CHAPTER 1

Surveys and Business Surveys

Jacqui Jones, Ger Snijkers, and Gustav Haraldsen

1.1 THE OBJECTIVE OF THIS BOOK

The objective of this book is to provide a coherent overview of designing and conducting business surveys. Using the generic statistical business process model (GSBPM) as a high-level framework, the book brings together what we currently know about planning, designing, and conducting business surveys, right through to producing and disseminating statistics or other research results from the collected data. This knowledge is accumulated from various disciplines such as survey methodology, organizational sciences, sociology, and psychology. The result is a multidisciplinary process-quality approach. The contents of the book reflect the existing literature (books, journal articles, conference papers, etc.) and the experiences and observations of the authors. The book is intended to help anyone involved in designing and/or conducting business surveys, producing statistics or other research results from business surveys, or using statistics produced from business surveys; and open up new areas for future business survey research.

Businesses are central to a country’s economy in terms of both economic growth and maintaining the nation’s infrastructure. Because of their importance, data from businesses are needed for national, regional, local, and individual business monitoring, and policymaking and decisionmaking, as well as decisionmaking for individual members of society. The required data may relate, for example, to the economic performance of businesses, business perceptions of current and future performance, or working practices, policies, or conditions.

Business surveys are one method for collecting data from businesses, which are organizations involved in the production and/or trade of goods and/or services. In some respects the methods used to design, build, collect, and process a business survey are the same as those used in surveys of individuals and households. A sample frame is
required; a sample is designed and selected; data are collected; various communication methods are used to elicit contact and cooperation with respondents; the collected data need to be captured, coded, and cleaned; and the survey methods need to focus on minimizing errors, response burden, and building trust. Yet, underlying these high-level processes are unique features relevant only to business surveys.

Cox and Chinnappa (1995) note that there is no generally accepted definition of a business and they use an expanded approach including businesses (e.g., manufacturing, construction, retail, financial organizations), farms (e.g., crop, livestock, vineyards) and institutions (e.g., schools, hospitals, prisons) (ibid., p. 3). Although this book focuses on surveying businesses, the methodologies, procedures, and practices described can be applied to surveying farms and institutions.

A business can also be defined from a national accounts perspective, where the focus is on institutional units that must be capable of “owning assets, incurring liabilities and engaging with economic activities and in transactions with other entities” (United Nations 2008, p. 61). Businesses can be privately owned profit or not-for-profit organizations, state-owned not-for-profit, or a hybrid of private and state-owned.

This book is intended as a “how to” handbook covering the end-to-end business survey process set, in the context of the statistical production process. It is not, however, a cookbook type treatise; there is no standard recipe for designing and conducting a business survey. Every survey has its own special features that are relevant to the overall statistical production process. For every phase in the business survey process this book provides guidelines that facilitate educated tradeoff decisions in order to minimize survey errors, costs, and response burden.

This chapter is divided into three main parts: Sections 1.2 and 1.3, Sections 1.4–1.7, and Section 1.8. These are followed by an appendix outlining the history of UK official business statistics. In Section 1.2, we discuss the statistical production process; in Section 1.3, surveys in general and the survey process, with a brief historical overview of surveys in Section 1.3.3; in Section 1.4, types of business data outputs; in Section 1.5, how business data outputs are used; in Section 1.6, obtaining business data; and in Section 1.7, business surveys. In Section 1.7.2.1, we discuss business survey constraints and considerations, with resulting unique features of business surveys. These features are discussed further throughout the book. Section 1.8, outlines the organization of the book and summarizes the topics discussed in each chapter (see Section 1.8.3).

1.2 THE STATISTICAL PRODUCTION PROCESS

The generic statistical business process model (GSBPM) (Vale 2009) (Figure 1.1) provides a useful overview of the required phases and subprocesses for producing statistical outputs from any type of source; it can also be applied to the development and maintenance of statistical registers. Having a model helps define and describe statistical processes in a coherent way. It should also assist with standardizing terminology and comparing, benchmarking, and identifying synergies within and
Figure 1.1 The generic statistical business process model.
between organizations. The GSBPM was originally based on the business process model developed by Statistics New Zealand, and two additional phases (archive and evaluate) were added from reviewing models used in other national statistical institutes (NSIs). Originally it was seen as a vehicle for developing statistical metadata and processes (Vale 2010). The GSBPM identifies the phases in producing statistics independent of data sources (e.g., surveys, censuses, administrative sources, register-based statistics, mixed sources), and acknowledges that the order of phases will vary between the production of individual statistical outputs. There are four levels in the GSBPM (Vale 2009):

- **Level 0**: the statistical business process
- **Level 1**: the nine phases of the statistical business process
- **Level 2**: the subprocesses within each phase
- **Level 3**: a description of those subprocesses

In addition to the GSBPM phases and processes highlighted in Figure 1.1, there are 12 overarching themes (see Section 4.6), although only the first two themes are represented in Figure 1.1 (quality management and metadata management). These 12 themes need to be considered and strategies implemented to manage the numerous aspects of the statistical production process. What is evident here is the importance of planning and managing the whole statistical production process (see Chapters 4 and 10).

In this book the GSBPM is used as the high-level framework for the organization of the chapters, but with additional focus on the survey process phases required to collect and process business data.

### 1.3 SURVEYS

#### 1.3.1 Definition of Surveys

Surveys typically collect data from a subset of the population of interest; if the population is appropriately sampled, the results are generalizable to the population. This is not as easy as it seems and is challenging from a number of perspectives, for example, selecting a sample representative of the population of interest, selecting appropriate data collection modes, designing questions and questionnaires that will collect the required data and that respondents can successfully complete, developing and implementing strategies for improving response, and quality-assuring and cleaning the collected data.

To meet known data needs, surveys can provide timely data using specific survey questions. Surveys can collect a variety of different types of data, for example, factual data (e.g., date that the business started), monitoring data (e.g., the amount of money invested in capital), attitudinal data (e.g., attitudes toward government’s economic policy), and/or perception data (e.g., perception of the business’ performance). However, the type of data collected can impact on key characteristics of the
survey design. Such as design of the data collection instrument, the mode of data collection, and how the data are validated. Surveys can also provide better control of processing and coverage errors (Lavallée 2002).

A survey is a method of collecting quantitative data from a sample of the population of interest. In some cases qualitative data, from responses to open-ended questions, may be collected but will be coded during the processing phase to produce quantitative results. Groves (1989) acknowledges that the term survey is not well defined, as does De Leeuw et al. (2008), who found differing definitions, with some definitions defining surveys by the “major components of surveys and survey error.” From a review of the literature, De Leeuw et al. (ibid, p.2) identified the common characteristics of existing survey definitions and description stating that “a survey can be seen as a research strategy in which quantitative information is systematically collected from a relatively large sample taken from a population.” The survey outputs are statistics; “quantitative descriptors” (Groves et al. 2004, p. 2).

In Section 1.2 we described the GSBPM as providing an overview of the statistical production process regardless of source (e.g., survey or existing source); what is not evident are the key components of the surveys process. What distinguishes the production of statistical outputs from survey data, in comparison to, say, using administrative data, is essentially the fact that the survey components (sample frame; sample; questions and questionnaire; survey communication; and data capture, coding, and estimation) need to be designed, built, and tested, and then the data collected and processed, within the context of predefined statistical research purposes. This is in contrast to existing data sources where the data have already been requested, collected and processed, aimed at administrative use of the data, and ‘organic’ data that are generated automatically within processes (like traffic loop data, mobile phone and GPS data, scanner data on purchases (Groves, 2011)). Table 1.1 shows the distinguishing characteristics of the survey process set in the context of the GSBPM.

Once collected and processed the survey data are used to produce statistical outputs. The survey process and statistical production process therefore comprise several phases, which all need to be planned, designed, and tested to run a successful survey and produce fit for purpose outputs.

1.3.2 Survey Constraints, Considerations, and Tradeoffs

When designing and conducting a survey, you will be faced with constraints and consideration relating to: (1) the survey project, including financial resources, relevant expertise, time, and the production environment (see Chapter 4); and (2) the design and conduct of the survey, including survey errors (see Chapter 3), response burden (see Chapter 6), and trust. Undoubtedly these constraints and considerations will lead to tradeoff decisions (i.e., the tradeoff between, e.g., timeliness and accuracy).

1.3.2.1 Survey Errors and the Process Quality Approach

Groves (1989, p. 35) states that “survey estimates are subject to many sources of error” and categorizes these errors as nonobservation (coverage, sample, and
nonresponse) and observations errors (construct and measurement). The ultimate concern is that potential errors be recognized and factored into the design and conduct of surveys, as they ultimately can affect the quality of the survey outputs. For example, if the sampling frame has missing units, then this will affect the quality of the statistics; if the questions are not comprehended as intended, different data will be collected. In 2004 (Groves et al. 2004, p. 48) related these errors to the survey process: “good survey estimates require simultaneous and coordinated attention to the different steps in the survey process.” In this book we will take the same process quality perspective. Chapter 3 provides a detailed discussion of total survey error in the context of the business survey process, integrating quality perspectives related to the survey design, the survey organization, and users.

Table 1.1 Distinguishing Characteristics of the Survey Process Set in the Context of the GSBPM

<table>
<thead>
<tr>
<th>Design, Build, and Test&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Collect: Running the Survey</th>
<th>Process: Processing the Survey Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whom you need to request data from (sample frame and sample).</td>
<td>Select sample.</td>
<td></td>
</tr>
<tr>
<td>How you will request and collect the data (survey communication, questions and questionnaire, and mode).</td>
<td>Request and collect the data.</td>
<td></td>
</tr>
<tr>
<td>For recurring surveys with panel or overlapping sample designs, how you will build and maintain respondent relations.</td>
<td>Implement questionnaires, and survey communication, taking recurring contacts into account.</td>
<td></td>
</tr>
<tr>
<td>How you will process the data (data capture, coding, editing and imputation).</td>
<td>Initial data capture into the data collection instrument. Data transfer to the survey organization.</td>
<td>Data capture processing, coding and cleaning.</td>
</tr>
<tr>
<td>How you will use the survey data to provide estimates of the population of interest.</td>
<td>Implement quality and process management to minimize and measure sampling and nonsampling errors, costs, and actual and perceived response burden.</td>
<td>Implement quality and process management.</td>
</tr>
<tr>
<td>How you will minimize, measure, and monitor sampling and nonsampling errors, costs, and actual and perceived response burden; trust in the survey organization and the produced outputs are also linked to this characteristic.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup>Please note that the survey processes listed are not linear.
1.3.2.2 Response Burden
Response burden is multidimensional and includes actual and perceived response burden. Traditionally response burden has been regarded as the time spent responding to the survey (actual burden). But this economic cost is not the only consideration. Perceptions of burden are also significant, as these perceptions can impact the quality of collected data. For example, respondents who perceive the topic of the survey as uninteresting and/or irrelevant may be less likely to carefully consider the questions asked and their responses. Perceived response burden addresses this wider quality issue and includes respondents’ perceptions of the usefulness of the statistics, interest in the survey topic(s), and knowledge of the survey organization (Dale et al. 2007). Chapter 6 discusses response burden in more detail.

1.3.2.3 Trust
In relation to any statistics, there are trust considerations from the user perspective. If the statistics are produced from survey data, trust will also be relevant from the respondent perspective. From the user perspective the key determinants of trust are: (1) perceived independence in the production of the statistics (e.g., produced without political interference), (2) perceived accuracy of the statistics, (3) personal knowledge of the trustworthiness of the statistics, and (4) personal experience of the trustworthiness of the statistics. Users will use these four determinants to derive an “overall level of trust in specific statistics” (Wilmot et al. 2005, p. 5). The qualitative study carried out by Wilmot et al. found that the more information available on the independence and accuracy of the statistics, the less weight was placed on personal knowledge and experience. From the opposite perspective, then, the less information available on the independence and accuracy of the statistics, the more weight placed on personal knowledge and experience (Wilmot et al. 2005, p. 25): Figure 1.2 provides an overview of the determinants of trust from the user perspective.

From the respondent perspective, the key determinants of trust are intrinsically linked to data confidentiality. Respondents need to believe with confidence that the data that they provide to the survey organization will not be: (1) lost (e.g., left on a train), (2) given to people outside the survey or statistical production area without their permission, (3) accessed by unauthorized people, and (4) identifiable in the statistics that are released (disclosure control). Chapters 9 and 12 provide further information on these issues.

\[
\text{Level of trust} = \left(\frac{\text{perceived independence}}{\text{perceived accuracy}}\right) + \left(\frac{\text{self-validation using knowledge}}{\text{self-validation using experience}}\right)
\]

Figure 1.2 User determinants of trust. [Source: Wilmot et al. (2005, p. 25). © Crown copyright 2005.]
1.3.3 A Brief Historical Look at Surveys

From the earliest days of collecting survey data, there existed nonsampling errors (e.g., coverage, measurement, processing) that impacted the quality of the collected data and ultimately the statistical outputs; measurement error was explicitly identified as an issue in the 19th century by Quetelet, the Dutch/Belgian mathematician-astronomer (Bethlehem 2009). Collections of data using samples were seen in historical population studies in the 1600s and 1700s [e.g., Webster, 1755 (Anderson 2011)], but these samples were not scientifically chosen, instead relying on convenience sampling. In the 1700s there was growing pressure to collect data using surveys, as surveys began to gain acceptance as vehicles for obtaining information to make decisions. For example, in 1767 Sir James Steuart, one of the earliest writers on modern economic science, “recommended local surveys as the only safe basis of political and financial regulations” (Sinclair 1837, p. 2). The development of modern sampling theory started around 1895, when the Norwegian Anders Kiaer (founder and first director of Statistics Norway) published his “representative method”, which consisted in selecting and interviewing a large number of people. This method stressed the relevance of sample representativeness, the selected group should mirror the population (Bethlehem 2009).

It was not until the 1906 Bowley study that sample surveys became accepted as a scientific method for producing statistics, as Bowley made the first steps toward statistical inference. The first scientific survey was conducted by Bowley in 1912, surveying working class conditions in five British cities. Between the 1930s and 1950s sample surveys gained popularity and standardized instruments to measure attitudes and opinions were developed [see e.g., Bogardus (1925), Thurstone (1928), Likert (1932), and Guttman (1950)].

During the 1930s–1950s there was an increasing demand for survey research; World War II saw an increased focus on the need to measure the attitudes and opinions of society. By the 1960s low cost collection methods such as paper self-completion further increased the demand for survey outputs (Groves et al. 2004). The 1970s saw increased use of the telephone as a general data collection mode. Prior to then there was concern about the representativeness of telephone ownership, following the failure of the 1936 Literary Digest poll failure (in which telephone directories were employed to help create the sample frame) (Squire 1988). With increased telephone ownership and the need to reduce survey costs, the telephone became accepted as a general mode of data collection (Massey 1988). Moving onto the 1980s and 1990s the shift in emphasis was toward development of alternative modes of data collection and new technologies, such as computer assisted data collection and the web (Couper et al. 1998). More recently the focus has been on measurement and data quality (De Heer et al. 1999).

The first recorded successful mail survey (achieving 100% response) commenced in 1790 and took 7.5 years to complete (see Figure 1.3). The survey faced many of the challenges that we still face today in conducting surveys: balancing the need for data with the number of data requests that can reasonably be expected for people to provide in one survey, motivating respondents to respond through respondent communication, using different modes of data collection as the survey period progresses, and safeguarding the data collected (some of the survey data was lost in a fire). To achieve the high response rate, the surveyors used various incentives, eventually...
sending out data collectors to collect data from nonresponders. The output from this survey was the first Statistical Account of Scotland, which became regarded as the “model book of the nation” for every country in Europe and initiated similar activities in other countries.

John Sinclair, a former pupil of Adam Smith, and a lay member of the General Assembly of the Church of Scotland, undertook the task of collecting information on the state of every Scottish parish. The original intention of this initiative was to “close his History of the Revenue with a general view of the political circumstances of the country, but had been obliged to abandon the attempt from the scantiness of existing information” (Sinclair 1837, p. 8). So in May 1790, having abandoned his previous attempt, he attempted to collect this information himself and publish it in volumes. He developed a circular letter, which he sent to the minister of every parish in Scotland, containing 160 queries under the five headings of: geography, natural history, population, productions, and miscellaneous subjects. To quality assure the queries, Sir John sent them to Bishop Watson who responded that “your statistical queries are all good but they are too numerous to be answered with precision by a country clergyman” (Sinclair 1837, p. 9).

By 1791 Sir John had received some parish returns and published a specimen volume containing the accounts of four parishes. He sent the specimen volume to ministers as an incentive for them to respond, along with a second copy of the circular. Yet for many respondents there remained resistance to responding, even though Sir John was well known to them. Resistance originated from a variety of factors (Sinclair 1837, p. 11):

- “Boldness of an individual expecting that a whole nation would ‘consider him a fit centre for general co-operation’”
- Concern that their responses would be criticized
- Inability to respond because of ill health
- For large parishes the requested information was too burdensome

By the middle of 1791 he had received enough information to compile and publish the first volume of the “Statistical Account of Scotland.” Yet, nonresponse remained an issue, with many parishes suspecting that the requested information would be used to increase rents or introduce new government taxes. By mid-1792, 413 parishes had still not responded. So, as a further incentive to respond, Sir John arranged that the profits from the Statistical Account would be given to a newly established society for the “Benefit of the Sons of the Clergy.” At the time this society could not distribute any of its funds until their capital had doubled. Sir John persuaded the societies’ directors to apply for a royal grant—the grant application was successful and given “as a reward to the clergy for their statistical exertions” (Sinclair 1837, p. 16). Following this, Sir John sent out a third circular requesting the same information, followed shortly after by a fourth circular.

Sir John then sought and achieved endorsement from the General Assembly of the Church for his inquiry. This was then followed by dispatch of another circular “entreated compliance with the recommendation of the supreme ecclesiastical court.” Despite all these efforts, nonresponse remained an issue. In total, Sir John sent out 23 circulars as reminders. The last circular was written in red ink.

Figure 1.3 The first recorded successful mail survey.
In a last attempt to receive outstanding responses, Sir John employed people, at his own expense, to go out as “statistical missionaries” and visit nonresponding parishes and collect the information themselves. Eventually responses were received for 100% of parishes.

Now, with all parish data collected, John Sinclair began the process of organizing, classifying, and editing the data. How to present the enormous amount of data was an issue, and Sir John sought advice from his friends, including the historian Dr. Adam Ferguson, who suggested the use of tables and a full index. Repeat requests for the information from some parishes had to be made as the 14th volume was destroyed in a fire at the printers and 12 parish returns were lost. Finally, however, the 21 volumes of the “Statistical Account of Scotland” were published in January 1798, “seven years, seven months and seven days” after starting. This represented “the contributions of about nine hundred individuals” (Sinclair 1837, p. 22). Following publication, it became regarded as the model book of the nation for every country in Europe and initiated similar activities in other countries, for example: The 1800 Census Act of Great Britain and the first census in 1801, Cesar Moreau’s Statistical Works on France, and Dr. Seybert’s enquiries as to the United States of America.

**First use of the word statistics in the English language**

Sir John Sinclair was also the first person to use the word *statistics* in the English language. In his 1791 volume, containing the accounts of four parishes, the terms *statistics* and *statistical*, which occurred continually in this volume, were such novelties in the British *nomenclature* of economic science, that Sir John thought it necessary to apologize for their introduction. He explained that he had derived the term from the German, although he employed it in a sense somewhat different from its foreign acceptance. In Germany, a statistical enquiry related to the *political strength* of the country, or to questions of state policy, whereas he employed the word to express an enquiry into the state of a country, for the purpose of ascertaining the account of *happiness* enjoyed by its inhabitants, and the means of its future improvement (Sinclair 1837, pp. 9–10).

**Figure 1.3 (Continued)**

### 1.4 TYPES OF BUSINESS DATA OUTPUTS

There are various types of business data outputs, produced by a variety of organizations (e.g., NSIs, central banks, universities, research organizations). This section provides an overview of some of them.

#### 1.4.1 Official Statistics

Business data collected by NSIs are used to produce official business statistics. They provide a statistical picture of the economy of a country. Official business statistics
can be broadly categorized into national accounts, structural business statistics and short term statistics.

1.4.1.1 National Accounts
The system of national accounts (SNA) is an international framework used to measure the economic activity of a country; the most recent manual is SNA 2008. There is also a European version of SNA called the European system of national accounts (ESA); the most recent manual is ESA 2010, which is approved under regulation by the European Council. Both SNA and ESA focus on economic activities and market transactions, and are periodically reviewed to ensure that they align with economic changes (Giovannini 2008).

National accounts employ an accounting technique to measure the economic activity of a country. Central to the SNA framework are accounts that are comprehensive, consistent, and integrated, showing the economic flows and stocks in the production of goods and services in a particular country. SNA focuses on institutional units and their activities related to production, consumption, and assets. These are recorded as transactions between institutional units. SNA also distinguishes between two kinds of institutional units: households and legal entities (profit and not-for-profit businesses, government units). These institutional units are then grouped together into the following sectors, which make up the whole economy (United Nations 2008, p. 2):

- Nonfinancial corporations
- Financial corporations
- Government units, including social security funds
- Nonprofit institutions serving households
- Households

Three different accounts are included, each representing a different economic function: the production account, consumption account, and the adding-to-wealth account. The sequence of accounts begins with the production accounts and moves to the primary distribution of income accounts, the secondary distribution of income accounts, the use of income accounts, the capital account, the financial account, and finally the balance sheet (United Nations 2003, p. 7); there is also a rest-of-the-world account.

The focus of national accounts is on producing a balanced and comprehensive picture of the flow of products in the economy and the relationships between producers and consumers of goods and services; this is achieved by construction of supply and use tables [Mahajan (2007) provides a useful overview of the development, compilation, and methodology for UK supply and use tables]. These macroeconomic accounts are then used for a variety of analytical and policy purposes such as identifying potential gaps in supply and demand.

National accounts provide an overall picture of a country’s economy by presenting the expenditure, income, and production activities of corporations, government,
and households in the country’s economy, and economic relations with the rest of the world. Data used to compile national accounts come primarily from business surveys and administrative data. National accounts are published both quarterly and annually. The UK annual national accounts include data from annual business surveys, generally available 15 months after the relevant year, and quarterly data, which are used to estimate the latest period (Mahajan 2007). Lequiller and Blades (2006) provide a useful overview of national accounts.

The aggregates derived from national accounts are also used as key economic indicators in their own right. For example, quarterly and annual gross domestic product (GDP) provide an indication of whether the economy is growing or contracting, and gross value-added (GVA) is used to analyze the importance of different industries. The GVA metric is the difference between output and intermediate consumption (goods and services consumed or used as inputs in production).

1.4.1.2 Structural Business Statistics

Structural business statistics (SBS) by definition collect information on the structure and development of businesses in industry, construction, and distribution trade and services. The data collected are more detailed than national accounts data and can be broken down to a very detailed sectoral level. The information collected includes monetary values (current prices) or counts (e.g., number of people employed) and can be used for point-in-time and change-over-time comparisons. In contrast, national accounts are regarded as providing more comprehensive coverage of economic activities (OECD 2006). It is challenging to collect data that reflects up-to-date changes in business demography, and SBS data are generally compiled by NSIs from a combination of annual business survey data and their business register, which results in a time lapse between data collection and statistical production.

- In the United Kingdom information is collected via the annual business survey, with updates from the statistical business register (number of enterprises).
- In the United States information is collected via the economic census, the annual survey of manufacturers and services, with updates from the statistical business register (number of enterprises and establishments).
- In the Netherlands information is collected via the annual structural business survey and administrative data, with updates from the statistical business register (number of enterprises).
- In Norway information is collected via numerous sources, including annual surveys, annual company accounts, the value-added tax (VAT) register, and the statistical business register (OECD 2006).

In Europe SBS are produced under European regulation. SBS provide information on wealth creation, investment, and labor input of different economic activities. The statistics are disseminated by enterprise size, which allow for comparison of structures, activities, competitiveness, and performance of businesses.
1.4.1.3 Short-Term Statistics

Short-term statistics (STS) cover the domains of industry, construction, retail trade, and other services (e.g., transport, information and communication, business services but not financial services). The data are generally published monthly and presented as seasonally and workday-adjusted indices. Indicators classified as STS include production, turnover, prices, number of people employed, and gross wages. STS generally include monetary values (current prices) or counts (e.g., number of people employed). The statistics are used to identify changes between industries in terms of how productive they are, and can be used for point-in-time comparisons and changes over time (OECD 2006).

In Europe comparability of short-term statistics across member states is made possible by harmonized: definitions, level of detail, and reference periods laid down in the Short Term Statistics Regulation 1165/98. Table 1.2 summarizes the indicators and the variables compiled for STS.

1.4.1.4 International and European Comparisons

The Organization for Economic Cooperation and Development (OECD) collates and publishes on a monthly basis a wide range of short-term indicators from 34 OECD countries and a number of nonmember countries. Types of indicators included are gross domestic product, private and government consumption, gross fixed-capital formation, imports and exports, business confidence, consumer confidence, and inflation rate (OECD 2009). The collation of indicators allows for country comparisons on the economic status of countries.

In Europe, principal European economic indicators (PEEIs) are produced to ensure a reliable and regular supply of statistics. They consist of statistical indicators from national accounts, external trade, balance of payments, prices, business statistics, and monetary and financial statistics, as well as the labor market (Eurostat 2009c, pp. 9–10). Their dissemination provides information on the economic status of individual European member states and can be used to produce aggregated macroeconomic models.

### Table 1.2 European STS Indicators and Variables

<table>
<thead>
<tr>
<th>Production</th>
<th>Construction</th>
<th>Retail Trade and Repair</th>
<th>Other Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Turnover</td>
<td>Production</td>
<td>Turnover</td>
<td>Turnover</td>
</tr>
<tr>
<td>Number of people employed</td>
<td>Number of people employed</td>
<td>Number of people employed</td>
<td>Number of people employed</td>
</tr>
<tr>
<td>Hours worked</td>
<td>Hours worked</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gross wages and salaries</td>
<td>Gross wages and salaries</td>
<td>Construction costs</td>
<td>Construction permits</td>
</tr>
<tr>
<td>Output prices</td>
<td>Construction costs</td>
<td>Deflator of sales</td>
<td>Services producer price index</td>
</tr>
<tr>
<td>Import prices</td>
<td>Construction permits</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
1.4.2 Other Types of Business Data Outputs

Economic business data are not the only data collected from businesses. From a policy perspective, business surveys are carried out to review, for example, the status of company policies. For example, the European Foundation for the Improvement of Living and Working Conditions (Eurofound) periodically carries out a European company survey that focuses on company policies in relation to flexibility practices and employee participation in the workplace (Eurofound 2010). The survey is carried out across European member states and candidate countries, and in 2009 included more than 27,000 establishments in the private and public sectors that had 10 or more employees. Via computer-assisted telephone interviews (CATI), survey data are collected from both management and employee representatives in the businesses. The findings from the survey assist in monitoring the European objectives stated in the Lisbon strategy: making the European economy competitive, dynamic, and knowledge based, with more and better jobs (Eurofound 2010).

At a European Union (EU) level, the European Commission funds the joint harmonized EU program of business and consumer surveys (European Commission 2007) to complement official statistics produced by EU NSIs. The program began in 1961, and its benefits are seen to be the production of timely and harmonized indicators that can identify economic turning points. Originally the program focused on the manufacturing industry and then expanded to include the construction sector (1966), consumers (1972), retail trade (1984), the service sector (1996), and more recently the financial services sector. Every 3–4 years the contracts for carrying out the surveys in each member state go out to tender, which result, across member states, in a variety of different organizations running the surveys, such as, NSIs, central banks, research organizations, business associations, or private companies (European Commission 2007). The surveys all include harmonized questions and a harmonized timetable; the size of the samples is dependent on the heterogeneity of the member states economy and population size. Nearly all the questions ask about perceptions and the majority of response categories are based on a three-option ordinal scale, such as increase, remain unchanged, or decrease; more than sufficient, sufficient, or not sufficient; or too large, adequate, or too small (European Commission 2007). Table 1.3 provides some examples of the different indicators, with examples of harmonized questions and response categories. The indicators are used as an index to allow comparisons over time. For example, the economic sentiment indicator is referenced from 1990 to 2010 as the long-term average, therefore equaling 100. Thus, if the indicator is above 100, the economic sentiment is improving; if below, it is decreasing.

Similar economic indicators are produced around the world. For example, in the US the Institute for Supply Management produces the purchasing managers index (PMI), which measures the economic health of the US manufacturing sector on the basis of five indicators: new orders, inventory levels, production, supplier deliveries, and the employment environment. An example of the PMI output is presented in Table 1.4. To compile the index, a monthly survey is dispatched to nationwide purchasing and supply respondents, who are asked about changes, in relation to a
number of business conditions, including the five indicators that make up the PMI. Like the EU business indicators, the response categories offered are based on an ordinal scale. The responses reflect changes between the current and previous months.

From a sociological perspective, data from businesses are important to gain understanding of the social aspects such as internal business structures, how
decisions are made in the business, and employee satisfaction. The data collected from businesses are often used, for example, to develop organizational theories and/or understand employee satisfaction. Such studies generally collect data using qualitative research methods such as observation, indepth interviews, or focus groups, although surveys can be used. One of the most famous studies of employee satisfaction was carried out by F. J. Roethlisberger and W. J. Dickson. In the late 1920s and early 1930s they studied employee working conditions in the telephone “banking wiring room” of the Western Electric Works in the Chicago suburb of Hawthorne. They attempted to study how changes in working conditions would improve employee satisfaction and productivity and discovered a linear association between working conditions and productivity. As conditions improved further, so did productivity. The sting in the tail was at the end of the study when working conditions were reduced and productivity continued to increase. This was attributed to the fact that the employees were receiving attention, which contributed to the increase in productivity (Babbie 1995).

1.5 USE OF BUSINESS DATA OUTPUTS

Business data can be used for a wide variety of purposes. A major objective is the production of official business statistics. Other objectives include policy-oriented research (e.g., into working conditions), or theory-testing academic research (e.g., to

### Table 1.4 Institute for Supply Management, Purchasing Managers Index (March 2012)

<table>
<thead>
<tr>
<th>Index</th>
<th>Series Index</th>
<th>Percentage Point Change</th>
<th>Direction</th>
<th>Rate of Change</th>
<th>Trend(a) (months)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mar</td>
<td>Feb</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PMI</td>
<td>53.4</td>
<td>52.4</td>
<td>+1.0</td>
<td>Growing</td>
<td>Faster</td>
</tr>
<tr>
<td>New orders</td>
<td>54.5</td>
<td>54.9</td>
<td>−0.4</td>
<td>Growing</td>
<td>Slower</td>
</tr>
<tr>
<td>Production</td>
<td>58.3</td>
<td>55.3</td>
<td>+3.0</td>
<td>Growing</td>
<td>Faster</td>
</tr>
<tr>
<td>Employment</td>
<td>56.1</td>
<td>53.2</td>
<td>+2.9</td>
<td>Growing</td>
<td>Faster</td>
</tr>
<tr>
<td>Supplier deliveries</td>
<td>48.0</td>
<td>49.0</td>
<td>−1.0</td>
<td>Faster</td>
<td>Faster</td>
</tr>
<tr>
<td>Inventories</td>
<td>50.0</td>
<td>49.5</td>
<td>+0.5</td>
<td>Unchanged from contracting</td>
<td>1</td>
</tr>
<tr>
<td>Customers’ inventories</td>
<td>44.5</td>
<td>46.0</td>
<td>−1.5</td>
<td>Too low</td>
<td>Faster</td>
</tr>
<tr>
<td>Prices</td>
<td>61.0</td>
<td>61.5</td>
<td>−0.5</td>
<td>Increasing</td>
<td>Slower</td>
</tr>
<tr>
<td>Backlog of orders</td>
<td>52.5</td>
<td>52.0</td>
<td>+0.5</td>
<td>Growing</td>
<td>Faster</td>
</tr>
<tr>
<td>Exports</td>
<td>54.0</td>
<td>59.5</td>
<td>−5.5</td>
<td>Growing</td>
<td>Slower</td>
</tr>
<tr>
<td>Imports</td>
<td>53.5</td>
<td>54.0</td>
<td>−0.5</td>
<td>Growing</td>
<td>Slower</td>
</tr>
<tr>
<td>Overall economy</td>
<td></td>
<td></td>
<td></td>
<td>Growing</td>
<td>Faster</td>
</tr>
<tr>
<td>Manufacturing sector</td>
<td></td>
<td></td>
<td></td>
<td>Growing</td>
<td>Faster</td>
</tr>
</tbody>
</table>


\(a\)Number of months moving in current direction.
study growth conditions for small and medium-sized businesses). In this section we
discuss the different uses of business data outputs.

As a country’s economic structure changes, so does the importance of certain
industries to the country’s economic growth; this shapes the need for business
statistics. In writing this chapter, one of the questions we focused on was how did we
get to where we are in relation to the production of business statistics? To assist us in
addressing this question, the appendix at the end of this chapter provides a timeline
of the development of official business statistics in the United Kingdom. What is
evident from this timeline is the increasing demand for business statistics, to enable
monitoring, decisionmaking, and policymaking as the economy changed, and
consequently an increased demand for business data.

More recently there has been a progressive change in the industrial makeup of
countries, with many countries seeing an increase in the service industry. In 1970, at
1995 constant prices, the service industry contributed 53% to UK GDP; by 1995 this
had increased to 67%. In terms of employee jobs, in 1970, the service industry
accounted for around 54% of total UK employee jobs, compared with 72% in 1992
(Julius and Butler 1998). Many have referred to this structural change as
“deindustrialization” (Besley 2007). With the increasing contribution of the service
industry, this led to the need for developing and implementing a UK index of
services, to measure the economic contribution from the service industry.

Business statistics are used for a number of reasons: to monitor national, regional,
and local economic performance; and to monitor individual business and policy-
making. Business statistics are also used in our daily lives.

**1.5.1 National, Regional, and Local Economic Performance**

Business statistics are required to monitor the economic performance of a nation,
region, or local area (the latter are more difficult unless administrative data are
available and compiled statistics are not disclosive). Compilation of these statistics
requires information on how businesses are performing, including their levels of
sales, levels of stocks, the amount of money they are investing in capital, and the
number of people they employ. The produced statistics provide essential information
on levels and change in economic performance that are used to both monitor and
inform economic decisions and policymaking. For example, in the United Kingdom
(UK) the Monetary Policy Committee (MPC) of the Bank of England meets every
month to review the economic statistics produced by National Statistical Institutes,
the Bank of England, Her Majesty’s Treasury, other government departments, other
survey organizations, and international organizations such as the International
Monetary Fund (IMF) and the World Bank. Based on these statistics, the MPC
make their decision on the national interest rate for the forthcoming month, and in
times of recession or economic downturn, decisions on whether to apply quantitative
easing. In 2011, following the financial crisis, a similar Financial Policy Committee
(FPC) was also setup by the Bank of England to monitor the financial sector.

Business statistics need to keep pace with economic changes. The response to the
2008–2009 global financial crisis is a good illustration of this. Prior to the crisis the
financial sector was monitored using traditional asset and liability approaches shown in the balance sheets of individual organizations and each country’s national accounts. However, the asset and liability statistics did not always fully include the financial sector’s increased use of new financial instruments, for example, derivatives and subprime mortgages. For the majority of countries there was also little information on flows of funds between sectors and the effects of increased globalization. So from the perspective of their balance sheets, the financial sector appeared healthy, but this was not the full picture. When information on new financial instruments etc. were included in the balance sheets, many organizations were actually in dire financial straits and unable to meet their financial obligations. In the UK, following the global financial crisis there has been a statistical drive (macroprudentials) to ensure that financial statistics keep pace with financial innovation in the collection and presentation of statistics (Walker 2011); this is also mirrored at the international level by the IMF’s G20 data gaps initiative (Heath 2011). Improved financial statistics should in turn, improve monitoring with the aim of providing early indication of any issues in the financial stability of the financial sector, in an attempt to prevent another financial crisis.

1.5.2 Individual Business Monitoring and Policymaking

For individual businesses there is a need to complement their internal performance indicators with statistics that provide insight into how their business is doing relative to competitors. Business managers may use statistics to assess the viability, stability, and profitability of their business in comparison to others. Feedback from surveys may alter production or service goals, and statistics that forecast future trends may be used to identify new business opportunities. Some types of businesses are more reliant on business statistics than others; for example, investment companies, such as securities dealers and hedge funds, use business statistics as part of their assessment of where to make investments and where to withdraw from investing.

1.5.3 Everyday Decisions

Although we might not realize it, data from businesses are essential to our everyday decisions. Virtually every day each of us interacts with businesses such as when buying groceries, withdrawing money from a bank account, or filling a car with gas or petrol. Every year we interact with a number of different types of businesses depending on our work and home circumstances, for example, when buying or selling a house, applying for a mortgage or loan, or going for job interviews. What we might not realize is the extent to which our everyday decisions are based directly or indirectly on data available to us from businesses. For example, macrolevel economic indicators such as GDP and CPI may influence, our decisions on how much to spend and save, whether to purchase a new car, and/or whether to change jobs especially if the decision involves moving to a job in another industrial sector. On a day-to-day basis, we might not even realize that these economic indicators are the sources of TV, radio, newspaper, and news website headlines and stories (see Figure 1.4).
1.6 OBTAINING BUSINESS DATA

So far, we have introduced the statistical production process (using the GSBPM), surveys, and the survey process, and we have discussed the types and uses of business data outputs. Now, we return to the production process, and look at different methods for obtaining business data. Using the GSBPM, it is evident from the “specify needs” subprocesses that once data needs are confirmed, one must decide how the data will be obtained to meet the need for information. The following section provides an overview of how data can be collected from businesses and questions that need to be considered to determine whether a survey is needed.

1.6.1 Business Data Collection Methods

There are five possible methods for obtaining business data: (1) surveys, (2) administrative data, (3) electronic data interchange (although this can be used as a collection method within a survey), (4) published business information (e.g., published company accounts), and (5) qualitative methods (e.g., in-depth interviews, focus groups, observation). When considering what method to use to obtain the required business data, it is imperative to determine why the data are required, that is, which issues the data will address and whether the data will be generalizable to the total population, as this will help to determine the most suitable method of data collection (see Table 1.5).

Administrative data are data that have been collected for another purpose. For example, each country has a taxation system that collects tax data from individuals and businesses; this data can be, and often is used, instead of collecting information on people’s income or profits from businesses. Electronic data interchange is used to electronically retrieve data directly from a business’s record system and transfer these to the survey organization. Business records may differ in terms of the concepts that they use and the time periods they relate to, compared to the concepts and time periods required by the survey organization. There are two possible approaches for dealing with this issue; either the original data are transferred to the survey organization.
organization who then matches the data onto their conceptual definitions, or the data are matched and checked to the required definitions of variables by the business. Either approach requires careful preparation and can be time-consuming (Keller 1996; Roos 2010). Data provided from the businesses themselves are disseminated, for example, via annual reports, stock reports, and the release of profit figures. Qualitative data are obtained using methods such as indepth interviews, focus groups, observation, or documentary analysis.

As the focus of this book is on business surveys, we will not

- Deal specifically with the use of administrative and register data; for those interested in these methods, Wallgren and Wallgren (2007) and a special issue of Statistica Neerlandica (Bakker and Van Rooijen 2012) are useful texts. However, although this book focuses on business surveys, it must be noted that administrative data can play a role at different stages of the survey process, such as by, creating and maintaining the statistical business register, quality assessment, and estimation. Nowadays, many statistical offices make use of these data next to survey data, to produce statistics (Lane 2010).

- Discuss electronic data interchange (EDI) [Swatman and Swatman (1991) provide a useful overview of EDI; Clayton et al. (2000) provide examples of the use of EDI]. Electronic data interchange can, however, be incorporated in surveys as a data collection technique using Internet technologies [see, e.g., Roos (2010) and Haraldsen et al. (2011)].

- Cover qualitative research [see, e.g., Boeije (2010)], except for the use of qualitative methods as part of the development of business survey designs. Qualitative methods are essential in the development of business survey data collection instruments and survey communication and play an important part in Chapter 7, which discusses development and testing.

<table>
<thead>
<tr>
<th>Question</th>
<th>Possible Associated Data Collection Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. What is the economic performance of individual businesses, businesses in a specific industry, and/or all businesses?</td>
<td>Quantitative data from surveys, electronic data interchange, administrative data, and/or published business data</td>
</tr>
<tr>
<td>2. What are the perceptions of businesses in relation to the future economic prospects?</td>
<td>Quantitative data from surveys; or qualitative data from (e.g.,) indepth interviews or focus groups</td>
</tr>
<tr>
<td>3. What are the business policies and practices in relation to flexible working hours?</td>
<td>Quantitative data from surveys; or qualitative data from (e.g.,) indepth interviews, focus groups, or documentary analysis</td>
</tr>
<tr>
<td>4. How satisfied are employees with their working conditions?</td>
<td>Quantitative data from surveys; or qualitative data from (e.g.,) indepth interviews, focus groups, or observation</td>
</tr>
</tbody>
</table>
When business data are needed, a general guideline is to explore the availability of existing data in either registers or business publications before considering whether to collect “new” data (i.e., from a survey or using qualitative methods). Questions to ask, when considering the feasibility of using existing data, are listed in Table 1.6. It is evident that the mere availability of existing data does not necessarily mean that it will meet your data needs. For example, the definitions, reporting period, and/or when the data are available, may not meet your statistical needs. Data checking, cleaning, and sometimes coding may also be needed before the data can be used. An example of this is Statistics Canada’s use of tax data, which they receive from the Canada Revenue Agency. The records in the files do not contain industrial classification codes, so on receipt of the files, Statistics Canada codes the data. When the coding is complete, a separate file providing the industrial codes is sent back to the Canada Revenue Agency with a stipulation that the file is to be used for “statistical purposes only”. In conjunction with this, Statistics Canada have developed an algorithm to determine when a business should be removed from the business register as the tax department leaves businesses on their files longer than required for business register purposes, that is, no activity for a set period of time (Sear 2011).

The questions in Table 1.6 are not the only questions that you need to ask yourself. There are also benefits and losses from using existing data sources. The benefits include reduction of response burden, reduced data collections costs, and generally electronic availability of data. In contrast, the losses include limited control of the data, processing errors, and coverage error (Lavallée 2002). So, when considering using existing data, the questions posed in Table 1.6 should also be considered in relation to the benefits and losses associated with using the data. We refer to Bakker and Van Rooijen (2012) who discuss the methodological challenges of register data statistics.

In many countries such as the United States and United Kingdom there are also legal barriers to accessing and using administrative data. In these countries there is often greater reliance on data collection using surveys. The UK 2007 Statistics and

---

**Table 1.6 Questions to Ask When Considering the Use of Existing Data**

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Does there appear to be a possible existing source for the data you require?</td>
<td>If yes:</td>
</tr>
<tr>
<td>Does the timing of its availability match with your timing requirements?</td>
<td>Yes</td>
</tr>
<tr>
<td>Does the existing source(s) use the same definitions and reporting periods?</td>
<td>Yes</td>
</tr>
<tr>
<td>What was the objective of collecting the existing data source—links to possible errors (e.g., possible underreporting if from tax data or overreporting if from profit data)?</td>
<td>Yes</td>
</tr>
<tr>
<td>How comprehensive is the existing source(s) in terms of businesses that it covers?</td>
<td>Yes</td>
</tr>
<tr>
<td>How “clean” are the data? How were they processed? Were consistency checks carried out?</td>
<td>Yes</td>
</tr>
<tr>
<td>Is it likely that the existing source(s) will continue?</td>
<td>Yes</td>
</tr>
<tr>
<td>Are you able/allowed to access the existing source(s)?</td>
<td>Yes</td>
</tr>
<tr>
<td>Are there security issues for transferring the data? If so, can these be overcome?</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Registration Service Act has provisions for secondary legislation that allows for the sharing of data between government departments. However, using these provisions can be laborious and time-consuming as they require the agreement of all parties and the passage of legislation in either parliament or one of the devolved administrations. Hence there is greater reliance on acquiring data using surveys, and countries often have legislation that allows them to collect business data using surveys for the production of official statistics. For example, in the UK business data are collected under the 1947 Statistics of Trade Act.

On the other hand, in many countries, such as Finland, Sweden, Norway, and Denmark (United Nations Economic Commission for Europe, 2007) and the Netherlands (Snijkers et al. 2011a), NSIs have a strict data collection policy. These policies state that existing data should be considered first both for business and social statistics. If existing data cannot be used, for any of the reasons mentioned above, a survey can be considered.

1.7 BUSINESS SURVEYS

Following the decision to use a business survey to obtain the required data, the survey needs to be planned, designed, and conducted. This is more easily said than done. Although business surveys follow the same high-level survey process as in any other type of survey (see Table 1.1), they have some additional constraints and considerations (e.g., heterogeneity of businesses, the business context, the labor-intensive response process), which in combination with general survey constraints and considerations (e.g., financial resources, time, survey errors, response burden) result in some unique survey design and conduct features. This section provides an overview of the types of business surveys and some unique features that will be discussed later in the book.

1.7.1 Types of Business Surveys

Survey organizations conduct different types of business surveys to collect different types of data from either the business unit (e.g., production, financial, business perceptions, or policies) or employees (e.g., earnings, pension contributions, working conditions). The latter is basically a social survey within a business survey. The data collected in business surveys can include: (1) economic data (e.g., flows, balance sheets, products, or employment), (2) business characteristics (e.g., contact information, organizational structure, ownership), (3) business perceptions, (4) data on business policies, or (5) data on business practices (see Chapter 8 for further information on questions commonly found in business surveys). The type of business survey (i.e., what it collects, from whom—i.e, type and/or size of business, and using what methods, e.g., self-administered or interviewer-administered) will ultimately be determined by the data requirements, how the survey data will be used, and survey constraints and considerations, such as costs and business context.
Business surveys can be categorized according to a number of characteristics. The most obvious are periodicity, industry, business size, and mode. Generally the characteristic of the survey will be determined by

1. The information needs (e.g., one-off information requirement or continuous requirement), one specific industry or a number of industries, and a specific size of business or all sizes of businesses
2. The available budget and time

Furthermore, not just one design is used [the one-size-fits-all approach (Snijkers and Luppes 2000)]. Instead, business surveys are often tailored to the business context (Dillman et al., 2009). There may be different designs (or questionnaires) for different industries and/or sizes of business, reflecting the “heterogeneity” of the business world (Rivière 2002).

1.7.2 The Business Survey–Output Production Process

Figure 1.5 provides an overview of the business survey and output production process. At the production level, the production of statistics from business surveys follows the phases in the GSBPM (left side of Figure 1.5), and the same survey process as any other type of survey. Moving from left to right in the figure, what distinguishes the business survey from other types of surveys are some of the constraints and considerations (especially in relation to the characteristics of the business world, sample frame, sample, mode, questions and questionnaires, respondent communication, and running the collection), and obviously the unique features (note that some of the unique features are more commonly used, rather than unique features of business surveys).

1.7.2.1 Business Survey Constraints, Considerations, and Tradeoffs

Designing and conducting a business survey entails the same constraints, considerations, and tradeoff decisions as in any other type of survey, for example, financial resources, relevant expertise, time, the production environment, survey errors, response burden and trust (see Section 1.3.2). In addition to these, the production of statistics from business surveys includes specific constraints and considerations such as the heterogeneity of businesses, the business context, and the labor-intensive response process (see Figure 1.5: constraints and considerations).

Heterogeneity of Businesses The heterogeneity of businesses is characterized by the type of activities they undertake and their size (defined either by turnover or number of employees) (Rivière 2002). In addition, the business world is characterized by enterprises [a business under autonomous and single-person control, usually producing a single set of accounts], local units [a single site (geographic location) where a business operates], and enterprise groups [a group of enterprises under common ownership]. These constraints and considerations need to be considered in relation to aspects such as the register, sample frame, sample design, and survey communication. Chapters 3 and 5 provide further information on the heterogeneity of businesses; Chapter 11, on business classifications.
<table>
<thead>
<tr>
<th>Constraints and Considerations</th>
<th>Unique Features of Business Surveys*</th>
<th>Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>The need for business statistics</td>
<td>International: SNA and IMF European: ESA, ECB, and regulations National: policies and initiatives</td>
<td>User trust</td>
</tr>
<tr>
<td>Characteristics of the business world</td>
<td>Businesses vary by industry, size, and turnover Different industries have different economic importance Businesses can evolve in terms of what they produce</td>
<td>Fit for purpose statistics</td>
</tr>
<tr>
<td>Sample frame</td>
<td>Coverage error Keeping up to date with business changes Categorised by industry, turnover and size</td>
<td>Keeping pace with changes</td>
</tr>
<tr>
<td>Sample</td>
<td>Sampling error Burden Costs Sample coordination Mandatory Available experts Businesses often in more than one survey Businesses in surveys for life or a set period Sample skewed to large businesses Small businesses often protected by government policy or initiatives</td>
<td>Actual response burden Perceived response burden Output quality Process measures Sample measures</td>
</tr>
<tr>
<td>Questions and questionnaires</td>
<td>Labor intensive response process Collect data from the business unit Technical definitions and concepts Lots of numerical data collected Requested data may not match data in business records</td>
<td>Actual response burden Perceived response burden Output quality Process measures Sample selected</td>
</tr>
<tr>
<td>Respondent communication</td>
<td>Measurement error Response burden Advance notification not always sent Person receiving survey communication might not be the respondent(s) Little explanation of use of statistics Prioritized nonresponse follow-up Telephone follow-up toward end of survey field period Enforcement</td>
<td>Actual response burden Perceived response burden Output quality Process measures Sample selected</td>
</tr>
<tr>
<td>Run collection</td>
<td>Available experts Time Costs Data scanned and keying Industrial classification coding Product coding</td>
<td>Process measures Data captured Data coded</td>
</tr>
<tr>
<td>Data capture and coding</td>
<td>Processing error Coding error</td>
<td>Process measures Data imputed</td>
</tr>
<tr>
<td>Data editing</td>
<td>Measurement error Time Costs To reduce costs selective editing is often used Respondents might be recontacted during editing to confirm data</td>
<td>Actual burden Perceived burden Process measures Data edited</td>
</tr>
<tr>
<td>Data imputation</td>
<td>Nonresponse bias Fast reporting periods used for imputation</td>
<td>Process measures Data imputed</td>
</tr>
<tr>
<td>Estimation</td>
<td>Differences between large and small businesses Treatment of outliers Widespread use of ratio estimation (or extensions of ratio estimation)</td>
<td>Raw survey estimates</td>
</tr>
<tr>
<td>Design, Build, and</td>
<td>Time Expertise Data security Seasonal adjustment Revisions Index numbers Growth and levels</td>
<td>Derived survey outputs Quality output measures</td>
</tr>
<tr>
<td>Design, Build, Collect, and Process</td>
<td>Data security Many statistical outputs classified as market sensitive</td>
<td>Derived survey outputs - Tables, graphs, and commentary</td>
</tr>
<tr>
<td>Archive</td>
<td>Confidentiality Data security The confidential nature of the data reduces quickly</td>
<td>Data archived to benefit other researchers</td>
</tr>
<tr>
<td>Evaluate</td>
<td>Time Expertise Recurring surveys periodically reviewed to assess burden and methods</td>
<td>Actual and perceived burden Quality User trust</td>
</tr>
</tbody>
</table>

*Some of the unique features are more commonly used in business surveys, rather than unique.

Figure 1.5 An overview of the business survey and output production process.
The Business Context–Response Process  Collecting data from businesses requires the establishment of a data collection process within the business surveyed: the response process. Two stages in this process can be distinguished: the decision to participate and the performance of the response tasks. To collect good survey data with minimum production and compliance costs (i.e., response burden), it is vital that the survey design be tailored to this process. For example, if businesses use definitions of variables other than those used in the questionnaires, this will affect the quality of the data, and will also increase response burden in mapping the definitions; if the questionnaire is sent at a time when the data are not yet available, this may result in additional nonresponse follow-ups, and increased survey costs and response burden. Chapter 2 discusses the business context in detail from a multidisciplinary perspective.

1.7.2.2 Unique Features of Business Surveys
Figure 1.5 includes some of the unique features of business surveys that are derived primarily from the need to deal with general survey and business survey constraints and considerations. The outcomes of each survey and production process are then highlighted in the right column of the figure.

From the discussion thus far and further detailed discussion in this book, the distinguishing features of business surveys appear to be as follows [see, e.g., Snijkers and Bavdaz (2011)]:

- Registers and sample frames have to be kept up-to-date as the business world can change rapidly (e.g., business births, deaths, mergers, takeovers, and business size; see Chapters 3 and 5).
- Samples are stratified according to business size, as large businesses contribute more to economic output (see Chapter 5).
- Recurring surveys with overlapping sample designs are common (see Chapter 5), resulting in recurring contacts (see Chapter 9).
- Surveys are often mandatory (e.g., NSI business surveys), which can make response quality a more prominent quality issue than response rates (see Chapter 3) and lead to enforcement for noncompliance (see Chapter 9).
- Businesses can be classified to more than one industry depending on whether a sales or value-added approach is undertaken (Chapter 5, Box 5.1); and how the coding is carried out (e.g., respondents, automatic coding, or expert coders; see Chapter 11). The quality implications of this aspect are discussed in Chapter 3.
- Response burden is a political and methodological concern (see Chapter 6).
- Business surveys collect data about business units and not about the respondent. The important consequence of this is that while surveys of individuals focus very much on the psychological information processing processes, business surveys also need to factor in social processes, as well as how information is recorded, stored, and retrieved in a business (see Chapter 2).
- Survey communication may not be seen by the respondent(s), as it is often sent to a gatekeeper in the business (see Chapters 2 and 9).
• Self-administrative designs (e.g., paper, web, telephone data entry) are more common than surveys conducted using interviewers (see Chapter 8).
• Data often have to be retrieved from business records or work colleagues (see Chapter 2).
• There may be more than one respondent to a survey, and one respondent may report for more than one survey (see Chapters 2 and 8).
• In NSI business surveys, most questions concern production activities and financial results (see Chapter 8).
• Responses to questions often require calculations (see Chapter 8).
• To reduce survey organization costs, selective editing approaches are often used, so data errors are prioritized according to their impact on the final output (see Chapter 11).
• During the data editing phase respondents are often recontacted to check the submitted data (see Chapter 11).
• For recurring surveys, data for past reporting periods for either individual businesses or similar businesses can be used in imputation (see Chapter 11, historical imputation).

In relation to the statistical production process, key points to remember are that in NSIs, the need for business statistics is generally dictated by the requirements of national accounts, structural business statistics, and short-term statistics, which, in turn, are determined largely by keeping pace with economic changes to assist decisionmaking, monitoring, and policymaking needs. For NSIs a substantial amount of business statistics will be determined by regulations, including European regulations such as the European system of accounts (ESA), the structural business statistics (SBS) regulation, and the short-term statistics (STS) regulation.

1.7.3 Perspectives of the Business Survey Process

Having identified the processes involved in carrying out a business survey, constraints and considerations, and the unique features, we will now discuss the business survey process from the perspective of the survey organization, respondents, and users.

1.7.3.1 Survey Organization Perspective

From the survey organizations perspective the business survey process, just like any other type of survey, needs to be cost-efficient, minimize response burden, be optimized to produce statistical outputs that meet users’ needs, and maintain or build trust in the statistics produced. Developing and implementing an appropriate survey design is therefore challenging. Here, design is defined as “the way in which something has been planned and made, including what it looks like and how well it works” (Oakland 2004, p. 205). Before implementing the survey, it is
important that the survey organization design, build, and test the survey process. This strategy should include

1. Agreeing and documenting data requirements with users
2. Considering the costs and benefits of different survey designs (e.g., sample size, data collection modes, numbers of questions and reminders, method of processing data)
3. Agreeing with users on the most cost-efficient design that will produce fit-for-purpose statistical outputs; acknowledging the need for balance between costs and quality
4. Involving the relevant people (e.g., system builders, survey methodologists, potential data suppliers) in developing the components of the survey process
5. Testing the different components of the survey process (e.g., sample frame for coverage, sample design for minimizing sampling error, questions that can be understood and responded to, data capture and coding to minimize error, editing to identify errors but minimize costs)
6. Documenting the survey methodology and processes
7. Maintaining user engagement throughout the development–testing process

All these points should always be considered from both user and respondent perspectives and undertaken within the frameworks of quality and project management; see Chapters 3 and 4 for more detail.

The ultimate goal of the survey organization is to compile survey outputs that meet user needs. However, tradeoff decisions often have to be made by survey organizations when developing and running surveys. For example, from 2003 to 2005 ONS redeveloped the new earning survey (now known as the annual survey of hours and earnings). Drivers for the redevelopment included new data requirements and known data problems. The redevelopment and testing resulted in increasing the proposed length of the questionnaire from two to six sides of A4 paper. Following a field test ONS had a tradeoff decision to make between increased costs of the questionnaire (paper, printing, postage, and scanning) versus reduced actual and perceived response burden; even though the questionnaire had increased in length and more questions asked, the improved questionnaire and visual design actually resulted in a reduction in respondent burden. The final tradeoff decision was to limit survey costs by reducing the length of the new questionnaire to four sides of A4 paper (Jones et al. 2008a).

From the survey organization perspective, however, respondents are key to any survey process, as they provide the most valuable contribution—their data. In business surveys an important part of the production process is outside the survey organization: the data collection process that goes on within businesses (i.e., the response process).

1.7.3.2 Respondent Perspective
Most respondents would prefer no surveys, but unless existing data are available for all data requirements, then a world of “no” surveys is impossible. Respondents
therefore attempt to tolerate the inconvenient requests from survey organizations. From their perspective, survey requests

- Come from various survey organizations, including NSIs, other public bodies, and private survey organizations; and from multiple surveys from the same organization. For example, for NSI surveys, large businesses can be selected for many survey samples at the same time.
- Often come at a time before the requested data are available; for example, requests for monthly retail turnover before the monthly figures have been fully compiled.
- Come at a time when the business is occupied with other activities (e.g., end-of-year financial accounts).
- Are tailored to the business but people in the business have to respond on behalf of the business. This may involve more than one person in the business if the survey includes questions on different business activities, such as human resources (number of employees) and business accounts (turnover, stocks).

It is seldom clear to business respondents why they have been selected to participate in the survey and why the data are being requested from the business. Therefore, two central themes should be considered from the respondent perspective: (1) building trust in survey methods (especially confidentiality and disclosure control), and (2) building trust and knowledge in the outputs that are produced from business surveys. These themes should be apparent in all survey communication materials: in the questionnaire, and also in letters, brochures, and other correspondence. Chapter 9 (in discussion of survey communication to encourage survey participation) in particular deals with these issues.

1.7.3.3 User Perspective
From the user perspective there is generally a need for more and more information. This is especially true when economic conditions are changing and/or policies have changed. Often users will not have in-depth knowledge of the processes and methods involved in designing and conducting a survey. They know what they need and simply want to have the data as soon as possible; they may have little knowledge of the complexities and difficulties in designing and conducting a survey, or any notion of the concept of response burden. Discussing these issues and the related tradeoffs when specifying data needs with users is therefore important.

1.8 OVERVIEW OF THE BOOK
1.8.1 The Audience
This book has been written for anyone who is involved in designing and/or conducting business surveys, wishes to conduct a business survey, produces statistical or research outputs from business surveys, or uses business survey outputs. The
readers may work in NSIs, universities (e.g., business studies, social sciences, economics, methodology and statistics), profit and not-for-profit survey organizations, international statistical organizations (e.g., OECD, IMF, UN, Eurostat), or central banks. Users of business statistics, such as policymakers, analysts, and researchers, may find this book of interest to learn more about the world of collecting data from businesses, and the issues involved.

In fact, this book is of interest to anyone interested in surveys, such as social survey methodologists and survey practitioners in general. The book gives new insights into survey methodology, as well as guidelines that are relevant not only for business surveys but also for social surveys (like the design of web surveys in household surveys). This book is a useful resource tool, providing guidelines and discussing and explaining methodologies in terms of their theoretical backgrounds. It gives guidance to analysts, researchers, and survey practitioners.

1.8.2 Organization of the Book

This book focuses on the business survey process set in the context of the generic statistical business process model (GSBPM). The overarching considerations and practices for designing and conducting business surveys, and producing survey results, represented in the spine (five left columns) of Figure 1.6 (planning, management, business context, quality, and response burden) should be regarded as the foundation blocks for business surveys.

The concepts of planning and management are generic to any type of data collection (e.g., surveys, administrative data sources, electronic data interchange, published information, qualitative methods), but there are specific requirements for business surveys (see Chapters 4 and 10). The business context, quality, and response burden also have unique features in relation to business surveys (see Chapters 2, 3, and 6).

The individual components of the survey process, leading to the production of survey outputs, are represented in the vertical flow of boxes from “the need for business statistics” to “evaluate” in Figure 1.6. These chapters provide guidelines on designing and conducting a business survey: sampling, data collection, and respondent communication; right through to the capturing, coding, and cleaning of data. The book concludes with a chapter on the methods and procedures for moving from survey data to statistical or research outputs. The book is structured around the components shown in Figure 1.6. It is hoped that this will provide a coherent approach to designing and conducting business surveys and producing business survey outputs.

1.8.3 Chapter Summaries

Chapter 2. One of the main underlying themes of this book is that effectively designing and conducting business surveys relies on an understanding of the business context—the nature, motivation, and behavior of businesses, including the behavior of people involved in the business, (at work, vs. in their personal lives)—because,
Figure 1.6 Overview of the statistical production process, survey process, and book chapters.
after all, it still takes a person to respond to a survey on behalf of the business. We also formulate a model of the business survey response process to assist survey researchers in making decisions on designing and conducting business surveys.

Chapter 3. Ultimately the objective of all kinds of surveys is to achieve maximum quality for minimum cost. Unfortunately, neither the quality nor the cost concept is straightforward. The major quality challenges and cost elements in business surveys may also differ from those in social surveys. In this chapter we discuss these issues and develop a model of business survey quality criteria. On the basis of this model, we discuss both sample-related and measurement-related quality issues in business surveys, in an attempt to identify the key challenges, that business survey designers and project managers face. These challenges are addressed in the following chapters in terms of survey planning and management, sampling, questionnaire development, and implementation of business survey designs.

Chapter 4. The initial step in the design of a survey involves planning of the survey production process and everything that is needed to collect and process the data. The main challenge is how can we increase the likelihood of achieving quality responses at low costs, knowing that an important part of the production process is outside the control of the survey organization (with compliance costs associated with that response process). These uncertainties (or risks) need to be managed. This task is even more challenging since business surveys can be regarded as complex. All components of the survey need to be ready when the fieldwork begins; the sample needs to be drawn, the questionnaire implemented, the data collection process organized, and so on, which means that many activities have to be carried out within constraints. To get that done, all activities, the people involved, material and financial resources, and scheduling need to be organized on a timetable and managed. This often necessitates tradeoff decisions. This chapter presents guidelines for dealing with these issues: project management principles applied to business surveys.

Chapter 5. It is very expensive and often unnecessary to obtain information from every business, so the usual approach is to use a sample, this chapter discusses topics related to sampling. It gives summary information on the construction and maintenance of registers and frames, and then presents guidelines on how to select the properties of a sample to make estimates with the best tradeoff of quality and cost. Once the information has been collected, then an estimation process is needed to ensure that the sampling is appropriately accounted for. This chapter also discusses considerations such as outlying observations and decisions regarding which businesses to obtain information from, and how to use this information to obtain survey estimates.

Chapter 6. Burdensome questions and information tasks should be avoided because they place survey quality in jeopardy. In business surveys, response burden is also important from an economic perspective. With respect to quality, perceived response burden is probably more important than the actual time spent on completing questionnaires. From an economic perspective, the reverse applies. Business surveys are commonly considered as a nonprofitable cost and a potential threat to the nation’s productivity. Even if only a tiny proportion of total regulatory costs are due
to business surveys, there is strong pressure in many countries to reduce business survey response burden. Reductions can be achieved by reducing samples or the number of variables, by sample coordination, or by improving the survey communication and measurement instruments. This chapter reviews response burden issues and measurements and suggests ways to minimize the response burden in business surveys.

Chapter 7. In this chapter we focus on the development and testing of survey questions, questionnaires, and data collection instruments. We discuss how to develop the concepts that data users wish to measure into survey questions. But survey design doesn’t end there, because no survey researcher wants to spend time and resources collecting data that do not meet user needs. To ensure that survey questions capture the desired data, they need to be tested and evaluated, with respect to the business context. This chapter describes a wide variety of research methods to accomplish this, within a quality framework of reducing measurement error while also reducing or controlling respondent burden.

Chapter 8. This chapter discusses the measurement instruments used in business surveys. The main focus is on self-completion questionnaires, partly because self-administered surveys are the most common data collection method employed in business surveys. Much of the previous literature on business questionnaires has described how business survey questions should be presented. This aspect is present in our chapter as well, but we also focus closely on the content of business questions. Instead of using the common term questionnaire design, we prefer to discuss questionnaire communication. Questions are communicated to the respondents through the questionnaire, and as questionnaires are computerized, the communication can assume a conversational character. Another important effect of computerization is that the content of questionnaires is no longer limited to questions. The same is true for administrative tasks before and after the business survey questions are answered. This means that there is a whole set of questionnaires that need to be designed and presented together.

Chapter 9. Next to questionnaire communication, all other aspects of communication are important in business survey designs. This is what we call business survey communication, which includes activities mentioned in Section 9.1. The ultimate goal of these communication activities is to obtain quality responses. Traditionally survey communication has received little attention in comparison to other components of the business survey design. In books on survey methodology, survey communication is often discussed in the chapter on data collection, focusing on operational issues instead of motivating and facilitating businesses to cooperate. Chapter 9 focuses exclusively on this important component.

Chapter 10. During the fieldwork stage, the survey components are implemented and the survey launched. It is during the fieldwork that it will be clear whether the planned survey design is effective in terms of quality and cost challenges. In this stage of the production process there may remain uncertainties that need to be managed. To ensure that the targeted survey results are met, the fieldwork needs to be systematically monitored. Using real-time information from the data collection
process, such as the response rate at any given moment in time. This ensures that appropriate actions can be taken early on in case the targets are not met. This chapter focuses on managing the fieldwork—monitoring and controlling the data collection process and the quality of the survey results, adopting an active fieldwork management approach—and relating the essential elements of this approach, paradata (or process data) and indicators, to survey errors and costs.

**Chapter 11.** During the survey field period, the data will be initially captured and transferred to the survey organization for data capture. Once captured, and depending on the type of data collected, the data may need to be coded (e.g., to industrial codes). The data will then need to be cleaned using editing and imputation methods. This chapter provides an overview of capturing, coding, and cleaning survey data. It discusses the processes and methods involved, as well as potential sources of error; elements that impact on the design of other parts of the survey process (e.g., questions, questionnaire instructions, survey communication); and ways to minimize, measure, and monitor errors. As the literature on data capture and coding, and the treatment of errors is somewhat sparse, this chapter goes some way to address this issue.

**Chapter 12.** As this book sets the survey process in the context of the statistical production process, we felt it necessary to conclude by providing an introductory overview of the processes and methods that take you from survey data to statistical outputs. This chapter discusses different types of analysis, and analytical techniques for improving statistical interpretation, namely, seasonal adjustment, index numbers, and values and volumes. It then focuses on the prerequisites for dissemination (tables, graphs, disclosure control, statistical commentary, etc.), and finally on dissemination activities, including data archiving. This chapter merely scratches the surface of some specialized areas; key literature sources on this topic are cited throughout the chapter.

**ACKNOWLEDGMENTS**

In writing this chapter we would like to thank Simon Compton and Martin Brand (ONS) for their reviews, comments, and suggestions, Julie Griffiths (ONS) for her support, and the ONS media team for supplying relevant newspaper headlines.

**APPENDIX**

(This appendix presents a timeline of the development of official business statistics in the United Kingdom.)

In writing this book, one of the questions we had was: How did we get to where we are now in relation to the production of official business statistics? To assist in answering this question, this appendix provides a general, nonexhaustive timeline of

---

1 Appendix written by Jacqui Jones.
the development of official business statistics in the UK; what is evident from this timeline is the increasing demand for business statistics, to enable monitoring, decisionmaking and policymaking, and consequently the increasing need for business data.

- Back as early as the 13th and 15th centuries external trade figures for textiles were recorded. In the 18th century, government regulation of the Yorkshire wool industry and Scottish linen industry provided two output series. Into the 19th century textile factory inspectors provided more useful data. However, it was not until the beginning of the 20th century that the output from the textile industry was actually measured (Mitchell 1988, pp. 324–329).

- External trade statistical series commenced in 16th and 17th centuries; in the late 16th century customs figures were used to measure the trade deficit to guide policy.

- In England in 1665 Petty, followed by King in 1696, produced the first national income estimates. The rationale for producing these estimates was to provide statistical evidence that ‘the State could raise a much larger revenue from taxes to finance its peace and wartime needs and to disprove once and for all the notion that England had been ruined by the Revolution and foreign wars (Frits 1992, p. 5). Both Petty’s and King’s estimates included a comprehensive concept of production and income, which remain to this day in SNA. The central element to this concept is that value added is generated from the production of goods and services; in contrast to Adam Smith’s view that it could be generated only from the production of goods.

- The first comprehensive production statistics were those compiled from the shipbuilding industry, beginning in 1786.

- In the 1800s the dominant industries for Great Britain’s economy were textiles, coal, iron, and agriculture. It was therefore important that these industries were measured for monitoring purposes.

- During the 1830s the first statistical societies were created across Great Britain, in cities such as Manchester, Bristol, Liverpool, Glasgow, and Leeds; the most prominent one—the Statistical Society of London—was founded in 1834 (Ward and Doggett 1991).

- In 1854, the first publication of the annual Statistical Abstract of the United Kingdom was published, followed in 1855 with the publication of the Annual Statistics of Trade, and in 1856 Miscellaneous Statistics of the UK (ibid).

- The official Mineral Statistics series, containing data on the coal and iron industries, commenced in 1854; however, the official collection of sales and electricity generation did not take place until 1920 (Mitchell 1988, pp. 236–239). From the 1850s coal mine inspectors made estimates of the number of people employed in these industries. For the ironworkers, except for the census, no data collection occurred until after World War I, when national insurance statistics commenced (ibid., pp. 274–278).
The first Agricultural Census of Great Britain was carried out in 1865, and started the continuous acreage and livestock series. At that time agriculture was the dominant sector in the economy, thus the importance of measuring the output from this sector. At this time livestock coverage was less prevalent than crops. In the first full census of agriculture production in 1908, both crops and livestock were successfully measured. In relation to the numbers of people employed in agriculture, these data first became available in the 1811 population census, and from 1921 the annual agricultural census also included a count of farmworkers (ibid., pp. 180–185).

Into the 20th century, the British government still ‘collected little information about industrial activity’. The need for better industrial information was recognized when questions on tariff policy were attracting attention (Ward and Doggett 1991, p. 114). In response to this observation, the following developments in official business statistics and business surveys took place (please note that this is not an exhaustive list):

- In 1906, the UK Census of Production Act was passed, which laid down the regulatory requirements for undertaking a census of production at suitable intervals. At the same time there was concern that Parliament was asking for increasing amounts of information that may have already been available to them, which some believed would lead to distrust of public statistics (Ward and Doggett 1991). The first census was carried out in 1908 in relation to production in 1907. It included questions on “the nature of the trade or business, particulars relating to the output, the number of days on which work was carried on, the number of persons employed, and the power used or generated” (Smith and Penneck 2009). It included the manufacturing industries, public utilities, and mining industries.

- In 1914, the UK Board of Trade started a regular monthly retail prices survey. Initially this covered only food prices, but in 1916 it was extended to cover clothing, fuel, and some other items. The food prices of 14 foodstuffs were collected each month in over 600 locations; data on clothing prices and fuel and light prices were collected using paper questionnaires sent to appropriate retailers. Other item prices were generally collected from administrative sources; for example, train, tram, and bus fares were supplied by the Ministry of Transport and transport operators (Ward and Doggett 1991).

- Official statistics of new house building became available only in 1920, partly because the industry was dispersed across the country and the focus was generally on external trade statistics—a category under which household building does not fall (Mitchell 1988, pp. 382–384).

- The quarterly index of industrial production was first published in 1928. The data were voluntarily collected from organizations such as trade associations. In 1947, the Central Statistical Office assumed production of the index, which was also published more frequently (monthly rather than quarterly) (Ward and Doggett 1991).
In 1932, Clark published *The National Income, 1924–1931* and raised concerns about the quality of British official statistics citing classification issues as a quality issue. The creation of a system of national accounts was pushed further along by the 1930s Great Depression, John Maynard Keynes 1936 book *General Theory of Employment, Interest and Money*, and Tinbergen’s 1936 construction of the first econometric model of the whole economy business cycle. Keynes challenged traditional economic theory and argued for government intervention to tackle unemployment. As the Keynesian approach was adopted in countries, national accounts were introduced to provide an analytical tool for economic activity. Also in 1936 Wassily Leontief published his paper on quantitative input–output (I/O) relations in the economic system of the United States, which documented his I/O study that acted as the catalyst for I/O tables linked to national accounts (Frits 1992).

In 1932, the Import Duties Act was passed, which “included provisions for collecting statistics about industries affected by the duties imposed under the Act.” This included “quantity and value of materials used and goods produced” (Ward and Doggett 1991, pp. 118–119).

In 1935, Roy Glenday presented a paper to the Royal Statistical Society on the use and misuse of economic statistics, where he raised concerns about the uncoordinated approach to the production of economic statistics.

In 1939, the League of Nations commissioned the production of guidelines to improve national accounts comparability, but this was delayed until after World War II. In December 1945, work on the guidelines resumed and was finally published in 1947 as the first international national accounts guidelines (United Nations 1947). However, the guidelines were ambitious, and on the request of the Organisation for European Economic Cooperation (OEEC), a simplified system were published in 1951, which only identified a current and capital account and three sectors (government, enterprises and households). This simplified system was seen as being more realistic for countries to implement (Frits 1992).

In 1941, a central statistical office (CSO) was created to centralize the collection of statistics from government departments, including maintaining a comprehensive collection of all statistical returns. The work of the CSO included the preparation of national accounts, and the discussion of proposed statistical questionnaires to be issued to businesses (Ward and Doggett 1991). In 1941, the first official estimates of national income and expenditure were published.

In 1946, the first monthly digest of statistics was published (ibid.).

In 1947, the Statistics of Trade Act was passed. Prior to its royal assent, industry representatives welcomed the information that the act would bring, it provided the opportunity to collect more information from industry, “necessary for the appreciation of economic trends and provision of a statistical service for industry and government departments” (ibid., p. 120). But it also raised concerns about the burden of completing questionnaires, especially on small businesses. The act also made provision for conducting a census of distribution
(Ward and Doggett 1991). The first British census of distribution was carried out in 1950, and included wholesale and retail distribution, with a limited number of service trades. Businesses were required to provide figures on ‘sales, purchases, stocks, employment and wages and salaries’ (ibid., p. 121).

- In the 1949, 1950, and 1951 production censuses, the type of information requested was changed to summary information to provide important aggregates for the national income and expenditure accounts and the changing importance of different industries (ibid). Then in 1951 sampling methods were used instead of a census; for this survey, one in three establishments employing more than 10 persons were selected and for those employing 10 or fewer persons, 1 in 20 were selected (Ward and Doggett 1991).

- In 1952, the first *National Income and Expenditure Blue Book* was published (ibid). The time delay between the latest period listed in the blue book and the date of publication was a concern, with the blue book regarded as “too late to be useful.” This led to the production of quarterly national accounts (ibid., p. 61).

- In 1952, the OEEC 1951 national accounts guidelines were enhanced to contain more accounts but remained simplified in comparison to the 1947 United Nations guidelines. 1953 saw the publication of the United Nations *A System of National Accounts and Supporting Tables* (United Nations 1953), which were very similar to the OEEC guidelines and included some types of nonmarket output. Further revisions to this were published in the 1953 report (Frits 1992).

- In 1954, a committee was appointed by the Board of Trade to provide advice on future censuses of production and distribution. The committee recommended the extension of sampling methods to reduce the burden on businesses. Sampling methods were used for the 1955–1957 production and distribution censuses, and there was also a radical overhaul of the questionnaire, reducing it to a single page, and the questions reframed to match, as far as possible, data available in businesses accounts. In 1958, a full census (based on both coverage and questions) was run, but the detailed questions were sent only to businesses employing 25 or more persons. Then established was a full census every 5 years and a more basic census in the intervening years (Ward and Doggett 1991).

- In 1956, the *National Accounts Sources and Methods* was published (ibid.). In the same year, the then chancellor prepared a detailed written statement for improving statistics. Part of his statement included a plea to industry to return their questionnaire more quickly.

- In 1958, the *Monthly Production Inquiry* began.

- In 1960, the second edition of the 1953 SNA extended the framework to include flow of funds and I/O tables; in 1964, the third edition improved consistency with the (IMF) *Balance of Payments Manual* and updated references to other international guidelines (Edwards 2007).


- In 1968, the United Nations published a revised and more detailed *System of National Accounts* (United Nations 1968). The 1968 revision included major
extensions to national accounts, and the SNA was now seen as a guide for countries to develop their systems of basic economic statistics (Edwards 2007).

- In 1969, the first UK business statistics office (BSO) was created, with responsibility for most of the government’s collection of business statistics (Ward and Doggett 1991). The BSO continued running the production census but also introduced monthly and quarterly surveys to provide more timely statistics. These statistics were supplemented with surveys about capital investment, stocks, purchases and sales (ibid., p. 123).

- In 1971, the first employment census was carried out; this was the key source for workplace-based employment information.

- In 1974, the first purchases inquiry was held in conjunction with the annual production census.

- In 1988, the Pickford review recommended changes to the way macroeconomic statistics were collected and compiled; and changes to the structure of the UK Central Statistical Office (Pickford et al. 1988).

- In 1991, the quarterly survey into the Distribution and Services Sector started. Industry by industry, the frequency of this survey gradually progressed from quarterly to monthly in 2001.

- In 1993, there were further revisions to SNA and in 1995, to ESA. Frits (1992) discusses the development of national accounts guidelines, prior to 1992 in further detail.

More recently in the UK, there have been efficiency initiatives in business surveys such as the merger of several surveys, to effect external savings in relation to response burden—less surveys, less burden—and internal financial savings by sending out fewer questionnaires, processing fewer data, and merging internal teams. For example, in 2000, the first UK annual business survey results were published, with data relating to 1998. This new annual survey was an amalgamation of several previous annual surveys (e.g., the annual production and construction censuses, the purchases inquiry, the annual employment survey, and several surveys covering the distribution and services sectors). In 2010, the monthly production survey and monthly survey into the distribution and services industries were merged into a single monthly business survey.

There has been a further revision to SNA (in 2008), and ESA (in 2010). For European member states, ESA revisions will be implemented in 2014.