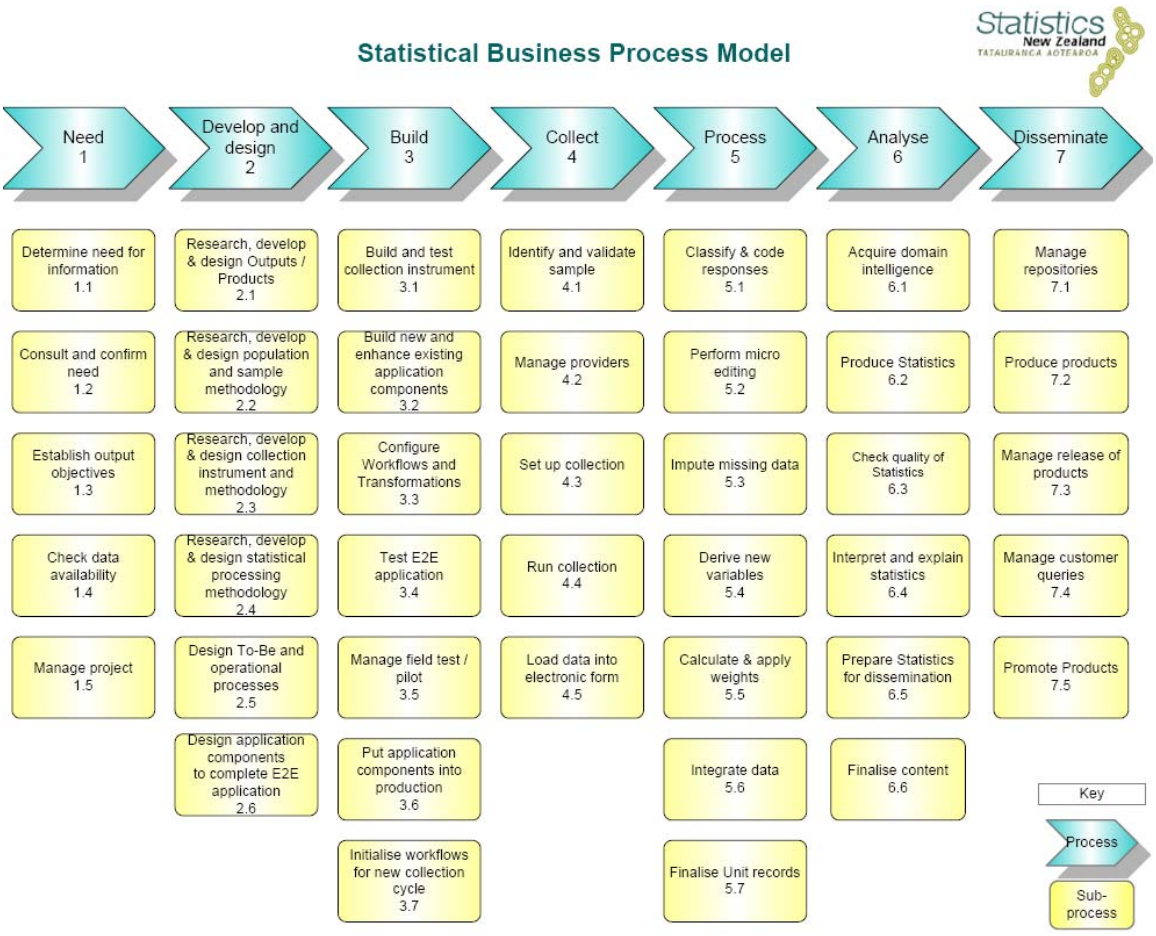
Includes Metadata (4.1) Classifications (4.2) Data sources (4.3) Business and agricultural censuses and registers (4.3.2) Household surveys (4.3.3) Business and agricultural surveys (4.3.4), Other administrative surveys (4.3.5) Data editing and data linkage (4.4) Dissemination, data warehousing (4.5)

5. Strategic and managerial issues of official statistics

Includes Institutional frameworks and principles (5.1) Statistical programmes, coordination within statistical systems (5.2) Quality frameworks and measurement of performance of statistical systems and offices (5.3) Management and development of human resources (5.4) Management and development of technological resources (5.5) Technical cooperation and capacity building (5.7).

Annex 3. The production of statistics in New Zealand

1. The system of official statistics in New Zealand is relatively centralised, as Statistics New Zealand is responsible for the production and publication of most economic statistics. The main exception is a set of money, credit and financial statistics that are published by the Reserve Bank of New Zealand. Statistics New Zealand has taken a long-term approach to the integration of economic statistics and changes have been made to all aspects of the economic statistics system. Because the system is centralised, the emphasis has been on integration through design. The initial focus was on building statistical infrastructure and increasing the coherence of data collections. A strategic plan (2002) was focused heavily on improving business processes. The first step was to develop a generic Business Process Model. The primary objective of this exercise was to document all major business processes across Statistics NZ using a "best practice" methodology. All critical business processes were identified and structured into a sequence of process and sub-processes to all statistics produced by Statistics NZ:



2. Each sub-process can be further broken down into to activities and tasks. Different subject matter areas can tailor the sub-processes and activities below them to better reflect way that they operate. For example, the national accounts division added a number of compilation-related sub-processes to the analyse process.

3. A challenge for the integration of economic statistics is for all economic collections to be seen as part of an integrated whole. This approach was adopted in New Zealand in 1986, when the Annual Enterprise Survey (AES) was introduced to collect information for the entire economy. It has been important for integrating economic statistics into a consistent whole.

4. The AES covers the entire economy and is designed to produce estimates by institutional sector and for 107 industries (approximately the four-digit ANZSIC) level). The AES has a three-strata design with strata being defined by size of turnover and numbers of employees (RME). The three strata are:

- Full coverage - each industry has a full coverage stratum made up of large or complex units with significant economic activity within their industry group;
- Tax Strata -Most industries also have a tax stratum where IR10 information is as a substitute for survey data; and
- Sample strata-The remaining strata contain a postal sample of medium-sized units drawn from the BF. Respondent load is managed by placing a limit on the number of units sampled each year.

5. The AES collects detailed measures of financial performance and financial position by industry and institutional sector. This approach contributes to the integration of statistics.

- The AES was specifically designed to produce industry statistics and to collect data needed for the compilation of New Zealand's national accounts. The survey questionnaires collect both standard accounting variables needed for structural statistics and the additional information needed to derive SNA variables;
- The AES collects information about production, but also interest and dividend flows and capital formation.; and
- The AES line codes are aggregated to National Accounts variables prior to data editing. Analysts working on the AES check and explain unusual movements in both SNA variables and accounting aggregates as a normal part of data checking. This minimises the need for the compilers of national accounts to check unit record data.

6. The wide range of activities undertaken by New Zealand businesses makes different types of postal questionnaire essential. There are thirty different variants of the AES questionnaire which all ask the same core questions and collect a core set of variables from all businesses. The differences in the questionnaires are designed specifically to capture variables that are specific to particular industries or types of business or industry. Demographic information on the Business Register is used to ensure that each business gets a relevant questionnaire.

7. Since 1999, the AES has used a mix of postal survey and administrative data to minimise respondent load. The main administrative data source is the IR10 form administered by the Inland Revenue Department that collects about forty accounting variables from Statements of Financial Performance and Financial Position. Most industries now have a tax stratum where IR10 information is as a substitute for survey data. Information for the government sector comes directly from another administrative data source, the Crown Financial Information System (CFIS) operated by the Treasury. The units on CFIS match those on the NZ Business Frame. All government transactions are coded to SNA and GFS classifications to ensure coherency between accounts produced on a GAAP, SNA and GFS basis.

8. Information for the government sector comes directly from another administrative data source, the Crown Financial Information System (CFIS) operated by the Treasury Department. The units on CFIS match those on the New Zealand Business Frame. All government transactions are coded to SNA and Government Financial System (GFS) classifications. This ensures coherency between accounts produced on a GAAP, SNA and GFS basis. Data from different sources is integrated using the Business Frame to eliminate under-coverage and duplication.

9. The long term programme is to move toward maximum utilisation of administrative data. Postal surveys are used to collect information that is not available from administrative sources. This will involve working with government agencies to adjust their collections to better comply with meet statistical requirements.

Annex 4. The organisation of the National Accounts Department in the Netherlands

1. Before the reorganisation in 2000 of the National Accounts Department in the Netherlands was organised around products. So, there were sections working on the annual Supply and Use Table, the Sector Accounts, the Quarterly Accounts and the Regional Accounts. After the reorganisation, the organisation went according to processes. One section became responsible for all estimates of goods in the national accounts. Another estimated services. A third became responsible for estimates of financial enterprises and the government, and the fourth dealt with estimates for households (and the labour accounts). All specialists in these sections managed their source statistics and were involved in, and responsible for, the balancing corrections in their field. They all have to manage all estimates, starting with the earliest quarterly flash estimates to the last final estimate. The specialists must be able to explain (in detail) all adjustments in the figures that are published. To ensure these processes go smoothly, a fifth section was established to coordinate the integration in which the input of data is centralised and the automation of the systems is facilitated. This annex includes the integration procedures for the Supply and Use Tables, the Sector Accounts and the Labour Accounts.

The supply and use table (SUT)

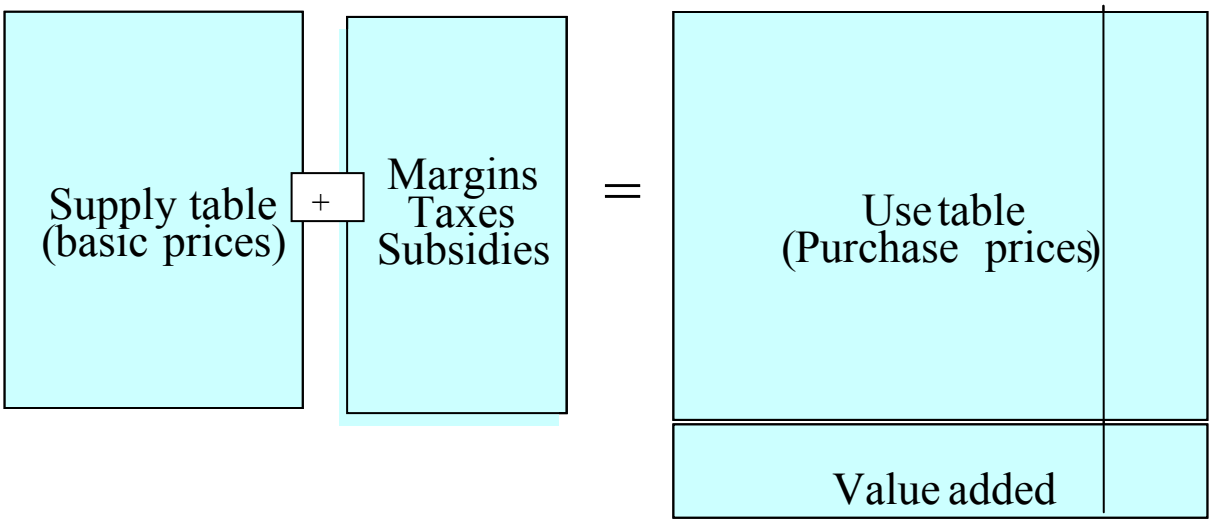
2. Traditionally, the economic process is visualised by a cycle[25]. Goods and services have an origin and they have a destination. This cycle was described in 1941 by Leontiev in the input-output table[26]. The original intermediate part of this table has the dimensions Industry x Industry. The most important use of the I/O-concept is the analyses of policy instruments, where first order and higher order consequences of policies are important. The I/O table turned out to be a very useful tool for the statistical integration of different figures on the economic process. Statistical information on parts of the economic process was scarce and fragmented. The I/O table helped to show the blank spots in a more systematic way. So this approach stimulated the development of a system of statistics about production, intermediate use and value added including a system of statistical coordination.

3. Many statistics provide not only industry data, but also data on goods and services. The foreign trade statistics of a country form a traditional example. The production statistics measure the output not only in terms of money, but also in terms of the goods and/or services produced. Intermediate consumption is also collected in terms of goods and services and not in terms of the industry where those goods and services originated. The development of the supply and use table as the integration framework for economic statistics was a natural process. In the supply and in the use table, columns show industries and rows goods and services. In the column of the supply table, the output of a certain industry is described, including a

[25] One of the earliest thoughts about the economy as a cycle comes from Quesnay (1694 – 1774). See:
F. Quesnay, 1758, Tableau économique avec son explication et les maximes générales du gouvernement économique.
[26] Wassily W. Leontief, 1941, The structure of the American economy, 1919 – 1929 : an empirical application of equilibrium analysis.

breakdown into goods and services. The totals of the rows, as far as it concerns industries, give the domestic production of the commodities. The use table gives a description of the production process. The column-total equals total output of an industry. The column is divided into two parts: the intermediate consumption and the value added. Intermediate consumption is broken down into goods and services used in the production process.

Figure 1. Supply and Use Table[27]



4. The supply and use table is also a very powerful tool for extrapolation purposes. Assuming that the structure of the production process of a certain branch of industry does not change in the short term, it is possible to estimate a whole column of an industry (in constant prices) having only one volume indicator for the output of that industry. For the short term indicators, the nature of statistics is that they are very simple and not very detailed. So, this principle of extrapolation can be used very efficiently in a supply and use framework.

[27] The figures in this paper are taken from a PowerPoint presentation of L. B. (Leo) Hiemstra from the National Accounts Department, Statistics Netherlands.

The sector accounts

5. The national accounts are traditionally a system of accounts. Originally there was a logical link to the bookkeeping systems of enterprises characterised by every item also has an opposite item. In a number of countries, the sector accounts are linked to the I/O table or to the supply and use table, however many countries do not produce an annual I/O and /or supply and use table. The sector accounts – just like the SUT – start with the production process. In the sector accounts there is no need for (detailed) information on goods and services. The sector accounts are characterised by the types of money flows: output, taxes, subsidies, property income, social contributions and so on. The description of the production process (the production account) is followed by the process of distribution of income (the income account, primary distribution of income) and the process of redistribution of income (the income account, secondary distribution of income). The process of expenditure (income account, use of income accounts) is described. It is followed by the capital account (capital transfers and capital accumulation) and the financial accounts.

6. The sector accounts describe the total economy. The break-down into institutional sectors is the main topic. The process of statistical integration of the source data is a process for each separate sector. The main sectors distinguished are the following.

S11. Non-financial corporations,

S12. Financial corporations,

S13. General government,

S14. Households,

S15 Non-profit institutions serving households and

S2. The rest of the world.

An important indicator for the quality of sector accounts is the difference between the balancing item 'net lending/net borrowing' resulting from the capital accounts and the same balancing item resulting from the financial accounts[28]. In theory, the outcomes of the two balancing items should coincide for each (sub) sector in the system of sector accounts. In practice, it can be difficult to attain this ideal situation and statistical discrepancies arise. It follows that statistical discrepancies can only be calculated when a full set of non-financial and financial accounts is available. In many countries, financial accounts form a relatively new part of the system of national accounts, the possibility to calculate statistical discrepancies is relatively new too. Since financial accounts are compiled and statistical discrepancies can be calculated, an extra tool has become available to judge and to improve the quality of the sector accounts.

[28] Please see: Wouters, Hans, 2008, Treatment of statistical discrepancies, internal paper of Statistics Netherlands.

Figure 2. The Sector Accounts

	I. Production account			
Uses	*(for all sectors excluding ROW)*			*Resources*
Intermediate consumption	**456,1**		**Output (basic prices)**	**870,4**
B1g = Gross domestic product (mp)	**414,3**		**Taxes less subsidies on products**	**50,9**
Consumption of fixed capital	**69,4**			
B1n = Net domestic product (mp)	**395,8**			
	921,3			**921,3**
	II.1.1 Generation of income account			
Uses	*(for all sectors excluding ROW)*			*Resources*
Compensation of employees	**238,9**		Net domestic product (market prices)	**395,8**
Taxes on production and imports	**58,9**			
Less: subsidies	**-8,1**			
B2n = Operating surplus or mixed income	**106,1**			
	395,8			**395,8**
	II.1.2 Primary distribution of income			
Uses	*(for all sectors)*			*Resources*
Property income	**222,9**		**Operating surplus or mixed income**	**106,1**
			Compensation of employees	**238,6**
			Taxes on production and imports	**56,4**
			Less: subsidies	**-6,9**
B5n = Net national income	**400,1**		Property income	**228,8**
	623,0			**623,0**
	II.2 Secondary distribution of income			
Uses	*(for all sectors)*			*Resources*
Current taxes on income, wealth	**52,3**		Net national income	**400,1**
Social contributions	**115,0**		Current taxes on income, wealth	**53,2**
Social benefits	**81,4**		Social contributions	**115,4**
Other current tranfers	**122,2**		Social benefits	**79,9**
B6n = Net disposable income	**393,5**		Other current tranfers	**115,8**
	764,4			**764,4**
	II.4 Use of income account			
Uses	*(households, government and NPISH)*			*R*
Final consumption expenditure	**343,3**		Net disposable income	**393,5**
Adjustment for change in net equity of households on pension funds	**19,4**		Adjustment for change in net equity of households on pension funds	**19,7**
B8n = Net saving	**50,5**			
	413,2			**413,2**
	III.1 Capital account			
In Assets	*(for all sectors)*			*In Liabilities*
Gross fixed capital formation	**93,0**		Net saving	**50,5**
Less: consumption of fixed capital	**-69,4**		Capital transfers, receivable	**16,4**
Changes in inventories	**-1,4**		Capital transfers, payable	**-17,4**
Acquisitions less disposals of valuables	-			
Acquisitions less disposals of non-produced non-financial assets	-			
B8n = Net lending(+)/borrowing(-)	**27,3**			
	49,5			**49,5**

7. As the sector accounts developed, the emphasis changed. Originally the emphasis was on S11, the largest sector in most countries. Later the emphasis changed to the sectors government S13 and financial corporations S12, due the increased interest in the balance in government budgets and in the financial innovations followed by the turmoil on the financial markets. The increased interest in the capital accounts and the change in liabilities and financial assets moved the emphasis from the production account to the accounts “lower” in the system.

Annex 5. Statistics for the harmonised revenue allocation formula in Canada

1. The harmonised tax arrangement was to be simpler and less burdensome for consumers and businesses, and cheaper for government to administer. During the intergovernmental discussions leading up to the harmonisation agreement, it was considered to be important that the statistics used in the revenue allocation formula should be reliable. Statistics Canada drafted a plan to accomplish this objective.

2. The plan subsequently put forward by the Bureau and accepted by the four governments entailed the following principal elements:

- Annual provincial input-output tables and improved annual provincial economic accounts estimates;
- More frequent family expenditure surveys with a larger sample size, regular surveys of residential repairs and renovations, and a regular survey of travel expenditures;
- An expanded and improved business register database, recording the names of all Canadian businesses of significant size, their addresses, their industry classification and other key information necessary for survey-taking purposes;
- An improved business survey system, yielding more accurate, complete and detailed business data of roughly equal reliability for all twelve provinces and territories; and
- An implementation strategy based on tighter integration.

3. A full range of issues relating to the last, and to some extent the second-to-last of the four project elements were examined. The planning for the others was done separately, although they were closely related.

4. Two alternative approaches were considered for implementing the project. The first which was ultimately rejected, would have involved a broad scaling-up of the existing business statistics programme originating from the “stovepipe model” to achieve the desired data quality improvements. Survey sample sizes would have increased, questionnaires would have lengthened and new surveys would have been initiated to fill data gaps, but the system itself and the underlying model upon which it was based would have remained unaltered. This approach might achieve the project goals with minimal risk and delay, but, the scaling-up strategy was considered problematic for a number of reasons.

5. The existing survey system provided no assurance of complete business sector coverage. Information was collected from individual establishments and any given business may have several of these. There was a significant risk in the current system, that some of these entities could be overlooked. The underlying model would needed to be improved by giving it a more top-down focus, measuring revenues and expenditures at the enterprise level first and then determining their distribution across establishments.

6. The data quality improvements required for this project required improving in at least four aspects: consistency, coherence, breadth, and depth. Consistency meant more consistent use of concepts, standards, statistical units, methodology, and terminology. Coherence referred to the coherence of data within an enterprise. Breadth related to the comprehensiveness of coverage in terms of filling gaps in the measurement of industrial sectors and ensuring comprehensive non-duplicative coverage of all business activity of complex enterprises. Finally, depth referred to the size of samples and the number of data elements measured for industrial sectors. It would have been impossible to address quality improvement in all these aspects of data quality using the scaling-up strategy.

7. Statistics Canada was using more than 700 questionnaires for its business surveys and there were duplication, inconsistency and a general lack of integration among them. Allowing this situation to continue and indeed, adding to the problem, would imply a higher-than-necessary burden on respondents. The project offered instead an opportunity to rationalise, integrate and simplify survey questionnaires, thereby making it easier for businesses to provide the required information.

8. No effective means was available to monitor and control the total response burden imposed on each individual business enterprise. Increasingly, businesses were seeking to negotiate the total burden one-on-one with Statistics Canada. The need for a database and monitoring system for this purpose would increase as the aggregate response burden would rise and it would be difficult if not impossible to implement an adequate control mechanism without at the same time developing a more tightly integrated business survey system.

9. As the statistical system faced increasing demands for more detailed and regionally disaggregated information, the magnitude of the challenge involved in maintaining the confidentiality of data from individual businesses could only increase. The risk of residual disclosure, in particular, was much greater than in a non-integrated data collection system. The maintenance of data confidentiality could however be better ensured through the application of uniform methods.

10. Finally, there was a growing need for detailed micro-information at the enterprise level. At the time the system was collecting a wide range of detailed facts, primarily from the establishment, business location or legal entity, and stored the information in a constellation of non-standardized databases dispersed through the Bureau. The lack of standardisation and general dispersal of information was making it prohibitively expensive to conduct analyses across survey boundaries and this situation had to be rectified.

11.So the scaling-up approach was rejected and the Bureau opted instead for a general restructuring of the business statistics program that would bring greater integration, consistency and coverage while improving operating efficiency, better management and control of the aggregate response burden.

Annex 6. Structure and application of the SDMX

1. SDMX provides a way of modeling statistical data, metadata and data exchange processes. The data (and related metadata) for a particular statistical domain are structured according to a "Data Structure Definition" (DSD). The DSD describes the structure of a particular statistical data flow through a list of dimensions (for example: country, variable/topic, year), a list of "attributes" (for example, unit of measure) and their associated code lists. Attributes are metadata about an individual value, a time series, or a group of time series.

2. SDMX also defines a model for additional explanatory metadata, which are often referred to in SDMX as reference metadata. Reference metadata are generally in a textual format, using concepts describing the content, methodology and quality of the data. The reference metadata for a particular statistical data flow, statistical domain or – if used homogeneously throughout a statistical institution - a particular statistical institution are structured according to a "Metadata Structure Definition" (MSD).The idea is that it should be possible, using the SDMX standards, to exchange or share the data and the metadata that will allow a thorough understanding and interpretation of the corresponding statistical data. Again, the metadata in the SDDS and GDDS could be structured in this way.

Box 1. Origins and Purpose of the SDMX

The Statistical Data and Metadata eXchange (SDMX) initiative was launched in 2001 by seven organizations working on statistics at the international level: the Bank for International Settlements (BIS), the European Central Bank (ECB), Eurostat, the International Monetary Fund (IMF), the Organization for Economic Co-operation and Development (OECD), the United Nations Statistical Division (UNSD) and the World Bank. These seven organizations act as the sponsors of SDMX.

The stated aim of SDMX was to develop and use more efficient processes for exchange and sharing of statistical data and metadata among international organizations and their member countries. To achieve this goal, SDMX provides standard formats for data and metadata, together with content guidelines and IT architecture for exchange of data and metadata. Organisations are free to make use of whichever elements of SDMX are most appropriate in a given case.

With the Internet and the world-wide web, the electronic exchange and sharing of data has become easier and more common, but the exchange has often taken place in an *ad hoc* manner using all kinds of formats and non-standard concepts. This creates the need for common standards and guidelines to enable more efficient processes for exchange and sharing of statistical data and metadata. As statistical data exchange takes place continuously, the gains to be realized from adopting common approaches are considerable both for data providers and data users.

SDMX aims to ensure that metadata always come along with the data, making the information immediately understandable and useful. For this reason, the SDMX standards and guidelines deal with both data and metadata.

Common standards and guidelines followed by all players not only help to give easy access to statistical data, wherever these data may be and without demanding prior agreement between two partners, but they also facilitate access to metadata that make the data more comparable, more meaningful and generally more usable.

Source: SDMX Users Guide, p. 11.

3. These are recommendations for categorizing and describing data. The Content-Oriented Guidelines are intended to be generic and not influenced by the specificities of any domain or organization. The guidelines consist of the:

- Cross-Domain Concepts, which provide common descriptors for concepts used in DSDs and MSDs for different statistical domains;
- Cross-Domain Code Lists, which provide a collection of code lists that are used for different statistical domains;
- Statistical Subject-Matter Domains which provides a list of statistical domains based on the UNECE Classification of International Statistical Activities; and
- Metadata Common Vocabulary (MCV) of terms used for describing statistics and their compilation processes (across subject-matter domains) by national statistical authorities and international organizations.

Architecture for data exchange

4. SDMX supports two complementary modes for data exchange and data sharing (see Box 2): the "push" mode (where data are transmitted from one organization to another) and the "pull" mode (where one organization retrieves data from another organization's server). SDMX also supports the "hub" concept, where users obtain data from a central hub which itself automatically assembles the required dataset by querying other data sources.

BOX 2: Push and pull

Messages can be exchanged in two different modes, the push mode and the pull mode:

Push mode means that the data provider takes action to send the data to the organization collecting the data. This can take place using different means, such as e-mail or file transfer. These are the traditional modes of data collection, and have been carried out by international organizations for many years.

Pull mode implies that the data provider makes the data available via internet technology. The data may be made available for download in an SDMX-conformant file, or they may be retrieved from a database in response to an SDMX-conformant query, via a web service running on the provider's server. In both cases, the data are made available to any organization requiring them, in formats which ensure that data are consistently described by appropriate metadata, whose meaning is common to all parties in the exchange. While all combinations of the modes above are supported by SDMX standards, it is the aim of the SDMX initiative to further promote data sharing exchange using the pull mode.

5. The SDMX IT architecture also comprises SDMX registries, implementing the general idea of a metadata registry for use with SDMX standards. The idea of a metadata registry is essentially that when a business wants to start a relationship with another business, it queries a registry in order to locate a suitable partner and to find information about requirements for dealing with that partner. SDMX has developed specific

registry standards in order to enable statistical organizations to perform efficient data and metadata sharing. In general terms, an SDMX registry is essentially an application which can accept SDMX query messages and return the locations of SDMX-compliant information, which may include data as well as structural and reference metadata

6. To support the use of SDMX, many IT tools have been developed by the SDMX sponsoring organizations or by other bodies. These tools can generally be freely downloaded via the SDMX website. The source code is available so that they can be used as components for building IT systems in statistical organizations.

SDMX and websites

7. SDMX standards and guidelines can be usefully applied to the publication of statistical data and reference metadata on websites. The major aspect of web publishing, which distinguishes it from data reporting or collection over the Internet, is that the counterparties which receive the data are not known ahead-of-time to the publisher. That is, anyone with access to the data may come to the site to browse and view it, even if they only just discovered the existence of the data and metadata. Thus, it cannot be assumed that the user knows anything about the data or metadata other than that which is provided on the site by the publisher, or which is provided for in the SDMX technical specifications or SDMX Content-Oriented Guidelines, as relevant.

8. There are several basic scenarios for the use of SDMX in Internet publication of statistics. SDMX as a standard XML format for end users: this scenario is primarily aimed at providing data and metadata in a more easily used delivery format. The XML format for statistical data and metadata means that users can more easily load it into databases and other applications. Because XML has become ubiquitous in databases and development environments, this is generally well-received by users, as seen as very positive. SDMX as a format for web presentation: if the capability exists to realize SDMX-ML from internal data sources, it makes sense to use this standard XML format as a way of creating other output formats such as CSV, HTML, PDF, etc. SDMX as the basis for web portals: this scenario provides a single place on the Internet where users can come to get all of the data and metadata for a particular domain, or for a topic or set of related topics. This scenario leverages the SDMX standards to make it easier for people to find and use the data they need within a “data bank”. SDMX as the basis for services provision: this scenario is aimed at users who both produce and consume data, but who will benefit from having a single mechanism for sharing this data. In this scenario, the creator of the site is not responsible for the data or metadata themselves, but provides a portal mechanism which may or may not have a front end “catalogue” application for the use of a community. The business driver behind this scenario is to remove the middle-man from the statistical publication process. By creating a mechanism and policies for use, data producers and consumers are connected by the services operator, but still are responsible for their own data and metadata. This is an extension of the web portal case above, but provides a greater degree of strategic benefit by allowing for a

decentralisation of responsibility for content, while still offering a single place on the Internet for the acquisition and use of data and metadata. This scenario can be seen as the fullest realisation of a “data sharing” process.

The statistical process and SDMX

9. The statistical process encompasses: planning and developing the statistical task; data collection; data validation; analysis; data dissemination; management of metadata information; and archiving.

10. When planning and developing the statistical task the SDMX Information Model forces statisticians to think about the organization of the data to collect. It gives a framework for this organisation that can be applied consistently across statistical tasks, thus leading to economies of scale. The Content-oriented Guidelines help us to choose, for example, statistical concepts and code lists that have been used by others, thus potentially increasing the inter-operability and statistical harmonisation. (There is no need to reinvent the wheel.) Thinking about data organization and data (and metadata) structures will also have a learning effect across the statistical organization.

11. The collection and validation steps build on the data structures developed during the previous step of the statistical process. The SDMX data formats now become important for the actual data and metadata exchange related to the data collection tasks. The use of standards formats facilitates automation of the exchange process and also the technical validation of the exchanged information. SDMX registries can further enhance the data exchange process, e.g. if statistical information has to be provided to more than one recipient.

12. The SDMX information model brings together data and metadata into a consistent and integrated model and thus supports moving towards metadata driven processing: generic processing (and storage) systems based on the SDMX IM are being developed. They will help to lower the marginal cost for new data collection activities. In addition they have “built-in” features for offering metadata driven navigation and search facilities for statistical analysts and users and thus support analysis and dissemination. Standard data exchange formats facilitate the dissemination of statistical information to a variety of clients. For example, dissemination from a National Statistical Office (NSO) may involve reporting to an international statistical body, using the SDMX "pull" mode. The manage metadata information and archiving steps of the statistical process are related to and rely on a consistent treatment of metadata, so they also benefit from the application of the SDMX framework.

13. In general, the following benefits from using the SDMX framework in the statistical process can be derived:

- Speed up movement of data through the statistical process;

- Reduced "time to users" for data and metadata;
- Increased level of automation, reducing the risk for errors; and
- Enhanced support for metadata for a better understanding of the data.

14. It is important to note that the implementation of the SDMX framework should not be considered a "pure IT task". As shown above, the key ingredient is the SDMX Information Model and its application. This is mainly a task for statistical experts, who need to take responsibility for modeling data and metadata structures for their statistical domains and processes before any IT implementation of data exchange formats and processes can start.

Where and how to apply the SDMX framework?

15. SDMX can and should play a role in each of these basic processes. In most organizations, SDMX has its most important place in data collection and dissemination processes, i.e. the processes where data and metadata have to be communicated with the outside world. Here there is considerable scope for standardising, and the result would be that, for instance, the data flowing from national organizations to international ones can be generated in a standardised, orderly and efficient way across different topics and different international organizations, and in particular metadata can be attached and exchanged to a much higher degree than has been the case so far; also international organizations receiving the data can receive them in a standardised way across topics and countries and integrate them into their systems. In these processes, the content-oriented guidelines play a particularly important role in aligning the concepts used among receivers and providers of data and metadata.

16. It follows from the use of the SDMX standards in the collection and dissemination phases that they will also be used to plan and develop statistical tasks. They have the additional strength of helping to identify possible existing sources, which may be registered in SDMX registries. In order to use the SDMX standards for collection and dissemination, organizations will build gateways into and out of their databases using SDMX. These gateways can also be used for validation and analysis processes.

17. The Archiving function for statistics has long been in need for a solid, well-documented standard format that is also rich enough to preserve attached metadata and allow for them to be readable and understandable after hundreds of years. The SDMX standards, being official ISO standards and having rich metadata capability, are ideal for this.

Annex 7. How do the SDDS and GDDS support good statistical practices?

1. The SDDS and GDDS were established in the mid-1990s. Turmoil in international financial markets at that time led to a recognition that timely, reliable, comprehensive, and accessible data could facilitate the formulation and implementation of sound macroeconomic policies and investment decisions and, as a result, reduce turbulence in financial markets. Recognising the "public good" features of data, and as a service to the membership, the IMF's governing body called for data standards in April 1995. Following consultations by the IMF with national statistical agencies on best practices in disseminating economic and financial data to the public, and on the needs of various data users in the financial community, the IMF's Executive Board in March 1996 approved the SDDS as the first of a two-tier data standards initiative. The IMF Executive Board established the SDDS to guide member countries in the provision of economic and financial data to the public. That year the IMF established an electronic bulletin board, the DSBB, on the IMF's website at http://dsbb.imf.org, as part of the data standards initiative to support ready access by the public to information on countries' data dissemination practices.

2. In December 1997 the GDDS was introduced as the second tier of the Fund's data dissemination initiatives. The GDDS provides a framework for participating countries to develop a strategy for strengthening their statistical systems. The GDDS fosters: the application of sound methodology, the adoption of good compilation and dissemination practices, and the observance of procedures ensuring professionalism. GDDS metadata for all its participants are also posted on the DSBB. As of September 2010, there were 68 subscribers to the SDDS, and 97 participants in the GDDS. Over 87 per cent of the IMF's 187 member countries are involved in the Fund's data dissemination initiatives.

National Summary data pages and advance release calendars

3. The SDDS prescribes that subscribers disseminate 21 data categories[29] on National Summary Data Pages (NSDPs, posted on national websites), which have a standardized format to disseminate the latest two observations for each category. These NSDPs also may contain additional data and hyperlinks to longer time series and more complete datasets. The SDDS also requires subscribers to disseminate a standardized Advance Release Calendar (ARC) covering all the data categories. With the alignment of the GDDS with the SDDS requirements, endorsed by the IMF Executive Board in December 2008, the GDDS encourages participants to disseminate NSDPs and ARCs. Links to NSDPs and ARCs are available through the DSBB. The implementation of NSDPs and ARCs enhances both data and metadata accessibility, through uniform formatting (both), preannouncement of data releases (ARCs), and simultaneous data releases (NSDPs).

[29] The SDDS allows flexibility options and "as relevant" features, so that not all data categories are disseminated by every subscriber.

Metadata and the DSBB

4. SDDS subscribers are required to provide metadata on each of the data categories in a standardized format, via electronic means. The SDDS system was enhanced in 2009 to allow subscribers to more directly update their metadata (as well as their ARCs) using an integrated correspondence system (ICS). Moreover, certification of the veracity of these metadata shifted from a quarterly to an annual exercise (facilitated via ICS), to reduce the reporting burden, but subscribers are still required to update their metadata within one quarter after any significant changes have been implemented. Moreover, the SDDS metadata appear on the DSBB in two standardised formats: i) a traditional view that provides users with the original structure of the SDDS; and ii) a DQAF view of the metadata. A search facility on the DSBB gives users the capability to compare the metadata according to the DQAF codes across data categories, across countries, or both. As part of the GDDS alignment with the SDDS, GDDS metadata are in the process of being reformatted to a DQAF view, which would allow a similar search facility to users, and permit comparisons across SDDS and GDDS countries and data categories. The availability of these well structured and searchable SDDS and GDDS metadata reinforce good statistical practices for integrated economic statistics, especially regarding the availability of metadata, as well as cross-references and linkages to data and across datasets.

Linkages to the SDMX

5. The next logical step to enhance these SDDS and GDDS data and metadata is to bridge between the DQAF structure and the internationally endorsed SDMX. This way forward is described in the next section.

Good Practices

6. The DQAF provides a useful structure for reviewing good practices in the dissemination of integrated economic statistics, and the Fund's data dissemination initiatives demonstrate some examples of how these good practices can be implemented (focusing primarily on macroeconomic statistics). However, there are some additional practices that could be applied, extending this discussion to more practical and technological aspects. Specifically, users need to easily and cheaply receive, understand, and be able to reuse the data and metadata for their own purposes. Making the data more useful will help promote better, more transparent data and metadata, and reinforce the demand for such information, thereby strengthening arguments for adequate and reliable budgetary support for these efforts. Some of these aspects concern presentation of the information, the length of historical data, and electronic access. A particularly useful way forward to enhance the dissemination of integrated economic statistics that is being implemented by the international community and national authorities concerns the development and implementation of SDMX.

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