

Methodology of short-term business statistics

Interpretation and guidelines



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THEME 4
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4

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Introduction and acknowledgements

The Short-term Statistics (STS) Regulation is now approaching the end of its implementation phase. However, the methodological work on the wide range of indicators covered by STS is by no means finished. The Member States and Eurostat make constant efforts to improve the quality of the indicators, in particular their timeliness. Moreover, there is a strong demand for the clarification of methodological questions in the implementation process in Candidate Countries.

A methodological manual is an essential tool for assisting the statisticians dealing with the calculation of STS indicators. Such a manual is also explicitly required by the STS Council Regulation: *“The Commission, after consulting the Statistical Programme Committee, shall publish an advisory methodological manual which explains the rules set out in the Annexes and also contains guidance concerning short term statistics. This manual shall be revised at regular intervals. ”*

Since the publication of the previous methodological handbook in 1997, certain elements have considerably changed the situation as regards cyclical statistics. First of all, the regulation on short-term statistics entered into force in May 98. Secondly, the practical usage of the data by the European Central Bank has changed expectations as regards short-term statistics. Indeed, they are now more eagerly awaited, more analysed and therefore more criticised. Thirdly, the entry into force of implementation Regulations during 2001, in particular the definition of the variables and the definition of the MIGs steps up the harmonisation efforts and provides a more precise framework for the handbook.

A first version of the new methodological manual was written by a Task Force jointly formed by the Member States and Eurostat. Its work started in May 2000. Eurostat would like to thank all members of the Task Force which was chaired by Gunter Schäfer (Eurostat) for their contributions and constructive comments:

Andreas Dollt (Statistisches Bundesamt, Germany), Frédéric Donzel (Eurostat), Humberto Jorge Pereira (Instituto Nacional de Estatística, Portugal), Ian Richardson (Office for National Statistics, UK), Isabelle Tiedrez-Remond (Institut National de la Statistique et des Etudes Economiques, France), Jan Mol (Centraal Bureau voor de Statistiek, Netherlands), Mauro Politi (Istituto Nazionale di Statistica, Italy), Ole Black (Office for National Statistics, UK) and Thom Werkhoven (Centraal Bureau voor de Statistiek, Netherlands).

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Pedro Diaz Munoz

Structure and contents

PART I	4
THE MANUAL AS A GUIDE	4
SECTION A	4
INTRODUCTION	4
1. European statistics	4
2. European business statistics	5
2.1 Overview of Community business statistics tools and data production	5
2.2 Coordination between different domains of business statistics and with national accounts	6
3. Need for short-term business statistics	6
3.1 Use of short-term business statistics	6
3.2 Types of economic analysis	7
4. European short-term business statistics	7
4.1 Preparing the STS-R	7
4.2 Overview of the STS-R	8
4.3 Implementation in practice - transition periods, derogations, action plans	10
4.4 Areas of attention and development	12
SECTION B	14
INFRASTRUCTURE & COVERAGE	14
5. Infrastructure	14
5.1 Statistical units	14
5.2 Classifications	18
6. Business populations	23
6.1 Registers at the heart of business statistics - the frame population	23
6.2 Contents, coverage and maintenance of the SBR	24
6.3 Target population for short-term statistics	26
6.4 Particularities of certain activities	27
SECTION C	29
COLLECTION TO PROCESSING - GENERAL	29
7. National Data collection	29
7.1 Subsidiarity, national coverage	29

7.2 Combination of sources	29
7.3 Sources	29
8. Compiling national results	32
8.1 Data control/editing	32
8.2 Treating non-response	33
8.3 Weighting samples / grossing up	34
8.4 Confrontation	35
8.5 Compiling indices	35
8.6 Decomposition	40
SECTION D	45
COLLECTION TO PROCESSING - INDEX SPECIFIC	45
9. Common indicators	45
9.1 Employment	45
9.2 Hours worked	50
9.3 Wages and salaries	55
9.4 New orders and alternative leading indicators	61
10. Industrial indicators	70
10.1 Production	70
10.2 Turnover	82
10.3 Output prices	88
11. Construction indicators	98
11.1 Production	98
11.2 Construction costs and prices	105
11.3 Building permits	115
12. Services indicators (including retail trade)	118
12.1 Turnover	118
12.2 Deflator of sales	123
SECTION E	125
TRANSMISSION TO DISSEMINATION	125
13. National Data transmission to Eurostat	125
13.1 Preparation: identification of confidential data, data robustness	125
13.2 Transmission: format and media	126
13.3 Data transmission timetable	127
13.4 Data revisions	131
14. Compiling EU indices	132
14.1 Data reception	132
14.2 Compiling EU indices and decomposition	132
15. Dissemination of results by Eurostat	135
15.1 Identification of confidential data for geographical aggregates	135

15.2 Choice of data for compilation: indices and growth rates	135
15.3 Choice of dissemination format/media	135
15.4 Timetable for compilation and dissemination	136
15.5 Revisions of EU indices	138
15.6 Quality and national practices	138
PART II	146
THE MANUAL AS A REFERENCE TOOL	146
SECTION F	146
REFERENCE	146
16. Reference documents	146
16.1 Contacts and coordinators	146
16.2 STS-R	147
16.3 Definitions	162
16.4 Classifications	173
16.5 Summary of the STS to be compiled	189

Part I

The Manual as a guide

Section A

Introduction

1. European statistics

Since February 1997 the organisation of the European statistical system has the Council Regulation on Community statistics as its legal basis and this is also known as the statistical law. This legal basis concerns the production of Community statistics and lays down the roles to be played by national and Community authorities in the production of these statistics.

The statistical law is structured into four main parts.

- The procedures for the drawing-up and implementation of Community statistical programmes which cover all Community statistics, including business statistics.
- The definition of the principles of impartiality, reliability, relevance, cost-effectiveness, statistical confidentiality and transparency by which all Community statistics shall be governed.
- The dissemination of Community statistics with a qualified obligation on Eurostat to disseminate Community level results before the next transmission of national results is due.

- The definition of statistical confidentiality, the conditions under which such data must be transmitted to Eurostat and the uses that can be made of this data. This last part is of particular significance for business statistics.

A Commission Decision on the role of Eurostat as regards the production of Community statistics was adopted on the 21st of April 1997 which restates the principles of the statistical law to be followed by Eurostat, explains the tasks of Eurostat, its autonomy, its obligations to disseminate data simply and impartially and its responsibility for coordination and co-operation with other services of the Commission. This Decision reiterates the importance of the Community Statistical Programme, the rules governing the use of confidential data and the access to administrative data sources held by the Commission.

For more information on the statistical law see: Council Regulation No 322/97 of the 17 February 1997 on Community statistics, Official Journal No L 52 p.1 of 22.2.97 Commission Decision No 281/97 of 21 April 1997 on the role of Eurostat as regards the production of Community statistics, Official Journal No L 112 p.56 of 29.4.97
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2. European business statistics

2.1 Overview of Community business statistics tools and data production

The table below shows the main business statistics tools as they are at the time of writing. Many of these have a legal basis which has been developed during the 1990s.

General statistical legislation
Statistical Law: Council Regulation (EC) No 322/97 of 17 February 1997 on Community statistics
Role of Eurostat: Commission Decision of 21 April 1997 (97/281/EC) on the role of Eurostat as regards the production of Community statistics
SPC: Council Decision of 19 June 1989 (89/382/EEC, Euratom) establishing a Committee on the Statistical Programmes of the European Communities
ESA: Council Regulation (EC) No 2223/96 of 25 June 1996 on the European system of national and regional accounts in the Community
Statistical confidentiality: Council Regulation (Euratom, EEC) No 1588/90 of 11 June 1990 on the transmission of data subject to statistical confidentiality to the Statistical Office of the European Communities
Classifications
NACE Rev. 1: Council Regulation (EEC) No 3037/90 of 9 October 1990 on the statistical classification of economic activities in the European Community; Commission Regulation (EEC) No 761/93 of 24 March 1993 amending Council Regulation (EEC) No 3037/90 on the statistical classification of economic activities in the European Community
CPA: Council Regulation (EEC) No 3696/93 of 29 October 1993 on the statistical classification of products by activity (CPA) in the European Economic Community; Commission Regulation (EC) No 1232/98 of 17 June 1998 amending Council Regulation (EEC) No 3696/93 on the statistical classification of products by activity (CPA) in the European Economic Community
Statistical tools
Statistical Units: Council Regulation (EEC) No 696/93 of 15 March 1993 on the statistical units for the observation and analysis of the production system in the Community
Business Registers: Council Regulation (EEC) No 2186/93 of 22 July 1993 on Community coordination in drawing up business registers for statistical purposes
Data collection legislation
Prodcod: Council Regulation (EEC) No 3924/91 of 19 December 1991 on the establishment of a Community survey of industrial production
INTRASTAT: Council Regulation (EEC) No 3330/91 of 7 November 1991 on the statistics relating to the trading of goods between Member States
Structural Business Statistics: Council Regulation (EC, EURATOM) No 58/97 of 20 December 1996 concerning structural business statistics; Commission Regulation (EC) No 2699/98 of 17 December 1998 concerning the derogations to be granted for structural business statistics; Commission Regulation (EC) No 2700/98 of 17 December 1998 concerning the definitions of characteristics for structural business statistics; Commission Regulation (EC) No 2701/98 of 17 December 1998 concerning the series of data to be produced for structural business statistics; Commission Regulation (EC) No 2702/98 of 17 December 1998 concerning the technical format for the transmission of structural business statistics; Commission Regulation (EC) No 1618/99 of 23 July 1999 concerning the criteria for the evaluation of quality of structural business statistics
Structural Business Statistics, Insurance Services: Council Regulation (EC, EURATOM) No 410/98 of 16 February 1998 amending Regulation (EC, EURATOM) No 58/97 concerning structural business statistics; Commission Regulation (EC) No 1225/99 of 27 May 1999 concerning the definitions of characteristics for insurance services statistics; Commission Regulation (EC) No 1226/99 of 27 May 1999 concerning the derogations to be granted for insurance services statistics; Commission Regulation (EC) No 1227/99 of 27 May 1999 concerning the technical format for the transmission of insurance services statistics; Commission Regulation (EC) No 1228/99 of 27 May 1999 concerning the series of data to be produced for insurance services statistics
Short-term Statistics: Council Regulation No 1165/98 of 19 May 1998 concerning short-term statistics; Commission Regulation (EC) No 586/2001 of 26 March 2001 on implementing Council Regulation (EC) No 1165/98 concerning short-term statistics as regards the definition of Main Industrial Groupings (MIGS); Commission Regulation (EC) No 588/2001 of 26 March 2001 on implementing Council Regulation (EC) No 1165/98 concerning short-term statistics as regards the definition of variables; Commission Regulation (EC) No 606/2001 of 23 March 2001 on implementing Council Regulation (EC) No 1165/98 concerning short-term statistics as regards Derogations of Member States
Audiovisuals: Council Decision of 26 April 1999 (1999/297/EC) establishing a Community statistical information infrastructure relating to the industry and markets of the audiovisual and related sectors; Commission Decision of 24 November 1999 (1999/841/EC) on the implementation of Council Decision 1999/297/EC establishing a Community statistical information infrastructure relating to the industry and markets of the audiovisual and related sectors
Earnings and labour costs: Council Regulation (EC) No 2744/95 of 27 November 1995 on statistics on the structure and distribution of earnings; Council Regulation (EC) No 23/97 of 20 December 1996 on statistics on the level and structure of labour costs; Council Regulation (EC) No 530/1999 of 9 March 1999 concerning structural statistics on earnings and on labour costs
Tourism: Council Directive 95/57/EC of 23 November 1995 on the collection of statistical information in the field of tourism; Commission Decision of 9 December 1998 on the procedures for implementing Council Directive 95/57/EC on the collection of statistical information in the field of tourism

2.2 Coordination between different domains of business statistics and with national accounts

Structural business statistics generally provide information referring to a whole reference year. They show changes from one year to the next, and can be used to judge the accuracy of sub-annual data, which is often produced from smaller sample sizes. The value of production figures from structural business statistics can also be used to compare with product data from the Prodcum surveys. Finally they can provide a benchmark population figure for analysing infrequent, irregular or one-off surveys.

Short-term business statistics are used to produce monthly or quarterly indicators (annual indicators may then be compiled from these). Most commonly they take the form of indices (and rates of change) although it is common practice for absolute figures to be disseminated as well. They are usually produced to a strict timetable, and they are required as soon as possible by policy makers. Sometimes this means that initial figures are subsequently revised as more data is collected and analysed.

Business statistics are normally used as one of the inputs for the compilation of national accounts. The European System of Accounts (ESA95) consists of two main sets of tables, the (institutional) sector accounts and the input-output tables, both of which often make use of business statistics.

The (institutional) sector accounts provide for the evaluation of macroeconomic aggregates, while the input/output framework describes the links among the different branches. Business statistics try to meet these demands in two different ways. Firstly by the production of enterprise data broken-down into principal and secondary activities, and secondly, by the role given to the statistical unit used to provide information on the technical conditions of the production process namely the Kind of Activity Unit. Within the European context, business statistics has, wherever possible, adopted ESA concepts and definitions. This requirement has been balanced against the ability of respondents to provide information and the cost and burden attached to the provision of this information.

3. Need for short-term business statistics

Statistics seem to play an increasingly important role in the distribution of information. That probably comes from the fact that today information has to be concise, easy to illustrate and quantify. Within this framework, STS play a role apart. They are supposed to answer the following type of questions. Which phase of the economic cycle are we in at present? What will be the probable development in the near future? Are we currently in the continuation of a movement already started (upward or downward) or is it possible that we

are in a break in relation to this movement (turning or reversal point)?

3.1 Use of short-term business statistics

STS aim to provide the statistical information necessary to improve the competitiveness and performance of the business community in the European Union. STS give information on a wide range of economic activities and they are becoming increasingly important for economic analysis. There are several reasons for this development.

- Internal market - In order to carry out the tasks entrusted to it under the Treaties, especially with regard to the internal market, the Commission must have exhaustive, up to date, reliable and comparable information on the activity, competitiveness and performance of enterprises in the Community.
- Tools for decision-making - New economic, competition, social, environmental and enterprise policies and guidelines call for initiatives and decisions based on valid statistics. Business statistics are needed to provide harmonised, reliable and fast statistical information, to assist and inform policy decisions by both the Commission and individual enterprises.
- GDP - The Amsterdam Council summit of June 1997 concluded on the need for reliable data on real GDP, especially for the third phase of European Monetary Union. Business statistics have therefore an essential role to play since these statistics are used in compiling the various components in national accounts, which are in turn needed in the calculation of GDP¹.
- European monetary policy must be able to base itself on reliable European statistics which are totally comparable at all levels. The Maastricht Treaty already provided the Central Bank the right and obligation to obtain the tools necessary to fulfil its mission: "In order to ensure the missions of the ESCB, the ECB, assisted by the national central banks, shall collect the necessary statistical data, either from the competent national authorities, or directly from the economic agents". This challenge must continue to encourage Eurostat and the national statistical authorities to draw up an economic statistics programme which can satisfy the needs of users.

The national statistical authorities, coordinated by Eurostat, have a significant role to play in meeting the European Union's need for information on the business community. STS, like all business statistics, faces the opposing forces of the need for data on one hand and the cost and burden of providing data on the other hand. In fact, production of business statistics can be

¹ It should be noted that the use of STS data to compile national accounts is only done at a national level, not in Eurostat.

considered as bridging the gap between information demanded by users and information held by respondents.

3.2 Types of economic analysis

Although there are many users of STS with many different motivations for using the data, the analyses performed generally fall into one of two types:

- comparison between two different points in time, of one or several parts of the business population;
- comparison within one reference period of two or more different sub-populations.

EU STS are nearly always presented as indices (relative to a base period) or as growth rates and hence are intrinsically a comparison of the first type. These indices or growth rates may then be compared in the manner described as the second type, by comparing across sub-populations. Activity and geography are the key characteristic used when choosing a sub-population of the business population for analysis, comparing indices for different activities or for different countries or geographical groupings.

An analysis at a detailed level of activity must allow political and economic leaders to base their decisions on precise knowledge of certain cyclical economic events in each activity; but this analysis obviously does not have the same requirements in terms of deadline as for monetary policy.

Given that the EU has many small and medium-sized Member States characterised by a high proportion of small and medium-sized enterprises, the interest that there is in following closely the activity cycle of enterprises according to their size should not be underestimated.

In addition to the need for detailed information, there are, within the Union, other demands with regard to economic indicators:

Decision-makers want to be in a position to analyse several aspects of the cycle of economic activity. The indicators must first give different insights into a situation at a given moment, not only the development in production in volume terms, but also the development of output prices, of employment, of sales (turnover). They must also make it possible to understand different time frames. In particular, the index of new orders constitutes an essential element of appraisal with regard to the foreseeable development of an activity (leading or advanced indicator);

4. European short-term business statistics

4.1 Preparing the STS-R

For many years harmonised Community short-term statistics had been available for a limited part of the business population, namely the traditional industrial activities of extraction, manufacturing, energy and water supply and construction. The coverage of services by some Member States had been both incomplete and carried out in a non-harmonised format which had severely limited the comparability of the resulting information at an EU level. The statistical information that has been available for the industrial activities since the two Council Directives covering this area were adopted in 1972 and 1978 became progressively less useful due to the inflexibility of the legal instruments. Economic and technical developments in the intervening years had not been taken into account.

The importance of STS has grown in recent years with the development of the Single Market and the implementation of the European Monetary Union. These developments as well as structural changes in the economy with an ever-increasing importance of the service activities showed the weaknesses of the system of short-term industrial statistics.

Despite the number of years during which the Directives were in force the production of European business statistics remained to a greater or lesser extent an add-on to most national systems. Although a European methodology did exist to some extent, in practice it resembled a collection of national practices. As a general rule, the larger the Member State, the more elaborate the respective system was, and today still is. However, the structure of the short-term statistics followed largely national patterns and was shaped by very different national regulations that reflected the perception of the statistical short-term needs by individual governments, National Statistical Institutes (NSIs) and the National Central Banks. Despite existing driving forces for harmonisation, such as international statistics from the OECD and the IMF, as well as the general need for international comparisons with other countries, the variations between the national statistics were often too large to allow the simple aggregation to EU-wide statistics.

At the beginning of the 1990s many serious problems with the replies to the Community's data requests were still evident.

<p>Main general problems with the Directives from the 1970s</p> <p>The majority of users complained that the delay in the availability of data was far too great.</p> <p>The statistics were produced for different statistical units with neither the enterprise nor the KAU being adopted as statistical units by all the national statistical authorities.</p> <p>Most national statistical authorities faced difficulties to supply certain indicators and only the index of production was produced by all countries.</p> <p>The frequency of the indicators varied with some Member States providing monthly data and others quarterly.</p>	<p>Definitions applied to the indicators varied. For example, the question of whether to calculate an output price index inclusive or exclusive of excise duties may result in huge differences in times of rapid changes in prices.</p> <p>Inconsistency in the application of aggregate classifications, for example distinguishing capital, intermediate and consumer goods.</p> <p>Changes in base years were not consistently applied across countries.</p> <p>Some activities, notably construction, were ignored by some Member States.</p>
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It was clear that many of these problems would remain without a concerted effort to address them and hence an updating of the relevant legislation appeared indispensable.

Preparation for the drafting of the STS-R started at the end of 1992. This was the first piece of EU business statistics legislation in which the European Monetary Institute (EMI), the forerunner of the ECB, was active in its preparation. Statements of requirements by the European Monetary Institute (EMI) dating from 1995/96 provided support for many of the Commission's proposals.

As with most of the draft legislation on business statistics prepared by Eurostat, the national statistical authorities were strongly implicated in the preparation of the STS-R from its beginning. Thus, sound practical expertise has been drawn together in the drafting process. As a consequence, the STS-R exhibits a high degree of competence and practical knowledge, evidenced for example in the coverage of economic activities by the various indicators.

However, by no means all of the requirements of the EMI were taken up to their full extent in the Commission's proposal for the STS-R. For example some indicators such as import prices have been left out of the Regulation and for other indicators the reference period and the timeliness specified in the Regulation do not fully reflect the requirements for monetary policy expressed by the EMI.

4.2 Overview of the STS-R

The STS-R was adopted in May 1998 and entered into force in June 1998. The STS-R created an ambitious EU-wide legal framework for short-term statistics. It has created a regulatory framework in which to launch a process of successive harmonisation of EU STS. In so doing, the STS-R follows the tradition of other Regulations, such as the Structural Business Statistics Regulation (SBS-R).

The new legal instrument aims to provide a common framework for the production of short-term Community statistics on the business cycle. This will result in the national statistical authorities transmitting to Eurostat data which is comparable between the Member States and which will provide a uniform basis for the analysis of the short-term evolution of supply and demand, production factors and price. It is the Member States who are responsible for the collection of the data, not the Commission. The STS-R lays down the norms, standards and definitions necessary for producing comparable Community statistics, without detailing the actual collection methods to be used. As such the national statistical authority in each Member State may conduct the data collection exercises in the manner most appropriate to its own situation, for example to take account of administrative declarations such as those for value added tax and for social security.

The STS-R continues the reinforcement of the EU statistical system, incorporating into the production of short-term statistics the EU statistical tools such as the classification of activities (NACE Rev. 1), the definition of statistical units and the drawing up of business registers for statistical purposes as well as the transmission of confidential data.

The STS-R also aims to create a legal framework which is sensitive to the response burden, in particular by opening up the use of existing administrative information for statistical purposes.

Through its Committee procedure the STS-R provides a degree of flexibility whereby measures for adjustment to economic and technical developments can be taken by the Commission after consulting the Member States.

Structure of the STS-R

The STS-R can be broken down into its core part and four Annexes.

	Subject
Preamble and Article 1	Objectives of the STS-R
Article 2	Coverage in terms of activities.
Article 3	Minimum contents of Annexes.
Articles 4 to 11	Various stages of production of short-term statistics: collection, compilation, transmission as well as assessing quality.
Article 12	Publishing of a methodological manual
Articles 14 and 15	Metadata and coordination by Member States
Articles 13 and 16 to 20	Implementation of the STS-R in terms of transitional periods and derogations, pilot studies, the responsibilities and procedures of the Committee, repealing provisions and entry into force.

Annexes - structure

Each of the 4 Annexes has a similar structure starting with its specific coverage in terms of activities and units, the list of indicators, form, reference period (frequency), detail of breakdowns (activity or other), deadlines for delivery. The Annexes then give details on the pilot studies. They finish with information on the first reference period and the transition period during which they must be implemented.

Annexes - main elements

The STS-R has a comprehensive coverage based on NACE Rev. 1. From the beginning it requires indicators for Sections C to H, most of Section I and Divisions 72 and 74. Pilot studies are foreseen for other parts of Section K and for Sections J, M, N and O. The level of detail foreseen varies but is normally at least at the 2-digit level of NACE Rev.1 and sometimes finer. In construction the CC is used for breakdowns rather than NACE Rev. 1. In the Annex for industry the concept of Main Industrial Groupings (MIGs) is introduced with the exact definition of these groupings left to the Committee procedure.

The list of indicators varies depending on the activities with the most extensive lists foreseen for industry and construction. In these activities there are indices relating to output, labour input and prices as well as leading indicators such as new orders.

The STS-R allows for a number of approximations, mostly limited in time, such as the number of employees instead of the number of persons employed.

Indicators of production and prices are required as indices, building permits as absolute figures. The remaining variables can be provided as either. Most indicators are required in a gross or working day adjusted form, with an option to also provide indicators in the form of trend-cycles or seasonally adjusted.

The reference period for industry is the calendar month with the exception of the labour input indicators that are required "at least" on a quarterly basis. Construction indices are quarterly. The retail trade and repair indicators are foreseen as monthly data for turnover and the deflator of sales and quarterly for the employment indicator. The indicators for other services are required on a quarterly basis.

The STS-R foresees a transition period ending in the middle of 2003. By this time the full range of data should be provided by all Member States in accordance with the provisions foreseen in the STS-R. All Member States have been granted derogations for some of the provisions for part or all of this transition period.

4.2.1 Special focus on Comitology

Articles 17 and 18 of the STS-R concern the measures for the implementation of the STS-R and the committee procedure used to assist the Commission in the implementation. In practice proposals for adoption by the Commission following the Comitology procedure start off in less formal working parties or task forces - delegates from the Member States and Eurostat monitor the progress of the implementation and prepare supplementary implementation measures in working parties that are normally held once or twice a year, assisted by task forces on specific subjects.

Articles 17 and 18 of the STS-R concern the measures for the implementation of the STS-R and the committee procedure used to assist the Commission in the implementation. In practice proposals for adoption by the Commission following the Comitology procedure start off in less formal working parties or task forces - delegates from the Member States and Eurostat monitor the progress of the implementation and prepare supplementary implementation measures in working

parties that are normally held once or twice a year, assisted by task forces on specific subjects.

Once the proposals are regarded by Eurostat as ready to be submitted to the SPC they are presented first to a preparatory meeting of the SPC at which Eurostat seeks the views of the national statistical authorities. The SPC authorised the creation of such a preparatory meeting for STS in 1998, shortly after the STS-R was adopted. Once the SPC preparatory committee has expressed its views on the Commission's proposals, the proposals are then submitted to the SPC for their formal opinion. The consultation and subsequent modification or adoption of the proposals by the Commission then follows the Comitology procedure. It should be noted that since the adoption of the STS-R the Comitology procedures have been revised² and the procedures followed are no longer those in the STS-R itself.

For more information see:
The ABC of Community law by Dr Klaus-Dieter Borchardt,
Directorate-General for Education and Culture

The areas in which this procedure can be used are specified in Article 17. This article provides the STS-R with some flexibility and avoids having to include a set of very detailed rules in the STS-R itself. The flexibility is broad, allowing the Commission to use the Comitology procedure to determine implementing measures for the STS-R as well as measures to allow for economic and technical developments. Within this broad framework the following measures are explicitly mentioned:

- the use of particular units;
- the updating of the list of variables;
- the definitions and the appropriate forms of the transmitted variables;
- the frequency of compilation of the statistics;
- the levels of breakdown and aggregation to be applied to the variables;
- the transmission deadlines;
- the criteria for the measurement of quality;
- the transition periods and derogations granted during the transition period;
- the institution of pilot studies.

As well as these measures listed in Article 17, the Annexes also foresee the Comitology procedure being followed for the following tasks:

² In 1999, the decision-making procedure was redesigned to make for greater simplicity and transparency, and not least greater Parliamentary involvement. The number of decision-making procedures was reduced from five to three. Parliament was brought into the procedures concerning the adoption of implementing measures with which it had been involved as part of the co-decision procedure. Parliament may, in these instances, deliver a reasoned opinion stating that the planned measure exceeds the scope of the legal instrument to be implemented, and may require the Commission to modify the implementing measure accordingly. In addition, the Commission is subject to wide-ranging obligations to keep Parliament informed and properly notified.

- the use of non-standard observation units (paragraph (a) of Annexes A to D) - this effectively repeats the first bullet point of Article 17;
- the extension or contraction of the periods for the use of approximations concerning certain variables (paragraph (c) of Annexes A to D);
- the modification of the activity coverage of indicators on orders and output prices (paragraph (c) of Annex A);
- the definition of main industrial groupings (paragraph (f) of Annex A);
- the extension of the transition periods (paragraph (j) of Annexes A to C).

At the time of writing this procedure has been used several times, leading to the adoption of a number of Commission Regulations concerning implementing measures.

4.2.2 Special focus on Commission Regulations implementing the STS Regulation

At the time of writing the Commission has drafted and, after a positive opinion from the SPC, adopted the following measures as Commission Regulations:

- the definitions of the indicators
- the transitional period and derogations from the provisions of the STS Regulation
- the definitions of the main industrial groupings
- the appropriate technical format for the transmission of results

Each one of these Regulations includes a timetable for their implementation nationally.

Further implementation measures will be needed during the next few years in order to achieve the original objectives of the STS-R. One of the priorities will be a Regulation on the criteria for the measurement of quality.

4.3 Implementation in practice - transition periods, derogations, action plans

The first reference year (see terminology box below) for which the national statistical authorities should produce and transmit data to Eurostat is generally January (M1) 1998 or quarter 1 (Q1) 1998. The delays in the negotiations of the STS-R meant that it was not adopted until after this date. At the time of adoption no Member State met all of the provisions of the STS-R and hence all Member States needed to adapt their STS systems in order to comply with their obligations. The development of robust systems/procedures for producing regular statistics takes time and the STS-R foresaw a transition period of a maximum of 5 years to allow this to happen. All transition periods are for a fixed number of whole years. The following table shows the year in which the transition period ends for each indicator - the final period

in the transition period is June for monthly data or quarter 2 for quarterly data.

	Indicator	Transition period ends in June of:		
		Year		
A110	production		2001	
A120	turnover		2001	
A121	domestic turnover		2001	
A122	non-domestic turnover			2003
A130	new orders received			2003
A131	domestic new orders			2003
A132	non-domestic new orders		2001	
A210	number of persons employed		2001	
A220	hours worked			2003
A230	gross wages and salaries			2003
A310	output prices			2003
A311	output prices of the domestic market		2001	
A312	output prices of the non-domestic market			2003
B110	production		2001	
B115	production of building construction		2001	
B116	production of civil engineering		2001	
B130	new orders received			2003
B135	new orders received for building construction			2003
B136	new orders received for civil engineering			2003
B210	number of persons employed		2001	
B220	hours worked		2001	
B230	gross wages and salaries			2003
B320	construction costs			2003
B321	material costs			2003
B322	labour costs			2003
B411	building permits: number of dwellings			2003
B412	building permits: square meters of useful floor area or alternative size measure			2003
C120	turnover - detailed level of NACE			2003
C120	turnover - aggregated level of NACE	2000		
C210	number of persons employed		2001	
C330	deflator of sales			2003
D120	turnover			2003
D210	number of persons employed			2003

All Member States have asked for and been granted derogations from some of the provisions of the STS-R within the timetable foreseen.

Terminology box

Note that in the domain of STS the term reference period has traditionally been used to describe the precise period of time to which an *individual* data point refers. Because of the sub-annual frequency of STS data it is common to refer more precisely to a reference month or a reference quarter. The reference year is rarely referred to in STS but is effectively the sum or average of all of the sub-annual reference periods that fall within a specified calendar year. Hence the reference year 2002 covers the reference periods from January to December of 2002. In contrast, the Handbook on price and volume measures in national accounts gives the following definition: the reference year is the year which is used for the submission and presentation of the constant price data. In a series of index numbers it is the year that takes the value 100. In STS this would be referred to as the base year - see also the terminology boxes in points 8.5.1 and 8.5.2.

Slower implementation than needed by users, notably the ECB

In the negotiations, at the drafting stage and in Council working parties, the national statistical authorities expressed concerns, amongst others, about the lack of resources to produce the STS. In many countries the full implementation of the STS-R requires a considerable enlargement in the scope of the existing short-term statistics and the increase in the number and extent of national surveys has not been matched in all cases by a corresponding increase of resources. As a consequence, the implementation of the STS-R takes longer than desirable in view of the urgency with which these statistics are required for economic policy making. The five year period foreseen as the maximum transition period has been interpreted by many Member States as the normal delay for a compliant implementation. At the time of writing, more than three years after the Regulation came into force, the data availability allows the compilation of reliable European aggregates only for a very few indicators. Some indicators, in particular those that concern the non-domestic markets and the indicators for the service activities are only covered by a few Member States.

The question arises as to whether the STS-R and its implementation respond adequately to users' wishes. Reactions from the media and the political sphere would suggest that this is not yet the case. The need for a faster implementation has been acknowledged by the ECOFIN Council in June 1999. It asked for a full implementation of Annexes A to C of the STS-R and considerable progress for business cycle sensitive service activities (from Annex D) by the end of 2001. The ECOFIN Council reiterated its request in 2000 but realising that this objective may not be feasible to its full extent, demanded specific, urgent actions in order that significant progress could be achieved for priority indicators. A list of such actions per Member State has been compiled in co-operation with the ECB as part of a wider programme covering other statistical domains, such as quarterly national accounts. The list of urgent actions defines some pragmatic priorities that may help to make best use of limited efforts by the Member States. At the time of writing the list is being studied by Member States for its feasibility. Eurostat has requested a detailed planning for the actions foreseen. This planning will provide some important indications on the medium term availability of STS data.

Although the progress is slower than politically desirable, the application of the STS-R has already shown important achievements. The key indicators of production, domestic output prices and deflated turnover of retail trade are regularly published by Eurostat on a monthly basis with an aggregate for the EU. Other indicators have seen improvements in quality. Moreover, the practical co-operation between Eurostat, the Member States and the ECB has been strengthened. The speed of

transmission and the transparency of the planning of the index compilation, for example in terms of the availability of national indicators, reflect this strengthening.

For more information on the derogations received by Member States see:
Commission Regulation (EC) No 606/2001 of 23 March 2001 on implementing Council Regulation (EC) No 1165/98 concerning short-term statistics as regards Derogations of Member States

4.4 Areas of attention and development

Since the period when the STS-R was conceived and finalised, the economic situation in the EU and monetary policy have fundamentally changed. The introduction of the euro has created new challenges that could not have been foreseen to their full extent some years ago. EU statistics in general and short-term statistics in particular have moved into the focus of attention by economic analysts and the international media. Their judgement can often be summarised as “too little too late” emphasising that the range of available indicators and their timeliness does not match the importance of these indicators for economic and monetary policy.

It also emerges from an international user survey³ that the demand for short-term data appreciably exceeds the relatively limited supply currently provided by the national statistical authorities.

The range of comparable indicators in the US and the speed of their dissemination are assumed to be a suitable gauge or benchmark for EU statistics. The EU Statistical System cannot match in particular the short time delays achieved in the US. Although most economic analysts recognise that the EU political and economic situation is fundamentally different from that of the US, they assume that the unfavourable comparison exhibits some truths and highlights a need for improvement.

In its report “Statistical requirements of the European Central Bank in the field of general economic statistics” that was released in August 2000, the ECB clarified its needs. This report puts the discussion on weaknesses of STS and other statistical domains back on a rational level. To meet some or all of these needs may be possible through the use of the pilot studies foreseen in the STS-R, through Comitology described above or by a revision of the provisions of the STS-R itself. This will be the subject of discussion between Eurostat, the national statistical authorities and the ECB in the near future.

³ See findings of the international survey “User needs with respect to short-term statistics on trade and services”, Voorburg Group working paper of the Rome seminar, 1998.

Special focus on pilot studies

The STS-R foresees for each Annex a series of potential pilot projects. Eurostat has supported in recent years some projects with the objective of testing possible directions for further evolution. A particularly interesting project concerned the development of "corporate service prices" (CSPI) in the UK.

This project is integrated into a long-term development plan of the ONS. Some early development of service activities price indices began in the early 1990s as an adjunct to the familiar industrial output prices (PPI). Initial efforts concentrated on price collection in a small number of "simple" activities where collection methods used were very similar to those already in place for the PPI. In 1995, ONS began a further investment in the development of service activities prices. The range of activities has increased substantially since then and a range of price collection methodologies are now employed to cope with the problems of defining prices in the more "difficult" activities, many of those providing business services for instance.

The aim the project is to develop price indices for corporate services, defined as those services provided to other enterprises or to intermediate users rather than the end user or consumer. The goal for CSPI is the provision of price indices which are fit for their purpose as deflators and as indicators of corporate inflation. It is the intention to cover the majority of the relevant activities of corporate services and to publish CSPIs progressively as mainstream statistics following on from initial publication as experimental statistics, with the majority published as mainstream by the end of 2003. Coverage will be partial in most NACE Sections because of the intermediate/final user split and in a number of Sections it will be particularly low. In distribution (Section G) low coverage results because a high proportion of output is destined for final consumers and in Education (Section M) because only a very small proportion of educational

activity is provided by enterprises for exclusive use by the business community.

In general, the service activities are statistically relatively poorly developed by comparison with industry and construction and a key feature of this under-development is the almost complete lack of a statistical infrastructure. This infrastructure had to be created as a pre-condition for the project. This required substantial organisational change within ONS.

Of great concern are the practical effects arising from conceptual problems associated with the actual methods of price collection. Practical difficulties arise especially in the area of professional services such as architecture or legal services and stem from the possibility of allowing for productivity or quality changes, dealing with one-off services and representativeness. The ONS has sought to cope with many of these difficulties by developing the concept of "model" contracts for regular re-pricing by contributors.

A development plan has been drawn up covering:

1. Development of reliable price collection mechanisms for the remaining activities;
2. Quality assurance of all developed activities and those currently under development;
3. Re-assessment of weighting schemes;
4. Establishment of CSPI database and improvements to the robustness and efficiency of data capture;
5. Development of CSPI compilation system;
6. Quarterly publication of experimental CSPIs;
7. Research and development of price collection mechanisms for professional services;
8. Examination of the methodology underlying the collection and compilation of the indices;
9. Rebasing the CSPI to year 2000.

This phase of the work will end with the development of an agreed set of criteria for the acceptance of corporate services price indices as deflators suitable for UK national accounts.

Section B

Infrastructure & Coverage

5. Infrastructure

5.1 Statistical units

5.1.1 Introduction - Statistical Units Regulation and the list of types of statistical units

Statistical units play a prominent role in the EU system of business statistics. Indeed, the Council Regulation on statistical units (SU-R) explicitly states that: "only if the member states use common definitions of statistical units will it be possible to provide integrated statistical information with the reliability, speed, flexibility and degree of detail required for the management of the internal market". Statistical units are therefore:

- the corner stones of business statistics;
- the building blocks of statistical aggregates;
- the links allowing statistics to be harmonised.

The SU-R lists and defines eight types of statistical units and can be considered the methodological reservoir out of which the various Regulations like the 1995 ESA, SBS-R, STS-R and Statistical Business Register Regulation (SBR-R) take the units that best serve their purposes. These statistical units are:

- the enterprise;
- the institutional unit;
- the enterprise group;
- the kind-of-activity unit (KAU);
- the unit of homogeneous production (UHP);
- the local unit;
- the local kind-of-activity unit (LKAU);
- the local unit of homogeneous production (LUHP).

The institutional unit, the UHP and the LUHP, are more commonly used in the field of national accounts. The legal unit is not listed as a statistical unit.

5.1.2 Definitions

Generally speaking, a unit is a specific entity which is defined in such a way that it can not be confused with any other unit. Units are the elements of a population. It must be possible to count these elements without omissions or duplication. Statistical units may be identifiable legal or physical entities or statistical constructs.

The definitions contained in the Annex to the SU-R are to be used by the national statistical authorities to identify units for the collection, transmission, publication and

analysis of business statistics data. The SU-R does not however specify which units should be used for each of these actions, nor does it specify which units should be used in particular surveys.

Section 2 of the Annex to the SU-R lists three criteria, by which statistical units can be defined. They are:

A. Legal, accounting or organisational criteria

In order to define units that are recognisable and identifiable in the economy, legal or institutional criteria must be applied. In some cases, legally separate units must be grouped together as they are not sufficiently autonomous in their organisation. In order to define some types of unit, accounting or financial criteria also have to be applied.

To constitute the enterprise unit, use is made of legal units that exercise, wholly or partially, a productive activity.

Legal units include:

- legal persons whose existence is recognised by law independently of the individuals or institutions which may own them or are members of them;
- natural persons who are engaged in an economic activity in their own right.

The legal unit always forms, either by itself or sometimes in combination with other legal units, the legal basis for the statistical unit known as the "enterprise".

B. Geographical criteria

A unit can be geographically identified. A distinction is made between local, regional, national, Community and worldwide areas.

The local level here means the territory corresponding to the "smallest administrative area": the "commune/gemeente" in Belgium; the "kommune" in Denmark; the "Gemeinde" in Germany; the "demos" or "koinotis" in Greece; the "municipio" in Spain; the "commune" in France; the "DED/ward" in Ireland; the "comune" in Italy; the "commune" in Luxembourg; the "gemeente" in the Netherlands; (the "Gemeinde" in Austria;) the "concelho" in Portugal; (the "kunta/kommun" in Finland; the "primaerkommun" in Sweden) and the "ward" in the United Kingdom.

The regional levels are defined by the nomenclature of territorial units for statistics (NUTS), which distinguishes three levels (I, II, III)⁴.

The observation and analytical units are defined in such a way as to permit data first to be determined for each Member State and these data to be combined to give figures for the Community as a whole or for larger areas.

The rules regarding geographical criteria must be in order to permit consolidation and avoid double counting and omissions.

C. Activity criteria

The economic activity of production - hereinafter referred to as "activity" - can be said to take place when resources such as equipment, labour, manufacturing techniques, information networks or products are combined, leading to the creation of specific goods or services. An activity is characterised by an input of products (goods or services), a production process and an output of products.

Activities are determined by reference to a specific level of NACE Rev. 1.

If a unit carries out more than one activity, all the activities which are not ancillary activities are ranked according to the gross value added at factor cost which they generate. A distinction is made between principal activity and secondary activities.

If no value-added figures are available, other criteria must be used, such as, for example, employment, payroll, turnover and assets, with a view to obtaining the closest possible approximation of the classification which would have been obtained on the basis of value added.

Units are classified in terms of their activities. If one activity accounts for over 50 % of the value added this determines the classification of the unit. In all other cases, classification rules must be observed. Classification is carried out in stages from the highest level of aggregation which is the section (one letter), down to the class (four digits) via the division (two digits) and the group (three digits). The classification at each level must be compatible with the previous level. The Statistical Programme Committee referred to in Article 7 of Regulation (EEC) No 3037/90 has competence in this field.

Principal and secondary activities are backed up by ancillary activities, such as, for example, administration, accounts, data processing, process monitoring, purchasing, sales and marketing, warehousing, repairs, transport and renovation. These ancillary activities within

a unit are carried out in order to permit or facilitate production by the unit of goods and services for third parties. The products of ancillary activities are not themselves supplied to third parties.

For more information on the concept of ancillary activities and the definitions of the full list of units see the Annex to the SU-R. The definitions of the enterprise and the KAU are given below as these are the two main types of statistical unit used in the STS-R.

Enterprise

The first statistical unit mentioned in the SU-R is the Enterprise. It is defined as follows:

The enterprise is the smallest combination of legal units that is an organisational unit producing goods or services, which benefits from a certain degree of autonomy in decision-making, especially for the allocation of its current resources. An enterprise carries out one or more activities at one or more locations. An enterprise may be a sole legal unit.

The enterprise thus defined is an economic entity which can therefore, under certain circumstances, correspond to a grouping of several legal units. Some legal units, in fact, perform activities exclusively for other legal units and their existence can only be explained by administrative factors (e. g. tax reasons), without them being of any economic significance. A large proportion of the legal units with no persons employed also belongs to this category. In many cases, the activities of these legal units should be seen as ancillary activities of the parent legal unit they serve, to which they belong and to which they must be attached to form an enterprise used for economic analysis.

Kind-of-Activity Unit (KAU)

The KAU is meant to reduce the heterogeneity according to activity, which is inherent to the Enterprise. At the same time, it tries to avoid being an artificial construct that could not be implemented.

The Kind of Activity Unit is defined in the SU-R as follows.

The kind-of-activity unit (KAU) groups all the parts of an enterprise contributing to the performance of an activity at class level (four digits) of NACE Rev. 1 and corresponds to one or more operational sub- divisions of the enterprise. The enterprise's information system must be capable of indicating or calculating for each KAU at least the value of production, intermediate consumption, manpower costs, the operating surplus and employment and gross fixed capital formation.

The KAU was devised as an observation unit in order to improve the homogeneity of the results of statistical surveys by activity and hence the international

⁴ Since the adoption of the SU-R the NUTS classification has been revised and the number of levels and their naming convention have changed.

comparability of these results, since at the level of the enterprise different types of horizontal and vertical integration can be observed at both national and international level. An entity which only carries out ancillary activities for the enterprise to which it belongs cannot be considered as a separate KAU. In fact the KAU corresponds to the operational definition given in paragraph 96 of the introduction to ISIC Rev.3.

The KAUs falling within a particular heading in the NACE Rev. 1 classification system can produce products outside the homogeneous group, on account of secondary activities connected with them which cannot be separately identified from available accounting documents. Conversely, the KAUs classified under a particular heading in the classification system on the basis of a principal activity do not produce the entire output of homogeneous groups of specific products because the same products can be produced in secondary activities of KAUs falling under some other classification heading.

The internal accounts of enterprises (e. g. profit or cost centres) have often been developed according to criteria that are close: the activity concept. They enable the supply of data at KAU level, so that these can be observed.

All the costs of ancillary activities of an enterprise must be allocated to the principal and secondary activities and thus to the KAUs observed within the enterprise.

This definition of the KAU is more pragmatic than that used before the SU-R was adopted. Instead of being a pure activity breakdown of the enterprise, the KAU may have secondary activities. It is no longer defined purely in terms of activities, but its existence is also conditional on the availability of certain basic variables and of operational subdivisions within an enterprise. A KAU can consist of more than one legal unit. This follows logically from the fact that the KAU is derived from the enterprise without the legal structure being a discriminating criterion. This also means that if an enterprise consists of more than one legal unit, this can never be sufficient justification for splitting it into two or more KAUs.

5.1.3 Existence of other statistical units

The transitional period laid down in the SU-R was somewhat unclear, although it would seem that the use of the definitions in the SU-R were not compulsory until the 1996 reference period. With the Commission's consent this could be delayed until the 1998 reference year. After the transition period, national statistical authorities wishing to introduce new types of statistical units other than those laid down in the SU-R required the authorisation of the Commission after consultation of the SPC following the Committee procedure. At the time of writing this possibility had never been used.

5.1.4 Use in business registers

The conceptual model of the information for registers implicitly defined by the Community Regulation on the harmonisation of the development of national business registers for statistical purposes is very simple. It explicitly comprises three units: the enterprise, the local unit and the legal unit, and three relationships between entities. It also implicitly comprises the [enterprise] group.

5.1.5 Use in short-term business statistics

The use of different types of statistical units in the STS-R is laid down in each of the four Annexes. These Annexes specify the "observation units". The terms "observation unit" and "analytical unit" are also used several times in the SU-R, but without a definition of their role in the production of statistics. The explanatory notes of NACE Rev. 1 also refer to reporting units, again without defining the role of these units. Hence the exact role of the units specified in the Annexes to the STS-R may be open to some interpretation. A common interpretation of the term "observation" would suggest that these units should be used by the national statistical authorities as the units observed - in other words about which basic data is collected. However, bearing in mind the principle of subsidiarity and the aim to produce harmonised statistics (rather than to harmonise the production of statistics) that are both mentioned in the preamble of the STS-R, it would seem more reasonable that, in the context of the STS-R at least, the observation unit is in fact the unit for which the indicators transmitted to Eurostat should be compiled.

General rule on observation units

The choice of units in the STS-R can be summarised as the KAU for indicators in Annexes A (industry) and B (construction) and the enterprises in Annexes C (retail trade) and D (other services).

Other observation units - Committee procedure

In all four Annexes it is foreseen that other observation units can be used following the Committee procedure laid down in the STS-R. At the time of writing this procedure for permitting alternative observation units has not been used. It should however be noted that the Commission Regulation on derogations provided a temporary derogation for indicators B411 and B412 concerning permits. Unlike the derogations that are country specific there is no explicit reference to the end of this derogation and hence it is open to interpretation whether this is limited by the overall transition period foreseen for these indicators, or whether in fact it is a permanent derogation.

It would appear that the STS-R tries to solve this problem of the unit for building permits by way of paragraph (b) 3 of Annex B. Instead of saying that there is no statistical unit for the indicators relating to building

permits or proposing that the permit itself plays the role of a unit, in a rather clumsy solution a reference is made to the classification of constructions, as though this provided a statistical unit which it does not.

In practice it seems likely that all Member States and the Commission will treat the reference to permits in the derogations and the special provision of paragraph (b) 3 of Annex B as a permanent situation in which it is widely accepted that there is no sense in specifying a statistical unit for building permits.

Non-use of the KAU

In Annexes A and B it is foreseen that, instead of the KAU, the enterprise or the local unit could be used for those enterprises with few persons employed in secondary activities. The reference to "few" is vague. One possible interpretation is: when a secondary activity of an enterprise is small the benefit for STS of separating it from the principal activity, even if it can be done in accordance with the SU-R's definition on KAUs, may well be insignificant compared to the cost for the statistical authority and the burden for the unit. At the time of writing no guidelines have been established for the practical implementation of this provision.

Use of non-standard units after the transition period

The derogations granted to several Member States concern the use of statistical units other than those foreseen in the STS-R. Once these derogations run out the units specified in the STS-R should be applied by all Member States. Two specific situations will have to be studied with some care. Firstly, where national statistical authorities use the KAU in services they may feel that this is methodologically superior to the requirement of the STS-R to use the enterprise and may be unwilling to lower the quality of their national statistics in order to increase the comparability of EU statistics. Secondly, the provision allowing the enterprise or the local unit to be used when secondary activities of the enterprise are small may be used by several Member States and a decision will be needed on the extent to which this can be done and what are its impacts on the quality of the indicators produced.

Whilst the aim must clearly be for all Member States to move to a common interpretation of the STS-R concerning statistical units, in the short term, it is vital that current practices are well known to avoid misinterpretation of the results.

5.1.6 Current debate over statistical units - role of statistical units in the production process

One of the conclusions of the first Business Statistics Directors Group meeting held in November 1998 was the necessity to resume work on statistical units; this conclusion was the consequence of the general agreement on the great impact of statistical units on quality and on the difficulty to implement the SU-R in the same way in the Member States. A Task Force was set up to focus on the most important issues: Three main

issues were addressed: economic relevance, homogeneity by activity and consistency between data sets, especially SBS and STS data.

Resulting from this Eurostat proposed a "General orientation": a single statistical unit for statistics by activity, with a counterpart for regional statistics by activity. This proposal aimed to solve simultaneously these issues by using a single statistical unit for data compiled at the national level (Member State) instead of providing users with different statistical data series each of them aiming at solving separately only one issue through a specific statistical unit.

This single statistical unit should be the best trade-off in terms of:

- quality (economic relevance and homogeneity);
- feasibility (observability, response burden and costs for statistical authorities).

At the regional level, a single statistical unit consistent with the national one should also be used.

Which characteristics for such a single statistical unit?

Eurostat put forward proposals for the characteristics of the single unit concerning economic relevance, homogeneity and consistency (between STS and SBS data). Due to the fact that the quality of the data collected strongly depends on their own use by business managers themselves, this unit should be an observation unit, recognised as a real entity by business managers; nevertheless some data might be estimated, in some cases, preferably by the unit itself. The variable set to be directly observed, ensuring thus a high level of quality, remained to be clarified but should at least cover the variables already mentioned for the KAU in the SU-R.

Which main changes?

By comparison with the current status (national practices as well as EU Regulations or explanatory notes), the main changes would be:

- a more common approach amongst countries with respect to the enterprise unit which should be more economically relevant;
- a greater role played by enterprise groups in accordance with their economic role;
- a more restricted use in splitting up into KAUs;
- a greater consistency between STS and SBS data through the use of the same unit;
- elimination of duplicated data series (by different statistical units) from the SBS-R.

The feasibility study (implementation processes)

It has been proposed to set up a feasibility study to look at the proposed changes, firstly to see how to correctly define the enterprise and secondly to determine how and when to split up this enterprise into more than one KAU.

For more information see:
Doc. BSDG/June2001/6 from the (Eurostat organised) Business statistics directors meeting of the 21st of June 2001

5.2 Classifications

5.2.1 Development of classification systems

One of the basic requirements for statistical work is the existence of a recognised framework which can accommodate the vast range of statistical data available so that they can be presented and analysed in a meaningful way. Classification systems provide a common language both for the compilation and presentation of statistics.

As classifications are the basic instruments for categorising phenomena of the real world there is a need to revise them from time to time as the real world changes. Such revisions usually affect not only the single elements of a classification but also the whole hierarchical structure. The more a classification is changed in its elements and in its structure, the more the continuity of the time series data based on that classification will be affected. There is, therefore, a trade-off between continuity and the necessary updating of the classification. It is thus advisable not to revise classifications too often. Furthermore, the applicability of a revised classification should be checked thoroughly before it comes into force.

Harmonisation of classifications

Harmonisation has at least three aspects:

The first one relates to harmonisation between classifications of the same nature. In this case, harmonisation is achieved if the elements of one classification are comparable with the elements of another. The relations between the elements could be 1:1, 1:n or n:1. The relationship 1:n or n:1 means that one classification is just a further aggregation or disaggregation of another. Such a relationship exists for instance between NACE Rev. 1 and ISIC Rev.3 where the former is based on the elements of the latter. However, in achieving harmonisation it is not only necessary to consider the single elements but also to take into account the classification structure. This is especially necessary in the case of activity classifications where the hierarchical structure affects the classification of the statistical units because units are classified on the basis of their principal activity by applying a top-down approach; i.e. classifying first to the highest level and then proceeding to the more detailed levels.

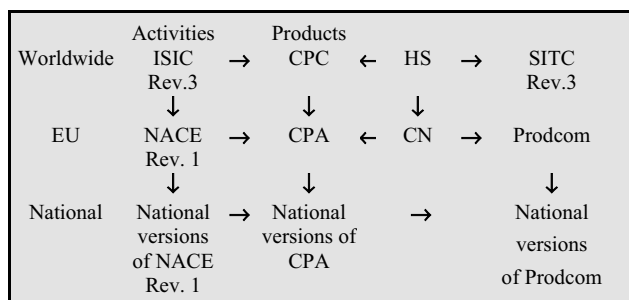
A second aspect relates to harmonisation between classifications of a different nature, especially between activity and product classifications. In this context, harmonisation means not aggregation or disaggregation

but the maintenance of consistent conceptual relationships.

The third aspect is international harmonisation which is one of the main tasks of international statistical bodies.

International classifications/lists

A thorough revision of the international statistical classifications was completed during the 1990s, with the result that the classifications have been developed as an integrated system where the various classifications have been harmonised and linked at global, EU and national level. The EU classifications developed/ revised during the 1990's are harmonised with classifications for world-wide use, in that the EU versions were derived on the principle of further disaggregation of the respective classification elements. This derivation principle holds true for the NACE Rev. 1 with respect to the ISIC Rev.3. It also holds true for the Combined Nomenclature (CN) with respect to the HS as well as for the Classification of Products by Activity (CPA) with respect to the CPC. Thus, harmonisation is achieved between these most important economic classifications at the world-wide level and the corresponding classifications at EU level. Harmonisation between EU Member States is likewise achieved because the Member States have agreed to apply either the relevant EU classifications directly or national versions derived from them. In order to ensure that comparability of economic statistics between the Member States will be continued in the future, the revised EU classifications are subject of EU Regulations. The system of international classifications is shown in the following diagram (the arrows indicate where the revision of one classification forces the revision of another):



For the latest versions of the classifications mentioned, and information about many other classification systems see:
The RAMON classification server

For more information on the predecessors of NACE Rev. 1 (NICE, NCE, NACE (1970)), the details of the history of the preparation of NACE Rev. 1 and its relation with ISIC Rev.3 see point 4.2.1 of the Eurostat Manual of Business Statistics.

Through a joint United Nations Statistical Office/Eurostat working party, Eurostat and representatives of the Member States were closely involved in the third revision of the International Standard Industrial Classification of All Economic Activities (ISIC Rev.3), which was adopted by the United Nations Statistical Commission in February 1989. Subsequently, a working party made up of Eurostat and representatives of the Member States developed NACE Rev. 1. Starting from the structure of ISIC Rev.3, sufficient detail was added to reflect the more important activities of the Member States that were inadequately represented in ISIC. Special features of national classifications were introduced in this process.

Because NACE Rev. 1 reflects national structures, it features not only the activities that are important in all Member States, but also those that are important in some countries and unimportant in others. The views of the relevant trade associations were taken into account at this stage. This has resulted in a considerable expansion of headings in NACE Rev. 1 compared with ISIC.

The first level of ISIC Rev.3 (sections) is embodied in NACE Rev. 1 as an alphabetical code, A to Q, and is further disaggregated in some areas into subsections indicated by 2-digit alphabetical codes. The second level of ISIC Rev.3 (divisions) is included in NACE Rev. 1 without any changes. The third and fourth levels (groups and classes) are subdivided to reflect European needs, each 3- or 4-digit item in NACE Rev. 1 being capable of being aggregated to the 3- or 4-digit levels of ISIC Rev.3 from which they have been derived.

To emphasise the differences in the coding systems, NACE Rev. 1 codes include a full stop between the second and third digit. Also, in ISIC Rev.3 the digit "9" always signifies "other", whereas in NACE Rev. 1, "9" is used in the same way as any other digit, in order to provide for more subdivisions.

NACE Rev. 1 may be regarded as a European version of ISIC Rev.3 which has been extensively enlarged.

Operation 2002

The advantages of the integrated system described above are recognised by all. Such a system is however also a straightjacket, that constrains the participating parties. Taking into account the constraints Eurostat and the Member States agreed to have on January 1 2002 an *adopted and published* updated CPA, with explanatory notes and conversion keys to CPA 96 and to the latest CPC as well as an *adopted and published* updated NACE Rev. 1, with explanatory notes and conversion keys. The only changes will be indispensable changes and that changes to the structure itself would only take place in exceptional cases requiring unanimity.

5.2.2 Activity classifications

A classification of economic activities is designed to categorise data that can be related only to the unit of activity, for example an individual plant or group of plants comprising an economic entity such as an enterprise. It provides the basis for preparing statistics of output, the various inputs to the production process (labour, materials, energy, etc.), capital formation and the financial transactions of such units.

Most Community countries used to work with activity classifications that had been designed with specific national criteria in mind, producing activity data that was comparable between countries was causing considerable difficulties.

There was therefore general agreement that comparable data on activities for all Member States was essential and that these could be produced only if there was a harmonised classification. This led to the construction of a Community classification of economic activities which could serve as the basis for the collection and presentation of activity related statistics.

Classification systems have to be revised from time to time to reflect changes in technology and economic structures. Thus the Community activity classification has evolved over time.

ISIC Rev.3		NACE Rev. 1		Code
17	Sections	17	Sections	Letters A to Q
-		31	Subsections	2-digit alphabetical codes
60	Divisions	60	Divisions	2-digit codes (01 to 99)
159	Groups	222	Groups	3-digit codes (01.1 to 99.0)
292	Classes	503	Classes	4-digit codes (01.11 to 99.00)

So far as implementation of the Regulation is concerned, Member States must use the classification in an unabridged form, but they have the option of using a different coding system and of adding further levels of disaggregation. The Commission and a committee of representatives of Member States are charged with the responsibility for monitoring the implementation of the Regulation, making minor amendments (for example to reflect technological change) and liaising with international organisations concerned with classifications of economic activities. The experience gained in Member States made it clear that a certain number of minor changes were desirable and the Commission has, with the approval of the Management Committee, issued Commission Regulation (EEC) No 761/93.

Any level of a classification of economic activities can generally be described in terms of the output of its characteristic goods or services. It is, however, always necessary to have regard to the description of the activity as, in some instances, it is the process or the raw materials used, rather than the product, by which the classification is defined. As a tool in the practical everyday statistical work, the CPA can be helpful in delineating the characteristic products of the individual activities.

In drawing up the structure of NACE Rev. 1 the distinction between market and non-market activities was not a criterion, even though this had been the case in NACE 1970. Although there are some classes in NACE Rev. 1 which are normally non-market, there are several other ones which define activities that are usually carried out both market and non-market.

Definitions of activities and classification of units

An activity classification system is dependent on both the adoption of satisfactory descriptions of the respective activities and of the statistical units to which these

activities are attributed. An activity is said to take place when resources such as equipment, labour,

manufacturing techniques, information networks or products are combined, leading to the creation of specific goods or services. An activity is characterised by an input of products (goods or services), a production process and an output of products.

In practice the majority of units carry on activities of a mixed character. The identification of a "principal activity" is necessary to allocate a unit to a particular NACE Rev. 1 heading. The "principal activity" is identified by the "top-down" method as the activity which contributes most to the total value added of the entity under consideration. The principal activity so identified does not necessarily account for 50% or more of the entity's total value added. A "secondary activity" is any other activity of the entity that produces goods or services.

Principal and secondary activities are generally carried out with the support of a number of ancillary activities, such as accounting, transportation, storage, purchasing, sales promotion, repair and maintenance, etc. Thus, ancillary activities are those that exist solely to support the main productive activities of an entity by providing non-durable goods or services for the use of that entity.

For more information on classification methods such as the top-down method and details of the definition of ancillary units see: The explanatory notes of NACE Rev. 1

MIGS

The objective of MIGS (Main Industrial Groupings) is to provide an activity breakdown of industry (Sections C to E inclusive) which is an intermediate level between the Sections and the Sub-sections. The need for an intermediate level comes from the fact that the three Sections provide only a limited amount of detail and in all EU Member States manufacturing dominates to a large extent. The 17 Sub-sections belonging to these 3 Sections on the other hand are too numerous and also too different in size to make it possible to explain succinctly the development of industry over time. After numerous technical discussions over many years a final definition for the MIGS was adopted by the Commission on 26 March 2001.

There are 5 MIGS, which, despite the reference in three cases to "goods" in fact regroup all of the activities without exception in Sections C to E. These are:

- intermediate goods;
- capital goods;
- consumer durables;
- non-durable consumer goods;
- energy.

These groupings are based on the 3-digit level of NACE Rev. 1, not the 4-digit level as used in a previous

version. However, there is no connection with the 2-digit level as the majority of Divisions belong to at least two MIGS. It should be noted that the MIGS are not comparable in size, in particular the consumer durables heading is smaller than the others.

The implementation of this Regulation on the MIGS was due to be completed by July 2001. Some countries use similar but different groupings than the MIGS. This latter situation in particular creates a number of difficulties. From a practical viewpoint it is a potential source of errors and renders impossible the checking of consistency between national and EU publications. It also causes problems for users if the economic messages differ slightly from one classification to another. In some Member States national classifications similar to the MIGS will continue to coexist with the MIGS, at least temporarily. Gradually, the MIGS should replace these classifications.

5.2.3 Product classifications

Product classifications are designed to categorise products (goods and services) that have common characteristics. They provide the basis for preparing statistics of the price, production, distribution, consumption, external trade and transport of such products. The revised world-wide activity classification - ISIC Rev.3 - has its counterpart product classification in the Central Product Classification (CPC). For transportable goods, the building blocks of CPC are the elementary categories of the "Harmonised Commodity Description and Coding System"(HS). The European version of the CPC is the Classification of Products by Activity (CPA)

CPA is a product classification whose elements are related to activities as defined by NACE Rev. 1. Each product - whether it be a transportable or a non-transportable good or a service - is assigned to one and only one NACE Rev. 1 activity. The linkage to activities as defined by NACE Rev. 1 gives CPA a structure parallel to that of NACE Rev. 1 at all levels distinguished by NACE Rev. 1. However, the detailed linkage between products and activities could only be established to a certain degree. It should be noted that there are cases where products could be assigned to activities only at a higher level than the Class level (for example textile yarn and fabrics) and where the classification is based on certain conventions (for example waste and scrap).

In order that CPA may serve as a "central" product classification, all other product classifications designed for special survey purposes have to be related to CPA in strictly defined ways. This is, for example, already the case for the Prodcom list, CN and CC. In general, product classifications which are more aggregated than CPA consist of precise aggregations of CPA subcategories and classifications which are more detailed than CPA consist of subdivisions which are wholly

contained within CPA subcategories. The same rules apply for national versions of CPA.

The CPA was originally derived from a provisional CPC and resulted in CPA 1993. The revision of HS 1996 was taken as an opportunity to produce a slightly corrected version, the CPA 1996.

CPA is a classification system with six hierarchical levels and one intermediate level. As CPA is aligned to the structure of NACE Rev. 1 the first four levels and the intermediate level are similar in structure to the NACE Rev. 1 levels.

Level	Number of headings
First level consisting of headings identified by an alphabetical code (sections)	17
Intermediate level consisting of headings identified by a two-character alphabetical code (subsections)	31
Second level consisting of headings identified by a two-digit numerical code (divisions)	60
Third level consisting of headings identified by a three-digit numerical code (groups)	220
Fourth level consisting of headings identified by a four-digit numerical code (classes)	492
Fifth level consisting of headings identified by a five-digit numerical code (categories)	946
Sixth level consisting of headings identified by a six-digit numerical code (subcategories)	2303

CC

The CC has been developed on the basis of the CPC. The CC is designed to serve different purposes such as statistics on construction activities, construction reports, building and housing censuses, price statistics on construction work and national accounts. In addition CC is to be used for the definition of constructions which will be needed for the provision of information on specific variables concerning short-term indicators. The classification is a 4-level hierarchical system.

Level	Number of headings
First level with a 1 digit code (section)	2
Second level with a 2 digit code (division)	6
Third level with a 3 digit code (groups)	20
Fourth level with a 4 digit code (class)	46

The principal breakdown, at the Section level is between civil engineering and buildings. Below this level the CC

differentiates primarily according to the technical design which results from the special use of the structure and, in particular for buildings, according to the main use.

It should be noted that, unlike CPA and NACE, there is no legal basis for the CC. However, like CPA and NACE, the CC contains many introductory remarks that provide definitions and classification guidelines, essential for a clear and coherent implementation of the classification.

For more information on construction classifications see: CC, Eurostat, 14/03/1997

5.2.4 Use in business registers

Every statistical unit, must be associated with variables which define its activities. These concern principal, secondary and auxiliary activities. The SBR-R foresees that the principal activity should be recorded for enterprises and local units at the 4-digit level of NACE Rev. 1.

For enterprises the SBR-R also foresees that any secondary activities should be recorded at the 4-digit level. It qualifies this provision on secondary activities by limiting this to significant secondary activities and defining this as those activities of an enterprise that represent over 10% of the enterprise's total activity in terms of gross value added at factor cost or over 5% of national activity of that type. A second qualification is added that this requirement to register secondary activities is limited only to enterprises that are subject to surveys. In the recommendations manual for business registers this second qualification is interpreted as meaning those enterprises subject to the annual SBS surveys. Recording of secondary activities for local units is optional according to the SBR-R. The recommendations manual for business registers proposes that this information be recorded for local units if local KAUs are not explicitly recorded.

To enable statistical analyses to reallocate the cost of ancillary activities to the activities for the benefit of which they are pursued, the SBR-R requires a field to specify whether or not a local unit carries out an ancillary activity of the enterprise on which it depends.

The recommendations manual for business registers foresees other additional codes that can usefully be applied to distinguish, for example, continuous activity from seasonal activity or, within NACE Rev. 1 Groups engaged in the manufacture of industrial equipment, to indicate units which are classified under these headings because they actually manufacture it, as opposed to those which only carry out repairs or installation.

5.2.5 Use in short-term business statistics

The STS-R makes reference to two classifications, namely NACE Rev. 1 and the CC, as well as providing a legal basis for the development of the MIGS. Without reference to a classification as such a distinction is made along geographical lines between domestic and non-domestic territorial areas.

NACE Rev. 1

NACE Rev. 1 is used to i) determine the scope of each of the Annexes ii) restrict this scope for specified variables iii) determine the scope of certain pilot studies and iv) specify the level of activity detail at which all indicators need to be provided.

It should be noted that the STS-R requires different levels of activity detail depending on i) the indicator ii) the activities covered and iii) the reporting country.

In general the STS-R follows the hierarchical nature of NACE Rev. 1. The one main exception to this is in Annex C where the STS-R lays down the following aggregations of Classes:

- sum of Classes 52.41, 52.42 and 52.43;
- sum of Classes 52.44, 52.45 and 52.46;
- sum of Classes 52.47 and 52.48;

the following aggregations of Classes and Groups:

- sum of Class 52.11 and Group 52.2;
- sum of Class 52.12 and Groups 52.3 to 52.6;

and the following aggregations of Groups:

- sum of Groups 52.1 to 52.6.

The impact of the 2002 revision of NACE on STS is expected to be very small. There are no changes at the Division level within the scope of the STS-R and the changes at a more detailed level will have no impact on the definition of the MIGS.

See also sub-chapter 6.3 for information on the activity coverage of the STS-R and sub-chapter 16.5 for a summary of the activity coverage of each indicator.

CPA

Although the STS-R makes no direct reference to the CPA, in practice it is important for STS as some of the main indices such as production and prices are often compiled from data collected for products. Furthermore the CPA is the central classification to which is related the CC which is expressly referred to in the STS-R.

CC

The CC is used in Annex B to i) split the production and new orders variables into two parts, one each for building and civil engineering ii) determine the scope of the construction costs and building permits variables iii) specify the level of detail at which building permits variables should be compiled.

Territorial coverage

Territorial coverage is an important aspect of the STS-R. Several of the indicators, such as turnover, new orders and output prices, have to be subdivided between domestic and non-domestic. This distinction is extremely useful for analytical purposes as it provides valuable information on the short-term development of distinct markets, especially close to turning points. The definition of the word "domestic" is laid down in the STS-R as the territorial area of the [reporting] Member State. Annex 1 of Commission Regulation (EC) No 588/2001 of 26 March 2001 regarding the definition of variables states that "this definition may be revised in the future in order to take specific account of European and/or monetary integration in line with other relevant Regulations".

There is also a great interest in considering the EU and the euro-zone as markets and hence it has been proposed to extend this classification by separating the non-domestic market into "extra-EU" and "intra-EU" and to split the latter again between euro-zone and non-euro-zone. At the present time it is quite difficult to consider the EU or the euro-zone as the domestic market but this view may change. If the definitions do change, this will clearly create a break in time series that will need to be addressed.

Given the interest in this kind of breakdown, although not required by the STS-R, it is recommended that national statistical authorities consider adopting sub-indicators related to the breakdown of the non-domestic market.

6. Business populations

Populations can be determined with respect to statistical units and classifications. The Handbook on design and implementation of business surveys identifies four levels of populations:

A	Ideal target population
B	Intended target population
C	Frame population
D	Sample population

The population that fully meets the users requirements may be unrealistic given methodological and resource constraints and can therefore be regarded as the ideal target population. What users can expect to receive from

a statistic can be regarded as the intended target population. This may deviate from the frame population which, in the case of STS, is normally the population in the business register. The difference between the frame and the intended target population is due to imperfections in the business register which it may or may not be possible to correct for. Finally the sample population consists of the units drawn from the frame population (the statistical business register) about which data are requested (see point 7.3.1 concerning sampling). Throughout this manual references to the target population concern the intended target population.

For more information on population of business statistics see: Handbook on design and implementation of business surveys, Eurostat, edited by Ad Willeboordse.

6.1 Registers at the heart of business statistics - the frame population

Business registers are of fundamental importance to the compilation of economic statistics. Their coverage, comprehensiveness and quality vary considerably between Member States.

A statistical business register can be considered as a system transforming data from administrative sources into data suitable for statistical use⁵. In other words, business registers are designed to function as a bridge between administrative and statistical units.

Studies have shown that registers are used in various ways, amongst which the following.

1. Detection and construction of statistical units - statistical units are often constructed units which do not always correspond to legal or administrative units. Administrative sources provide information on the creation and existence of legal units, including the address details.
2. As tools for the preparation and coordination of surveys - this includes;
 - providing a directory from which mailing lists can be assembled for the dispatch of questionnaires;
 - providing a (frame) population of the business community for which efficient sampling schemes can be designed and panels monitored;
 - providing the basis for grossing-up results from sample surveys to produce (frame or target) population estimates;
 - helping to prevent duplications and omissions in the collection of information on enterprises;
 - improving congruence between the results of different surveys;

⁵ An SBR does not rely entirely on administrative sources as they normally also incorporate statistical information from special register proving surveys and from the regular schedule of statistical surveys.

- helping to improve coverage or reveal inaccuracies;
- allowing coordination between the departments conducting surveys, if a register is central and covers units from all activities;
- keeping the statistical burden on small enterprises under control by keeping track of the questions put to units in surveys and avoiding selection of the same units more than once.

1. As a tool for mobilising administrative sources - the demand for economic information is constantly increasing, which can lead to statistical surveys imposing increased burdens on enterprises. Statistical surveys should avoid asking for information which the enterprise has already supplied to other authorities. One problem often encountered is that administrative units do not always correspond to statistical units. By correlating administrative units and statistical units, the register offers a partial solution to these difficulties.

The main users of business register data are business surveys and enterprise panels (groups of sampled units that are surveyed over several time points). Taking into account that business statistics should both observe and describe a country's total productive (market) activity, the output of the ideal business register can be defined as an up to date file of all statistical units active within the country's territory and generating value added, as well as their relevant statistical and administrative attributes.

Council Regulation on business registers for statistical purposes

The SBR-R was adopted on 21 July 1993. It represents a compromise between what is desirable and what can reasonably be achieved within a five-year period. The initial position as regards registers differed greatly from one country to another. Some countries have had to develop their register, and in some cases even create one, whereas others needed only to adapt their instrument to meet the business statistics harmonisation requirements. The SBR-R required Member States to set up business registers for the enterprise and local unit as statistical units and also for the legal unit. The SBR-R also states which characteristics relating to these units should be recorded, and how often these characteristics should be updated.

The SBR-R requires national statistical authorities to set up, for statistical purposes one or more harmonised registers. It should be noted that there is no obligation to have one register only, nor that the register(s) should be maintained centrally nor that the register(s) should be maintained by one single authority. Finally there is no obligation to use the register(s) for any particular function in the conduct of any particular survey.

Timetable for implementation of the SBR-R

National statistical authorities were required to register enterprises before 1 January 1996 and to register legal

and local units before 1 January 1997. There is no formal transition period foreseen in the registers Regulation, however there is the possibility for the Commission to grant a derogation after consulting the SPC following the Committee procedure. This has been done in the case of Germany to allow for a staggered implementation through until January 2000.

6.2 Contents, coverage and maintenance of the SBR

Contents

The conceptual model of the information for registers implicitly defined by the SBR-R is very simple. It explicitly comprises three units: the enterprise, the local unit and the legal unit, and three relationships between entities. The list of information which needs to be recorded depends on the intended uses of the register. National business registers developed for statistical purposes clearly have to identify units with certainty in order to:

- permit the collection of information about them in administrative files;
- provide a sampling base for surveys;
- permit demographic analysis of the population of enterprises and their units.

This clarification of the functions of the register permits analysis of the "information" which it has to record in three "categories" - identification variables, stratification variables and demographic variables - which are directly linked to the explicit units of the model. Other variables associated with the relationship between units relate indirectly to the implicit units.

	Legal unit	Enterprise	Local unit
Identification variables			
Identity number	(X)	X	X
+ external identity numbers	X		(X)
State (situation)	X	X	X
Name	X	(X)	(X)
Legal form	(X)		
Address		(X)	X
Stratification variables			
Activity		X	X
Size		X	X
Institutional sector		X	
Demographic variables			
Date of creation	X	X	X
Date of incorporation in the register	X	X	X
Date of elimination from the register	X	X	X
Relationship variables	(1)	(2)	(3)
Date of creation of the relationship	X	X	X
Date of termination of the relationship	X	X	X
Description	X	X	X

- (1) Control links between legal units
- (2) Links between the enterprise and the legal unit(s) on which it is dependent
- (3) Links between the enterprise and its dependent local units

For a full explanation of the contents of business registers see: Council Regulation No 2186/93 on Community coordination in drawing up business registers for statistical purposes
Methodological recommendations on business registers, Eurostat

Coverage

Ideally, every unit engaging in the production of goods or services, in other words contributing towards Gross Domestic Product, should be included in registers for statistical purposes. However, on cost grounds it is recommended that certain units be excluded because of their small economic size.

Activity coverage

Harmonised national registers are essentially business registers. Thus, they take no account of institutional units which make an ancillary contribution to gross domestic product without constituting "an organisational unit producing goods or services". Households producing goods or services for their own use are therefore not covered by the registers, since they are not regarded as enterprises. It does not matter whether that production is consumed by the household itself (for example production from domestic gardens) or even invested in the household (for example DIY activity). This exclusion applies in particular to households producing "domestic services" within the meaning of Section P of NACE Rev. 1, in other words households as employers of domestic staff (daily help, nanny, cook, gardener, chauffeur, etc.).

Registers also exclude natural persons owning property (land, buildings for residential use or other buildings) whether they use that property for their own needs (or those of their household) or even rent them to third parties. This means that a natural person will not be included in the registers on account of his/her activities in Group 70.2 of NACE Rev. 1.

Since they do not contribute towards the Gross Domestic Product of the countries in which they are located, international organisations, embassies and foreign government representations whose activity falls within Section Q (extra-territorial activity) of NACE Rev. 1 are not included in the national register of the country where they are located. On the other hand, embassies and government representations may be included in the national registers of the countries which they represent. Their activity then falls within Section L of NACE Rev. 1.

The SBR-R does not require Member States to include in their registers units engaged only in activities covered by

Sections A, B and L of NACE Rev. 1, however their inclusion may be recommended.

Size coverage

All enterprises must be included in the register, whatever their size. Entities which do not constitute an "organisational unit producing goods or services" should not be regarded as enterprises and need not be included in the registers. It will be deemed impossible to create an enterprise unit without a combination of factors of production involving a minimum amount of labour. Thus, an enterprise must provide employment, be it voluntary or paid. The convention is that an enterprise must employ at least one person half-time. The only exception to this rule concerns holding companies, which must be recorded as enterprises since they control more than one enterprise, even if they do not declare any employment. Apart from this exception, if a unit below this employment threshold is entered in the register for practical reasons, it will have to be eliminated from the total for enterprises and their local units.

Maintenance

Member States are increasingly using administrative sources of information to compile and maintain statistical registers. Some are integrating the information held in the two types of register with the aim of producing a multi-purpose register. The VAT register is one source of administrative information used by some statistical institutes while registers maintained by other taxation authorities, social security administrations and chambers of commerce are others. Where these exchanges of information occur, the shape and content of the administrative and statistical registers can influence each other. The maintenance of statistical registers should not be regarded as an isolated operation but as part of a coordinated approach towards the joint development of statistical and administrative registers, although care must always be taken that the interests of a unit will not be harmed by the transfer to other authorities of information it has given to the statistical institute.

Some countries carry out proving exercises on sections of their registers from time to time, by adding questions to an existing survey or conducting *ad hoc* surveys. For example, in the first case, information might be sought from enterprises - at intervals of say five years in conjunction with an annual survey - about the addresses of all their local units. An example of an *ad hoc* survey is one addressed to retailers asking them to tick which of a list of retailing activities (the list based on NACE) they consider to be their principal activity. Countries have found that surveys of this kind sometimes throw up quite marked gaps and inaccuracies in their registers. Verification surveys therefore need to be included as part of the normal maintenance of the register.

The SBR-R requires the register to be kept up-to-date. In general information obtained from administrative sources or annual surveys should be updated annually. Other

information should be updated every 4 years. Specifically the following shall be updated annually:

For all units
Entries to the registers
Removals from the register
The name and address of the legal units
The legal form of the legal units

These descriptive details should be updated for units subject to surveys if they are included in annual surveys
Identity number(s) of the legal unit(s) legally responsible for the enterprise
Activity code of the enterprise at the 4-digit (Class) level of NACE Rev. 1
Secondary activities of the enterprise, if any, at NACE Rev. 1 4-digit level
Size of the enterprise: measured by the number of persons employed
Net turnover of the enterprise from sale of goods and services

6.3 Target population for short-term statistics

The STS-R only explicitly mentions the activity as a characteristic of a unit by which the population should be limited and hence it can be assumed that the objective is to compile indicators that are representative of all units within the activity coverage.

It is however relatively common practice for national statistical authorities to compile indices from sources that are limited by characteristics other than activity. The most common is the size of the unit and this is discussed after the explanation of the activity limits of the STS target population. Other characteristics that are used at the time of writing are the geographical location (some regions may be excluded) and the public/private nature of the unit or even of the client (for example certain indices on civil engineering may only look at public works).

Activity

The activity coverage of the STS-R is specified in Article 2 paragraph 1 as being Sections C to K and M to O. Paragraph 2 of the same article defines the population in a general sense as the statistical units classified to these activities but qualifies this by noting that the precise population is determined by the statistical units specified in each Annex. The four Annexes each specify their scope in terms of activity in the first paragraph (a) and determine the population by specifying the appropriate unit in the second paragraph (b). The following table summarises the activity coverage, and statistical unit (and hence the population) of the STS-R and its Annexes.

	Activity scope	Statistical unit
STS-R	Sections C to K, M to O	Not specified beyond the list of units in the SU-R
Annex A	Sections C to E	KAU
Annex B	Section F	KAU
Annex C	Division 52	Enterprise
Annex D	Divisions 50 and 51 and Sections H to K and M to O	Enterprise

Special notes concerning activity coverage:

- although the scope of Annex D includes Divisions 70, 71, 73 and Sections J, M, N and O no indicators are foreseen for these activities and they only figure in the list of pilot studies. In particular an inconsistency between the SBR-R and STS-R can be noted in that the former excludes Group 70.2 from its coverage while the latter includes it, albeit with no compulsory indicators.
- Group 63.3 and Class 74.15 are treated in pilot studies in Annex D although the Divisions to which they belong are covered to some extent by the compulsory variables in this Annex.

The precise activity coverage varies from indicator to indicator - see sub-chapter 16.5 for details.

Size

At the time of writing it is clear that certain EU aggregates, such as the number of employees, are built partly from national data which is representative of units of all sizes and partly from national data which is only representative of larger units; the highest known threshold currently employed limits the indicator to units with 500 employees or more but most thresholds are around 10 or 20 persons employed or employees. As it is known that not only levels but also growth rates depend on the size of the respondents, the representativeness of the target population of such aggregates is questionable.

Information for smaller enterprises needs to be incorporated into these results. This may come from extending statistical surveys, using administrative data or estimation of an indicator that is representative for units of all sizes. There is no general solution, but by working with various parameters (stratification, primary aggregation of individual data, clarification of bias, estimate of bias, implementation of new data collection), efforts need to be made to move towards the objective of having data representative of units of all sizes - the target population.

It should be noted that some national statistical authorities have difficulty to cover units of all size

because of national legal restrictions, often introduced in order to reduce the statistical burden on smaller units.

6.4 Particularities of certain activities

The contents of the business register and the general coverage of STS have already been outlined. Throughout, the activities have been presented as a neutral list and clearly this is not the case.

Many activities have certain characteristics which make them special. These particularities may lead to units in these activities being treated differently from others, not least in that the choice of indicators to assess the business cycle may vary from one to another. The rest of this sub-chapter looks briefly at some of the consequences of these particularities for the compilation of STS.

6.4.1 Mining and manufacturing

Sections C and D are amongst the most detailed parts of the NACE Rev. 1 classification. See also point 16.5.2 concerning cases of marginal importance.

Activities that work to order

Some of these activities work to orders and some do not and the STS-R limits the scope of the orders variables accordingly (for more details see sub-chapter 9.4 on new orders).

Long production cycles

Some of these activities involve the production (or construction) of goods over very long periods of time. Groups 35.1 (building and repairing of ships and boats) and 35.3 (manufacture of aircraft and spacecraft) are examples and involve the manufacture of items that are often large and in many cases may be unique and hence are difficult to price consistently over time, especially as there may not be a regular series of transactions to be observed⁶. The STS-R excludes these Groups from the coverage of the output prices. Group 33.3 (manufacture of industrial process control equipment) faces similar problems, but is complicated further by the fact that the activity concerned is in fact a service (design and assembly) and only part of it clearly involves a manufacturing process⁷.

Regulation

Some Groups' output is regulated to such an extent that the prices (and hence all value data as well) do not reflect market conditions. Examples are Groups 12.0 and 23.3 (mining and processing of nuclear ores and fuels) and Group 29.6 (manufacture of weapons and ammunition). The STS-R also excludes these Groups from the coverage of the output prices.

⁶ Despite their exclusion from the scope of the STS-R price indices are compiled for these Groups and published by Eurostat.

⁷ The design services could be likened to NACE Group 74.2.

Mining and manufacturing activities that produce services not goods

Group 22.1 concerns publishing and is also excluded from the coverage of output prices in the STS-R⁸. This activity is a non-industrial⁹ service and hence it can be difficult to define a product whose price can be observed precisely over time.

The difficulty of establishing prices for certain activities appear to be harder than reflected in the STS-R. Contrary to the requirements of the STS-R, no price indices are available (from Eurostat at least at the time of writing) for Group 11.2 for any EU Member State. Furthermore Groups 17.3 and 22.3 have data available only for a few countries. These three Groups, unlike Group 22.1, cover activities that are industrial services. The poor data availability of these Groups almost certainly reflects the compilation methods for price indices where prices are typically collected for a physical good; for these Groups the products are generally services or a mixture of services and goods. This is also the case for Groups 27.5, 28.4 and 28.5 which involve industrial services although data availability here is generally better than the three previously mentioned Groups.

Recovered secondary raw materials

Groups 37.1 and 37.2 concern recycling and these activities are clearly manufacturing as they involve the transformation of a material (normally waste) into a raw material. Again, data availability for output prices is very poor, and again this reflects the use of prices for individual products to compile the indices by activity. In the case of these two activities the difficulty stems from separating goods that have been recovered from waste from those that have been manufactured from new materials.

6.4.2 Production and distribution of electricity, gas and water

These activities in Section E are normally characterised by very large units, many of which have been or still are in the public sector. The activities are quite different in that some concern the production or refinement of a good in a way that is very similar to a manufacturing activity while the others concern distribution by way of networks and pipelines which is effectively the transportation of the good to the user. Although treated in the STS-R as industrial activities there are a number of exceptions made for some or all of these activities.

In particular the supply of steam and hot water (Group 40.3) and water supply (Division 41) are not included in

⁸ Despite its exclusion from the scope of the STS-R price indices are compiled for this Group and published by Eurostat.

⁹ Non-industrial is used here to indicate a service that does not involve the transformation of a physical good into another. The terminology is not very precise.

the scope of the production index in the STS-R on the grounds that these activities have a very stable production and hence do not have a business cycle in the same sense as the other industrial activities; their inclusion would hinder an analysis of the business cycle.

All of these activities in Section E are excluded from the coverage of the turnover index in the STS-R. The main reason is the difficulty of collecting this information compared to the availability of alternative variables which for many of these activities is generally good based on specialised statistics collecting output measures in quantities. The collection of value measures is difficult because it requires knowledge of the quantity and the price; in these activities the latter tends to vary according to different categories of clients and the former is rarely measured at the level of the individual client on a monthly basis (in fact it is often collected only annually). The combination of good data availability from other sources and the high cost of trying to collect value data on a monthly basis hence makes it unwise to collect turnover measures for these activities in the context of the STS-R.

6.4.3 Construction

Construction as defined by NACE Rev. 1 covers a very broad range of activities. Some of the activities are very similar to service activities, such as renting of construction or demolition equipment. Demolition and wrecking involves transforming goods by destroying them rather than producing a physical good although the by-product of this destruction may be recycled into an intermediate good. Other activities such as building and civil engineering clearly involve the production of a final good.

NACE Rev. 1 does not permit the distinction between building and civil engineering although this distinction is found in the classification by type of construction. Construction is also characterised by a large degree of subcontracting and by enterprises carrying out many different activities.

Administrative procedures

Construction is typified by the presence of administrative features that do not exist in many other areas. For statistical purposes these can provide a wealth of information of use for the compilation of STS. The lack of harmonisation in these administrative features does however have inevitable consequences when it comes to compiling harmonised EU statistics.

The customary sequence linking orders, production/construction and turnover gains another element - building permits - providing information prior to orders, and this information can provide an alternative leading indicator that is not commonly available in other activities.

Building permits refer mainly to the activity of construction of buildings. Other administrative data on government activities related to civil engineering works may be available from invitations to tender and award procedures. Systematic use of sources other than permits for the compilation of leading indicators is not yet a regular practice among national statistical authorities.

Structure and conduct

Construction is characterised by a strong presence of small enterprises. It also makes extensive use of subcontracting. Production processes involve medium to long completion times (similar to Groups 35.1 and 35.3 mentioned above) and hence care needs to be taken in order to correctly account for turnover and change in stocks of finished goods and work in progress.

The pattern of work - different types of buildings and civil engineering structures, as well as repair and maintenance work - varies from period to period and from year to year. Each building and civil engineering work is, in some way, unique, mainly because of variations in ground or site conditions. This, allied with the long production process, can make evaluation of costs and/or prices quite hard. The activity can be regarded as unique in the complexity and variability of its products

6.4.4 Distribution and services

In some service activities, notably retail trade, enterprises or local units are not very stable; an enterprise is created, starts its activity and, sometimes, even just a few months later, closes or changes its activity. Hence, bearing in mind the aim of STS to be consistent over time, it can be particularly difficult to collect the appropriate information for these activities. In general most of the EU Member States have less experience compiling STS for services than for industry. Cooperation between Member States and the exchange of experience will be particularly important in determining best practice in this area.

Section C

Collection to processing - general

7. National Data collection

7.1 Subsidiarity, national coverage

The statistical law lays down in very general terms the manner in which subsidiarity applies to all Community statistics. It states that the national authorities at national level and the Community authority at Community level shall be responsible for the production of Community statistics in compliance with the principle of subsidiarity. To guarantee comparability of results, Community statistics shall be produced on the basis of uniform standards and, in specific, duly justified cases, of harmonised methods.

In terms of data collection this has two important consequences. The first is that it is the Member States who are responsible for the production of the national data - this has always been the situation in STS. Secondly uniform, Community standards such as definitions and classification shall be used by all Member States where they exist, but that the methods of data collection shall not be restricted without due cause.

The STS-R acknowledges the principle of subsidiarity in paragraph (9) of the preamble.

In practice, in most Member States data collection and the compilation of the majority of the STS is done by the statistical office (national or regional) of the country concerned, although it is not uncommon to find the responsibility for the production of STS for certain indicators or certain activities (such as construction) in other parts of the public administration. In exceptional cases (part of) the production of the STS is done by some trade associations. Where this is done attention should be paid to ensure that the basic principles laid down in the statistical law, such as impartiality, are respected.

Regardless of the responsibility for the production of STS, article 15 of the STS-R requires one national authority to coordinate i) the transmission of variables ii) and the measurement of quality and the transmission of relevant information. In practice this role is normally played by the statistical office. In order to achieve this coordination all Member States have been asked to nominate coordination offices for the implementation of the STS-R and Eurostat believes that this has improved communication significantly. The list of coordination

officers at the time of writing are included in sub-chapter 16.1.

7.2 Combination of sources

The production of STS is normally based on the compilation of data from numerous sources. In chapters 9 to 12 the sources commonly used for each indicator are presented. The following table provides an overview of the main types of sources that are used for collecting information from the business community:

Status	Statistical	Administrative	Mixed
Official or non-official	Compulsory or voluntary Regular or ad hoc Census or sample Postal, electronic or interview	Company register VAT declarations Social security declarations Tax declarations Permits Membership records	Statistical business register Estimations (synthesis)

STS may be produced by combining data from several of these types of sources and possibly also using data not originating within the business community; for example data from household surveys may be used for labour input variables. The reasons for choosing different sources relate to the respondent burden and cost, the requirements of users and also the validity of the possible source in terms of coverage and conceptual definitions.

The administrative or statistical information may be collected by many different parts of the public administration at national or regional levels. A prerequisite for comparable Community statistics is that they all apply common standards to the greatest possible extent. The degree to which comparable data are produced depends on the extent to which the national statistical authorities are able or willing to ensure that these standards are respected.

7.3 Sources

7.3.1 Statistical surveys

All national statistical authorities have statistical questionnaires used for compiling STS however their content and style vary enormously, partly because of cultural differences and partly because of the greater or lesser importance attached to respondent burden and cost. These influences as well as others determine what information the national statistical authorities think that they can observe. In most of the national statistical authorities the surveys are rarely restricted to one standard questionnaire or form but tend to be a

combination of forms, differentiated by major characteristics, namely:

- the activity, size, legal form and the type of variables asked on the form (output, prices, employment, other specialised variables);
- occasionally an extra characteristic, the geographical location of the unit, may influence the contents of a survey.

When considering statistical surveys size thresholds play an important point in determining the target population and, where relevant, the sample population (for information on sampling of products for production and price indices see sub-chapters 10.1, 10.3, 11.1 and 11.2).

Size thresholds to determine the target population - cut-offs

Traditionally many statistical business surveys have been conducted for units above a certain size threshold. The reasons for this are diverse and include the desire to limit the size of the survey, to limit the response burden and also to take account of the problems of maintaining registers for smaller units. This practice leads to problems of comparability between the results for different activities where the importance of small units varies from one activity to another. In a similar manner, when making international comparisons cut-off thresholds distort comparisons between Member States. See also sub-chapter 6.3.

Sampling of statistical units

Statistical surveys may be exhaustive surveys (census) or sample surveys. The use of sampling is a method for easing the statistical burden; it may be used in conjunction with a cut-off or not. The STS-R does not specify any sample size - the decision is left to the judgement of each national statistical authority and may vary between surveys on different subject matters and for different activities.

The construction of a sample is normally based on (an extract from) the statistical business register. If several separate surveys are used to compile STS, the use of a common register is recommended. It is also recommended that this should be the same register as used for other surveys with which STS may be confronted (see sub-chapter 8.4) or to which they may be benchmarked.

Samples are generally not drawn with the same frequency as statistical surveys used for STS and hence the sample is in some respects like a panel and needs to be updated. It may be necessary to have a reserve pool of units that can be used as needed, particularly in activities like retail trade where the number of enterprises start and ceasing operations in any period is proportionately large. Samples should be periodically reviewed.

When drawing the sample attention should be paid to the results to be compiled, the resources available and the accuracy and timeliness required. Some indicators are required at particularly fine levels of activity details and others only at a more aggregated level. The sample should be constructed in order to provide representative results at the level of detail to be disseminated¹⁰. If necessary the sample may need to be representative for certain size classes, regions or other sub-populations.

Samples may be simple in design, taking a number or proportion of units from the frame population, or they may be stratified samples where a variable number or proportion of units are taken from different non-overlapping sub-populations, each sub-population being a strata determined by one or more characteristics appropriate for the frame population.

If more precision is the reason for stratification, it is beneficial to form strata which are more or less homogeneous groups in the sense of the target variables. Activity is commonly used as a criteria for determining the strata for statistical surveys for STS. In business surveys size is also a useful stratifying criteria as size is often highly correlated with most variables of interest. Given that the size characteristics needs to be available in the frame population for all units, the common size measures used in STS are employment and / or turnover.

It is quite common for the sample rate in the strata covering larger enterprises to be 100%. For units in strata representing smaller enterprises the proportion of units selected within each cell will normally decrease with size, with lower proportions for the smallest units, reflecting the correlation of the stratification criteria with the target variable. Where there are few units in the frame population for a cell it may be best to specify a minimum sample size and in some cases this may result in the frame population for that cell being totally enumerated (100% sample).

For construction the split between building and civil engineering may also be a feature of the sample design.

In the case of distribution it is particularly important to consider stratifying the population by turnover classes as well as by employment, in order to obtain better results because enterprises in distribution activities may have particularly high turnover per person employed.

The use of stratified sampling is important in most service activities because of the existence of very large numbers of units.

¹⁰ Disseminated is used here in a broad sense to cover not only dissemination by national authorities, but also transmission of data to Eurostat; it is possible that Eurostat disseminates data that a national statistical authority has chosen not to disseminate.

For a more detailed presentation of sampling see sub-chapters 3.3 and 3.4 of:
Handbook on design and implementation of business surveys, Eurostat, Edited by Ad Willeboordse, 1998.

Response rates

In recent years some national statistical authorities have noted that the increase in the number of statistical surveys has resulted in a decrease in response rates. Sufficient and timely response however is crucial for statistics. To try to get complete data and also to avoid problems with sample designs the response must be as high as possible. If response to a survey can be increased within the time constraints of the survey, statistics would be more accurate and timeliness can improve. See also sub-chapter 13.3 which looks at timeliness in general.

7.3.2 Administrative sources / registers / declarations

For the purposes of business statistics a limited definition of administrative sources can be used - an administrative register is a systematic collection of data which can be related to individual unit in such a way that updating is possible. According to the purpose they serve, administrative registers can be subdivided into basic registers and specialised registers.

- Basic registers are maintained as a basic source for public administration in general or for serving several different administrations. These registers typically aim to keep stock of the business population and its dynamics. An important condition is that such registers maintain identification attributes also used by other administrations. Moreover they should contain certain basic data of common interest to a number of administrations.
- Specialised registers serve one or an explicitly defined limited group of purposes only. These registers are maintained by the authority that is also the user. Basic registers often provide part of the input for these specialised registers, such as the basic attributes name, address, legal form, activity code and size class of legal and local units. Examples of specialised registers are the VAT register and the statistical business register.

Administrative sources can be used for statistical purposes in different ways: as a single source in their own right, as a frame for sampling, as a complementary source to complete existing statistics and to confront statistical data across time and space.

The use of administrative sources should be considered when producing STS in order to reduce the response burden. Using administrative data sources can bring some opportunities such as a low marginal cost, a high response rate, a high coverage of the target population (no sampling errors), edited data.

However there are potential drawbacks with administrative data. The (frame) population covered by many administrative sources is often not the same as the target population for STS. Due to the primarily administrative purpose of an administrative source the concepts, definitions and units used will often differ from statistical norms and standards. A common and important difference is in the definition of the unit which may be defined on criteria other than the legal, activity and geographical ones used for statistics. Policy changes can lead to changes in the administrative source which may influence the frame population by exempting sub-populations on the grounds of activity, legal form or size, or they may change the definitions of the information recorded or simply stop recording some information altogether. This in turn threatens the continuity of the information used for statistical purposes. Information drawn from administrative sources may be slow in becoming available compared to statistical sources if the time given to comply with the administrative requirement is long and the processing of the administrative data slow. Units making non-statistical administrative declarations may have an interest in inaccurate filing (for example for tax evasion) which can lead to bias.

Weighing the advantages and the disadvantages most national statistical authorities use administrative data for updating their business registers. Some also use these sources for STS to supplement or even replace statistical survey data, particularly in the case of small enterprises. Examples of such administrative data files are VAT declarations (containing sometimes very detailed breakdowns of current income and expenditure), social security declarations (employment and labour cost data) and building permits. The precise contents of these files varies between Member States, as do the characteristics of units required to register or make declarations.

Finally it should be noted that the access of national statistical authorities to administrative information is greater in some Member States than others.

Many pieces of European legislation in the area of statistics adopted during the 1990s mention the use of or access to administrative sources, among these are the STS-R and the Statistical Law.

For more information on the use of administrative sources see:
Proceedings of the seminar on the use of administrative sources for statistical purposes. Eurostat, Luxembourg 1997.

7.3.3 Estimations

The STS-R explicitly permits the use of statistical estimation procedures. For example these may be used for item or unit non-response, grossing of sample results to the level of the frame population or to adjust results from surveys or administrative sources where the frame population does not match sufficiently the target population or the variables collected are not sufficiently

close to those required. Hence this need for estimation may arise either because of non-response or because the statistical authority has chosen not to collect directly the information required.

Under the principle of subsidiarity, the provisions of the STS-R do not specify the methods employed to make estimations and hence these are left to the discretion of the national statistical authorities. In accordance with Article 14 the Commission can ask for methodological documentation.

The existing pressure to reduce the data collection burden adds to the need to invest in coordinating statistical surveys, administrative data and the development of estimation techniques.

Some national statistical authorities use techniques that may be classed as estimations, not because data is unavailable, but because conflicting data is available from different sources. In order to provide users with coherent data sets synthetic results may be compiled, for example labour accounts that reconcile data from the business population with data from individuals.

7.3.4 Non-official sources

There is a great variety of non-official data, much of it available from consultancies or research institutes. Trade associations and chambers of commerce also produce non-official data about the business community.

With only a few exceptions, private research institutions do not carry out regular surveys and tend to produce results from ad hoc surveys for clients.

The statistical capability of trade associations varies greatly. Some are capable of providing data within short delays on a regular basis. Their main disadvantage is that in most activities they tend to be voluntary organisations and hence they may not cover all enterprises within their field of activity and hence, unless adjusted, their statistical data may not be representative of the target population.

For a more detailed presentation of data collection see: Handbook on design and implementation of business surveys, Eurostat, Edited by Ad Willeboordse, 1998.

8. Compiling national results

The starting point for the processing stage is the information as collected from respondents. The aim is to bring these data to the level of the intended statistical output. For various reasons, the act of processing comprises more than just aggregating questionnaire items:

1. some respondents will make errors while filling in the questionnaire and data entry errors may be introduced within the national statistical authority;
2. both at micro (a) and aggregated (b) level there will inevitably show inconsistencies with related items as obtained from other surveys;
3. some respondents will only partly complete the questionnaire (item non-response);
4. not all of the information collected is a perfect representation of the output concepts envisaged;
5. a sample rather than a complete enumeration (census) may have been used;
6. there will inevitably be non-response;
7. the frame population from which the sample was taken may not be an adequate representation of the target population;
8. certain variables require more complex combination than simple aggregation, for example to be presented as an index;
9. certain variables require more complex analysis, for example seasonal and / or working day adjustment.

Processing comprises a range of operations aiming to counter some or all of these complexities. The steps can be summarised as follows:

- After data entry, errors (1) and inconsistencies (2a) are detected and corrected during editing.
- Subsequently, item non response (3) as well as gaps between questionnaire concepts and output concepts (4) are dealt with by imputation.
- The resulting set of clean and complete micro data serves as the basis for weighting (5) and reweighting (6). During this stage, also frame errors (7) may be accounted for.
- The aggregated data may then be confronted with related data from other sources and possibly integrated (2b).
- Finally, where appropriate, statistical compilations (8) and analysis (9) are carried out, resulting in a non-public data set. Prior to dissemination the one remaining stage is to identify and treat confidentiality (see sub-chapters 13.1 and 15.1).

A number of these steps are described in the following sub-chapters, particularly those that have some elements that are specific to STS.

For a more detailed presentation of data processing see chapter 5 of: Handbook on design and implementation of business surveys, Eurostat, Edited by Ad Willeboordse, 1998.

8.1 Data control/editing

Editing involves studying data from respondents with the aim of identifying (and eventually correcting) errors. Not all errors can be identified and the aim is to detect the errors that have a significant influence on the results. Rules to assist in identifying errors may flag possible

errors that require further investigation to determine where there really is an error as opposed to an unusual result or they may identify definite errors. Editing involves checks for completeness, that values are within given ranges and that values for related variables are coherent.

Data editing may take place during or after data entry.

Responses can be compared to the response of previous months. Inconsistency, or large deviations (outside of a pre-established range) indicate that a closer look is desirable. This may result in editing. In the context of timeliness the editing process may be designed to give top priority to those outliers which are most in need of editing for the sake of reliable aggregates. By solving the worst cases, large improvements can be achieved.

For a more detailed presentation of data editing see sub-chapter 5.1 of: Handbook on design and implementation of business surveys, Eurostat, Edited by Ad Willeboordse, 1998.

8.2 Treating non-response

Non-responses are one of the main problems the national statistical authorities have to face when carrying out data editing. A non-response means that all (unit non-response) or part (item non-response) of the statistical information sought for an observation unit is missing.

Even though response to statistical surveys conducted by national statistical authorities is in general a legal requirement and non-respondents are liable to various levels of penalty, non-response remains a problem in virtually all statistical surveys, not least because of the impact on timeliness.

Reasons for non-response include lack of appreciation of the importance of the statistics, lack of funds, refusal, not knowing how to respond, difficulty in finding the items required by the data collector in time for the survey or the non-existence of the unit. Although some non-response is systematic (occurring repeatedly over a long period) such that enforcement measures have to be taken, others are sporadic but nevertheless require action.

Although eliminating non-response is a desirable goal and national statistical authorities should take the necessary steps to reduce it, there are no definitive values for the level of non-response considered acceptable. For example, a non-response rate of 1% or 2% seems acceptable, but national statistical authorities often have to cope with values of the order of 20-30% or even higher.

There are many ways of trying to encourage response including reminders to the non-responding units by various media (post, fax, telephone or e-mail) before resorting to the enforcement measures laid down in national legislation. Another approach is to offer

statistical units rewards for their collaboration, thus motivating them to take part. It is recommended to use a selective respondent follow-up strategy whereby effort is focused on units which have a significant weight.

The existence of non-response means that certain measures have to be taken to reduce its effects on the results. Several methods of estimating for non-response and preventing bias in the results exist. These methods are varied and none stands out as being superior in all circumstances. The choice of method depends on the circumstances and the parameters they are to be estimated. For example, in a non-inflationary context it may be appropriate to estimate non-responses for prices on the basis of the previous month's price, the average price for the stratum or the price used in the equivalent month of the previous year, but these will not always be acceptable.

General treatment of non-responses in STS

In the case of item non-response the missing elements are usually imputed. In the case of unit non-response imputation or correction of the weights of the respondents in the sample are the usual methods.

Methods of imputing non-responses

As mentioned above the choice of a particular imputation method depends on the possible constraints on assigning an imputation value which most reliably reflects the value sought. Imputing non-responses consists of the allocation of plausible response values in order to obtain data for all elements of a sample.

Mean value imputation

This method consists of giving the non-response the mean value of the responses. It may be applied to the whole of the sample or, in the case of a stratified sample, to a specific stratum. The effect of this mean value method is to reduce the variance and standard deviations of the observations, which are far more centred to the mean.

Hot deck

Hot deck means giving a non-respondent a value(s) chosen from amongst the respondents values, whether or not this is selected at random. The respondent unit is called the donor, and all of its response values are allocated to the imputed unit. This method is particularly useful in that it gives the values for non-respondents some consistency as they are obtained directly from respondents. This can also be used for the whole sample or at the level of each stratum.

Cold deck

This method is similar to the last one, but differs in that the values obtained from the "donor" are taken from a source external to the statistical survey, such as administrative data or previous surveys.

Nearest neighbour matching / Distance function matching

This is another hot-deck procedure, consisting of giving the non-respondent the same value as the respondent regarded as being the most similar.

Regression

This method is based on the relationship between variables. The information provided by respondents is used to establish a regression relationship with the variable to be imputed or other available variables.

Imputation of historic data

Imputation based on historic data is used frequently and involves allocating values obtained in previous periods. The major advantage of this method is that it enables plausible values to be attributed to non-respondents. The allocation of historic data may include the use of update coefficients to make the imputation more consistent. For example, the previous response may be adjusted by a growth rate corresponding to that observed for respondents common to the two periods. This method is frequently used where variables are presented in the form of indices. This method cannot be applied to units which have been selected but have yet to send in their first response. Where a unit is known to exhibit a certain characteristic on a regular basis (for example the payment of an annual bonus in a particular month for wages and salaries), it may be necessary to override the computed estimate to ensure this knowledge is used in the calculation.

Multiple imputation

Multiple imputation means imputing different values for a single non-respondent. The estimate is then calculated on the basis of one or more sets of values to be imputed. This method is rarely used.

Member State practices

The table below shows the methods used for treating non-response for the industrial turnover index.

Country	Year	
DK	2000	Data for non-respondents are estimated by using the previous month's data for the unit and the monthly movement of the series in general to provide a figure for the month.
D	2000	A small amount of non-response is treated using results for previous months.
IRL	1995	Data for non-respondents are estimated by using the previous month's data for the unit and the monthly movement of the series in general to provide a figure for the month. No manual adjustments are made for outliers.
I	2000	Data for non-respondents are estimated by using the previous month's data for the unit and the monthly movement of the series in general to provide a figure for the month.
L	2000	Estimations are carried out using recent data for the missing unit and the movement of other similar units in the population. Outlier amendments are only made if it is known that the unit has provided incorrect data.
P	2000	Non-response is imputed using the average for the cell. In special cases imputation may be done using the answer of the same unit from the same period of the previous year. If non-response is due to closure or temporary suspension of activity, no imputation is made.
S	2000	Non-respondents are estimated. No details available on the method used.
UK	1999	Non-respondents are estimated based on responses from similar units.

For a more detailed presentation of treating non-response see sub-chapter 5.2 of:
Handbook on design and implementation of business surveys, Eurostat, Edited by Ad Willeboordse, 1998.

8.3 Weighting samples / grossing up

If a level is required, a grossed(-up) value needs to be calculated for the frame population. Grossing will use returned or imputed data to calculate a value representative of all units. In its simplest form it may be a factor based on the sampling fraction (or the factor using returned data) for each cell in a stratified sample. More sophisticated methods are often employed which use information on auxiliary variables both in the sample and the frame population. One area which needs careful treatment is the identification and handling of outlier values. It is possible that in some cells a returned value for one respondent may be very different from others in the cell. For example this may be due to the payment of a very large bonus, a special payment or some unusual circumstances. If the grossing factor is large and the unit included, the overall estimate will be substantial and unrepresentative since it will be driven by one extreme

value. In these cases, the outlier unit should be given a lower weight which means it represents itself only or a more appropriate weight should be calculated by statistical techniques. The identification of outliers needs some care. Possible methods are:

- units showing substantial changes between periods (for example a factor greater than 3 or less than a third);
- as above but use gates based on per head or per hour measures;
- units whose absolute values per head, or per hour lie above or below certain thresholds;
- units having a particularly high impact on the aggregate. Where this is above a certain level, the unit may be treated as an outlier.

For a more detailed presentation of weighting and reweighting see sub-chapter 5.3 of: Handbook on design and implementation of business surveys, Eurostat, Edited by Ad Willeboordse, 1998.

8.4 Confrontation

In the three preceding sub-chapters the references to micro data, the sample population and the frame population have treated statistical surveys as more or less isolated activities. In reality the collection and processing of data from different surveys may be done separately or collectively, depending on the survey management decisions in each national statistical system. Regardless of which approach is adopted the results generated after the editing and weighting stages can be considered as a self-contained data set and at the same time a part of a wider arrangement of business statistics, both nationally and internationally. For this reason it is important that all surveys fit conceptually within a common general framework, based on harmonised concepts. Nevertheless, even where concepts of variables and classifications are standardised to a large degree, confrontation of data drawn from different surveys will reveal discrepancies and inconsistencies.

Causes of differences

There are two major categories of difference:

- conceptual differences, referring to the use and definition of variables, units and classifications;
- operational differences, referring to the observation of concepts, in other words to methods of collection and processing.

The second of these categories may lead to inconsistencies, for example due to different dates of extracting data from a common frame population.

External consistency checks (confrontation with other data sources), first at the aggregated level and where necessary also at the micro level may help to flag possible errors. The applicability of this type of checks depends

heavily on the degree of coordination of concepts used among the sources compared.

It needs to be recognised that when comparing two different surveys the sampling errors associated with each will mean that exact congruence will not be achieved. The difference gates which are set to trigger detailed investigation should take into account these measures of accuracy. When undertaking comparisons with administrative data, allowances may need to be made for differences in concepts.

8.5 Compiling indices

This sub-chapter does not deal with the subject of how each index is compiled as this is dealt with on a case by case basis in chapters 9 to 12. Attention here is focused on a number of general aspects of index compilation that are common to nearly all indexes foreseen in the STS-R. Before turning to these it should be noted that the STS-R does not always require national statistical authorities to provide indices. In fact it is only for the production and prices (or costs) indicators that the provision of an index is obligatory and only for building permits that absolute numbers are required; for all other indicators either an index or absolute figures may be provided to Eurostat.

8.5.1 Base years and base year changes

Indices in STS are expressed with reference to a base value and this base value is representative for a base year (see terminology box below). For a monthly series the base value is the monthly average during the base year and for a quarterly series the base value is the quarterly average during the base year. By convention the index value of 100 is assigned to the base value.

General criteria for suitable base years are that they should be a "normal" or "average" year, which has not shown very strong special influences. However, so that international data comparison and aggregation of national indices are not made more difficult through different nationally specified base years, the STS-R has specified that base years should be updated every 5 years and that the base years should be those ending in a "0" or a "5".

The STS-R requires that rebasing should take place within three years from the end of the base year. In other words rebasing to the new base year of 2000 will need to be done by the end of 2003 at the latest. There is room for interpretation whether this deadline means that the indices that are compiled in January 2004 (which in the case of monthly data may refer to October or November 2003) must be based on 2000 or whether it is the first delivery of data for the first reference period in 2004 (January or Q1 2004) that needs to be in the new base year.

The Handbook on price and volume measures in national accounts notes that a simple change in the base year

should not affect the rates of change in the values of an index. It recommends that indices at each activity level (of NACE) should be rebased independently rather than recalculating indices for higher activity levels based on weighting the rebased indices at lower levels. The result of this independent rebasing is non-additivity between the levels.

Terminology box

Note that in the domain of STS the term base year has traditionally been used to describe the year with respect to which the value of all other reference periods are compared. In a series of index numbers it is the year that takes the value 100. In contrast, the Handbook on price and volume measures in national accounts gives the following definition: the base year is the year of which the current price values are used to weigh the price and volume measures derived at the elementary level of aggregation. In STS there is no direct equivalence to the base year as used in national accounts as each different weighting procedure would be referred to in a specific manner - see also the terminology box in point 8.5.2.

8.5.2 Weights for activity aggregation of indices

As explained in chapters 10 and 11 indices such as production and prices may be compiled from product data. In these cases it is common to aggregate the indices for products (or product groups) to the most detailed level of the activity classification (for example the 4-digit level of NACE Rev. 1). From this most detailed level of activity the activity aggregation of these indices is the same as for the indices of the other indicators. Activity aggregation combines indices at the most detailed level of activity available using weights to produce indices at successively higher and higher levels of the activity classification. The one exception to this general practice is the calculation of MIGS which are compiled directly from the 3-digit level of NACE Rev. 1.

Each index requires its own specific weights based on a relevant indicator. The following table indicates for each indicator which variable is used for weighting. It should be noted that some national statistical authorities use other weights.

Index	Used weight
Production	Value added at factor costs
Turnover	Turnover
Domestic turnover	Domestic turnover
Non-domestic turnover	Non-domestic turnover
New orders	Turnover
Domestic new orders	Domestic turnover
Non-domestic new orders	Non-domestic turnover
Number of persons employed	Number of persons employed
Hours worked	Number of persons employed
Wages and salaries	Wages and salaries
Output prices ¹¹	Turnover

¹¹ For construction costs and output prices the domestic turnover may be used.

Index	Used weight
Domestic output prices	Domestic turnover
Non-domestic output prices	Non-domestic turnover
Permits	Number of permits ¹²

It should be noted that for any activity at any level (except the lowest) of the activity classification, the sum of the weights of all of the activities that are 1 level lower in the activity classification and derived from that activity, must be equal to 100%. The following general formula can be applied.

$$I_g(t) = \frac{\sum_{k=1}^K w_k(0) \cdot I_k(t)}{\sum_{k=1}^K w_k(0)} \cdot 100$$

(w) is the weight, (I) is the index, (g) is the higher level activity (for example a Group) made up of (K) lower level activities (for example Classes), (0) the base year and (t) the current reference period.

If for some reason an index is not available for one of the lower level activities (one of the k in the set K in the expression above), the weight of that activity should be distributed proportionately amongst the other activities that also contribute to the same activity one level higher in the activity classification (g in the example above). For example, if there is no index for Class 15.43, the weight of Class 15.43 should be distributed between Classes 15.41 and 15.42, not simply by assigning half of the weight to each of these two Classes, but by dividing the weight of Class 15.43 according to the relative weights of Classes 15.41 and 15.42. The index for Group 15.4 is then compiled from the adjusted weights of Classes 15.41 and 15.42.

Why revise weights?

Weights are revised because the structure of the economy changes over the course of time. For example it is clear that the weight of activities related to information communication technologies has increased in recent times in the EU as a whole, and in some Member States in particular. The relative share of some other activities by definition have decreased. If weights were not revised, the contribution to higher level aggregates of activities growing in relative terms would be understated and the contribution of activities declining in weight would be overstated. The STS-R requires that weights are updated at least every five years and implies that this should be coordinated with changes in the base years (see

¹² The use of the number of permits as the weight for permits indices is not optimal and the use of an alternative (a size measure of the work authorised by permits or turnover) is being considered.

terminology box below). The STS-R leaves open the possibility of updating weights more frequently.

The change of weights can be carried out only when reliable annual data for the year under consideration are available and hence changes to weights (and related changes to base years) happen retrospectively.

When weights are updated there is a break in the series compiled under the previous system of weights and the series compiled under the new system. These series need to be spliced in order to maintain a coherent time series. In the standard case of a rebasing every five years, the indices relative to a new weighting system have to be calculated retrospectively for several years, so that the point where the two series are spliced is between the two base years. For example when the new base year 1995 was introduced, the index with the new system of weights should have been calculated back to January 1993. As a result the indices for the reference periods from 1988 to 1992 have 1990 weights, from 1993 to 1997 have 1995 weights and so on. It is unknown to what extent this practice is actually followed.

Terminology box

Note that in the domain of STS weights have traditionally been adjusted at the time of transition to a new base year, although this is not always the case. As indicated above it is quite common for a long time series of an index to have been compiled running over several consecutive years in which several sets of weights (specific to a different year normally five years apart) have been used to compile parts of the time series. The whole series will however have been compiled relative to one particular base year (set to 100). It would be common practice to refer to each of these different sets of weights by their year, for example 1990 weights or 1995 weights. In STS there is no established collective term for the collection of different reference years for the weights that may be used in a single series. In contrast, the Handbook on price and volume measures in national accounts refers to these as the base years.

8.5.3 Length of time series

Long time series are often requested by users in many types of statistics but this is particularly important for STS, for several reasons. To carry out statistical analysis such as seasonal adjustment it is generally considered necessary to have observations for a minimum of 5 years. The same is true for the correction of working days, insofar as regressions are used. Moreover, the use of time series (raw or adjusted) is delicate or even impossible if the series are too short. This concerns both the econometric aspects (stability and quality tests of the forecast are very relative on short series) and the direct use of the series for economic analysis, for example, in the search for turning points it is important to be able to have data available for several complete cycles.

The STS-R lays down no provision on sending long series and only requires that data are sent from a particular starting period, generally January or first quarter 1998. Changes in weights require previous series to be spliced but there is no requirement foreseen in the STS-R for the reconstructed time series to be transmitted

to Eurostat. See also data revisions in sub-chapters 13.4 and 15.5 and compiling EU indices in sub-chapter 14.2.

8.5.4 Treating register changes

In STS the development of a variable is often measured by grossing-up the variable for the sample population for the reference period to the frame population and expressing it relative to the grossed-up value for the sample population for a previous period. The frame population is normally defined on the basis of the activity classification in the SBR. In the real world the population varies over time as new units are set up and others cease activities for one reason or another; units may be taken over, merged, hived off, or split up, they may expand or contract or change their activity(ies). Ideally these changes are reflected in the SBR and can therefore potentially affect the grossed-up values of the variables and hence the development in the variables between two periods. Are all changes reflected in the development and should they be? What are the alternatives for the statistical treatment of these changes? The rest of this point concerns value and volume statistics; changes in the goods observed in price statistics are not covered - see sub-chapters 10.3 and 11.2 specific to price and cost indices.

The treatment of changes in the real world population depends partly on the purpose of the short-term statistics in question.

Purpose of the statistics - which changes to reflect?

It should be borne in mind that different sets of statistics may have different purposes and that the purposes affect the statistical process. Statistics on a given sector often have to describe all the activities of all the enterprises in the sector, including any secondary activities. Branch statistics aim to describe a single activity based on KAUs with as many of the enterprises' secondary activities as possible separated into their own KAUs. The difference is illustrated in the following example.

Assuming that many wholesale enterprises also operate in transport activities, if there is a tendency to hive-off these operations into separate enterprises (which leads to changes in the register), total turnover in the wholesaling sector, including turnover on secondary activities, will show a downward development, while the corresponding development in the transport sector will be upward. These developments describe the wholesaling and transport sectors from a meso-economic viewpoint. However, the figures say nothing about the development in the wholesaling branch, even though the wholesalers themselves would probably be more interested in this than in the downward development shown by the sector based approach. In this example, the treatment of the changes depends on the type of statistics produced and their purpose.

Register changes

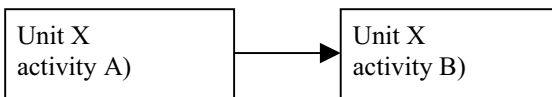
A population does not consist of exactly the same units in different reference periods. The population may be defined on the basis of a number of criteria and for STS the main one is the activity classification. There are a number of reasons why a population does not always consist of the same units. First, a unit may change its activity and thus end up in a different (sub)population. A second reason is simply births and deaths of units. Finally, a population may change because units can change their structure through take-overs, mergers, hive-offs or split-ups. All these changes lead to changes in the register.

However, changes in the register are not always the result of actual changes in units. Errors in the register may have been corrected, and units may have been combined or divided in the register to increase the descriptive capability of the statistics. When dealing with changes, therefore, we must distinguish between actual and apparent changes. What is the difference?

Actual change is a change in the SBR resulting from a recent event in the real world. For example one unit splits in two along activity lines and this change is introduced into the SBR.

Apparent change is a change in the SBR resulting either i) from an event in the (distant) past or from the correction of an error, for example because the unit has always been classified incorrectly or ii) from an administrative change in the register.

Example 1: a unit that has always been recorded in the register with an incorrect NACE code.

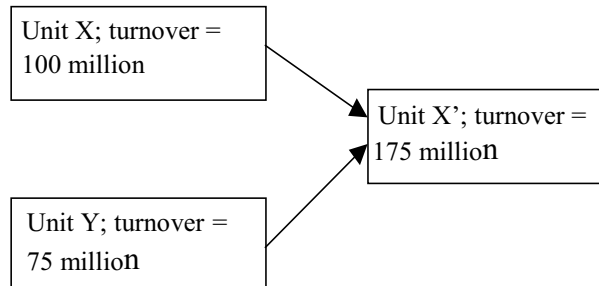


Example 2: two legal units have been recorded separately in the SBR. In the course of time the economic links between the two become increasingly strong and a point comes when it is decided that, for statistical purposes, it would be better in future to describe them as a single unit. The activities of one legal unit are exclusively geared to the other so that there is no longer any question of market orientation. The two units are combined in the SBR to form a single statistical unit, even though in reality there are still two closely linked legal units. The change in the SBR from two units to one does not, therefore reflect a change in the real world.

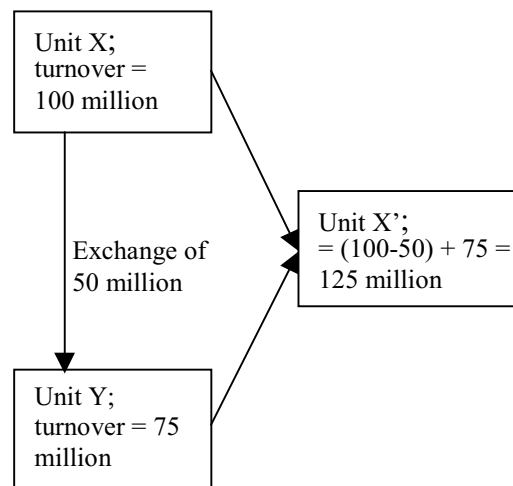
There is another aspect of changes that must be considered and that is the comparability of the unit(s) before and after the change. Frequently this can be assessed only after responses have been received from the units or by contacting them directly. In the following

two examples the concept of comparability is further illustrated.

Example 3. Unit X decides to take over unit Y. There was no economic link between the two before the take-over. Apart from the number of units, the situation before and after the change is comparable.



Example 4. Two units X and Y are closely linked through extensive exchange of goods. Unit X decides to take over unit Y.



Because the exchange of goods (50 million) has now become internal supplies in unit X', the turnover figure of unit X' has become smaller than the sum of the turnover of units X and Y. In this case, therefore, the situations before and after the change are not the same as witnessed by the total turnover figures that are not comparable before and after. Nothing has changed however in the combined value added (gross) output of the units.

Treating changes

Obviously there are several ways in which changes in the register could be treated. We will discuss the most important ones and describe a number of advantages and disadvantages.

Grossing-up of independent samples

This method involves grossing-up the sample to the frame population for each reference period independently of other periods. The index is calculated as the break between two levels. The register is followed in both periods and thus all changes are regarded as real (actual) and comparable. The disadvantage of this method is that the indices are contaminated to the extent that some changes are in fact apparent, non-comparable changes and it is therefore difficult to obtain a picture of economic reality. The advantage is that the method is straightforward and does not require any extra work.

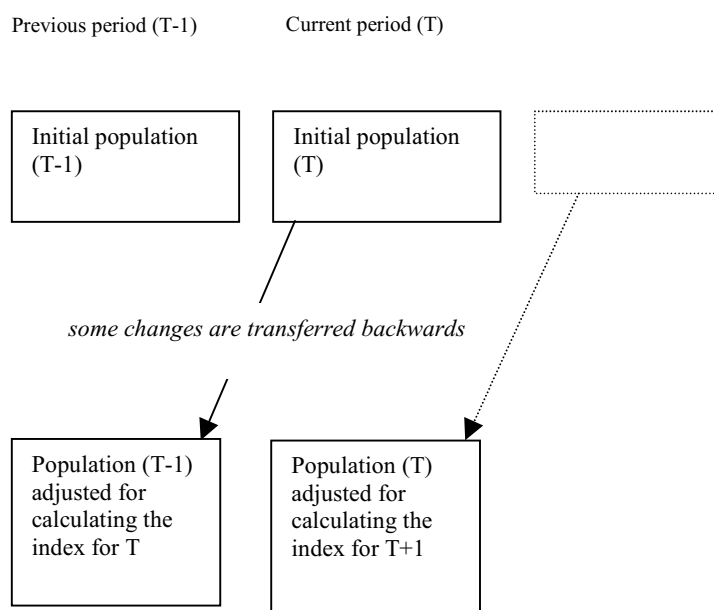
Index calculation on the basis of a panel

This method uses a panel of units that can be found in the same activity in both periods. The index is calculated by dividing the turnover of the panel in one period by the turnover in the other. Such a panel would tend not to include units that had been involved in a change, irrespective of whether it was actual or apparent. Even actual changes would not affect the index, therefore. Thus in this case all changes are regarded as apparent. However, the index calculated in this manner does not relate to the development in an activity as a whole but rather to the development in the "average" active unit. In order to obtain a better description of the development in the activity, the development emerging from the panel may be multiplied by a population development. The latter is simply the development in the number of units in the population or in other words: the number of units in the population in the current period divided by the number of units in the population in the previous period.

Instead, the units in the panel may also in each period be grossed-up to the population for the period in question. However, the development determined in this way may still be different from the development in the activity as a whole because the influence of start-ups and bankruptcies would be cancelled out. These units would tend to differ from the average in the initial and final phases respectively. However, since they are not included in the panel, they are regarded and estimated as behaving like an average unit during the period in which they were active. In activities with highly dynamic populations, this can lead to seriously biased results. Again, the advantage of this method is its relative simplicity.

Overlapping system whereby certain changes are transferred to the previous period

As with the first method, the sample is grossed-up to the frame population for each period. However, before this is done, the results of a number of changes are transferred back from the current period to the previous one so that the situations are comparable. This yields an "overlapping system" when calculating the index. The level for a given period is calculated twice - once for the index for the same period and once when calculating the index for the following period after the transfers have been made.



How are the different changes dealt with?

Actual comparable change

In the case of actual comparable changes, nothing is adjusted: the calculations are simply based on the register in both periods.

Actual non-comparable change

In the case of actual changes that are not comparable, there are two possibilities. If there is enough information to permit a good estimate to be made for the previous period that is comparable with the current period, the situation in the current period can be transferred. If this information is lacking, the unit is simply omitted when calculating the current index. Obviously, the choice between these two possibilities partly depends on the size of the unit and the scale of the change. It is almost always necessary to make an estimate for major units or changes.

All these points apply to units in the sample. In the case of units that are not in the sample, it is difficult to determine whether or not the situation is comparable. For these units the calculations in both periods are simply based on the register because an actual change is involved.

Reusing example 4 these points can be illustrated. The two units X and Y were closely linked through an extensive exchange of goods. Unit X decided to take over unit Y. In the previous period, units X and Y had been included in the sample with turnover of 100 million and 75 million respectively. In the current period, unit X' is observed with a turnover of 132 million (125 million plus 5% increase in turnover). If it is clear that the total combined turnover of the two units, excluding exchange

of goods, had been only 125 million in the previous period, unit X' can be transferred to the previous period with a turnover of 125 million and units X and Y can be removed from the previous period. If the value of exchange of goods is not known, making it impossible to make an estimate that is comparable with the situation in the current period, units X and Y are omitted from the previous period and unit X' from the current period.

Apparent comparable change

In the case of apparent comparable changes, the situation in the current period is transferred to the previous period. If data are not available for the previous period, this can be backwards calculated from the value for the current period by adjusting for the development in the sub population between the two periods. In the case of split-ups, the old unit can also be divided on the basis of the relationship between the new units. Obviously, units not included in the sample are simply transferred back to the population. No estimate is necessary because of the grossing-up.

Reusing example 1 this can be illustrated. A unit that has always been recorded in the SBR with the wrong activity code is corrected and is transferred to the sub-population for activity B and comes for the first time into the population to be described in the current period. Unit X records turnover of 110 million. If the turnover for the previous period is known, this turnover can be included under activity B in the previous period. If this turnover in the previous period is not known, the development for the sub-population can be determined, for example at 5% growth, and the turnover for unit X can be included under activity B in the previous period with a turnover of $(110 \text{ million} * 100/105) = 104.8 \text{ million}$.

Apparent non-comparable changes

In the case of apparent non-comparable changes, units in the sample are treated in the same way as in the case of actual non-comparable changes. If possible or required, these can be transferred back with an estimate, if necessary. Otherwise the unit is not included in the calculation of the current index. Units not included in the sample are simply transferred back to the population of the previous period.

The advantage of this method is that the indices show the development in the activity as accurately as possible. The distorting effects of apparent changes are eliminated as far as possible. The disadvantage is that it is laborious. Transferring units takes a good deal of time. This disadvantage can be offset somewhat by regarding all changes to small units (below an arbitrary threshold of 10 employees for example) as actual. These changes would not as a rule have much effect at the level at which indices are disseminated.

The overlapping system is possible only if developments are published (using indices or growth rates). If levels are published instead, it is not possible to transfer certain

changes in this way without breaking up the level already published for the previous period.

Irrespective of the method used, it is true to say that the further treatment moves the population away from the SBR in a given period because changes have been transferred, the greater the chance that STS developments will not correspond to annual developments that can subsequently be calculated on the basis of the SBS. Obviously, this also depends on the way in which various changes are dealt with in the SBS.

Conclusion

Using an SBR as the frame for sampling and grossing-up means that changes to the register must be dealt with in a consistent fashion. It is important to distinguish between the actual and the apparent and between the comparable and the non-comparable. In the case of indices that have to give a reliable picture of the economic reality of an activity, the effects of some changes can be corrected using the overlapping method.

The panel method is very suited to calculate the development in the "average" active unit. This is a very fast method, since no regard has to be paid to register changes. The method based on independent samples, in which all changes are reflected as actual and comparable is also very easy, but can lead to a loss of quality since the index can be polluted by administrative apparent changes.

8.6 Decomposition¹³

The most common justification for the use of decomposition is that it makes it possible to determine sub-annual growth rates that make sense and it also provides a means to establish long-term developments uninfluenced by seasonal and sub-annual factors.

The normal breakdown of a time series makes it possible to identify the trend, the cycle, the seasonal variation and the erratic fluctuations.

- The trend is a slow variation over several years, generally associated with the structural causes of the phenomenon involved.
- The cycle is an almost periodic fluctuation characterised by alternating periods of higher and lower rates of change (which may in fact be expansion and contraction); in the majority of cases, it is connected to the fluctuations of the overall economic activity. As regards decomposition of the series, the trend and cycle are often associated (they are not differentiated);
- The seasonal variation represents the effect of the climatic and institutional events which recur more or

¹³ For readability purposes, this sub-chapter refers to monthly data. However, in general, the methods explained can be easily transposed to provide quarterly data.

less regularly each year (for example, summer holidays or Christmas sales);

- The erratic fluctuations represent unforeseeable movements linked to any type of events. In general, they are of an unpredictable, stable nature but can in certain cases present extreme values. These extreme or aberrant values can have various origins. They may be economic, such as strikes or the impact of a harsh winter on electricity production. These may be referred to as the irregular component of the series.

The adjustment of working days takes account of the calendar nature of a given month in order to adjust the index. Seasonal adjustment endeavours, more generally, to take into account the similarities in the same month (for example December) for all the years in the series. It should be noted that these two methods overlap. Indeed, the similarities from month to month that the seasonal adjustment seeks to adjust can often be connected to calendar effects. For example, public holidays may, systematically be concentrated in a particular month which reduces the number of working days. The adjustment for working days would then in theory increase indices such as the index of production. At the same time, if a seasonal adjustment is made to the basic series, in many Member States values for the month of May will be increased since it is generally low owing to calendar effects. Why should these two methods then be used together? If the seasonal variation adjustment is more extensive (as it is not limited to the aspects of working days) it is not possible to take account of genuine, specific elements relating to the calendar. Continuing the example using May, if May 1st (a widespread public holiday) falls on a Sunday, the number of working days is not lower than a normal month. In this case the number of working days is higher than that for most Mays when the public holidays fall during the week and the unadjusted index would, all other things being equal, also be higher. It is possible to take account of the specific structure of each month by adjusting for working days whereas this would not be possible through seasonal adjustment. The STS-R requires first of all an adjustment for working days, and then adjustment for seasonal variations.

Adjustment of working days

The adjustment of working days is thus intended to adjust calendar effects, whatever their nature. The number of working days for a given month depends on the timing of certain public holidays (Easter can fall in March or in April depending on the year), the possible overlap of certain public holidays and non-working days (May 1st can fall on Sunday), the fact that a year is a leap year or not and other reasons.

STS are often strongly affected by calendar issues. For example, there may be close connections between industrial production and the hours worked or between retail sales and the number of trading days. In order to ensure comparability of these statistics across time -

usually months - the data need to be working-day adjusted.

The STS-R requires the transmission of working-day adjusted figures for four indicators:

- industrial production
- production in construction
- retail trade turnover
- retail trade deflator of sales

Some Member States do not publish working-day adjusted figures at national level. Nevertheless, working-day adjustments are often included in seasonal adjustments. The STS-R does not require, but allows Member States to transmit seasonally adjusted data. Only if data are not transmitted in this form, then Eurostat may perform the seasonal adjustment itself.

Two issues determine the outcome of working-day adjustment:

- the adjustment method, in other words proportional or regression methods;
- the number of working days, in other words how many working days (or more generally how much working time) there are in a month reference period.

Methods

All methods have the common assumption that part of the production/turnover varies with or even proportional to the number of working days.

However, in the proportional method, the factor is applied to the whole production whereas regression methods are usually only applied to the part of production that varies with the number of working days.

Therefore, for regression the time series is split into two parts:

- one part on which regression is applied;
- a part without regression.

This separation requires an additional effort. However it would be advisable to opt for the more elaborate methods of regression through modelling and analysis of chronological series, since they produce results that are closer to economic reality. It has in fact been demonstrated that the simple proportional method overestimated the number of working days in the series, since business decision-makers may make plans that compensate for a low number of working days for example by using overtime or temporary workers. These methods are also preferable because they make it possible to take account of less intuitive aspects such as the exact breakdown of a month into the different days of the week. It seems in fact that not only the number of

working days, but also the number of Mondays, Tuesdays, etc. influence the variables.

The concept of working or trading days is dependent on specific national characteristics, in particular where calendars and holidays differ from one Member State to another. The concept of working days also depends on the indicator under consideration. A month with five weekends is a priori a poor month in terms of working days for the production index. On the other hand, it is a good month in terms of trading days for the retail trade index, given that Saturday is an important day for sales.

For certain indicators, this adjustment is not made and it may be worth a reflection on the use of this adjustment for more indicators than foreseen in the STS-R.

Proportional method

The general approach for the proportional method is $z_t = C_t y_t$ for the periods $t = 1, \dots, n$, where y_t is the original series, z_t the working day adjusted series and C_t is the working-day correction coefficient. The calculation of the correction factor C_t may differ from approach to approach. Ideally, the correction should not change the levels of the series, in other words, the working day adjustment should not affect the annual average of a series. Following an additive model, the sum of the correction coefficients should be close to 0 for a year as the structure of a year in terms of working days does not vary greatly except for leap years.

Regression methods

Regression methods generally works as follows:

$$y_t = \beta_{it} x_{it} + \dots + \beta_{mt} x_{mt} + \varepsilon_t \quad \text{for the periods } t = 1, \dots, n,$$

where the β_{it} are the pre-defined regressors for effect i and period t and ε_t are the error terms of the regression equation (the errors are in effect the time series without the working day component).

Depending on the structure of the error term ε_t several types of regression are distinguished. Very popular are

RegARIMA models with a stochastic ARIMA model ε_t . The two programs TRAMO/SEATS and X12-ARIMA use this approach.^{X11}

Furthermore, the number and definition of the regressors β_{it} need to be determined. In general, two types of weekday regressors are possible:

- distinguishing only between weekdays and weekends (1 regressor)
- distinguishing between all days of the week (6 regressor)¹⁴

In addition to these weekday regressors, further regressors for the Easter effect¹⁵, length-of-month-correction, leap year or other calendar effects are possible. One major problem of regression methods is that the error term ε must be identified.

Current situation

The determination of the number of working-days in a reference period is a country-specific or even a region-specific task. Even though this aspect is crucial for the calculation, the collection and presentation of working-day calendars is too complex to include in surveys. In December 1998 a survey was made of national statistical authorities to look at the methods used and this was repeated in February 2001. In general, the working-day adjustment methods show a rather heterogeneous situation across the EU.

¹⁴ Alternatively it can be considered that there are 2 or 7 regressors if Sunday is distinguished.

¹⁵ The Easter effect is due to the fact that Easter can fall in either March or April and can not therefore be systematically assigned to one month.

Overview of working-day adjustment methods in the EU

	WD Adjusted Indicators	Method used
B	P, R, C, NO, HW, E OS (Future)	1 or 2-regression (P, C), 6 or 7-regression (R), 2 or 7-regression (rest) with TRAMO-SEATS (Excel macro (R, P, C)).
DK	No transmission of any working-day adjusted data	No method is used yet and no information about the software is available; probably regression method in the future.
D	P, C, R, OS	Regression (P, C) with Modified X11; 8-regression (R, OS) with BV4 (R, OS); probably "8+"-regression (R, OS) in the future and X12 ARIMA (P, C).
EL	P, R	Proportional (P, R) but no information about the software is available.
E	P	"1+"-regression but no information about the software is available.
F	P, R, C, OS	6-regression with TRAMO/SEATS (P, C) and specific program developed in France (R, OS).
IRL	P, R	Proportional (P, R) with specific internal CSO program.
I	P, C	Proportional (P) but no information about the software is available.
L	P, R, C	Proportional (P, C, R) but no information about the software is available.
NL	P, C R (Future)	Proportional (P, C) but no information about the software is available; probably 8-regression (P), 7-regression (R), regression (C) in the future with X12 ARIMA.
A	P, C, R (Future)	Regression with X11 ARIMA-88 (SAS).
P	P, R	Proportional (P, R) but no information about the software is available.
FIN	P, R, C, OS	Proportional (P), regression (R, C, OS) with X11 ARIMA (SAS); probably regression (P) in the future.
S	P, R, OS C (future)	Proportional (P, OS), regression (R, OS) but no information about the software is available.
UK	P, R	7-regression is chosen, 6 for the working days and one for the Easter effect, using X11 ARIMA.

P: industrial production

R: turnover in retail trade

C: production in construction

NO: new orders

HW: hours worked

E: employment

OS: turnover in other services

n-regression: regression with n regressors

"n+"-regression: regression with n regressors with additional ones when significant

TRAMO/SEATS: Time series Regression with ARIMA noise, Missing observations and Outliers and Signal Extraction in

ARIMA: Time Series, developed by Agustín Maravall and Victor Gomez.

X11: developed by the U.S. Bureau of the Census.

X12-ARIMA: the ad-hoc filters from X11 are enhanced by the X12-ARIMA package by regression techniques for the correction of outliers and calendar effects, and by the ARIMA technique for backward casting and forecasting and estimates of missing observations.

BV4: The "Berliner Verfahren" was originally developed by Siegfried Heiler and others at the Technische Universität Berlin and the Deutsche Institut für Wirtschaftsforschung.

Eurostat recommends the regression method and discourages the use of different methods within 1 country.

Seasonal adjustment

Seasonal adjustment, or the adjustment of seasonal variations, aims, after adjusting for calendar effects, to take account of the impact of the known seasonal factors that have been observed in the past. For example, in the case of the production index, annual summer holidays have a negative impact on industrial production. The level of this impact depends on the countries and whether or not observation units close. It also depends on the area of activity concerned. In addition, the situation is complicated as these practices/habits/traditions change over time. This changing seasonal variation is particularly hard to manage because it is difficult to identify early on whether this involves a real change or an unusual event.

To adjust seasonal variations properly, it is vital to manage the seasonal adjustment parameters in a judicious and practical manner. A good approach may be to find an ARIMA model that makes it possible to understand the series appropriately and it is also advisable to take account of possible aberrant points, the breaks in the series, the impact of the pace of the moving average used, the fact that an additive or multiplicative model is used, and so on. This management of the parameters must be implemented regularly for all chronological series since the addition of new points can change the nature of the series, and therefore the parameters used for its seasonal adjustment. [This is particularly true for the EU series which are very dynamic by nature and therefore frequently revised.]

Seasonal adjustment methods in the EU

It appears that two methods are mainly used within the EU¹⁶: TRAMO/SEATS and the methods of the “Bureau of Census”, X11 and X12 ARIMA. Some countries use both methods, according to the indicators. It seems that the program used (which is inseparable from the parameters used) has a strong impact on the series as well as the manner in which it is applied. This can be seen by diverging results compiled from the same basic data by different institutes in the same country.

One question that often returns as regards seasonal adjustment is whether or not seasonal variations should be adjusted for all indicators. For example, is it normal not to seasonally adjust the indexes of output prices? The answer is clear: before carrying out a seasonal adjustment, the seasonal nature of the series should be determined. It should be noted that it is not always the case that, if the presence of a seasonal variation is rejected by the test, the seasonal coefficients will be weak. Indeed, the seasonal variation test can be negative owing to a overly strong presence of fluctuating seasonal variations in relation to the stable seasonal variations, while both seasonal

variations are strong. In this case, strong coefficients may be achieved while at the same time the test was negative.

Certain statistical institutes only calculate the seasonal factors once a year. These factors are then applied throughout the year to all the monthly data. Another approach involves making a concurrent adjustment in other words calculating the seasonal factors each time they are received from new data. Lastly, certain countries adopt an intermediate solution by calculating the seasonal coefficients once every quarter. Although this increases the workload, it is obvious that the most recent data are much more precise. But this practice also results in slight revisions to the figures each month.

Trend-cycle

The trend is a slow variation over a long period of years, generally associated with the structural causes of the phenomenon in question. In some cases the trend shows a steady growth, in others, it may move either downwards or upwards. The cycle is a quasi periodic oscillation characterised by alternating periods of higher and lower rates of change possibly, but not always, involving expansion and contraction. In most cases it is related to fluctuations in overall economic activity.

If the irregular component of the time series is relatively important, the trend-cycle series generally offers a better series for analysis of longer-term past developments. However, this advantage is less clear when analysing very recent developments. Trend-cycle values for recent periods may be subject to greater revisions than the equivalent seasonally adjusted values and hence the latter may be more appropriate for the analysis of very recent developments. This is particularly true around turning points. Trend-cycle series may however converge to stable results more quickly than seasonally adjusted series.

For more information on this subject see:
Working-Day Adjustment Methods in the Member States -
results from the Survey in February 2001, Eurostat, 14 June
2001. Working document not published.

¹⁶ BV4 is also used.

Section D

Collection to processing - index specific

See sub-chapter 16.5 for an overview of the indicators required by the STS-R.

9. Common indicators

9.1 Employment

9.1.1 Introduction:

Name, synonyms and code numbers

The STS-R requires short-term statistics on the number of persons employed (210) for all 4 Annexes. It also foresees that this may be approximated by the number of employees (211) on a temporary basis.

Purpose of the indicator - theoretical concept

The variable persons employed is an important requirement for each of the Annexes in the STS-R; in fact it is the only variable that figures in all four Annexes.

Employment is a variable which is important in both economic and social statistics. Labour input is one of the main costs of production. Employment, in its own right, is an important short-term indicator in monitoring the economy. The proportion of the working population in employment, the type of job they do and their working patterns are social variables of interest.

The collection of short-term information on employment has a number of important uses:

- to evaluate the economic situation to help monitor the economic cycle;
- to calculate measures of productivity;
- to help calculate income from employment in national accounts.

The collection of information in all the Annexes of the STS-R gives a broad economic picture and shows the balance between services and industry.

Definition and reference period

Before considering the specific definitions there are a number of important concepts to understand.

Persons v jobs

Business surveys collect the number of persons employed in each observation unit. They are in effect measuring the number of jobs. For example consider a person, employed in a factory during the day who then works in a bar a few evenings a week. The individual will be counted as an employee in the manufacturing activity but will separately be included in the estimates for the services activities. Thus one person is being counted in two different places in the persons employed estimates demonstrating that this is a measure of jobs (though not necessarily full-time ones) rather than persons. Conversely the Labour Force Survey is a survey of individuals. It counts people and therefore provides a measure of the number of people employed. However it also collects information on second jobs and is therefore able to provide a jobs measure.

Employees v persons employed

The number of employees is defined as those persons who work for an employer and who have a contract of employment and receive compensation. The definition of persons employed is wider and, as well as covering all employees, also includes persons who are engaged in the observation unit during the reference period irrespective of whether they are paid or not.

The following groups should be included in the persons employed variable.

All paid employees, including:

- homeworkers (they should only be included if on the payroll of the unit -self-employed homeworkers who sell to the unit for example on piece rates should be excluded);
- apprentices/trainees (but should only be included if on a contract of employment);
- paid working proprietors and family members;
- persons on temporary leave (for example maternity, sickness, leave, strike, lock-outs) for a definite period;
- part time workers;
- temporary workers;
- seasonal workers.

Unpaid persons employed:

- unpaid working proprietors (owners);
- unpaid family workers.

Agency workers

The treatment of agency workers often is a cause of confusion. An agency worker is treated as an employee of the agency although the individual may be working at a different location. The observation unit should exclude from the number of persons employed workers it has hired from an agency unless it has a direct contract of employment with the worker. Persons carrying out repair and maintenance for an observation unit should be included if they are on the payroll of that unit; if they are on the payroll of another unit they should be excluded. Persons on indefinite leave should also be excluded where there is no continued receipt of wage nor assurance of return nor agreement of date of return.

Reference period

Employment should be measured at a point in time rather than an average over the reference period. It is important that a consistent point is taken in each period. Many countries choose the last day or the final week of the reference period.

9.1.2 Population

Classifications & coverage

The coverage of this indicator is limited solely by NACE Rev. 1. Across its 4 Annexes the STS-R requires a coverage of Sections C to I and Divisions 72 and 74.

Units

The STS-R requires the use of the KAU as the observation unit for this indicator under the provisions of Annexes A and B and the enterprise under the provisions of Annexes C and D.

9.1.3 Collection

How to measure - alternative methods

The STS-R allows Member States the freedom to obtain the necessary data from a number of possible sources which include compulsory surveys, administrative sources and synthetic estimation. The measurement of employment may be successfully accomplished in a number of different ways:

- in a specific business survey set up to collect employment figures;
- in a survey collecting other business variables;
- in a survey collecting other labour input variables;
- by the Labour Force Survey;
- from administrative sources;
- from a balanced system of labour accounts.

Specific business survey to measure employment

Advantages: sampling and estimation procedures may be set up to be optimal for the employment variable; data collection staff build up expertise in this variable;

response time may be quicker than for a multi-variable survey.

Disadvantages: separate surveys may be more costly to NSIs and respondents; lack of consistency with other business or labour input variables.

Survey collecting other business variables

Advantages: consistency with other output variables likely to give improved productivity measures; ability to cross check at data validation checking stage with other business variables; will identify and provide a useful diagnostic tool for measuring discontinuities due to structure changes for business variables; may be cheaper for NSIs and respondents.

Disadvantages: response time may be greater, particularly if the number of variables in the survey is large; methodology may be sub-optimal if shared with other variables.

Survey collecting other labour input variables

Advantages: provides a strong coherent basis for the wages and salaries component of a labour costs index; may be cheaper for national statistical authorities and respondents than separate surveys.

Disadvantages: response times may be greater than if employment were to be separately collected - hours worked may be difficult to provide; methodology may be sub-optimal if shared with hours worked and wages and salaries.

Labour Force Survey

In the LFS households are asked by direct interviewers to provide the appropriate information.

Advantages: covers the whole working population with the exception of communal establishments; overall employment figure likely to be more accurate; allows analyses by sex, age, hours worked, education and training and provides information on those without jobs or with more than one job.

Disadvantages: activity classification is often poor; may be inconsistent with other business variables and therefore not well suited to productivity.

Administrative sources

Advantages: may be comprehensive; no extra burden on respondents; cheap for NSIs if the raw data is of satisfactory quality.

Disadvantages: NSIs have no control over these sources; there may be timeliness or quality difficulties; may be inconsistent with other business variables.

Balanced system of labour accounts

Advantages: a comprehensive system which balances a range of input sources.

Disadvantages: system is complex and will take time to develop; the balancing makes the measurement less timely than using the results of a sample survey.

Data collection difficulties

Some elements of the definition may be difficult to measure. In particular it may be hard to obtain good information from business surveys on working proprietors and their families, on home workers and on voluntary workers. These figures could be estimated with the aid of the Labour Force Survey.

9.1.4 Compilation of the index

Methods to combine the raw data

For index compilation it is recommended to use a current weighted method.

$$I(t) = 100 \times \frac{EMP(t)}{EMP(0)}$$

EMP(t) is the value of employment at time (t)

EMP(0) is the average value of employment in the base year.

Data confrontation

Benchmarking

The best statistical practice is to benchmark the data to the latest information from the SBS. When SBS data is compiled from annual surveys they are generally more comprehensive than the surveys used for the STS. Benchmarking, whilst introducing revisions, will improve other aspects of the quality of the estimates. After the benchmark period, the estimates of changes in the level of employment derived from the short-term statistics should be linked to the benchmark levels. For example if the unbenchmark level at time (t) is EMP(t) and the benchmarked value is BEMP(t) then the benchmarked value of EMP^b(n) reference periods beyond time (t) is given by:

$$EMP^b(t+n) = BEMP(t) \times \frac{EMP(t+n)}{EMP(t)}$$

Thus the rate of change since the benchmark point is applied to the benchmarked level.

Additionally when a new benchmark becomes available it is necessary to recalibrate during the benchmark year. Suppose the initial benchmark value is BEMP(t). The next benchmark relates to the time (t+bp) and is given by

BEMP (t+bp). The points between (t) and (t+bp) need to be rescaled to the new benchmark. The number of periods between t and t+bp will normally be 4 for a quarterly series and 12 for a monthly series.

The benchmarked value EMP^b(t+n) is given by:

$$EMP^b(t+n) = \left(BEMP(t) \times \frac{EMP(t+n)}{EMP(t)} \right) + \left(BEMP(t+bp) - \left(BEMP(t) \times \frac{EMP(t+bp)}{EMP(t)} \right) \right) \times r(t)$$

where:

$$r_t = \frac{1}{bp}, r_{t+1} = \frac{2}{bp} \quad \text{etc.}$$

Comparisons with other Statistics

A number of sources of employment data have already been presented: monthly and quarterly surveys; SBS; LFS; administrative data. The routine comparison of alternative sources provides important plausibility checks. For short term and structural business statistics these can be carried out at the level of the respondent when data are being validated for structural business statistics. The aggregate results can also be compared and differences investigated. This is best undertaken initially at high levels of aggregation, for example starting at Section level and then exploring reasons for differences at lower levels and it could be considered useful to investigate and explain differences down to the Division (2-digit) level. This work might lead to changes being made to estimates in either the STS or SBS.

Care needs to be taken when making comparisons with the LFS since the classification in that survey may not be of good quality. It is recommended that where business surveys are used to produce estimates for the whole economy this work is undertaken on overall figures as a matter of routine. However classification problems may make more detailed comparisons less revealing.

Details of the compilation required

The precise description of the series to be compiled for the persons employed indicator varies between the Annexes of the STS-R as can be seen in the following table. However, the indicator is always provided gross, as either an index or as absolute figures, at least on a quarterly basis and within 3 months from the end of the reference period.

Annex	A	B	C	D
Activity	C to E	45	52	50, 51, H, I,

coverage NACE Rev. 1				72, 74
Level of activity detail	Divisions and MIGS	Division	Mixed: 52; sum of 52.1 to 52.6; 52.11+52.2, 52.12+52.3 +52.4+52.5 +52.6	Divisions
Compulsory forms	Gross	Gross	Gross	Gross
Index or absolute figures	Either	Either	Either	Either
Frequency	Quarterly	Quarterly	Quarterly	Quarterly
Deadlines	3 months	3 months	3 months	3 months

Special note on frequency

The supply of employment data is required at least on a quarterly basis. Where countries undertake monthly surveys Eurostat would like to receive the monthly data.

Special note on absolute values and indices

For the persons employed indicator there is a lot of interest from users in the absolute figures, particularly when they rise below or above important thresholds. In most Member States manufacturing employment has fallen over recent years; conversely services employment has risen and is achieving new record levels in most economies.

Special note on deadlines

In Annexes A and B the STS-R permits smaller Member States an extension to the deadline of 15 calendar days, in Annex C a similar extension of 1 month is permitted.

In the case of Annex A smaller Member States are defined as those with value added in Sections C, D and E of NACE Rev. 1 in a given base year that represents less than 3% of the value added of Sections C, D and E in the EU. It is not clear whether the criteria for the application of the extension of 15 calendar delays should be evaluated for each of the three specified Sections in turn or for their sum. Equally, in the case that the Sections are evaluated separately it is not clear whether the extension applies only to indices for branches within those Sections that meet the criteria or that the extension is only valid in the case that all three of the Sections meet the criteria.

In the case of Annex B a smaller Member State is defined as one with value added in Section F of NACE Rev. 1 in

a given base year that represents less than 3% of the value added of Section F in the EU.

In the case of Annex C a smaller Member State is defined as one with value added in Division 52 of NACE Rev. 1 in a given base year that represents less than 3% of the value added of Division 52 in the EU.

As with the deadlines themselves, the extension represents a maximum and national statistical authorities are encouraged to provide data earlier than permitted under the extension.

9.1.5 Approximation/alternative indices

The STS-R permits the persons employed indicator to be approximated by an indicator of the number of employees (see point 9.1.1 for an explanation of the difference). This approximation is permitted for a 5 year period (from July 1998) which will be extended by a further 5 years unless a decision is taken otherwise.

9.1.6 Overview of national methods

The table below shows the different sources currently employed by EU Member States. It demonstrates a wide variety of different approaches.

	Industry (excluding construction)	Construction	Retail trade	Services
B	BS			
DK	AS	ES	AS	AS
D	LI	LI	ES	ES
EL	LI	LI	LI	LI
E			ES	
F	LI	LI	LI	LI
IRL	LI			
I	LI		BS	LI
L	LI	LI		
NL	LA	LA	LA	LA
A	BS	BS	BS	AS
P	BS		BS	BS
FIN	LFS	LFS	LFS	LFS
S	ES	ES	ES	ES
UK	BS	LFS	BS	BS

ES employment survey; BS business survey; LI labour input survey; LFS Labour Force Survey; AS administrative sources; LA labour accounts

Population coverage

	Type of source	Coverage	Observation unit(s)
DK 2000	For industry and services: administrative source (ATP-scheme: Arbejdsmarkedets Tillaegspension-Labour Market Supplementary Pension)	For industry and services: Sections C, D, E, G, H, I and Divisions 72 and 74. For construction: Section F. Enterprises which only	For industry and services: administrative unit.

	Type of source	Coverage	Observation unit(s)
	Labour Market Supplementary Pension Fund). Census. For construction: statistical sample survey.	engage in construction activity abroad are excluded. Enterprises whose main activity is outside F but have a considerable activity and number of persons employed within Section F are included.	For construction: KAU.
D 2000	For industry and construction: Statistical survey. Census. For services: statistical sample surveys.	For industry: Sections C to E. For construction: Section F. For services: Sections G and H excluding Groups 51.1 and 52.7.	For industry: KAU. For construction: local unit. For services: enterprise.
EL 1998	Statistical sample survey.	All activities required by the STS-R excluding Division 37.	KAU.
E 2000	Statistical sample survey.	Division 52 excluding 52.31, 52.32, 52.5, 52.6 and 52.7. Note: whole country except for Ceuta y Melilla. Enterprises in municipalities with at least 2,000 inhabitants.	Enterprise.
F2001	Integration of various sources: census; administrative sources (UNEDIC, URSSAF); sample business survey (ACEMO).	Sections C to E (and F to O).	Individuals and enterprises or local units.
IRL 2000	Statistical survey. Census.	Sections C to E.	Local unit
I 2000 (1999 for retail trade)	For industry and other services: statistical surveys. Census. For retail trade: statistical sample surveys.	For industry and other services: Sections C to E, Divisions 50 and 51 and Sections H, I and K. For retail trade: Groups 52.1, 52.2, 52.3, 52.4 and Class 52.61. Excluding (national activity code) 52.11.5. Note: for industry and other services the population is limited to enterprises employing 500 persons or more.	For industry and other services: KAU (exceptionally the enterprise). Stores for retail trade.
L 2000	For industry and construction: statistical sample survey. For retail trade and services: administrative source. Census.	For industry: Sections C to E excluding Divisions 10 to 12, 23, 37, 41 and Group 40.3. For construction: Classes 45.21 and 45.23. The remaining Classes are covered from the 2000 base year. For retail trade: Division 52. For services: Divisions 50, 51 and 55.	For industry and construction: KAU. For retail trade and services: legal unit.
NL 2000	The data come from the labour accounts which use different sources, amongst which: Household surveys; establishment surveys; administrative records.	Sections C to K.	Mixed depending on source.
A 2002	For industry and construction: statistical sample survey. For distribution: statistical sample survey. For other services: administrative source.	For industry and construction: Sections C to F. For distribution: Section G excluding Group 52.7. For services: Divisions 55, 60, 61, 62, 63, 72 and 74.	For industry and construction: establishment ("Betrieb" as local KAU). For distribution: enterprise. For services: administrative unit.
P 2000	Statistical sample survey.	Sections C to E, G, H, I, J, K, M, N and O. Note: Continental Portugal (mainland) only.	Enterprise.
FIN 2000	Statistical sample survey - the monthly Labour Force Survey (combination of the national monthly LFS and the EU's LFS).	Sections C to I, Divisions 72 and 74. Note: household survey (LFS).	Individuals.
S 2002	Statistical sample survey.	No activities are excluded.	Local unit or establishment (local KAU).
UK 1999	Statistical sample survey. In addition data are obtained from the Iron and	Sections C to E, G to K, M to O.	Enterprise or the activities of a specified list of local units

	Type of source	Coverage	Observation unit(s)
	Steel Statistics Bureau and from the Ministry for Agriculture and Fisheries.	Note: Great Britain only.	belonging to an enterprise.

Calculations made

	Calculations made	Type of index	Method of weighting
DK 2000	Seasonally adjusted (X11) at an aggregate level.	Absolute figures.	The stratified samples are grossed up to the population based on total employment.
D 2000	For industry and construction: no seasonal or working day adjustment. For services: decomposition is done using Berlin procedure, version 4 (BV4).	For industry and construction: absolute figures. For services: indices are compiled for the number of persons employed. 1995 base year.	For industry and construction: not relevant.
EL 1998	No seasonal adjustment.	Absolute figures.	Not relevant.
E 2000	No seasonal adjustment.	Chained index. 1994 base year.	The weights are calculated from the DIRCE register.
F 2001			
IRL 2000	Seasonally adjusted using the X11 procedure.	Chain linked Laspeyres. 1985 base year.	
I 2000 (1999 for retail trade)	Seasonal adjustment is not carried out because of the short time series available.	For industry and other services: average value indices with a fixed base. 1995 base year. For retail trade: Laspeyres index. 1995 base year.	Weights for retail trade come from SBS data, the survey itself and external sources or estimates.
L 2000	For industry and construction: gross indices with a breakdown between manual and non-manual employees. Retail trade and services: gross indices.	For industry, construction, retail trade and services: Laspeyres indices. 1995 base year.	For industry, construction, retail trade and services: Employment from the SBS.
NL 2000	No seasonal adjustment.	Absolute figures.	Not relevant.
A 2002	No seasonal or working day adjustment.	For industry and construction: Laspeyres index. 1995 base year. For distribution the indices measure the persons employed as a percentage of the average monthly value of the base year. 1995 base year.	For industry and construction: not relevant. For distribution: base year employment.
P 2000	No seasonal adjustment.	Laspeyres type index. 1995 base year for industry, 2000 base year for construction, retail trade and other services.	Employment from 1995 SBS data.
FIN 2000	Quarterly and annual estimates are calculated as averages of the monthly estimates.		Weighting and grossing-up are performed together.
S 2002	No seasonal adjustment.	Absolute figures.	Not relevant.
UK 1999	Census II (X11 ARIMA) is used for seasonal adjustment. Data is available broken down simultaneously by full-time/part-time and male/female. Data are benchmarked to the annual business inquiry.	Absolute figures.	Not relevant.

Name, synonyms and code numbers

9.2 Hours worked

The STS-R requires short-term statistics on hours worked (220) under the provisions of Annexes A and B.

9.2.1 Introduction:

Purpose of the indicator - theoretical concept

The measurement of hours that people work is important when analysing a variety of economic and social phenomena. The number of hours worked is a measure of labour input which can be used to derive key indices of productivity and labour costs or labour prices. The patterns of hours worked and the changing activity or occupational breakdown give important evidence when studying lifestyles, the labour market and social changes.

In recent years there have been important changes in the jobs market. Part-time employment has become more common, there is a greater flexibility with regard to possible working patterns, which allows more women with families to work. Conversely for many managerial jobs, employees are often expected to work substantially longer than the contracted hours. A per head measure of labour input is a blunt measure as it misses these changes in the labour force over time.

Moreover the hours worked measure is one of the first to pick up turning points in the business cycle. It is therefore well placed to help decision makers. For example if there is a sudden increase in demand, a unit will normally respond firstly by offering overtime to meet the delivery date. If this situation continues and appears to be sustainable in the medium term, the unit may take on further employees. Thus the rise in hours will be seen first; the increase in employment will lag the improved production. Conversely if there is a reduction in demand leading to lower production overtime hours will be reduced; if the situation becomes more serious short-term working would be introduced or extra holidays taken. Restrictions of employment laws and the cost of redundancy mean that reductions in employment tend to be implemented only once the reduction in demand is seen to continue and thus it will again lag the lower production.

The STS-R requires hours worked to be provided only for industry (Annex A) and Construction (Annex B). Although the STS-R does not require hours worked for the retail or service sectors, it is likely that Member States will calculate this information for other demands. For example the labour cost index which is used by the ECB is shortly expected to be subject to a new European Regulation, requiring a measure of labour costs per hour.

As this Regulation will cover the service sectors, Member States will need to develop an hours worked measure for those parts of the economy to enable the denominator to be calculated.

The collection of short term information on hours worked has a number of important uses.

As an economic indicator in its own right

Hours worked can often be a good indicator of movements in the economic cycle - a unit's first response to adverse operating conditions, before it considers

reducing employment, will often be to decrease the hours worked by existing staff. The reverse procedure tends to be followed in period of increased demand.

To obtain better measures of productivity and labour costs

In recent years the concept of working time has been changing rapidly. With the introduction of flexible working and home working, combined with significant variations in working time, the per head measure is less suitable for productivity and labour cost measures. For an example if a full time person were to be replaced by two job sharers, the per head measure would fall but the per hour measure would be unaltered reflecting the status quo on labour input. ESA, therefore, recommends that total hours should be the preferred measure of labour inputs to the system and the basis on which productivity should be calculated.

National accounts

Requirements for hours information are based on ESA 95 definitions. These ask for total actual hours broken down by 31 activities.

Industrial production index

For compiling the IPI in some branches.

Definition and reference period

Before discussing methods of collection it is necessary to understand a number of concepts of hours worked and the differences between them.

Basic or Normal Hours

These hours are the hours which the employer and employee have agreed and have been imposed by contract. It may be related to a basic hourly rate for an agreed number of hours.

Overtime Hours

These are hours which have been worked above the basic hours which are required. They may be split up into paid and unpaid overtime.

Total Hours

These are all hours which have actually been worked during the period.

The ESA definition asks for total actual hours including both employees and the self-employed. The definitions within the STS are based on the ESA.

Total actual hours includes:

- basic or normal hours;

- overtime hours (hours worked in addition to basic hours - whether paid or unpaid);
- hours worked during nights, Sundays or public holidays;
- time spent on tasks such as work preparation, preparing, maintaining and cleaning tools and machines and the making out of receipts, invoices and reports;
- time spent at place of work during which no work is done owing to for example, machine stoppage, accidents or occasional lack of work for which payment is made in accordance with the employment contract;
- short periods of rest at the place of work including tea and coffee breaks;

Total actual hours excludes:

- hours which are paid but not worked such as paid annual holidays, public holidays, sick leave, or due to accidents, strikes, lock-outs or slack time;
- time spent for meal breaks;
- time spent commuting between home and place of work. However, such travel organised in employer's time is included in hours of work.

In order to provide harmonised measures of hours work there are two areas which need to be considered:

- the definition of actual hours with the inclusions and exclusions above;
- the employment measure used should be consistent with the definitions set out in the sub-chapter on employment.

9.2.2 Population

Classifications & coverage

The coverage of this indicator is limited solely by NACE Rev. 1. Across Annexes A and B the STS-R requires a coverage of Sections C to F.

Units

The STS-R requires the use of the KAU as the observation unit for this indicator.

9.2.3 Collection

How to measure - alternative methods

There are two main methods by which hours data may be collected:

- business surveys;
- the Labour Force Survey.

Business surveys

The requirements of the labour cost index which ask for an hourly measure have led a number of countries to run surveys which collect on the same form employment, hours and wages and salaries. This approach brings the strong advantage of consistency in measures of labour costs by using the same questionnaire and methodology. However the business community will only have records of basic hours and overtime. They will not normally have records of unpaid overtime unless specifically kept to ensure working time regulations are met. Similarly records of sick leave may not be available or of holiday leave (unless there are factory or plant closures).

Labour price index approach

The labour price index approach conducts a survey of the business community which tracks the remuneration of a basket of occupations. The concentration on individual jobs makes it easier to collect information on hours worked since the detailed information may be more easily provided for a specific post.

Labour force survey

The Labour Force Survey is a quarterly survey of households which collects information about the personal circumstances and work of everyone in them. In most countries households are interviewed five times, generally at three monthly intervals. Each quarter's sample is made up of roughly equal groups of people receiving their first interview, second interview and so on. People receiving their first interview replace the group of people receiving their fifth (final) interview in the following quarter. Thus 80% of the sample will be common to any two successive quarters, allowing more accurate measures of change to be compiled.

The questions asked on hours worked per week include:

- paid overtime;
- unpaid overtime;
- actual hours.

This allows the ESA definition to be followed and extensive analyses to be undertaken. As the survey goes to individuals, it allows hours worked but not actually paid to be recorded.

The following points summarise the main advantages and disadvantages of the two approaches of business surveys and the LFS.

Business surveys

Advantages: consistency with other related variables for example labour costs can be achieved by direct collection; sampling and estimation procedures may be set up to be optimal; good activity classification.

Disadvantages: sample deficiencies - may not cover small units - sometimes includes only manual workers; cannot in some instances meet the definition (for example collection of unpaid overtime).

LFS

Advantages: meets international standards and the required definitions; includes potentially all the population aged 16 or more (with the exception of communal establishments); includes a wide range of data related to the details of people's jobs giving a well-rounded picture.

Disadvantages: sampling variability can be large; population estimates for grossing may be out of date; activity classification is based on self-classification and is poorer than the register information used to classify business surveys; proxy response is likely to be inaccurate for hours.

Data collection difficulties

As already noted one of the disadvantages of business surveys for collecting hours is that it may be difficult to follow strictly the definition, notably with respect to unpaid overtime.

9.2.4 Compilation of the index

Methods to combine the raw data

The previous point described two principal methods - the LFS or business surveys. The LFS provides directly the information required by the STS, albeit with some restrictions outlined earlier.

Business surveys are generally limited to the collection of hours paid since the employer is unlikely to have a record of hours worked but not paid (equivalent of unpaid overtime - which for many managers may be undertaken in their spare time at home). In this case it is recommended that the measure be adjusted to the required definition. This change can be estimated by using the comparable data collected in the Labour Force Survey for each occupation group although it is unclear whether any country does this in practice.

Data confrontation

Benchmarking

A number of possibilities exist for benchmarking.

The SBS-R requires the provision of the number of hours worked by employees. Where this is provided by direct collection rather than synthetic estimation it may be used to benchmark short period estimates.

Time Use Survey. Each respondent is asked to complete:

- a household questionnaire;
- a one-day diary which will collect time use data in 10 minute intervals over a 24 hour period;

- a one-week diary for work and education purposes; this is to record the time they are in work and time spent travelling to and from work; extra work that has been brought home is also recorded.

Comparisons with other Statistics

Where business surveys are undertaken, the results may be compared with the LFS. However some caution needs to be taken to allow for known differences in definition and the deficiencies in activity classification in the LFS. Moreover since both are sample surveys exact congruence will not be achieved; allowance needs to be made for the confidence intervals based on the sampling errors in the separate surveys. Similarly comparisons may be made between the STS and SBS for the hours worked variable where NSIs have confidence in the annual data because it has been separately collected.

Details of the compilation required

The precise description of the series to be compiled for the hours worked indicator can be seen in the following table. As can be seen, apart from the coverage which is a function of the Annex concerned, the description is the same for industry and construction.

Annex	A	B
Activity coverage NACE Rev. 1	C to E	45
Level of activity detail	Divisions and MIGS	Division
Compulsory forms	Gross	Gross
Index or absolute figures	Either	Either
Frequency	Quarterly	Quarterly
Deadlines	3 months	3 months

Many countries publish a series of absolute figures, however indexation is undertaken wherever the hours worked measure is used in productivity or labour cost calculations.

Special note on deadlines

In Annexes A and B the STS-R permits smaller Member States an extension to the deadline of 15 calendar days.

In the case of Annex A smaller Member States are defined as those with value added in Sections C, D and E of NACE Rev. 1 in a given base year that represents less than 3% of the value added of Sections C, D and E in the EU. It is not clear whether the criteria for the application of the extension of 15 calendar delays should be evaluated for each of the three specified Sections in turn or for their sum. Equally, in the case that the Sections are evaluated separately it is not clear whether the extension applies only to indices for branches within those Sections that meet the criteria or that the extension is only valid in the case that all three of the Sections meet the criteria.

In the case of Annex B a smaller Member State is defined as one with value added in Section F of NACE Rev. 1 in a given base year that represents less than 3% of the value added of Section F in the EU.

As with the deadlines themselves, the extension represents a maximum and national statistical authorities are encouraged to provide data earlier than permitted under the extension.

9.2.5 Overview of national methods

Population coverage

	Type of source	Coverage	Observation unit(s)
DK 2002	The Working Time Accounts (WTA) use several data sources: register data; statistics of earnings; Labour Force Survey. Quarterly WTA are produced using short-term indicators to extrapolate the annual WTA. A model is used to describe quarterly patterns.	Sections C to F.	Mixed - integration of existing statistics.
D 2000	Statistical surveys. Census.	Sections C to F.	For industry: KAU. For construction: local unit.
EL 1998	Statistical sample survey.	All activities required by the STS-R excluding Division 37.	KAU.
F 2001	Quarterly and annual sample survey.	Sections C to F (and G to O).	Enterprise or local unit.
IRL 2000	Statistical survey. Census.	Sections C to E.	Local unit.
I 2000	Statistical survey. Census.	Approximately Sections C to E (as well as G, H, I and K).	KAU or exceptionally the enterprise.
L 2000	Statistical sample survey.	Sections C to E excluding Divisions 10 to 12, 23, 37, 41 and Group 40.3. Classes 45.21 and 45.23; the remaining construction Classes are covered from the 2000 base year.	KAU.
NL 2000	Labour accounts using different sources (sample and census): Labour Force Survey; annual survey on employment and earnings; quarterly survey on employment and earnings; labour cost survey; quarterly labour cost statistics; surveys for specific industrial activities; social security records.	Sections C to F.	Mixed - integration of existing statistics.
A 2002	Statistical sample survey.	Sections C to F.	Establishment ("Betrieb" as local

	Type of source	Coverage	Observation unit(s)
			KAU).
P 2000	Statistical sample survey.	Sections C to F (and G to K and M to O). The survey covers mainland Portugal.	Enterprise.
FIN 2000	Statistical sample survey - the monthly Labour Force Survey (combined the national monthly LFS and the EU's LFS).	Sections C to F.	Individuals.
S 2002	Statistical survey. This is a sample for the private sector and an exhaustive survey for the other sources.	Sections C to O.	Private sector: enterprise. Other sources: individuals, County councils or other authorities.
UK 1999	Mixture of statistical sample surveys and administrative sources: employee data from surveys and administrative data; average hours worked, self employed and unpaid family workers data come from the quarterly Labour Force Survey (LFS).	The LFS covers indirectly the whole economy. Employee data cover all employers registered for 'Value Added Tax' and 'Pay as You Earn' plus people employed by government.	Mixture of employers and individuals.

Calculations made

	Calculations made	Type of index	Method of weighting
DK 2002	Quarterly data are benchmarked to annual data.	Absolute figures.	Not relevant.
D 2000	No seasonal or working day adjustment.	Absolute figures	Not relevant.
EL 1998	No seasonal adjustment.	Absolute figures.	Not relevant.
F 2001		Absolute figures.	Employment is used to gross the sample to the population.
IRL 2000	No seasonal adjustment.	Chain linked Laspeyres. 1985 base year.	
I 2000		Average value indices with a fixed base. 1995 base year.	
L 2000	Calculation of gross indices only.	Laspeyres indices. 1995 base year.	Employment from the SBS.
NL 2000	No seasonal adjustment.	Absolute figures.	Not relevant.
A 2002	No seasonal or working day adjustment.	Laspeyres index. 1995 base year.	
P 2000	No seasonal adjustment.	Laspeyres type index. 1995 base year for industry, 2000 for other activities (construction, retail trade and other services).	Employment from the SBS.
FIN 2000			Weighting and grossing-up are performed together.
S 2002	No seasonal or working day adjustment.	Absolute figures.	Not relevant.
UK 1999		Absolute figures.	Not relevant.

9.3 Wages and salaries

9.3.1 Introduction

Name, synonyms and code numbers

The STS-R requires short-term statistics on gross wages and salaries (230) under the provisions of Annexes A and B.

Purpose of the indicator - theoretical concept

The measurement of wages and salaries is important when analysing a number of economic and social issues. Labour input is one of the main costs of production. A change in the level of wages and salaries can come from a number of causes. For example a rise may be due to:

- increased output needing more labour (either people or hours);
- higher wages but no increase in employment;
- changes in composition of the workforce (more skilled jobs).

The decomposition of wages and salaries, particularly if individuals can be tracked may be of economic or social interest:

- differences between men and women;
- differences by age;
- analysis by activity;
- regional analysis;
- occupational analysis;
- longitudinal information.

The STS requires wages and salaries to be provided only for industry (Annex A) and construction (Annex B). Within the Annexes specific requirements on the level of detail, timeliness, form and frequency may be found. Although the STS does not require wages and salaries for the retail or service sectors, it is likely that Member States will calculate this information for other demands. For example the labour costs index which is used by ECB is shortly expected to be subject to a new EU Regulation, requiring a measure of labour costs per hour. As this Regulation will cover the service sectors, Member States will need this information for those parts of services within the scope of the new legal requirement.

The collection of wages and salaries has a number of important uses.

As an indicator in its own right

Normally with a strong economy one would expect to see rises in this variable to finance increased production in the business cycle. Similarly difficulties in trading are likely to result in less overtime and possibly short time working and hence falls in remuneration. However, care needs to be taken in interpretation to consider the impact of extraordinary payments (bonuses, redundancy etc) and the impact of higher settlements.

As part of national accounts

Compensation of employees is an important component of the income account. It appears in both the generation of income of account (as a "use" for the (institutional) sectors which pay it) and in the allocation of primary income account (as a "resource" for the households and rest of the world (institutional) sectors, which receive it).

Compensation of employees is defined as the total remuneration payable by enterprises in cash or in kind, and comprises not only wages and salaries but also the value of social contributions payable by the employer (including imputed contributions for unfunded benefits), but not taxes paid by the employer. It is recorded on an accrual basis, in respect of entitlement arising out of work done during the accounting period whether paid in advance, simultaneously, or in arrears. It does not cover unpaid work (including that done by household members within their own households) or the earnings of the self-employed. Although wages and salaries is a component of this measure, for most countries it dominates the variable.

To monitor inflationary wages pressure

The use of wages and salaries in calculating unit wage costs, labour cost or labour price indexes will give indicators of wage inflation. Historically these have been calculated on a per head basis but increasingly a per hour formulation is felt to be more useful. With the introduction of flexible working and home working, combined with significant variations in working time the per head calculation is a blunt instrument. For example if a full time person were replaced by two part timers the per head measure would fall. However the per hour measure would largely be unaltered, reflecting the status quo and labour input.

Definition and reference period

The compensation of employees is defined as the total remuneration in cash or in kind payable by an employer to an employee in return for work done by the latter during the accounting period. This can be broken down into:

- wages and salaries;
- employers' social contributions.

The STS is only interested in the first component. The second tends to be relatively stable and moves significantly only when the rate of social contributions change or there are shifts in the composition of the labour force.

Gross wages and salaries are defined as the total sum of remuneration in cash and in kind, payable to all persons employed in return for work done during the reference period irrespective of whether this remuneration is paid regularly or not and whether it is based on working time, output or piece work. Income taxes and social security contributions payable by the employee should not be deducted, even if they are actually withheld by the employer and paid directly to Social Security schemes, tax authorities and the like.

The following should be included in wages and salaries:

- all basic wages and salaries payable at regular intervals;
- enhanced rates of pay for overtime, night work, weekend work, disagreeable or hazardous circumstances;
- cost of living, housing, local or expatriation allowance;
- allowances for travelling to and from work (excluding reimbursement of employees for travel, separation, removal and entertainment expenses.);
- bonuses based on productivity or profits;
- holiday bonuses, 13th month pay;
- holiday pay for official or annual holidays; and allowances paid for annual holidays not taken;
- extra allowances for extreme working conditions like dust, dirt, temperature, smoke, danger etc.;

- commission, tips attendance and directors fees paid to employees;
- payments made by employers to employees under saving schemes;
- allowances paid to employees for purchases of tools, equipment and specialist clothing needed for their work;
- wages and salaries, or parts thereof, which the employers continue to pay directly to the employee in cases of sickness, maternity, industrial accident, invalidity, etc.;
- any payment in kind.

The following costs are excluded:

- statutory social contributions, paid by the employer;
- imputed social contributions (social benefits paid directly by the employer);
- taxes paid on total wages and salaries paid;
- recruitment costs.

9.3.2 Population

Classifications & coverage

The coverage of this indicator is limited solely by NACE Rev. 1. Across Annexes A and B the STS-R requires a coverage of Sections C to F.

Units

The STS-R requires the use of the KAU as the observation unit for this indicator.

9.3.3 Collection

Difficulties with the theoretical concept/definition

The definition is long and detailed and will need refinement and updating since reward systems are complex and are evolving over time. A number of areas cause concern and difficulty.

- The stipulation that the wages and salaries should relate to work done in the reference period. This prescription is important for components such as basic pay and overtime. However, some elements such as 13th month pay and bonuses, whilst paid in the reference period, are a reward for work carried out over a longer period. The surveys should collect all pay pertaining to the reference period - however, some components will be facets of longer term rewards.
- Bonuses are an important part of wages and salaries. In many activities they make up a regular and substantial part of pay - it is not uncommon for the annual bonus to be equivalent to ten per cent of annual pay. In this case if data were to be collected monthly, pay for the "bonus" month would be at least double that of the previous month. The bonus element is very erratic and this makes collection and

estimation more difficult. In particular in business surveys care needs to be taken on outlier detection so that very large bonuses to small companies do not distort the overall position.

- The treatment of redundancy pay is controversial. This is included within the definition since it is counted as part of compensation for employees under ESA. It is certainly a labour cost but, on the other hand, it does not represent income from employment. In particular, redundancy pay is not a payment for work done by the employee during the reference period. Moreover, the collection of redundancy pay would make the wages and salaries variable harder to interpret. For example, during a downturn one would expect the variable wages and salaries to be lower. However, if this lack of demand were to lead to lay-offs, the resulting redundancy payments would boost the wages and salaries variable. Hence the increase in this case would be a sign of a deteriorating economy!
- The payment of shares is increasingly common and harder to collect and interpret. Where bonus shares are distributed free, they should be included. However, share options are to be excluded. From a practical perspective, it is not possible to value share options at the time of the reference period; the full worth will only be apparent some time later.

How to measure

There are three main methods by which wages and salaries may be collected: business surveys; the Labour Force Survey; administrative sources. The proposed Regulation for a labour cost index has led a number of countries to run surveys which collect employment, hours, wages and salaries in the same form. In some countries a separate survey is undertaken.

Specific business survey to measure wages and salaries

Advantages: sampling and estimation procedures may be set up to be optimal for the wages and salaries variable; data collection staff build up expertise in this variable; response time may be quicker than for a multi-variable survey.

Disadvantages: separate surveys may be more costly to national statistical authorities and respondents; lack of consistency with other business and labour input variables.

Survey collecting other business variables

Advantages: consistency with other labour input or output measures. In particular, the collection of wages and salaries and hours on the same form will assist the provision of data for the Labour Costs Regulation which asks for a per hour measure; ability to cross check returned figures at a data validation stage with other business variables; will identify and provide a useful diagnostic tool for measuring discontinuities due to

structure changes for business variables; may be more cost effective for NSIs and respondents.

Disadvantages: response time might be greater, particularly if the number of variables in the survey is large; sampling and methodology may be sub-optimal if shared with other variables.

The Labour Force Survey

The Labour Force Survey is a quarterly survey for households which collects information about the personal circumstances and work. In some countries this survey also collects information on earnings. Although the Labour Force Survey is used by many countries to supply hours data, it is not the direct or preferred source for wages and salaries information.

Advantages: covers the whole population with the exception of communal establishments; allows analysis by sex, age, hours worked, education and training.

Disadvantages: activity classification is often poor; may be inconsistent with other business variables.

Administrative Sources

Wages and Salaries information is available from administrative sources in some countries, particularly tax and social security information.

Advantages: may be comprehensive in coverage of population and all types of remuneration; no extra burden on respondents.

Disadvantages: NSIs have no control over these sources; there may be timeliness or quality difficulties; may be inconsistent with the definition; may be inconsistent with other business variables.

Other

Whilst the Netherlands does conduct a quarterly survey into earnings and employment, a balanced system of labour accounts is used to produce a fully reconciled picture of the labour market. Whilst this approach gives a comprehensive system which balances a range of input sources, it is complex and would take time to develop. The balancing process may also make the measurement less timely than using the results of a simple sample survey.

Conclusions

The preferred measure is business surveys, since this will bring coherence with other short term statistics. In particular, it is advantageous to use the same surveys for wages and salaries in the STS as for the provision of information to comply with European requirements for a labour costs index. Where separate surveys are used the coverage of the survey for wages and salaries should be the same as for the employment variable.

Data collection and validation

Employees may receive their remuneration in a number of different ways. Some may be paid weekly, others monthly, or for a four week period (which will necessitate a 13 month payment at some point) or even occasionally over five weeks. The processing of the data will need to be able to deal with the possible periodicity of data. One way of achieving this is to ask for weekly and monthly pay separately on the questionnaire. Where pay is provided for a four or five week span, the weekly average should be calculated. For weekly paid staff either the average of the weeks of the month should be taken or a specific week chosen. In the latter case this should always be at the same time in the month. Many countries pick the last week in the period.

Many types of remuneration will make the wages and salaries data for a unit volatile. For example, where an annual bonus is paid, this might amount to 10% of the annual basic wage and so would double the normal pay. To help check and explain these large variances, it is suggested that bonus data are collected separately. Where any other component of pay is known to be significant and volatile, it is suggested that NSIs collect it separately. One possibility for this could be overtime pay. Where information is collected with employment and hours on the same form it is recommended that data checks are made on wages and salaries per head, or per hour. These should be consistent over time for a particular unit. They would also be expected to lie in a certain range with upper and lower bands to be credible.

In the payment of wages and salaries there are often special circumstances, changes in pay and workforce, annual updates and back pay (arrears). It is suggested that the questionnaire includes a comments box to be added to the form to allow respondents to explain any significant movements or changes to the figures. This information should be held where it is easily available for future use.

Data collection difficulties

Payments in kind are to be included in the indicator but are difficult to collect. Wages and salaries in kind consist of goods and services or other benefits provided free or at reduced prices by employers. These may be used by employees or other members of their households. The most common include:

- meals and drinks provided free or in subsidised canteens or luncheon vouchers;
- housing or accommodation services;
- uniform or special clothing;
- vehicles;
- goods and services produced as outputs from the employer's own production range, for example free travel for airline or railway employees;
- provision of sports, recreation or holiday facilities for employees and their families;
- transportation to and from work; car parking;

- crèches for children of employees;
- cheap loans provided by employers.

The long list of inclusions and exclusions means that in some countries a number of categories will be insignificant. Where it is difficult for a Member State to strictly collect on the basis of a specific inclusion or exclusion, this may be waived if the impact is insignificant. Where such a deviation is made by a Member State it should be reported and the impact of non compliance approximately estimated.

9.3.4 Compilation of the index

Data confrontation

Comparison can be made with a number of sources of earnings data.

SBS-R

The SBS-R asks for information on wages and salaries. This can usefully be compared with information collected in the sub-annual surveys. If the SBS-R is thought to be comparable and of higher quality due to large samples benchmarking could be undertaken.

Labour Costs Index

The Labour Costs Regulation asks for an index of wages and salaries. This should be consistent with the variable in the STS.

LFS

Where earnings data are collected in the LFS, this provides another possible area of comparisons. However, care needs to be taken when interpreting results at detailed activity levels since there may be problems with LFS due to poor classification.

Comparisons with administrative sources

Tax or social security systems may provide another source - one which is comprehensive in coverage - though final data may be late in being available.

It needs to be recognised that when comparing two different surveys the sampling errors associated with each will mean that exact congruence will not be achieved. The difference gates which are set to trigger detailed investigation should take into account these measures of accuracy. When undertaking comparisons with administrative data, allowances may need to be made for differences in definition.

Details of the compilation required

The precise description of the series to be compiled for the wages and salaries indicator can be seen in the following table. As can be seen, apart from the coverage which is a function of the Annex concerned, the description is the same for industry and construction.

Annex	A	B
Activity coverage NACE Rev. 1	C to E	45
Level of activity detail	Divisions and MIGS	Division
Compulsory forms	Gross	Gross
Index or absolute figures	Either	Either
Frequency	Quarterly	Quarterly
Deadlines	3 months	3 months

Many countries prefer to publish a series of absolute figures. However, the Labour Costs Regulation requires the provision of an index of wages and salaries. It is important that if an index is provided for the STS it should be consistent with the requirements for labour costs¹⁷.

Special note on deadlines

In Annexes A and B the STS-R permits smaller Member States an extension to the deadline of 15 calendar days.

In the case of Annex A smaller Member States are defined as those with value added in Sections C, D and E of NACE Rev. 1 in a given base year that represents less than 3% of the value added of Sections C, D and E in the EU. It is not clear whether the criteria for the application of the extension of 15 calendar delays should be evaluated for each of the three specified Sections in turn or for their sum. Equally, in the case that the Sections are evaluated separately it is not clear whether the extension applies only to indices for branches within those Sections that meet the criteria or that the extension is only valid in the case that all three of the Sections meet the criteria.

In the case of Annex B a smaller Member State is defined as one with value added in Section F of NACE Rev. 1 in a given base year that represents less than 3% of the value added of Section F in the EU.

As with the deadlines themselves, the extension represents a maximum and national statistical authorities are encouraged to provide data earlier than permitted under the extension.

¹⁷ At the time of writing the methodology for the latter had not been agreed by the Expert Group.

9.3.5 Overview of national methods

Population coverage

	Type of source	Coverage	Observation unit(s)
DK 2000	Administrative source. Census.	Sections C to F.	Administrative unit.
D 2000	Statistical surveys. Census.	Sections C to F.	For industry: KAU For construction: local unit.
EL 1998	Statistical sample survey.	All activities required by the STS-R excluding Division 37.	KAU.
E 1999	Statistical sample survey.	Sections C to F (and G to K) Note: Directors, company President, family workers, workers paid on a commission basis, employees hired and laid off during the reference period are excluded.	"Account of contributions" - an administrative concept that does not coincide with the concept of enterprise or the local unit.
F 2001	Administrative source. Census.	Sections C to F.	Local unit.
IRL 2000	Statistical survey. Census.	Sections C to E.	Local unit.
I 2000	Statistical survey. Census.	Approximately Sections C to E (and G to I and K). Note: The population is limited to enterprises employing 500 persons or more. They represent approximately 25% of employment in activities covered.	KAU or exceptionally the enterprise.
L 2000	Statistical sample survey.	Sections C to E excluding Divisions 10 to 12, 23, 37, 41 and Group 40.3. Classes 45.21 and 45.23; the remaining construction Classes are covered from the 2000 base year.	KAU.
NL 2000	Labour accounts using different sources (sample and census): Labour Force Survey; annual survey on employment and earnings; quarterly survey on employment and earnings; labour cost survey; quarterly labour cost statistics; surveys for specific industrial activities; social security records.	Sections C to F.	Mixed - integration of existing statistics.
A 2002	Statistical sample survey.	Sections C to F.	Establishment ("Betrieb" as local KAU).
P 2000	Statistical sample survey.	Sections C to F (and G to K and M to O). The survey covers mainland Portugal.	Enterprise.
FIN 2000	Administrative source completed by a statistical survey. Census.	Sections C to F.	Administrative source: enterprise. Statistical survey: enterprises/KAU.
S 2002	Statistical survey. This is a sample for the private sector and an exhaustive survey for the other sources.	Several sources are used that in combination cover Sections C to O.	For the private sector the enterprise is used. In other sources the observation units are individuals, County councils or other authorities.
UK 1999	Statistical sample survey.	The whole economy. Note that only Great Britain is covered.	Enterprise.

Calculations made

	Calculations made	Type of index	Method of weighting
DK 2000	Seasonally adjusted only at an aggregate level.	Absolute figures.	Not relevant.
D 2000	No seasonal or working day adjustment.	Absolute figures.	Not relevant.
EL 1998	No seasonal adjustment.	Absolute figures.	Not relevant.
E 1999	No seasonal or working day adjustment.	Absolute figures. Elementary indices and wage rates are also provided. 1995 base year.	Only elementary indices are calculated.
F 2001		Chain index. 1998 base year.	
IRL 2000	No seasonal adjustment.	Chain linked Laspeyres. 1985 base year.	
I 2000		Average value indices with a fixed base. 1995 base year.	
L 2000	Calculation of gross indices only.	Laspeyres indices. 1995 base year.	Employment from the SBS.
NL 2000	No seasonal adjustment.	Absolute figures.	Not relevant.
A 2002	No seasonal or working day adjustment.	Laspeyres index. 1995 base year.	
P 2000	No seasonal adjustment.	Laspeyres type index. 1995 base year.	Employment from the SBS.
FIN 2000	Seasonally adjusted.	The index is calculated using a panel of enterprise data on wages and salaries. Wages and salaries during the latest reference period are compared to the same period of the previous year and the percentage change is calculated. The change is then used to calculate the index number of the latest reference period. 1995 base year.	Wages and salaries in the panel for a given month.
S 2002		Absolute figures.	Not relevant.
UK 1999	Data are published on both an unadjusted and seasonally adjusted basis. A wages and salaries index is not compiled, instead an Average Earnings Index is based on monthly wages and salaries data	The AEI is a base weighted index using modified chain linking to a common sample from one period to the next. 1995 base year.	Average earnings index is weighted with employment figures which are updated annually, currently based on the June 1999 Business Register.

9.4 New orders and alternative leading indicators

9.4.1 Introduction

Name, synonyms and code numbers

The STS-R requires information on new orders under the provisions of Annexes A and B. In both cases, new orders (variable 130) is the main new orders indicator. For industry the STS-R requires information on domestic new orders (131) and non-domestic new orders (132) and for construction it requires information on new orders for building construction (135) and new orders for civil engineering (136).

The STS-R also foresees that these indicators may be approximated by alternative leading indicators on a temporary basis. The new orders for construction may be approximated using information from building permits and there is no time limit to this approximation.

Purpose of the indicator - theoretical concept

The index of new orders makes it possible to measure the trend in the orders received from domestic and non-domestic customers. While the production index shows the trend in the volume of output and gives an indication of the trend in value added, the data on new orders allow us to calculate a very important indicator that forecasts, albeit only in the short term, future production and future turnover. Orders received appear subsequently in production and then in turnover, and they are therefore the first indication of what is going to happen in the short term.

Apart from indicating future production and turnover of branches that work based on orders, the orders indicator also provides information about the future development of the branches making orders. One example would be the manufacture of textile machines: if there is a healthy inflow of orders in this branch, it means that the manufacture of such machines will increase and also, since such machines are sold to textile manufacturers it can be deduced that the production of textiles is likely to increase once the new machines are installed.

Concerning new orders in construction, it is important to bear in mind the special features of this activity, both from the administrative point of view and with regard to

how the production process is organised (see sub-chapter 6.4 concerning the specific nature of the construction activity). Most notably the sequence linking orders, production and turnover gains another element - building permits. The administrative details concerning orders vary significantly between countries and hence the position of permits in the sequence of events varies but in some cases permits can provide similar information to orders and hence act as a leading indicator.

In conclusion, the index of orders is a forecast indicator that provides information on the economic cycle that is particularly useful at times when the cycle is changing. Series based on new orders may figure among the series included in composite leading indicators for the economic cycle.

Definition and reference period

The orders recorded for a particular reference month represent the value of contracts agreed during that month that connects a manufacturer with a third party for the supply of manufactured goods and services.

The definition of orders has the same headings as turnover, and hence excludes:

- VAT and other similar deductible taxes linked to turnover;
- reductions in prices, rebates and discounts when they are given at the moment of order;
- the value of packaging that is expected to be returned after the delivery;
- subsidies from public authorities or the institutions of the EU;
- sales of the KAU's capital assets.

Orders include:

- taxes and duties on goods and services (for example excise duty) that will be invoiced by the unit;
- all other charges such as packaging and transport that are passed on to the customer, even if these are listed separately on the invoice;
- orders for goods and services provided by the unit, including those originating from sub-contractors - this includes goods not processed by the unit and the provision of services and work carried out for third parties using raw materials provided by them.

Orders arriving in one reference period but cancelled in another (later) one must not be subtracted, neither from the value of orders in the reference period in which the order was originally received, nor from the value of orders for the reference period in which the cancellation was received.

Special note on sub-contracting in construction

With regard to construction a significant amount of work is subcontracted to other KAUs. It is a very common practice for units in construction (especially larger ones)

to agree a contract and then entrust the work to a number of smaller units that specialise in particular types of work (for example electrical installation, masonry). As for new orders in industry, the value of subcontracted work in construction must be included in the new orders of the client¹⁸ (that received the order from the final customer and sub-contracted it on) and by the contractor (receiving the subsequent order from the client). This double counting of orders is necessary as it is particularly difficult to define subcontracting in construction in a manner that is comparable for all EU Member States.

9.4.2 Population

Activity coverage

The coverage of these indicators is limited mainly by NACE Rev. 1 (see details below).

The sub-indicators of new orders in Annex A of the STS-R are also limited by their geographical market between domestic and non-domestic markets (see point 5.2.5 for the definition of these markets).

The two sub-indicators of new orders in Annex B are limited not by NACE Rev. 1 but by CC. The coverage of the indicator of new orders received for building construction is CC Section 1 and the coverage of the indicator of new orders received for civil engineering is CC Section 2.

Not every unit works on the basis of orders, and those that do tend to be concentrated in specific activities where the production process is lengthy or where goods are manufactured that will then be re-used by other units to make other goods - capital goods or consumer durables and also sometimes intermediate goods.

For industry

The STS-R lists which activities are to be covered and these are the ones that normally work to order:

- textiles (NACE Division 17);
- wearing apparel (NACE Division 18);
- pulp, paper and paperboard (NACE Division 21);
- chemicals and chemical products (NACE Division 24);
- basic metals (NACE Division 27);
- fabricated metal products (NACE Division 28);
- machinery and equipment (NACE Division 29);
- office machinery and computers (NACE Division 30)
- electrical machinery and apparatus (NACE Division 31);
- radio, television and communication equipment and apparatus (NACE Division 32);

¹⁸ For an explanation of the terms contractor, client and customer used in construction, see the diagram in point 11.2.1.

- medical and precision instruments (NACE Division 33);
- motor vehicles (NACE Division 34);
- other transport equipment (NACE Division 35).

For construction

The STS-R requires new orders only for Groups 45.1 and 45.2 of NACE Rev. 1.

Minimum and maximum coverage

Both of these lists are the minimum subsets of NACE Rev. 1 Divisions and Groups that national statistical authorities should cover. It is nevertheless possible that in various countries the lists covered may be more extensive for national purposes, and in fact the STS-R requires expressly that the validity of the list for industry should be regularly checked.

To establish whether a unit classified to a particular branch works to order, it is useful to study the graphs of the time series of the indices for turnover and orders: if the graphs match, or if there is only a slight variation, it means that orders are equivalent to turnover each month and that the unit therefore works in accordance with its own production plan and not in response to orders.

Observation units

The STS-R requires the use of the KAU as the observation unit for these indicators. To the extent that information based on products is used, notably building permits in construction, there is no observation unit in the sense foreseen by the STS-R.

9.4.3 Collection

How to measure

In order to measure the development in new orders it is normally necessary to conduct a statistical survey of the branches that work to order. In order to calculate the variable for new orders arriving in month t , there are two options for the design of the questionnaire:

- details of new orders arriving in month t ;
- details of the stock of orders (unfulfilled orders) at the end of month t , cancellations during month t of orders received in previous months, turnover in month t .

In the latter case, the orders are calculated by subtracting from the stock of orders at time t the stock at time $t-1$ and adding any cancellations of previous months' orders and adding the turnover during month t (this includes goods manufactured in month t and previously). In order to validate respondents' data, it is better to ask for details of the monthly turnover and stocks of orders on the same questionnaire (turnover may come from another source, for example another survey or an administrative source).

Measurement difficulties

Unknown prices

Sometimes it can be difficult for respondents to provide the information requested. In cases in which a KAU receives orders indicated only in quantities (for example tonnes or number of pieces), they need to be converted into value terms of the basis of the average current selling price. Should this operation be impossible because the quantities of the goods ordered is not known with sufficient precision (for example an order for "at least" a certain amount when the final amount is confirmed some weeks later), the orders should be reported in the month in which they can be correctly expressed in value terms.

Price revision in construction

One problem that is a feature of construction is price revision. It often happens that prices are revised during the course of work, and this naturally affects the orders of previous months. It is very difficult to take account of this when conducting statistical surveys and compiling indices.

Alternative methods/variables

For the compilation of new orders in construction it may be possible to use information from building permits (see sub-chapter 11.3 for more information on building permits). It should be noted that if new orders are calculated using building permits, it is possible to calculate only domestic orders. Furthermore, strictly speaking, permits normally only concern buildings. For public civil engineering work alternative administrative information is often available as may also be the case for private civil engineering work.

The registration of building permits is strongly connected to each Member State's administrative organisation. If this is done in a very decentralised manner it may be possible to sample the administrative units that collect building permits.

9.4.4 Compilation of the index

Methods to combine the raw data

Information on new orders can be compiled as absolute values or as indices. The methods are essentially the same for industry and for construction.

If the survey is exhaustive the final figures will be the sum of the data reported for the individual units. In the case of a sample survey the data from the sample will need to be grossed up to the frame population. The grossing-up of the results of a sample survey uses coefficients that represent the weight of the sample in relation to the frame population. This weight should be based on orders but can be estimated, preferably from turnover or alternatively from employment.

In order to calculate the basic index of new orders for a branch, the amount of the orders received in month t by respondents of that branch are divided by the average monthly amount of orders in the base year (the base value) for the same respondents. This index, which is neither seasonally adjusted¹⁹ nor deflated, incorporates any price variations.

Weights

To calculate aggregate indices up to the industry total, the Laspeyres index can be used. This involves weighting the basic indices (for each branch) on the basis of their economic significance. The determination of the weights to be used for the Laspeyres formula is done in two stages and is based on turnover data from SBS or an alternative source (for example an administrative sources such as the VAT register). Turnover is used for the weights because data on new orders for all units in the frame population is generally not collected in any survey and new orders in one reference period generally lead to turnover in a future reference period.

First, the total turnover of all units²⁰ in branch k is calculated. This figure is then adjusted by the ratio, for the base year, between the amount of the new orders of the units in the sample in branch k and their turnover. Weights for branch k can then be calculated as the share of this adjusted turnover value for branch k in the total adjusted turnover for all activities covered by new orders.

The STS-R states which activities have to be included in the index of new orders, but the countries can, for national purposes, consider others. In the case that one country includes more activities, it has to calculate two sets of aggregate indices:

- one set that includes only the activities that are considered in the STS-R in order to have

comparable data for calculating the European indices;

- one set including all the activities required for national purposes.

The possible discrepancies between the two sets of indices have to be explained to the users of the data.

Further calculations

The following further calculations can in principle be used for industry and for construction.

Volume of orders received

The STS-R and its implementing Commission Regulation do not foresee the deflation of the new orders index. However, if the aim is to calculate an index of the volume of orders in order to be able to compare it with the industrial production index, the basic index has to be deflated by dividing it by the corresponding price index (total, domestic market, non-domestic market).

Guaranteed work

The manufacturing processes of individual products vary in the time they take, ranging from less than a month to several months. If a unit's average production capacity (calculated on the basis of its average monthly turnover) is known, the stock of orders can be used to calculate guaranteed work expressed in time, in other words the number of months of production guaranteed by orders received.

Index of cancelled orders

It has already been indicated that the data on orders received in previous periods and subsequently cancelled must not be subtracted from the amount of the new orders received in the reference month (t), nor must they be used to revise the index of new orders for the months in which the order was originally received. However, they can be used to calculate an index of cancelled orders. This is an index that yields interesting information concerning the short-term development because it reveals a change in the economic decisions that clients have made and this will have an effect on future production and, consequently, turnover.

Details of the compilation required

The precise description of the series to be compiled for new orders can be seen in the following tables.

¹⁹ At least in industry, this generally has little impact on the new orders variable.

²⁰ In some cases a cut-off is used as the population used for calculating the weights may only reflect units above a certain size, for example 20 persons employed.

Annex A

	130	131	132
	new orders received	domestic new orders	non-domestic new orders
Activity coverage NACE Rev. 1	17, 18, 21, 24, 27 to 35	17, 18, 21, 24, 27 to 35	17, 18, 21, 24, 27 to 35
Market coverage	Total	Domestic	Non-domestic
Level of activity detail	Divisions and MIGS	Divisions and MIGS	Divisions and MIGS
Compulsory forms ²¹	Gross	Gross	Gross
Index or absolute figures	Either	Either	Either
Frequency	Monthly	Monthly	Monthly
Deadlines	1 month 20 days	1 month 20 days	1 month 20 days

Annex B

	130	135	136
	new orders received	new orders received for building construction	new orders received for civil engineering
Activity coverage NACE Rev. 1	45.1, 45.2	45.1, 45.2	45.1, 45.2
Type of construction coverage	Total	CC Section 1	CC Section 2
Level of activity detail	Aggregate of Groups 45.1+45.2	Aggregate of Groups 45.1+45.2	Aggregate of Groups 45.1+45.2
Compulsory forms ²²	Gross	Gross	Gross
Index or absolute figures	Either	Either	Either
Frequency	Quarterly	Quarterly	Quarterly
Deadlines	3 months	3 months	3 months

Special note on deadlines

In Annexes A and B the STS-R permits smaller Member States an extension to the deadline of 15 calendar days.

In the case of Annex A smaller Member States are defined as those with value added in Sections C, D and E of NACE Rev. 1 in a given base year that represents less than 3% of the value added of Sections C, D and E in the EU. It is not clear whether the criteria for the application of the extension of 15 calendar delays should be evaluated for each of the three specified Sections in turn or for their sum. Equally, in the case that the Sections are evaluated separately it is not clear whether the extension applies only to indices for branches within those Sections that meet the criteria or that the extension is only valid in the case that all three of the Sections meet the criteria.

In the case of Annex B a smaller Member State is defined as one with value added in Section F of NACE Rev. 1 in a given base year that represents less than 3% of the value added of Section F in the EU.

As with the deadlines themselves, the extension represents a maximum and national statistical authorities are encouraged to provide data earlier than permitted under the extension.

9.4.5 Approximation/alternative indices

It can be assumed that the STS-R requires the new orders indicator to be calculated using quantitative data. The STS-R permits the new orders indicator to be approximated by an alternative leading indicator compiled from data from opinion surveys on short-term developments. This approximation is permitted for a 5 year period (from July 1998) which will be extended by a further 5 years unless a decision is taken otherwise. Using the opinions of respondents (increase, reduction or no change) and applying the consolidated methodology for opinion polls on short-term developments, it is possible to arrive at an index. The purpose of such an indicator is the subject of debate. Should such an index aim to approximate the new orders index, which would then allow it to be combined with the new orders index from other countries to produce indices for geographical aggregates such as the EU or the euro-zone? Alternatively should the index aim to be a leading indicator of production, which is the underlying purpose of the new orders index?

For construction

The STS-R permits the new orders indicators to be approximated using building permits information and this has been presented earlier in this sub-chapter as a standard method. This use of this particular approximation is unlimited in time.

²¹ The STS-R refers to gross data as unadjusted.

²² The STS-R refers to gross data as unadjusted.

9.4.6 Overview of national methods

Industry - population coverage

	Type of source	Coverage	Observation unit(s)
DK 2000	Statistical sample survey.	Sections C and D excluding Division 11.	KAU.
D 2000	Statistical survey. Census.	Divisions 17, 18, 21, 24 and 27 to 35 (as well as Groups 45.1 and 45.2).	Local KAU.
F 2001	Statistical sample survey.	Divisions 17, 18, 21, 24 and 27 to 35.	Enterprise.
I 2000	Statistical sample survey.	Section D excluding Divisions 15, 16, 22 to 26 and 36.	KAU.
L 2000	Statistical sample survey.	Divisions required by the STS-R except where the production is not determined by new orders.	KAU.
NL 2000	Statistical survey. Census.	Divisions 17, 18, 19, Group 20.3, Divisions 21, 24, 27, 28, 29, 30, 31, 32, 33, 34, 35 and Groups 36.1, 36.2, 36.3.	Enterprise and parts of enterprise (KAU).
A 2002	Statistical sample survey.	Section D (and F).	Establishment ("Betrieb" as local KAU).
P 2000	Statistical sample survey.	Sections C to E. The area covered is mainland Portugal.	Enterprise.
FIN 2000	New orders index (total and domestic) are estimated from business sample survey data.	Section D excluding Division 37.	KAU.
S 2002	Statistical sample survey.	Sections C and D.	KAU.
UK 1999	Statistical sample survey. In addition data are obtained from the: Iron and Steel Statistics Bureau; Department of Trade and Industry (for energy); Ministry for Agriculture and Fisheries.	The survey covers Sections C to E but the orders questions are only included for Divisions 29, 30, 31, 32, 33, 35 and Classes 28.11, 28.52 and 28.62.	Enterprise or the activities of a specified list of local units belonging to an enterprise.

Industry - definitions

	Definition
DK 2000	New orders received during the reference period correspond to the total anticipated selling or invoiced value of orders in the given month, net of any cancellations. The figures include orders that are executed immediately on receipt. The valuation of new orders corresponds to that of turnover, and hence excludes VAT and all other taxes which fall on products (measured net, in other words including subsidies) when they leave the factory (basic price concept). Data is collected specifically for the domestic market and for the non-domestic market.
D 2000	The basic information collected is new orders received in value excluding VAT.
F 2001	Usually the information collected concerns the value of new orders received in the reference month.
I 2000	The data collected correspond to new orders received during the month for domestic, external markets and the European Union market. Cancellation of orders received in previous months are calculated in the stock of orders.
L 2000	Definitions are according to Commission Regulation No. 588/2001.
NL 2000	Value of orders accepted for own goods (produced by the unit or by third parties with raw materials of the unit) and services to be provided, with deduction of invoiced instalments (stage payments). Goods purchased for resale in the same condition as received are excluded. VAT and all other taxes which fall on goods and services when they leave the factory are excluded; subsidies are excluded. Further exclusions are the cost of packaging and the cost of transport and insurance charged by others. Rebates and discounts are not deducted. Data is collected for the domestic market and for the non-domestic market.
A 2002	Definitions are according to Commission Regulation No. 588/2001.
P 2000	Definitions are according to Commission Regulation No. 588/2001. Information is collected concerning the stock of orders at the beginning of the period, new orders received, orders satisfied in the period, cancellations and the stock of orders at the end of the period.
FIN 2000	Answers to four questions in the opinion survey are combined: (1) change of production in this month compared to previous months (2) stock of orders (3) stock of export orders and (4) the stock of finished products. To each of these questions there are three possible answers: increase, decrease or stability.
S 2002	Orders that have been placed in the reference month. Cancellations are also taken into account.
UK 1999	The data collected concerns the stock of orders, of which exports at the end of the reference month.

Industry - calculations made

	Calculations made	Type of index	Method of weighting
DK 2000	There are no corrections for variations in the number of working days, though orders data for four or five weeks are corrected to a calendar month. Procedure X11 is used to adjust seasonal variations.	Simple value index. 1995 base year.	No fixed weights are used. The base values are published.
D 2000	No working day adjustment. The "Berliner Verfahren", version 4 (BV4) is used for seasonal adjustment.	Indices in nominal values are calculated by simple comparison with the figures of the base year. Indices in volume are Paasche-indices. 1995 base year.	New orders received in 1995.
F 2001	The index is new and is not yet available.	Laspeyres index. 1995 base year.	Turnover of the base year (not corrected by the new orders/turnover ratio) of the sample. The split between domestic and non-domestic orders is calculated for the sample.
I 2000	Seasonally adjusted using the TRAMO-SEATS method.	Laspeyres type index. 1995 base year.	Turnover corrected by the ratio turnover/new orders of the sampled enterprises in the base year.
L 2000	Indices are calculated in a gross form.	Simple value index with a fixed base year. 1995 base year.	Turnover of enterprises whose production is determined by orders.
NL 2000	The new orders are calculated as the stock of orders (t) plus turnover (t) minus the stock of orders (t-1). No seasonal or working day adjustment.	Simple value index with fixed base year. 1995 base year.	No fixed weights are used.
A 2002	No seasonal or working day adjustment.	Laspeyres index. 1995 base year.	
P 2000		A fixed base year value index is used for the aggregated levels. For the 3 digit level a simple value index is applied based on the evolution compared to the preceding year. These evolutions are chained to produce the series.	Turnover from SBS.
FIN 2000	The forecasts of the growth rates in the volume of industrial production, in the domestic turnover and in the non-domestic turnover are calculated from the business opinion survey data. These forecasts are based on a model which is reformulated or re-estimated once a year.	The mean of the base year values is 100. 1995 base year.	Weighted to a 4-digit level using turnover (collected directly in the questionnaire). Weighted from the 4-digit level to a 2-digit level using gross value of production. Gross value of production (for the total and domestic indices) and the value of exports (for the non-domestic index) are obtained from structural business statistics.
S 2002	The calendar adjustment method takes into account the number of working days in the month. The seasonal adjustment method used is X11. Outliers are corrected automatically and by manual revisions.	Paasche volume index. 1995 base year.	Aggregation is done by grossing up the index - no external weights are used.
UK 1999	Corrected for the number of working days in the month and the number of days of the week worked. Public holiday effects are removed as part of the seasonal adjustment procedure using Census II (X11 ARIMA). Value indices are calculated for total orders on hand (stock of orders) with separate indices for domestic and non-domestic stocks of orders. Value indices are also calculated for net new orders (change in the stock of orders) also with separate indices for domestic and non-domestic new orders.	Simple Laspeyres index. 1995 base year.	Turnover.

Construction - population coverage

	Type of source	Coverage	Observation unit(s)
DK	This indicator is not compiled.		
D 2000	Statistical survey. Census.	Groups 45.1 and 45.2.	Local unit.
E 2000	Statistical sample survey.	Groups 45.2, 45.3 and 45.4.	Enterprise.
F 2001	Sample surveys by trade associations.	Section F.	Enterprise.
L 2000	Statistical sample survey.	Classes 45.21 and 45.23. The remaining Classes are covered from the 2000 base year.	KAU
NL 2000	Statistical survey. Civil engineering: sample. Building: exhaustive.	Section F.	Civil engineering: enterprise and parts of enterprises (presumed to be KAUs). Buildings: building permits.
A 2002	Statistical sample survey.	Section F.	Establishment ("Betrieb" as local KAU).
P 2000	Administrative source. Census.	Section F.	Building permits.
FIN 2000	Administrative source. Census.	Housing construction (believed to be residential construction). Note: Repairs and new buildings for military purposes are excluded.	Building permits.
UK 1999	Statistical sample survey.	Groups 45.1 and 45.2. Note: covers Great Britain. New work and renovations and alterations for building and civil engineering are covered; repair and maintenance, installation and completion are not covered. New construction work also includes site preparation and demolition.	Close to a KAU.

Construction - definitions

	Definition
D 2000	The index shows the evolution of orders received in value at current prices. In addition a quarterly volume index is produced. Parts of construction new orders that are passed on to subcontractors are only specified by the subcontractor to avoid such new orders to be counted twice. The statistics of new orders received do not take into account cancellations of orders.
E 2000	The new orders received concern the budget for new work, restoration, repair and maintenance, definitively contracted during the reference period and that will be executed under the order of a client. It includes also budgets of those buildings and other construction works that have been started during the reference period.
F 2001	The information collected concerns the value of new orders received in the reference month.
L 2000	Definitions are according to Commission Regulation No. 588/2001.
NL 2000	For civil engineering information is collected on: the stock of unfilled orders at the end of the reference period; the total amount invoiced in the reference period. For building information is collected on: the building permits for new dwellings with building costs of 100,000 NLG or more - their building costs are valued exclusive of VAT (according to NEN 2631 (1975)); the stock of order at the end of the calendar month.
A 2002	Definitions are according to Commission Regulation No. 588/2001.
P 2000	Information is obtained on permits for construction of building and public works for engineering.
FIN 2000	The following information is collected: the intended use of the building (classification of buildings); volume in m ³ ; the month the building project is started. The value of the building project is not collected but is estimated using volume data and the special data on construction prices per m ³ for different building types.
UK 1999	The figures collected refer to the "total contract value". This value includes the value of any work the observation unit undertakes itself or proposes to subcontract to third party contractors. It excludes VAT, the site value or land owned or leased by the firm itself and any architects' or consultants' fees. The definition of new orders received includes: all new contracts and orders for new construction work and renovations/alterations work obtained by the firm during the reference month from clients and contractors outside of construction (no sub-contracts); extensions to existing contracts in orders; the value of new construction work to be done during the contract on serial, run- or measured term contracts and package deals; new construction to be undertaken on the firm's own initiative, in other words work for which the unit has not been awarded a contract or order by any other party on a site already owned or leased by the firm itself or one of its subsidiary associated companies; the total value of contracts for which the unit is appointed management contractor. The definition of new orders received excludes: contracts for repair and maintenance; sub-contracts obtained by the firm from other contractors in construction; contracts obtained by the firm from management contractors; additional costs for work in an existing contract, for example on variation of price contracts.

Construction - calculations made

	Calculations made	Type of index	Method of weighting
D 2000	The adjustment coefficients take account of the number of working days in a month and of public holidays. The "Berliner Verfahren", version 4 (BV4) is used for seasonal adjustment.	Laspeyres formula. 1995 base year.	The volume indices use the new orders in the base year as weights.
E 2000	Value of new orders received is broken down by "type of works".	1990 base year.	
F 2001	The index is new and is not yet available.	Laspeyres index. 1995 base year.	Turnover of the base year (not corrected by the new orders/turnover ratio) of the sample.
L 2000	Indices are calculated in a gross form.	Simple value index with a fixed base year. 1995 base year.	No weights are used - the values are simply summed.
NL 2000	None.	Value indices. 1995 base year.	Turnover from SBS data.
A 2002	No seasonal or working day adjustment.	Laspeyres index. 1995 base year.	
P 2000		A fixed base year value index for the aggregated levels. A simple value index for the 3-digit level, based on the evolution compared to the preceding year. These evolutions are chained to produce the series.	
FIN 2000	None.	Absolute figures.	Not relevant.
UK 1999	The indices are seasonally adjusted according to the X11 ARIMA method on the basis of a multiplicative model. In summary, 3 types of new orders received series are produced: the volume of new orders received at constant (1990) prices; the value of new orders received at current prices; a volume index of new orders received (1990 = 100).	Laspeyres indices. 1990 base year.	

9.4.7 Technical annexes

In the case that new orders are not directly surveyed, the following equation can be used to calculate orders using data on the stock of orders:

$$NO(t) = SO(t) - SO(t-1) + OC(t) + T(t)$$

where

- $NO(t)$ = new orders arriving in month t ;
 $SO(t)$ = stock of orders at the end of month t ;
 $CO(t)$ = orders cancelled in month t relating to orders received in previous months;
 $T(t)$ = turnover in month t .

A significant check to test the consistency of the data provided by respondents is given by the following equation:

$$SO(t) = SO(t-1) + NO(t) - T(t) - CO(t)$$

These equations apply to basic data supplied by respondents.

The calculation of the value indices is based on the basic indices for each branch which are separate for the domestic and non-domestic markets. For the basic information at the most detailed level of activity, for example the Division (2-digit level of NACE Rev. 1), this gives an index of orders for the domestic market (I^D) for a branch (k) for reference period (t):

$$I_k^D(t) = \frac{NO_k^D(t)}{NO_k^D(0)} \cdot 100$$

and an index of orders for the non-domestic market (I^{ND}) for a branch (k) for reference period (t):

$$I_k^{ND}(t) = \frac{NO_k^{ND}(t)}{NO_k^{ND}(0)} \cdot 100$$

where

- $NO_k^D(t)$ = domestic orders arriving in month t from respondents in branch k ;
 $NO_k^D(0)$ = average domestic orders from respondents in branch k in the base year;
 $NO_k^{ND}(t)$ = non-domestic orders arriving in month

$NO_k^{ND}(0)$ = t from respondents in branch k;
average non-domestic orders from respondents in branch k in the base year.

To obtain the total index (I) for new orders for a branch (k), the domestic (ID) and non-domestic (IND) market indices have to be aggregated using their relevant weights. Since there are no data on orders for the population, the weights are calculated using turnover and adjusting this for the ratio between orders and turnover of the sample for the base year. The weighting of domestic orders of class k can then be calculated:

$$w_k^D = T_{k,tot}^D(0) \cdot \frac{NO_{k,s}^D(0)}{T_{k,s}^D(0)}$$

where

$T_{k,tot}^D(0)$ = domestic turnover of all units (tot) of branch k in the base year;

$NO_{k,s}^D(0)$ = domestic new orders of the sample units (s) of branch k in the base year;

$T_{k,s}^D(0)$ = domestic turnover of the sample units (s) of branch k in the base year.

Similar equations are used to calculate the weights of non-domestic new orders.

Applying these weights to the indices gives the total index of new orders (I) of a branch (k) for the reference period (t) (expressed by the Laspeyres formula):

$$I_k(t) = \frac{I_k^D(t) w_k^D + I_k^{ND}(t) w_k^{ND}}{w_k^D + w_k^{ND}}$$

It is then possible to aggregate the indices by activity to obtain indices for higher groupings up to the industry total. For the domestic and non-domestic orders this is shown by the following Laspeyres formulae:

$$I^D(t) = \sum_{k=1}^K I_k^D(t) w_k^D$$

$$I^{ND}(t) = \sum_{k=1}^K I_k^{ND}(t) w_k^{ND}$$

The index of new orders for the industry total is obtained by aggregating the indices for domestic and non-domestic new orders:

$$I(t) = I^D(t) w^D + I^{ND}(t) w^{ND}$$

The value indices also include variations occurring in prices. If they are deflated, they give volume indices that can be compared with the production indices.

Applying the price index (calculated according to the Laspeyres formula) to the value indices (vI) of orders is the same as calculating a volume index (VOL I) in accordance with the Paasche formula:

$${}_{VOL} I_k^D(t) = \frac{{}_V I_k^D(t)}{{}_P I_k^D(t)} \cdot 100$$

where

${}_P I_k^D(t)$ = price index of the domestic market of a branch (k) in reference period (t).

If the price indices for the non-domestic market and the total market are available, it is possible to apply similar formulae to use them to calculate the volume indices of non-domestic and total orders.

10. Industrial indicators

10.1 Production

Production determines the use of resources and labour and hence influences growth, income generation, and prosperity. The production index is regarded as one of the most important measures of economic activity. Developments in the industrial production index describe the economic cycles of industry, and this can also be used to assess the development of GDP as a whole. For STS this index is the reference indicator for economic development and it is used in particular to identify turning points in economic development at an early stage. The major advantage of the production index compared with other indicators is its combination of fast availability (relative to GDP for example) and at the same time its detailed activity breakdown.

10.1.1 Introduction

Name, synonyms and code numbers

The STS-R requires short-term statistics on production (110) under the provisions of Annex A (and B).

The production index is also known as an output index or a production volume index. In fact, as will be seen below, the theoretical purpose of the index is not to reflect production but value added. In practice however the index is not referred to as a value added index and very few (if any) national statistical authorities produce an index using value added and they rely instead mainly on production or turnover data.

This index is referred to hereafter as the IPI (industrial production index).

Purpose of the indicator - theoretical concept

The purpose of the IPI is to measure the price-change-adjusted own-output of a branch (and the total for industry) and to do so normally on a monthly basis.

Monthly measurement is common in order to detect changes in economic developments at the earliest possible stage. Only an up-to-date index is suitable for short-term observation of economic developments.

The IPI aims to identify volume changes in output. Values are affected by volume and price changes. Whenever values are used to compile the production index, they must be adjusted by removing pure inflationary price changes in order to isolate pure volume development (including quality changes).

The branch's own output should be measured. In other words, there is a shift from a gross to a net analysis of output (from production value to value added). All the inputs which are not produced by the observation unit itself but are obtained or purchased from other units (and hence make up intermediate consumption) must be deducted from the unit's gross output. This ensures that the output of a branch (and the total for industry) is presented without double counting and irrespective of changes in vertical integration.

Definition and reference period

As already noted above, the theoretical aim of the IPI is to reflect developments in value added. Value added at factor cost can be calculated from turnover (excluding VAT and other similar deductible taxes directly linked to turnover), plus capitalised production, plus other operating income plus or minus the changes in stocks, minus the purchases of goods and services, minus other taxes on products which are linked to turnover but not deductible, minus the duties and taxes linked to production.

Income and expenditure classified as financial or extraordinary in company accounts is excluded from value-added.

Subsidies on products and on production are included in value added at factor cost, whereas all taxes on products and on production are excluded.

Value-added at factor cost is calculated "gross" as value adjustments (such as depreciation) are not subtracted.

Dependent on the method used to compile the index, account should be taken of:

- variations in type and quality of the commodities and of the input materials;
- changes in stocks of finished goods and work in progress on goods and services;
- changes in technical input-output relations (processing techniques);
- related services, such as the assembling of production units, mounting, installations, repairs, planning, engineering, creation of software.
-

10.1.2 Population

Population

The coverage of this indicator is limited solely by NACE Rev. 1. The STS-R requires a coverage of Sections C and D and Groups 40.1 and 40.2.

Units

The STS-R requires the use of the KAU as the observation unit for this indicator.

10.1.3 Collection

Difficulties with the theoretical concept

The greatest difficulty in drawing up a production index is finding a useful measure of economic activity and measuring it in a way which is as precise and up-to-date as possible. In economic terms, the most appropriate measure of the activity of an observation unit or a branch is value added. The concept of an ideal IPI follows this approach. This theoretical requirement - short-term measuring of the development of value added - justifies, at a conceptual level, the use of the IPI as a short-term variable in assessing the development of GDP in volume terms.

In practice, however, value added is not available on a monthly basis in most countries. Therefore data is generally collected for variables other than value added in order to compile the IPI. Given the difficulties with the theoretical concept of the IPI, it is unsurprising that there are many ways that it can be compiled. In general it is impossible to say that one approach is better than another as the choice depends largely on the specific situation in a branch, and may differ from country to country. In every case, the key is to develop a "good" economic indicator of the business cycle. Possible alternatives for the compilation of an IPI are: (gross) output quantities, gross production value, turnover, raw material consumption, labour input and energy use. The choice of basic information is a complex task and of fundamental importance for the quality of IPI. The decision depends on numerous factors, so it is difficult to

make general recommendations; the expertise and experience of survey statisticians are crucial along with professional advice from the business community or their representatives.

The term "production" can be used to describe the production process and it can also be used for the results (gross output) of the production process, in other words the products (goods and services). The key variable in terms of resource consumption, the use of labour and income generation is the production process. In practice production process data cannot be collected and so the analysis is restricted to gross outputs and, to some extent, the input factors.

In industry the outputs are the goods produced, as well as the directly related industrial services (for example assembly, maintenance). In the case that outputs are used the decision as to precisely which measure / definition of gross output is selected as the basis of an IPI largely depends on three factors:

- the gross output should be recorded as precisely as possible and should be representative of the economic development in the branch concerned;
- the data should be as up-to-date as possible;
- the costs (for companies and statistical offices) of recording the statistical data should be borne in mind.

How to measure

Below, the basic compilation of an IPI is described using the value of gross production as the basic information. However, this does not imply that this method is preferred. The IPI compiled in this way is essentially a gross output index. Against this background, the IPI - at least at the level of the individual branches - is a measure of the development of the volume of gross output, which is a key economic variable in itself. Only with the aggregation of the IPI across branches does the net aspect play a part through the use of value added data for weighting. It is important to be aware of both the conceptual and the theoretical approach, in other words the theoretical IPI as an index of value added (net output), and the practical outcome, in other words the IPI mainly as a gross output index.

The most accurate production information on products is obtained from specialised surveys on output. In the EU Member States the Prodcom survey is carried out annually. The Prodcom list describes between 5,000 and 6,000 products and/or product categories assigned to NACE Rev. 1 Sections C, D and E. To calculate an IPI, however, sub-annual and preferably monthly production information is required. For this reason, the best theoretical basis for an IPI is a representative monthly

production survey²³. Production statistics ascertain the quantity and/or value of goods and their related industrial services. These products are assigned to branches at an appropriate level of NACE Rev. 1, in practice at the 4-digit level²⁴.

The question arises if quantities or value of products should be used to compile the index. At first, output quantities would appear to be most suitable (for example number of items, kg, litres) in order to track the development of production. However, this only applies to very homogeneous products. In cases where there are significant quality differences or heterogeneous products (for example high-technology machinery, personal computers or cars), declared values are the suitable observation variable. Here, the use of suitable price deflators must ensure that the quality component is reflected in the production volume.

The precise definition of production to be used in a survey of outputs must also be clarified. The Prodcom-R differentiates between "sold production", "production intended for sale" and "total production". The appropriate variable for an IPI is total production, since the entire economic activity of the unit is to be measured. Total production is the sum of production intended for sale and production for further processing within the same unit. It should be noted however that there may well be problems collecting data on total production as this information may not be easily available within an observation unit's records.

Measures of production
 Total production = production for sale + production for further processing
 Production for sale - net increase in stocks of finished goods and work in progress = production sold

Looking at the part of total production concerning production intended for sale, for the IPI it makes no difference whether the production is initially stored by the observation unit or is sold immediately (within the same reference period that it was produced). The difference between sold production and production intended for sale is significant as these two values are separated by the storage interval.

Looking at the other part of total production, namely production for further processing within the same observation unit, if this plays an important role within a particular branch it must also be adequately reflected in the IPI. The value for total production can be estimated by multiplying the amount (quantity) for further processing with the average value (unit value) of the sold

²³ Note that, even if production surveys are only carried out on an annual basis and hence can not be used to compile an IPI, they are useful in order to examine and, if necessary, to adjust the indices.

²⁴ The 8-digit Prodcom list conforms, with its first 6 digits, to the CPA product classification system, and with its first 4 digits to the NACE Rev. 1 activity classification.

production of the same product. If sold production, as a percentage of total production, is very small, the uncertain basis for the average value of sold production could give rise to implausible results; in these cases, it may be appropriate to compile the IPI by using quantities of total production instead of values.

Sampling

As the aim is to show in a representative manner the short-term development of individual branches and of industry as a whole it is not necessary to include all products and/or all observation units. Rather, a selection of products and/or units can take place. The quality of the selection can be verified on the basis of a comprehensive production survey which takes place at least once a year. It must also be ensured that the selection does not become too outdated and that actual structural changes and technical progress are reflected in the IPI.

Alternative methods/variables

Above, the collection of data for compiling the IPI on the basis of gross production values was described. In fact, as previously noted, a range of options for compiling the IPI is available. These are based on different output or input variables. The most suitable variable depends on the specific situation in a branch and the basic conditions (availability of statistical data) in a country. Therefore it is not unusual for different types of basic information to be used in parallel in any given country, and for differences to exist between countries in the type of basic information used for any given branch.

Output quantities as the basic data

The output quantity is at first sight the most obvious variable to use in order to construct an IPI (in the sense of an output index). However, as already noted, this is only true in the case of homogeneous products. The more heterogeneous the products, the more problematic it is to aggregate the quantities for individual products to product groups. In these cases, updating with gross production values (as already described) is preferred. A further problem in practice is the choice of the correct physical unit (for example number of items, weight, volume, surface, length). Here, it should be examined which series correlates most closely with the development of value added. Changes in the quality of a good over time must also be taken into account.

It is a major problem that it is not possible to say in which way quality changes will influence the change in quantity from one period to the next as quality changes may influence the quantity produced in different ways. In the case of significant quality changes, the only option is

to form a new series for the different qualities of the product²⁵.

The major advantage of using quantities as the basic information is that quantity relatives are obtained in the first stage of index computation - see point 10.1.4.

The appropriate variable for observation of the output quantities is the quantity of total production - thus the sum of production for sale and production intended for further processing in the same observation unit. As with the value of production, it is helpful that the quantities for the individual products can be assigned to the KAUs (via product groups).

Turnover as the basic information

In the case of compiling the IPI from turnover, there is an important methodological difference compared to the use of quantities or production values. Here, the process starts not with the individual products, but at a higher level, in other words the turnover of observation units. As already noted the observation unit for the IPI is the KAU.

The turnover for each NACE Rev. 1 Class is normally available from monthly surveys. In order to exclude pure price effects, a deflation with the appropriate price indices is necessary. Subsequently, relatives can be formed as the deflated turnover of the reporting period t is set in relation to the turnover of the base period 0 (the average monthly turnover in the base year) - see point 10.1.4.

Important advantages of the index updating with turnover are:

- to some extent, production data may not be available monthly, because there is no appropriate statistical survey, but turnover data are usually available based on their own survey;
- turnover data need not be collected in a highly disaggregated way and, especially in branches with very heterogeneous and extensive production ranges, can be collected more easily and more economically (above all if one is content with turnover for enterprises instead of KAUs);
- current turnover is frequently available more quickly than collecting a large number of production quantities or values on a differentiated basis.

However, further methodological/substantive problems also arise:

- turnover actually measures production sold on the market in the reference period and this can differ

²⁵ When compiling using production values, this quality difference is reflected in the development of the value of production and is taken into account by deflating with price indices which show pure inflationary developments only.

substantially from the target of measuring the production process as produced goods can first go into stock, or products are sold ex stock. If this effect is significant, it can lead to a misinterpretation of the IPI as regards economic cycles as, with this type of basic information, it is actually a pure turnover index. This applies also if an overall index consists partly of series based on turnover;

- the intermediate production of finished/semi-finished products for further processing in the same observation unit are not taken into account.

The first of these obstacles might be overcome by using information on the change in inventories. Hence it is possible to calculate the volume relatives with adjusted turnover data. For example for changes in stocks it would be necessary to add the value of products going into stock and to subtract the value of products sold ex stock (valued with prices of the reference period) in the reference period. To do so, fast and reliable data on stock movements and finished/semi-finished products has to be available. This might be difficult for observation units that produce a wide range of products because the information has to be aligned to the turnover of KAUs.

From a methodological point of view, the use of gross production values or quantities²⁶ is to be preferred to turnover. Nevertheless, the practical advantages of a turnover based IPI can outweigh these doubts. In the long run, the indices for each branch and the index for the industry total must be examined to establish whether the production and turnover series correlate closely enough and whether there is reason to believe that this correlation will exist in future, particularly with respect to cyclical turning points.

Raw material consumption (inputs) as the basic information

In principle, updating with output variables is simpler than with input variables, since the number is usually smaller and the products are more homogeneous than the necessary inputs. If, however, only a few very homogeneous inputs are needed for production or clearly some input factors dominate, inputs can be a good alternative to compile the IPI. Substitutive relationships between input factors should be as small as possible, so that input sizes are suitable for the construction of the IPI. Furthermore, the functional relationship between the input (as a value or quantity) and the production process (measured in terms of output) must be taken into account (for example observation units tend to try to decrease raw material consumption in the production process). If an increase of a certain input leads to a less than proportional increase of production and output there is a risk of misinterpreting an IPI constructed from input series. It is also important to take account of the raw materials actually used in the reference period, not

the raw materials purchased; here lies a special difficulty, because respondents usually only have an approximate idea of the quantities of the inputs processed in a particular reference period.

When using input values, similar difficulties arise to those described for using turnover, namely deflation. The problem of significant quality changes has to be checked for carefully when updating the index with quantity or value input data. There is no general rule how an increase of the quality on an input factor will influence the target of production or value added and the IPI.

If the necessary data are available on a monthly basis and the consumption of a particular raw material or a group of raw materials are considered as representative of production in a branch, the index construction can take place in exactly the same way as described for the value of production. The indices of the branches are then included in the calculation of the overall index for industry.

Two important input factors are dealt with separately - work input and energy consumption.

Work input as the basic information

A production process - the stages from the beginning of production of a product up to its completion - needs a certain period which can in some cases be longer than the reference period. The general problem with compiling the IPI from output or raw material consumption, is that these must closely correlate, in terms of time scale, with the production process. A serious difficulty arises, however, with long production cycles and if the output, turnover or raw material consumption only occurs in large quantities at given times (for example shipbuilding).

One solution here is to examine work input which is continuously used during the production process and, in terms of time, is very closely linked to the production process. An advantage of the work input series is that these are generally easily available on a monthly basis. The working hours actually performed during the reference period (taking into account overtime or short-time work) are a good approximation to the actual production process. The number of persons employed is not suitable as basic information as this is a more or less constant monthly variable.

Of substantial importance when using the work input as the basic information for compiling the IPI is the change in productivity, in other words the ongoing changes in the volume of the labour factor input needed to achieve a fixed amount of output, caused for example by changes in technology and organisation. Failure to take changes in productivity into account would lead to a misinterpretation of the IPI as regards production output, growth and income generation. When using work

²⁶ Although updating with quantities causes problems with quality changes.

input as the basic information it is necessary to include this productivity development via appropriate factors. Both the purely technological approach can be taken into account (in which case the change of the productivity is normally positive) and the cyclically-determined aspect, which can also lead to negative change rates in certain cyclical phases.

Branches which are suitable for the use of the work input due to the long manufacturing processes include the manufacture of railway and tramway locomotives and rolling stock, building and repairing of ships and boats, manufacture of aircraft and spacecraft as well as construction (see sub-chapter 11.1 for more information on the index of production in construction).

Energy use as the basic information

An input which may be closely linked, in terms of time, with the production process and is also rather homogeneous is energy consumption. These can normally be measured easily in quantity units, at least for the purchases, which makes deflation in the later index computation unnecessary. An advantage of energy input series is that they can be surveyed quite easily, economically and quickly; however, such data are not always available monthly.

It is important to ensure that the energy actually used in the production process during the reference period is measured. Accordingly, respondents should indicate not only the amount of purchased but also the amount of own-generated energy. For respondents, it may also be difficult to assign the energy use more or less correctly to kind-of-activity units (in other words to the different branches in which an enterprise is active).

The main problem is the possibility of a short-term change in energy use efficiency (for example as a result of technical progress or new production procedures). Thus an increase in efficiency could lead to a lower level of the IPI although, all things being equal, production had remained unchanged. When compiling the IPI from basic information on energy use it is therefore also necessary to constantly monitor the technical conditions of production regarding energy consumption and, if necessary, to adjust the IPI which has been calculated from it. There should be a general connection between energy inputs and production process and/or output quantity in order to be able to interpret the IPI of a branch correctly. This is of course a general problem whenever input measures are used to approximate output measures. Benchmarking to annual data based on output measures allows this to be adjusted for, although this adjusted series only becomes available after a longer delay.

In practice energy input is only used for a very small range of branches and often in conjunction with other indicators.

10.1.4 Compilation of the index

For an explanation of the compilation of the index, it is again assumed that the gross production values are used as the basic information. At the appropriate stages the compilation based on output quantities and turnover is introduced.

Due to the large number of products, it is appropriate to group similar products together into homogeneous product groups. Each product group must be assigned to a branch at an appropriate level of NACE Rev. 1 normally the 4-digit-level. It should be noted that each product group is assigned to only one branch (k). The production value (v) of a product group (j) is derived from the sum of the production values for the products (i) belonging to this product group (p = price, q = quantity):

$$v_j = \sum_i v_{ij} = \sum_i p_{ij} q_{ij}$$

This aggregation must be carried out for all product groups for the reference period. The same approach is also adopted when using other basic information to compile the IPI. For quantity data, several products within a product group can of course only be added together if the same physical unit is used to determine quantity.

First stage of index compilation: calculation of value relatives²⁷

After all the gross production value series have been calculated for the product groups, the value relatives can be formed. The value of the reference period t is set in relation to the value of base period 0. It should be noted that each value relative can only be assigned to one branch (k).

The value relative (vR) is derived for each product group (j) for the reference period (t) with respect to the base period (0):

$${}_v R_j(t) = \frac{v_j(t)}{v_j(0)} \cdot 100$$

The value relatives must be calculated for all the product groups.

Deflation of value relatives

²⁷ The term "relative" is used here to express the ratio of a variable in the reference period to the same variable in the base period. This might also be called an index but here the term index is reserved for more complex expressions.

For an IPI, Laspeyres indices and chain indices are suitable in principle. The following is based on a Laspeyres-type IPI, which redefines the weighting structures every five years and refers the basic information for a particular reference period to this base year. In the case of a chain index, the same process steps are to be used, but with the fundamental difference that the weights for the aggregation of the relatives are updated annually.

To isolate the volume developments, values must be deflated with suitable price indices. In order to obtain a Laspeyres-type IPI, price adjustment using Paasche price indices should be carried out. However, these indices are normally not available, because it is practically impossible to obtain monthly updated weights for Paasche price indices. Therefore as a substitute, Laspeyres price indices are used with the weighting structure of the base year. This procedure can also be justified methodologically, since for the duration of the base year of an index, the difference between Paasche and Laspeyres price indices are generally only small. Moreover, the more detailed the basic information at which the deflation begins (for example at the 8-digit-level of the Prodcum list), the smaller are the distorting effects resulting from the use of Laspeyres price indices.

The price indices should be defined as closely as possible to the respective product groups used for the value relatives, in other words they should measure the average price development of the goods in the product group that they are to be used to deflate. The quality of the price indices used is of great importance for the calculation of the IPI - see point 10.1.6 for the equation for a Laspeyres price index.

When deflating the value relative (vR) of a product group (j) with the relevant Laspeyres price index (pI), a volume relative ($_{VOL}R$) of the Paasche type is obtained as a result. For the reference period (t) the following equation applies:

$$_{VOL}R_j(t) = \frac{vR_j(t)}{pI_j(t)} \cdot 100 = \frac{\sum_i p_{ij}(t) q_{ij}(t)}{\sum_i p_{ij}(t) q_{ij}(0)} \cdot 100$$

Calculation of quantity relatives based on output quantities at the basic data

Deflation is not necessary when output quantities are used - this is an important aspect if price indices are not available at a suitable level of breakdown or are not of good enough quality. The quantity relatives (qR) for each product group (j) in period (t) are calculated as follows.

$${}_0R_j(t) = \frac{\sum_{i \in j} q_i(t)}{\sum_{i \in j} q_i(0)} \cdot 100$$

q_i = quantity of product i
 j is the product group to which i belongs

Problems of quality changes

Sometimes it is difficult to get suitable price indices. In such cases, the problem can be avoided by using quantity relatives instead of value relatives. With quantity relatives deflation is not necessary but the problem of quality changes occurs. Quantities ignore quality changes of a product and the index may be influenced in different ways (assuming that the product is considered to still be the same).

Quality changes of a product are incorporated in the value of that good and consequently in the indices which are based on value series. Of course this is true only to the extent that the price indices used to deflate the production values actually measure purely inflation driven price changes - see sub-chapter 10.3 on treating quality changes in output price indices. It is the incorporation of quality changes that mean that an IPI based on production values is closer to the idea of a value added index.

Second stage of index compilation: IPI for branches

After the volume (or quantity) relatives for all product groups have been determined, the IPI can be calculated at the 4-digit (Class) level of NACE Rev. 1. Each product group (j) is always assigned to just one branch (k), in other words a branch's economic cycle is represented by one or more product groups. The IPI should describe the average economic development of the entire branch; if several product groups are assigned to a branch these must be combined. To arrive at this average, the weighted arithmetic mean should be used.

In line with the Laspeyres model, the weights are calculated for the base period 0. It is thus assumed that the structure of production will remain more or less constant within each branch up to the next rebasing²⁸. When compiling the IPI from production values, the

²⁸ Through constant updating of the weighting structures, which is undertaken de facto in respect of chain indices, the danger of the ageing of weighting is reduced. On the other hand, these structural variations make the inter-temporal comparisons more difficult. Strictly speaking, for a chain index only a comparison to the previous period is correct because otherwise price and quantity structure change at the same time.

weights for the product groups for the base year are derived from the share of gross production value of the product group in gross production value of all product groups assigned to the same branch. To determine the gross production values, the Prodcom products needed for compiling the IPI in the base year are all taken into consideration.

The weighting factor (w) of a product group (j), which is assigned to a branch (k), is calculated from the gross production value (PV) and is thus:

$$w_j = \frac{PV_j(0)}{\sum_{j \in k} PV_j(0)}$$

$$\text{where: } \sum_{j \in k} w_j = 1$$

If other basic information is used to compile the IPI (for example output quantities), the weights are also to be calculated on the basis of gross production values.

With the weighting factors (w) and the volume (or quantity) relatives ($_{VOL}R$), the production index ($_{VOL}I$) for a branch (k) in the reference period (t) can be calculated:

$$_{VOL}I_k(t) = \sum_{j \in k} w_j \cdot _{VOL}R_j(t)$$

Calculation of volume relatives for Classes based on turnover at the basic data

In order to exclude pure price effects from turnover a deflation with the appropriate price indices $_{PI}I_k$ is necessary. Subsequently, relatives can be formed as the deflated turnover of the reference period t is set in relation to the turnover of the base period 0 (the average monthly turnover in the base year)²⁹. As a result, a volume relative $_{VOL}R$ of the turnover for branch k is obtained:

$$_{VOL}R_k(t) = \frac{T_k(t)}{_{PI}I_k(t) T_k(0)} \cdot 100$$

The results of this (second) stage of index computation are volume relatives for the branches.

²⁹ An alternative option is to form the value relatives for turnover and then to deflate them. Mathematically, this gives the same result. The sequence of the procedure depends on the data-processing structure of the index computation programme.

The problem of correct deflation arises with turnover as it did with gross production values. Since Paasche price indices are not available, deflation is undertaken with Laspeyres price indices; as a result, a Paasche-type volume index is obtained instead of the desired Laspeyres index. The problem of the inadequate price indices is more serious when compiling the IPI from turnover than with the gross production values, since deflation takes place at a higher level and the difference between the two types of price index tends to be more serious. On the other hand, price indices at the 4-digit level of NACE Rev. 1 are more likely to be available than for special detailed product groups of the Prodcom list. According to the underlying data (turnover for the internal market or external market), appropriate price indices (for the internal or external market) should be used.

Quality differences and changes in the quality of individual products are reflected in turnover, as higher quality will normally lead to higher prices and higher turnover. This is an advantage when compared to compiling the IPI from quantities. A precondition for this is the availability of output prices which isolate pure inflation driven price changes.

Third stage of index compilation: IPI at higher aggregation levels

IPIs for the branches at the 4-digit level (or the volume relatives in the case of deflated turnover) can be aggregated according to the hierarchical classification structure of NACE Rev. 1 to IPIs at higher aggregation levels and also to main industrial groupings. The share of value added of each Class in the base year is used for the calculation of the aggregations. The greater the value added of a branch (k) compared with others, the greater, too, is its weight in the higher level indices. Gross value added at factor cost is used for this weighting of the branches. Gross value added at factor cost is normally available at the 4-digit level of NACE Rev. 1 from SBS³⁰. In order to have a representative IPI it is important to measure the distribution of value added between the branches as exactly and comprehensively as possible. In line with the Laspeyres model, the weights (w) of the individual branches (k) for the base year (0) are calculated as follows (VA = gross value added at factor cost):

$$w_k = \frac{VA_k(0)}{\sum_{k=1}^K VA_k(0)}$$

Using these weights, the IPIs (or volume relatives) for each branch ($_{VOL}I_k$) can be consolidated to the overall index for industry for the reference period t :

³⁰ Note that the SBS requires turnover, production value and value added for the enterprise, but only turnover and production value for the KAU.

$${}_{VOL}I(t) = \sum_{k=1}^K w_k \cdot {}_{VOL}I_k(t)$$

The aggregation of the sub indices to the total index takes place regardless of which type of basic information was used in the compilation of the sub indices.

Details of the compilation required

The precise description of the series to be compiled for the IPI can be seen in the following table.

Activity coverage NACE Rev. 1	C, D, 40.1, 40.2
Level of activity detail	Divisions and MIGS; Classes in Section D for large ³¹ Member States
Compulsory forms	Working day adjusted
Index or absolute figures	Index
Frequency	Monthly
Deadlines	1 month 15 days

Special note on deadlines

The STS-R permits smaller Member States an extension to the deadline of 15 calendar days. In this case a smaller Member State is defined as one with value added in Sections C, D and E of NACE Rev. 1 in a given base year that represents less than 3% of the value added of the EU. It is not clear whether the criteria for the application of the extension of 15 calendar delays should be evaluated for each of the three specified Sections in turn or for their sum. Equally, in the case that the Sections are evaluated separately it is not clear whether the extension applies only to indices for branches within those Sections that meet the criteria or that the extension is only valid in the case that all three of the Sections meet the criteria. As with the deadlines themselves, the extension represents a maximum and national statistical authorities are encouraged to provide data earlier than permitted under the extension.

³¹ Member States whose value added in Section D in the base year represents 5% or more of the equivalent value for the EU.

10.1.5 Overview of national methods

Population coverage

	Type of source	Coverage	Observation unit(s)
B 2000	Statistical surveys plus some administrative data. Census.	Sections C to E.	Local KAU.
DK 2000	Statistical sample survey.	Sections C and D except Division 11.	KAU.
D 2000	Statistical survey. Quarterly census, monthly sample survey.	The coverage is made up of two parts: — local units classified in Sections C to F belonging to enterprises classified in Sections C to F with 20 persons employed or more; — local units classified in Sections C to F with 20 persons employed or more, belonging to enterprises not classified in Sections C to F.	Enterprise and local unit (plant).
EL 2000	Statistical sample survey. Data for the energy branch are taken from administrative declarations.	Sections C to E.	Local KAU.
E 2000	Statistical sample survey.	Sections C to E excluding Division 37.	Local unit.
F 2000	Generally a statistical survey. Data for energy are received from the "observatoire de l'énergie". Data for arms production are received from the "Ministère de l'armement". Some data are also obtained from trade associations. Quarterly or yearly census, monthly sample survey.	Sections C to E. Approximately 85% of value added in these Sections is covered by the index.	Local unit or enterprise.
IRL 2000	Statistical survey. Census.	Sections D and E.	Local unit.
I 2000	Statistical sample survey. Some data come from state monopoly enterprises or directly from the Industry Ministry.	Sections C to E except for Divisions 12, 37, 41.	KAU.
L 2000	Statistical sample survey.	Sections C to E except Divisions 10 to 13, 23, 37, 41 and Group 40.3.	KAU.
NL 2000	Statistical sample survey. For some Classes data are directly received from enterprises or institutions, in particular in the manufacture of food products.	Sections C to E.	The enterprise and parts of enterprises (presumed to be KAUs).
A 2002	Statistical sample survey.	Sections C to E (and F)	Establishment ("Betrieb" as local KAU).
P 2000	Statistical sample survey. Three different surveys are used to compile these indices, one for indices based on the method of physical quantities of production, one based on hours worked and the third on deflated sales.	Sections C to E.	KAU when the method of physical quantities is used. Enterprise when number of hours worked and deflated sales methods are used.
FIN 2000	Statistical sample survey.	Sections C to E.	Local KAU.
S 2002	Statistical sample survey. Some data are also obtained from trade associations.	Sections C to E.	KAU.
UK 1999	Statistical sample survey. In addition data are obtained from the: Iron and Steel Statistics Bureau; Department of Trade and Industry (for energy); Ministry for Agriculture and Fisheries.	Sections C to E.	Enterprise or the activities of a specified list of local units belonging to an enterprise.

Definition of variables

	Definition
B 2000	The production index is based on the deflated value of production (55% of activities in Sections C to F), deflated value of sold production (25%), productivity-corrected hours worked (20%) or inputs in quantities (<1%). Deflation is carried out at the 8-digit Prodcom product level for each responding unit, using unit prices based on values and quantities sold.
DK 2000	96% of the basic series measure production in deflated turnover and the remaining 4% in hours worked. The definition of turnover of own products and services (excluding goods purchased for resale in the same condition as received) includes the value of products invoiced, costs such as transport and packing itemised separately on invoices. Rebates and discounts are deducted. VAT and all other taxes which fall on products and services when they leave the factory are also excluded (measured net, in other words including subsidies). The definition corresponds to a basic price concept.
D 2000	The index is compiled from deflated gross production values, deflated turnover and working hours.
EL 2000	78% of the basic series measure production in physical quantities, 20% in deflated values, 2% in hours worked.
E 2000	The elementary indices are based on quantities produced (78% of industrial value added), deflated values (21%) and the number of hours worked (1%).
F 2000	40.2% of the series measure production in quantity, 8.1% in delivered quantities, 25% in deflated turnover, 21.7% use hours worked (adjusted annually for productivity) and 5% use raw material consumption.
IRL 2000	Turnover; value and/or quantity of production by Prodcom product.
I 2000	Information is collected on 22,000 basic observations for 1,005 products. 80% of the basic series measure production in physical quantities, 5% are deflated turnover data, 10% are the hours worked and 5% are compiled from other basic information.
L 2000	Definitions are according to Commission Regulation No. 588/2001.
NL 2000	Enterprises report gross production, turnover, changes in stocks, physical quantities of products, energy consumption, consumption of raw materials or hours worked.
A 2002	Definitions are according to Commission Regulation No. 588/2001. In the monthly STS-survey the "production in the reporting period" is collected as follows: <ol style="list-style-type: none"> 1. own production (with reference to commodity list 1); 2. subcontract work carried out by the observation unit as a subcontractor (referring to commodity list 1); 3. subcontract work carried out by a foreign enterprise as a subcontractor for the observation unit as a subcontractor (referring to commodity list 1); 4. production sold (in accordance to commodity lists 1 and 2); 5. production intended for sale (in cases of Prodcom-references); 6. in case of establishments of the multi-establishment enterprises "deliveries and performance within the enterprise" are also surveyed. The first 2 of these headings are referred to as "technical production" and are the basis for calculating the industrial production index.
P 2000	Definitions are according to Commission Regulation No. 588/2001. 80% of the series measure production in physical quantities, 13% in terms of the number of hours worked and 7% in terms of deflated turnover.
FIN 2000	The production index is mainly based on the quantity of production of representative goods (this method accounts for some 80% of the total weight). Hours worked, energy consumed, raw material used and deflated sales or production are used as substitute variables (these account for some 20% of the total weight).
S 2002	Data for the production index corresponds to: deflated deliveries (75%); physical production (20%); hours worked (5%). The monthly index figures are adjusted to quarterly estimates based on the sum of deflated deliveries and changes in stocks of finished and semi-finished goods.
UK 1999	For Section D (manufacturing) the production index itself is compiled essentially from deflated turnover, adjusted for changes in stocks of finished goods and work in progress taken from a quarterly survey of stocks. The deflation is done separately for domestic and non-domestic turnover. For Sections C and E and in a small number of manufacturing activities the index is compiled from production measured in physical quantities.

Calculations made

	Calculations made	Type of index	Method of weighting
B 2000	Gross indices are transformed consecutively into indices per working day, seasonally adjusted indices and trend figures, using TRAMO SEATS.	Laspeyres chain index. 1995 base year.	Value added at factor costs of the last available year (usually the reference year minus two) for Divisions and higher as well as for some Groups and Classes; for the other Groups and Classes the data for the Divisions are split using the total value of production sold in the previous year.
DK 2000	There are no corrections for variations in the number of working days, though turnover data for four or five weeks are corrected to a calendar month. Turnover is deflated using the domestic output price index at a detailed level of activity. Procedure X11 is used to adjust for seasonal variations.	Laspeyres index. 1995 base year.	Value added at basic prices (for KAUs) in the base year from SBS (account statistics).
D 2000	The working-day adjustment coefficients take account of the number of working days in a month, considering also regional aspects. The adjustment coefficients are based on series of previous periods. "Berliner Verfahren", version 4 (BV4) is used for seasonal adjustment. Data adjusted by X11 are published by the Central Bank.	Laspeyres index. 1995 base year.	Gross production value and value added at factor cost.
EL 2000	The calendar adjustment method takes into account the number of working days, public holidays and other days not worked. No seasonal adjustment.	Simple Laspeyres index. 1993 base year.	Value added at factor cost.
E 2000	The general index and the indices for consumer, intermediate and capital goods are adjusted for the number of effective working days.	Laspeyres index with a fixed base year. 1990 base year.	Gross value added at factor cost for the activity indices. For selected products the indices are weighted by the value of production.
F 2000	The gross index is adjusted for working days and seasonally adjusted using TRAMO/SEATS with 6 regressors.	Laspeyres index with a fixed base year. 1995 base year.	Gross value added at factor cost for the base year.
IRL 2000	Corrections are made for variations in the number of working days. The X11 program is used to adjust for seasonal variations.	Laspeyres chain index. 1995 base year.	Gross value added at factor cost.
I 2000	The calendar correction (working day adjustment) only takes into account legal and religious holidays. The production index is also adjusted for seasonal variation using the TRAMO-SEATS procedure.	Laspeyres indices. 1995 base year.	Production value for basic product information. Value added at factor costs for activity indices.
L 2000	Proportional corrections are made by applying coefficients for variations in the number of working days in the month, public and religious holidays and the number of days per week worked by the observation unit. There is no adjustment for seasonal variations.	Laspeyres index. 1995 base year.	Gross value added at factor costs.
NL 2000	The correction of working days takes into account the number of working days per month, official holidays and branch-typical shiftwork, but not lost production due to strikes and holidays. Census X12 is used for seasonal adjustment. In the near future (from 2001 onwards) the correction of working days will also be done with Census X12. As far as turnover and value of stocks is used for the calculation of the index, output price indices are used for deflation.	Simple Laspeyres index. The Production index is calculated as a chain index. 1995 base year.	Gross value added at basic prices according to the most recently available national accounts data.
A 2002	The calendar adjustment method takes into account the number of working days in the month, public holidays and fractions of working days in the month. No seasonal adjustment is done.	Laspeyres index. 1995 base year.	Net production value (without excise taxes).
P 2000	The monthly series are corrected to a standard number of working days by using a proportional method. No seasonal adjustment is carried out.	Laspeyres index with a fixed base year. 1995 base year.	Gross value added at factor cost for the 3-digit level from the SBS survey. Below the 5 digit level of CAE it is the value of production.
FIN 2000	Corrections are made for variations in the number of working days. Procedure X11-ARIMA is used to adjust for seasonal variations.	Laspeyres index. 1995 base year.	Value added at basic prices in the base year from SBS.
S 2002	The calendar adjustment method takes into account the number of working days in the month. The seasonal adjustment method used is X11.	Paasche volume index is used for most activities. A	Census value added of the base year.

	Calculations made	Type of index	Method of weighting
	seasonal adjustment method used is X11.	simple Laspeyres index is used for activities with homogenous products. 1995 base year.	
UK 1999	The correction for working days takes into account the number of working days in the month, the number of days of the week the enterprise works as well as fractions of working days. Public holiday effects are removed with the aid of the seasonal adjustment using Census II (X11 ARIMA).	Simple Laspeyres index. 1995 base year.	Value added at factor cost taken from the Annual Business Inquiry for the base reference year.

10.1.6 Technical annexes

Value (v) of production of product group (j) for products (i) with price (p) and quantity (q):

$$v_j = \sum_{i \in j} p_i q_i$$

Calculation of value relatives (vR) for gross production value (v) for product group (j) in period (t) compared to the base period (0):

$${}_v R_j(t) = \frac{v_j(t)}{v_j(0)} \cdot 100 = \frac{\sum_{i \in j} p_i(t) q_i(t)}{\sum_{i \in j} p_i(0) q_i(0)} \cdot 100$$

Laspeyres price index (pI) formula for product group (j) in period (t):

$${}_p I_j(t) = \frac{\sum_{i \in j} p_i(t) q_i(0)}{\sum_{i \in j} p_i(0) q_i(0)} \cdot 100$$

Calculation of volume relatives (VOLR) by deflation of value relative (vR) by a price index (pI):

$${}_{VOL} R_j(t) = \frac{{}_v R_j(t)}{{}_p I_j(t)} \cdot 100 = \frac{\sum_{i \in j} p_i(t) q_i(t)}{\sum_{i \in j} p_i(t) q_i(0)} \cdot 100$$

10.2 Turnover

10.2.1 Introduction

Name, synonyms and code numbers

The STS-R requires short-term statistics on turnover (120) for Annexes A, C and D. For industry it requires information on domestic turnover (121) and non-domestic turnover (122).

It should be noted that turnover is sometimes also referred as "sales", "shipments" or "deliveries". In the context of this manual, these terms are used as synonyms.

Purpose of the indicator - theoretical concept

In general turnover gives a global idea of the sales evolution including the sales of goods, merchantable goods and services provided to other units. It can be seen as an important indicator of activity in general, namely in terms of the demand for industrial output. It is the objective of the turnover index to show the evolution of the market for goods and services. For short-term analysis, turnover information is of particular significance.

While the IPI provides information on trends in volume concerning value added at factor cost, turnover is used in industry to assess current developments in sales. By contrast, in many of the distribution and service activities the concept of production can not be easily defined and turnover is the best proxy for the analysis of the short-term evolution of these activities. Therefore, for industry, turnover can be seen as a complement to production information in short term analysis.

Turnover is a fairly elementary concept in accounting³², which hence exists not only in industry but also in other market oriented activities like construction, distribution, transport, communication, hotels and other services. Hence, the turnover indicator can provide a common

³² The concept of turnover is to some extent defined by the Directive 78/660/CE, of 28th July 1978 (4th Directive), in article 28.

link for short-term comparisons of business cycle movements in various parts of the economy.

In normal circumstances, the most important part of the income of a unit is its operating income; it is here that the receipts coming from the non-financial ordinary activity are included. Within operating income turnover normally accounts for the highest share.

Turnover is a measure of the market growth and provides information useful for those activities supplying inputs and for those activities using a unit's output for further manufacturing processes. The business community itself calculates market share based on turnover.

It is sometimes believed that the turnover index and the IPI are quite similar but in reality, the differences are considerable:

- turnover includes sales of merchanted goods (resale) which is not considered in the IPI;
- services provided to other units are included in turnover, but usually are not included in production notably when the IPI is compiled from physical quantities;
- goods produced (or purchased) and stocked before sale are included in both production and turnover, but are considered at different moments in time;
- sales data will often include the output of secondary activities, while the IPI, if based on a list of products, is more homogeneous.

Nevertheless, there is still a strong connection between these two indicators and in some cases deflated turnover is used as proxy for the IPI.

Definition and reference period

The definition of turnover for STS follows the definition of SBS and in this respect follows to a large extent the ESA 95.

The definition of turnover is relatively straight forward. In the case of industry, the most important components of turnover are invoiced services provided by the unit and the sales of products i) produced by the unit, ii) produced by third parties with raw materials of the unit or iii) purchased for resale by the unit. However, some other items can be included in turnover.

In case of doubts concerning the eventual inclusion or not of any item in turnover definition "items may be included if they generate turnover in the principle field of operation of the observation unit".

Turnover comprises the totals invoiced by the observation unit during the reference period, and this corresponds to market sales of goods or services supplied

to third parties. Turnover includes all duties and taxes on the goods or services invoiced by the unit with the exception of the VAT invoiced by the unit vis-à-vis its customer and other similar deductible taxes directly linked to turnover. Turnover also includes all other charges (for example transport, packaging) passed on to the customer, even if these charges are listed separately in the invoice. Reduction in prices, rebates and discounts as well as the value of returned packing must be deducted. Price reductions, rebates and bonuses conceded later to clients, for example at the end of the year, are not taken into account. Income classified as other operating income, financial income and extraordinary income in company accounts is excluded from turnover. Subsidies received from public authorities or the institutions of the European Union are also excluded.

According to this definition, the items generally included are:

- sales of manufactured products;
- sales of products manufactured by subcontractors;
- sales of goods purchased for resale in the same condition as received;
- invoiced services provided;
- sales of by-products;
- invoiced charges for packaging and transport;
- hours worked invoiced to third parties for labour only subcontracting;
- invoiced mounting, installations and repairs;
- invoiced instalments (stage payments);
- invoiced development of software and software licences;
- sales of supplied electric power, gas, heat, steam and water;
- sales of waste and scrap materials.

Subject to the treatment of income classified as "other operating income, financial income and extraordinary income" in company accounts, the items generally excluded are:

- commissions;
- leases and rentals;
- leases for own production units and machines if used by third parties;
- leases of company-owned dwellings;
- receipts for license-fees;
- receipts from staff facilities (for example from a factory canteen);
- the supply of products and services within the observation unit;
- sales of own land and fixed assets;
- sales or leases of own properties;
- sales of shares;
- interest receipts and dividends;

- subsidies;
- other extraordinary income.

This definition should be used by national statistical authorities, but accounting rules in force in each country should be used as guiding principles of what to include and to exclude. The reality of each activity should be taken into account when measuring turnover, for example in some activities with large products with long production cycles turnover is likely to be more volatile.

Subcontracting

In industry it is very common, when a unit has insufficient capacity to completely fill an order, to subcontract part or all of the work to another unit. The subcontracting concept is difficult to define and various references can be found in business statistics, notably in the explanatory notes of Prodcom and NACE Rev. 1 and in the definitions adopted for the SBS. The definitions used for STS do not explicitly define sub-contracting. Nevertheless in industry, a large part of subcontracting comes from i) work done by third parties on raw materials belonging to the unit and ii) from a unit providing an industrial service to another.

As noted above, the sales of products manufactured by subcontractors should also be included in turnover of the main contractor. Equally the subcontractor should consider as turnover the invoiced services provided.

Hence, the services and the sales of this production are included in turnover by both units, the contractor and the subcontractor. This means that turnover double counts the sales of some products, which is correct when measuring the market size (which is a function of the structure of industrial activities) but causes difficulties for analysis if this is used as a proxy for production.

VAT

The treatment of VAT in turnover is another controversial issue, some consider that VAT should be included in the definition of turnover. The definition adopted for STS excludes VAT which is consistent with the definition adopted for SBS. There are some reasons for not including VAT in the turnover definition:

- the aim of STS is to follow developments over time and VAT does not have any impact on the tendency unless the rate of the tax is changed. In fact, if there is a change in the tax of different products this could introduce an artificial element into the evolution of the turnover indicator;
- if VAT is included in the weights, it can distort the share of each activity; bearing in mind that the tax differs from product to product, the impact of VAT on these weights can have a negative impact on the quality of the index;

- the tax for domestic or non-domestic markets may differ;
- the tax differs between Member States.

10.2.2 Population

Classifications & coverage

The coverage of these indicators is mainly limited by NACE Rev. 1. The STS-R requires a coverage of Sections C and D. The sub-indicators of turnover are also limited by their geographical market between domestic and non-domestic markets (see point 5.2.5 for the definition of these markets).

Units

The STS-R requires the use of the KAU as the observation unit for this indicator.

There are arguments in favour of the enterprise and the KAU as observation unit. If future investment prospects are to be analysed based on present income, enterprises are the correct observation units. Additionally data from enterprises is much easier to obtain than from KAUs. This is a particularly valid argument if administrative sources like the VAT register are used. Comparisons between turnover indices in other activities (for example distribution and services) only make sense for data following the sector approach, in other words collected for enterprises, since short term statistics in these parts of the economy use that approach. If the main purpose of the turnover index is to be compared with the IPI, employment and PPI in the same activities, KAUs should be the observation unit. In this case, the index will also be valid for updating quarterly national accounts, which is a further important role of short-term turnover information.

It should however be noted that even if the KAU is used, the comparison with the IPI will not be perfect because of other methodological problems, such as the differences in the definitions noted above.

10.2.3 Collection

How to measure

Traditionally the main method of collecting information on turnover is through the use of a statistical survey.

Sampling of units

In the case of statistical surveys either a sample survey or a census can be used. Usually if a sample is selected for turnover the distinction between domestic and non-domestic markets is not considered in the stratification plan as most SBR do not have information concerning this. Therefore the sample may not be representative for these sub-indicators.

Alternative methods/variables

Bearing in mind the aim of the turnover indicator, it should be decided whether it is possible or preferable to use administrative data or conduct a statistical survey instead. As turnover is recorded in accounts by all units, information concerning turnover does not need to be collected through a statistical survey and administrative sources can be used. The main administrative source for turnover is the VAT declarations made by enterprises regarding their purchases and sales.

Nevertheless, some attention should be paid to the definition used by the administrative authorities compared to that used in the implementation of the STS-R - some consistency problems may arise. The use of VAT registers may also lead to difficulties concerning the respect of delays as, for some enterprises, VAT authorities concede a delay for making declarations that is incompatible with the delay required under the provisions of the STS-R. It should also not be forgotten that each Member State determines the levels of turnover below which VAT declarations do not need to be made

Details of the compilation required

The precise description of the series to be compiled for the turnover indicator can be seen in the following table.

		Activity coverage NACE Rev. 1	Market coverage	Level of activity detail	Compulsory forms	Index or absolute figures	Frequency	Dead-lines
120	turnover	C, D	Total	Divisions and MIGS	Gross	Either	Monthly	2 months
121	domestic turnover	C, D	Domestic	Divisions and MIGS	Gross	Either	Monthly	2 months
121	non-domestic turnover	C, D	Non-domestic	Divisions and MIGS	Gross	Either	Monthly	2 months

and may also allow different frequencies for declarations (monthly, quarterly or annually) according to enterprise size.

The main advantage of the use of administrative sources is that it reduces the burden of data collection on enterprises.

10.2.4 Compilation of the index

Methods to combine the raw data

The STS-R requires this indicator to be transmitted to Eurostat as either an index or as absolute figures. The turnover index is a simple value index (price multiplied by quantity/volume), and is a direct index in that it compares the current period with the fixed period in the base year. The same compilation is used for the sub-indicators for the domestic and non-domestic markets.

In order to compile turnover indices at higher levels of NACE, the indices at the lowest level have to be aggregated. This aggregation is done by using weights based on the turnover share of each activity in the base year. For the sub-indicators the weights are based on the turnover shares of each activity in the two separate markets, domestic and non-domestic.

It is recommended to use SBS data for the weights in order to provide the maximum of consistency between different indicators. There are other sources that can be used, however attention must be paid to the consistency of the basic data, notably the definition of turnover used. From SBS it should be possible to obtain turnover data for KAUs. If this is not available in practice enterprise data is used.

Special note on deadlines

The STS-R permits smaller Member States an extension to the deadline of 15 calendar days. In this case a smaller Member State is defined as one with value added in Sections C, D and E of NACE Rev. 1 in a given base year that represents less than 3% of the value added of the EU. It is not clear whether the criteria for the application of the extension of 15 calendar delays should be evaluated for each of the three specified Sections in

turn or for their sum. Equally, in the case that the Sections are evaluated separately it is not clear whether the extension applies only to indices for branches within those Sections that meet the criteria or that the extension is only valid in the case that all three of the Sections meet the criteria. As with the deadlines themselves, the extension represents a maximum and national statistical authorities are encouraged to provide data earlier than permitted under the extension.

10.2.5 Overview of national methods

Population coverage

	Type of source	Coverage	Observation unit(s)
DK 2000	Statistical sample survey.	Sections C and D excluding Division 11.	KAU.
D 2000	Statistical survey. Census.	Sections C and D.	Local KAU.
F 2000	Monthly and quarterly tax returns of enterprises subject to VAT. Sample.	Sections C to F.	Enterprise.
I 2000	Statistical sample survey.	Sections C and D excluding Division 12 and Group 23.3.	KAU.
L 2000	Statistical sample survey.	Sections C to E (and Group 45.2) excluding Divisions 10 to 13, 23, 37, 41 and Group 40.3.	KAU.
NL 2000	Statistical survey. Census.	Sections C and D.	Enterprise and parts of enterprise (KAU).
A 2002	Statistical sample survey.	Sections C to E (and F).	Enterprise.
P 2000	Statistical sample survey.	Sections C to E. The area covered by the survey is Mainland Portugal.	Enterprise.
FIN 2000	Administrative source completed by a statistical survey. Census.	Sections C to E.	Administrative source: enterprise. Statistical survey: enterprise/KAU.
S 2002	Statistical sample survey.	Sections C and D.	KAU.
UK 1999	Statistical sample survey. In addition data are obtained from the: Iron and Steel Statistics Bureau; Department of Trade and Industry (for energy); Ministry for Agriculture and Fisheries.	Sections C to E.	Enterprise or the activities of a specified list of local units belonging to an enterprise.

Calculations made

	Calculations made	Type of index	Method of weighting
DK 2000	There are no corrections for variations in the number of working days, though turnover data for four or five weeks are corrected to a calendar month. Procedure X11 is used to adjust seasonal variations.	Simple value index. 1995 base year.	No fixed weights are used. The base values are published.
D 2000	Output prices are used to deflate nominal values and to obtain a volume index of turnover. The turnover index is not corrected for working days. The "Berliner Verfahren", version 4 (BV4) is used for seasonal adjustment. Data adjusted by X11 are published by the Central Bank.	Indices in nominal values are simple value indices compared with the base year. Indices in volume are Paasche-indices. 1995 base year.	Turnover from 1995.
F 2000		A value index with a fixed base year. 1995 base year.	Enterprise turnover.

	Calculations made	Type of index	Method of weighting
I 2000	The data is seasonally adjusted using the TRAMO-SEATS method.	Laspeyres index. 1995 base year.	Enterprise turnover.
L 2000	Indices are calculated in a gross form.	Simple value index with a fixed base year. 1995 base year.	Enterprise turnover.
NL 2000	No seasonal or working day adjustment.	Simple Laspeyres index. 1995 base year.	No fixed weights are used.
A 2002	No seasonal or working day adjustment.	Simple Laspeyres index. 1995 base year.	
P 2000	No working day adjustment.	A fixed base year value index for the aggregated levels. For the 3-digit level a simple value index is applied based on the evolution compared to the preceding year. These evolutions are chained to compile the series. 1995 base year.	Turnover from SBS.
FIN 2000	The turnover indices are seasonally adjusted.	Index based on a panel of enterprise data. The sum of turnover during the latest reference period is compared to the same period of the previous year and the year-on-year percentage change is calculated. The change is then used to calculate the index number of the latest reference period. 1995 base year.	Enterprises in the panel: share of the panel's turnover for a given month. For the domestic turnover index the weights are domestic turnover and for the export turnover index the weights are export turnover.
S 2002	The calendar adjustment method takes into account the number of working days in the month. The seasonal adjustment method used is X11. Outliers are corrected automatically and by manual revisions.	Paasche volume index. 1995 base year.	Aggregation is done by grossing up the index - no external weights are used.
UK 1999	The correction for working days takes into account the number of working days in the month, the number of days of the week the enterprise works as well as fractions of working days. Public holiday effects are removed with the seasonal adjustment using Census II (X11 ARIMA). Although turnover data is collected broken down between domestic and non-domestic turnover, only a total turnover index is compiled.	Simple Laspeyres index. 1995 base year.	Value added at factor cost.

10.2.6 Technical annexes

The calculation of value indices I for a given activity (k) are based on the turnover (T) of all observation units (h) of the reference month (t) compared with the monthly average of turnover of the base period (0):

$$I_k(t) = \frac{\sum_{h \in k} T_h(t)}{\sum_{h \in k} T_h(0)} \times 100$$

The turnover can be broken down by different activities and by different markets. Considering the distribution by (k) activities and (x) markets, each elementary index is determined in two dimensions (turnover T of activity k for market x) and the weights (w) assume the following composition:

$$w_k^x(0) = \frac{T_k^x(0)}{\sum_{k=1}^K \sum_{x=1}^X T_k^x(0)}$$

$$w_k(0) = \sum_{x=1}^X w_k^x(0)$$

$$w_x(0) = \sum_{k=1}^K w_k^x(0)$$

$$\sum_{k=1}^K \sum_{x=1}^X w_k^x(0) = 1$$

The turnover index is a value index (evolution in volume and prices of transactions). Thus, the index corresponds to the evolution of the turnover (value) of the activity (k) market (x) in the reference period (t) in comparison with the base period (0):

$$I_k^x(t) = \frac{T_k^x(t)}{T_k^x(0)}$$

The elementary index for total turnover in an activity (k) is defined from the aggregation of the elementary indices of the markets:

$$I_k(t) = \sum_{x=1}^X w_k^x(0) \cdot I_k^x(t)$$

Similarly, for an elementary aggregate limited to market (x), the index is defined from the elementary index of activity (k):

$$I_x(t) = \sum_{k=1}^K w_k^x(0) \cdot I_k^x(t)$$

Considering a certain activity aggregate or the whole industrial activity the index should respect the aggregation consistency of the index for each aggregation. In other words the index for all markets for all activities should be the same whether obtained from the aggregation of the index of each activity or of each market. Thus the index for total turnover can be obtained from elementary indexes of activities or of markets:

$$I(t) = \sum_{k=1}^K \sum_{x=1}^X w_k^x(0) \cdot I_k^x(t)$$

or from the elementary aggregation of activities or markets:

$$I_k^x(t) = \frac{T_k^x(t)}{T_k^x(0)}$$

The elementary index for total turnover in an activity (k) is defined from the aggregation of the elementary indices of the markets:

$$I_k(t) = \sum_{x=1}^X w_k^x(0) \cdot I_k^x(t)$$

Similarly, for an elementary aggregate limited to market (x), the index is defined from the elementary index of activity (k):

$$I_x(t) = \sum_{k=1}^K w_k^x(0) \cdot I_k^x(t)$$

Considering a certain activity aggregate or the whole industrial activity the index should respect the aggregation consistency of the index for each aggregation. In other words the index for all markets for all activities should be the same whether obtained from the aggregation of the index of each activity or of each

market. Thus the index for total turnover can be obtained from elementary indexes of activities or of markets:

$$I(t) = \sum_{k=1}^K \sum_{x=1}^X w_k^x(0) \cdot I_k^x(t)$$

or from the elementary aggregation of activities or markets:

$$I(t) = \frac{\sum_{k=1}^K \sum_{x=1}^X T_k^x(t)}{\sum_{k=1}^K \sum_{x=1}^X T_k^x(0)}$$

As the turnover index is an aggregate index obtained from the weighted average of elementary indices or elementary aggregates, the evolution of total turnover corresponds to a weighted mean of the evolution of elementary indexes or elementary aggregates. Thus:

$$\begin{aligned} \Delta I_{t/t-1} &= \frac{I(t)}{I(t-1)} - 1 \\ &= \frac{1}{I(t-1)} \cdot \sum_{k=1}^K \sum_{x=1}^X w_k^x(0) (I_k^x(t) - I_k^x(t-1)) \end{aligned}$$

10.3 Output prices

10.3.1 Introduction

Name, synonyms and code numbers

The STS-R requires short-term statistics on output prices (310, hereafter PPI) under the provisions of Annex A. It also requires an output price index of the domestic market (311, hereafter PPI^D) and of the non-domestic market (312, hereafter PPIND). Output prices are also known as producer prices. Input prices can also be considered as producer prices. The STS-R does not require input prices for Annex A and producer prices and output prices are often used as synonyms in the domain of STS.

Purpose of the indicator - theoretical concept

Output price indices seek to measure the gross monthly change in the trading price of products on the domestic market and the non-domestic market. In combination, the sub-indices for these two markets give the change in the PPI for a given product, and through aggregation, groups of products and activities.

Monthly measurement of output prices meets a need for information on the short- and medium-term economic activity of the Member States and the EU. They permit

monthly monitoring of prices at different stages of the manufacturing process, and they are also a means of distinguishing effective growth of the activity from price changes (the national accounts and IPI deflator) and provide information to the business community on particular markets of interest to them.

Non-domestic-price indices

Just like the PPI^D, the PPIND meets a need for short-term economic analysis, can be used as a deflator or for the purposes of analysis (calculating the terms of trade, for example); they are also useful for the business community in the evaluation of certain markets.

Definition and reference period

It is essential that all price-determining characteristics of the products are taken into account, including quantity of units sold, transport provided, rebates, service conditions, guarantee conditions and destination. The specification must be such that in subsequent reference periods, the observation unit is able uniquely to identify the product and to provide the appropriate price per unit.

The following rules apply for the definition of prices:

- the appropriate price is the ex-factory³³ price that includes all duties and taxes on the goods and services invoiced by the unit but excludes VAT invoiced by the unit vis-à-vis its customer and similar deductible taxes directly linked to turnover;
- if transport costs are included, this should be part of the product specification;
- in order to show the true evolution of price movements, it should be an actual transaction price, and not a list price;
- the output price index should take into account quality changes in products;
- the price collected in period *t* should refer to orders booked during period *t* (moment of order), not the moment when the commodities leave the factory gates;
- for output prices of the non-domestic market, the price should be calculated at national frontiers, FOB (free on board).

The collected price information refers preferably to a particular day in the middle of the reference period. If no price information is available for the day in question, the price may represent an average over the whole period.

The indices of domestic and non-domestic prices require separate output price indices to be compiled according to the destination of the product. The destination is determined by the residency of the third party that has ordered or purchased the product. The domestic market

is defined as third parties resident in the same national territory as the observation unit.

It should be noted that the ESA foresees the use of basic prices. Notable differences with respect to the above are: basic prices should always exclude transport costs; basic prices should include subsidies on products and exclude all taxes on products (not just VAT and similar deductible taxes).

Non-domestic-price indices - definition of "price"

In the case of trade between a unit and another unit abroad of the same enterprise group, the invoiced price may well be a transfer or disposal price whose evolution may not always reflect the price changes for a client not within the same enterprise group. For this reason preference may be given to the collection of prices paid by more representative clients (for example local importers) or a system may be set up with the enterprise monitoring an indicator based on disposal prices but whose evolution does indeed reflect that of prices on the local market.

Because there may not have been a transaction for a given product on a given date in the middle of the month, it may be preferable to measure a mean transaction price over the reference month for the product in question. This is, moreover, coherent with the mean monthly conversion rate for the transaction currency used; for the PPIND the evolution of prices of products is in national currency and the price of a transaction made in another currency must be converted on this basis by the national statistical authority. Price changes thus partially reflect exchange rate fluctuations.

10.3.2 Population

Classifications & coverage

The coverage of these indicators is limited mainly by NACE Rev.1. The STS-R requires a coverage of Sections C to E excluding Groups 12.0, 22.1, 23.3, 29.6, 35.1, 35.3. The sub-indicators of output prices are also limited by their geographical market between domestic and non-domestic markets (see point 5.2.5 for the definition of these markets).

Units

The STS-R requires the use of the KAU as the observation unit for this indicator. As has been noted elsewhere this is in fact not practical. As the information used is based on products it could be considered that there is no observation unit in the sense foreseen by the STS-R. However, the weights used for aggregating indices from the most detailed activity level should be based on KAU data.

³³ Or equivalent for activities outside of manufacturing.

10.3.3 Collection

How to measure

The monthly monitoring of changes in prices of products sold by domestic producers is done by means of a statistical survey of the producers in the activity in question. Regular collection of prices data normally flows from a sample of units and a sample of their products.

Sampling of units/products

The basic sampling method used varies between national statistical authorities. It may involve a two-stage sampling process of observations units and products. Alternatively, if an appropriate frame is available a single sample is made of "pairs of observation units and products".

The sampling frame used may vary depending on the market under study (domestic or non-domestic). On the domestic market, the sample of enterprises is normally drawn from the SBR. A probabilistic method (usually proportional to size) or reasoned selection is used to ensure a sufficient coverage. Once an observation unit has been selected a qualified field officer may visit the firm to:

- gain some understanding of the enterprise and its prices policy;
- decide the practical aspects of the survey;
- select with the firm products which are representative of its activity.

Rather than using a field officer to collect this information, some Member States undertake this work by telephone or by post.

For each of the product groups of the observation unit, a choice must be made of the products (or transactions) which are most representative of changes in the observation unit's prices. In some cases an estimate of their level of representativeness may be made and this subsequently reflected in an intra-enterprise weight used for the basic index of the product being monitored.

The use of a detailed level of the product classification to select the products ensures greater accuracy of the index at CPA 4-digit level. In most countries, product data is gathered at CPA 6-digit level or even finer.

Every product selected for monthly monitoring needs to be described in great accuracy, together with its price and all characteristics of the transaction.

Non-domestic-price indices

Observation units selected for non-domestic output price monitoring are the units that produce the products concerned.

In practice the flow of goods between the producer and the non-domestic customer may pass through an intermediary. This means that there may be some justification for measuring price changes in commercial transactions. In this case, the result is an index of non-domestic prices (rather than non-domestic output (producer) prices) since the observations are not restricted to producers. But the ideal indicator is still that which measures changes in output (producer) prices of products for delivery to non-domestic markets, and thus of the price of domestic production directly delivered to non-domestic markets.

The observation units for the PPIND are selected either by reasoned choice (normally applying a cut-off) or by sampling proportional to size, from external trade data. Samples for the PPIND are generally much smaller than those for the PPI^D and a probabilistic method is thus very rarely used.

The products are selected in a similar manner to those for the PPI^D except that products selected must be representative of the observation unit's sales to multiple destinations. At the same time, the number of products followed must be representative of a group of products.

Data collection difficulties

Unique products and computers

The evaluation of the price of unique products is problematic. Although no work has been done at an international level on this problem in the context of STS, attention is drawn to the work by a Eurostat organised task force on large equipment goods in the context of the Handbook on price and volume measures in national accounts.

Similarly the evaluation of the price of computers is problematic. The problems here relate to the bundling of software with hardware and the rapid technological change in these goods - other goods also pose problems due to rapid technological change.

For more information on both of these subjects see:
Handbook on price and volume measures in national accounts, points 4.3.2 and 4.3.3

Quality changes

Three distinct difficulties can be identified: an observation unit ceases to be active, a product ceases to be produced, the price determining characteristics of a product change. The first of these is treated in a general manner under point 8.5.4.

A product ceases to be produced

If a product ceases to be produced or a new product appears on the market it is impossible to directly compare the price between a period in which the product exists and one in which it does not. This situation is essentially an extreme case of a quality change in a product and the methods of treating it can be considered to be the same as those where a product has changed. These are described below. New products should be introduced into the compilation of the index as soon as possible.

Changes in the product

A change of product is defined as when product i' replaces product i , both being representative of the same family (or group) of products but being sufficiently different to distinguish them one from the other from an economic point of view. The price level of products i and i' is such that they should in theory offer the buyer the same service in terms of utility. In practice, a change of product becomes known if the observation unit (the producer) advises the national statistical authority of the fact, or if the price seems to change too much (or too little) for the activity in question³⁴.

The variation in price between $p_i(t-1)$ and $p_{i'}(t)$ results from the difference between the two in nature, composition, market positioning and so on. A breakdown of the change between $p_i(t-1)$ and $p_{i'}(t)$ must therefore be made, with one component, the "quality effect" measuring the price change attributable to changes in the product and a second "pure price" component. Market prices do not always properly reflect quality differences. The closer the market for a product is to perfect competition the better the quality evaluation from market prices. As such the appropriateness of a particular method depends in part on the characteristics of the market for the product.

The Handbook on price and volume measures in national accounts proposes the following measures for accounting for quality changes in price indices.

If products i and i' coexist at the time of replacement in period t :

- overlap (or market) approach - the price difference recorded on the market measures the quality effect. In this case, product i alone figures in the computation of the index up to the reference period t and product i' in the computation of the index for reference period $t+1$ onwards;
- unadjusted price comparison (or direct price comparison) - the price difference recorded on the market measures the pure-price component and it is assumed that there is no quality change;
- automatic linking (or link-to-show-no-price-change) - the products i and i' are regarded as non-comparable and the price level is considered to be unchanged; the price difference recorded on the market is assumed to measure the quality effect; this gives a similar result to the overlap approach but it can also be used whether or not the products i and i' coexist at the time of replacement in period t ;
- option prices - if the difference between products i and i' is the inclusion of an extra option this option can be valued at its price if purchased separately and this used to derive an estimate of the price or the product without the option; care has to be taken with the estimation as separately purchased options may however be more or less expensive than bundled options;
- production costs (or manufacturer) approach - the quality effect is represented by the difference in manufacturing costs (production costs) between the two products at time t ; this method can be improved by not only looking at differences in production costs but also producers' profit margins that should also be reflected in producers' prices.

Estimate the price of product i at time t or the price of product i' at time $t-1$:

- matched models only (imputation or imputed price change-implicit quality adjustment) - estimate the price change of product i (more often than not) from the mean price change of similar products between $t-1$ and t which themselves are unchanged - however these may well differ from the price change of the new product; note that this can be done whether or not the products i and i' coexist at the time of replacement in period t ;
- judgmental approach - subjective estimates may be made by the observation unit or an analyst with specialist knowledge using an overlap price or production costs method;
- by a hedonic econometric method which seeks to estimate $\hat{p}_{i'}(t-1)$. It assumes that the price of products of different qualities will depend on measurable characteristics. From a large number of observations of market prices and characteristics of various models a regression is carried out to investigate which characteristics are the determinants of price differences between the models. Either i) implicit prices of each characteristic are estimated

³⁴ Most Member States have set up a price change monitoring method. The range (for example +/- 5%) may be parameterised according to the activity or the market. For example, on the non-domestic market, changes can be much wilder on account of exchange rate fluctuations.

and applied to predict the price of products offering the same characteristics but absent from the market at time $t-1$ or ii) a price index is directly calculated from the regression. This method requires not only special processing and know-how but also a substantial volume of data, which can prove difficult to bring together in a recurrent data production process. The method is recommended for products whose technological evolution is very rapid, such as computer hardware.

Non-domestic-price indices - changes in the product

Any product change must be quantified in terms of pure price evolution. In the case of products monitored on the non-domestic market, the additional destination factor can also lead to a change in product external to all the other characteristics of the selected product. When a product i' replaces product i , both should be representative of the same family of products, and thus of the same (group of) destination. A change in price between the two products i and i' may be due to no more than a change in the product's destination. For this reason every effort must be made to quantify the pure price effect of this change of destination.

Non-domestic-price indices - no transaction

The absence of a real transaction is not perceptible when the price being followed is only an invoice price because the product takes time to manufacture or is a one-off. But for any other product, the additional dimension of the destination multiplies the risk of there being no sale of the product in the month in question. One solution is to maintain the price at its last level until the next sale period; an alternative is to apply the price change of other products (matched models approach to changes in the products described above).

10.3.4 Compilation of the index

Methods to combine the raw data

Output price indices are constructed from successive aggregations in which each level of aggregation uses the arithmetic mean of indices at the level below, duly weighted. The weights of the lower level indexes (below the Class level) are mostly given by the Prodcom survey. This survey does not always distinguish the domestic and non-domestic market and the system of weights is obtained normally from the sample of units in the domestic market.

The formulas used for the aggregations correspond to Laspeyres indices, either chained from the last month of the year or computed with a fixed structure of weights which is that of the base year.

PPIs for levels of aggregation higher than NACE Rev. 1 Classes (4-digit) are defined as the weighted arithmetic

mean of the price indices for the Classes, with the value of sales on the domestic or non-domestic markets³⁵ in the base period as the weights.

The computation formulae are set out in the Annex.

Non-domestic-price indices - weights

PPIND are destined for dissemination at the 4-digit level, at least in manufacturing for larger Member States. For data at a more detailed level, there exists an aggregation procedure allowing the change from products to NACE 4-digit level. The weights then used may be intra-enterprise and/or extra-enterprise data.

Intra-enterprise weights are normally provided by the observation units for each selected product. They correspond to non-domestic deliveries of the family of products represented by the monitored product.

Extra-enterprise weights within the same group of products (assigned to a NACE Class) may be taken from external trade statistics or from Prodcom. In either case, care must be exercised: the first source (customs) also comprises sales of goods abroad by wholesalers, and thus does not correspond to direct non-domestic sales by producers; the second does not always distinguish between sales on the domestic market and non-domestic sales.

³⁵ The production sold variable from Prodcom is also used.

Details of the compilation required

The precise description of the series to be compiled for the output price indicators can be seen in the following table.

		Activity coverage NACE Rev. 1	Market coverage	Level of activity detail	Compulsory forms	Index or absolute figures	Frequency	Dead-lines
310	output prices	C to E excluding 12.0, 22.1, 23.3, 29.6, 35.1, 35.3	Total	Divisions and MIGS; Classes in Section D for large Member States	Gross	Index	Monthly	1 month 15 days
311	output prices of the domestic market	C to E excluding 12.0, 22.1, 23.3, 29.6, 35.1, 35.3	Domestic	Divisions and MIGS; Classes in Section D for large Member States	Gross	Index	Monthly	1 month 5 days
312	output prices of the non-domestic market	C to E excluding 12.0, 22.1, 23.3, 29.6, 35.1, 35.3	Non-domestic	Divisions and MIGS; Classes in Section D for large Member States	Gross	Index	Monthly	1 month 5 days

Special note on deadlines

The STS-R permits smaller Member States an extension to the deadline of 15 calendar days. In this case a smaller Member State is defined as one with value added in Sections C, D and E of NACE Rev. 1 in a given base year that represents less than 3% of the value added of the EU. It is not clear whether the criteria for the application of the extension of 15 calendar delays should be evaluated for each of the three specified Sections in turn or for their sum. Equally, in the case that the Sections are evaluated separately it is not clear whether the extension applies only to indices for branches within those Sections that meet the criteria or that the extension is only valid in the case that all three of the Sections meet the criteria. As with the deadlines themselves, the extension represents a maximum and national statistical authorities are encouraged to provide data earlier than permitted under the extension.

10.3.5 Approximation/alternative indices

If the indicator of output prices for non-domestic markets is not available the STS-R permits this to be approximated by an indicator of the unit value. This use of this approximation is unlimited in time.

The unit value is the ratio of the value of non-domestic deliveries and their volume. Changes in unit value thus reflect both price changes and changes in volumes. Any quality adjustment in the products monitored is thus totally masked from estimation. The unit value index nevertheless offers three benefits vis-à-vis output price indices for the non-domestic market: they use an (almost) exhaustive source since the basic data are customs declarations; they are very cheap to produce, and the mean values are calculated from prices invoiced in real transactions. For this reason, the UVI can give a good estimate for an index of non-domestic output prices in as much as the product is relatively stable in both quality and volume of sales.

10.3.6 Overview of national methods

Population coverage

	Type of source	Coverage	Observation unit(s)
DK 2000	Statistical survey. Sample of products.	Products cover approximately Sections C and D.	KAU.
D 2000	Sample.	Sections C to E. Some Groups which are not required by the STS-R are not covered.	Reporting unit: enterprise and local unit (plant).
EL 2000	Statistical sample survey.	The survey covers Sections C to E excluding Divisions 12, 30 and 37.	KAU.
E 2000	Statistical sample survey.	Sections C to E except Divisions 11, 12, 37 and 41 and Groups	Local unit ("establecimiento").

	Type of source	Coverage	Observation unit(s)
		35.1, 35.2 and 35.4.	
F 2000	Statistical sample survey.	Sections C to E. However the following Divisions and Groups are not covered: 22.3, 33.3, 34.2 and 36.3.	The observation unit varies according to the producer's system of organisation (enterprise, department of an enterprise, head office of a group, etc.). The main criterion is that the unit is producing at least one of the products included in the sample.
IRL 2000	Statistical sample survey.	Approximately Sections C to E excluding: extraction of petroleum and natural gas; production and distribution of electricity, gas, steam and hot water; water supply; manufacture of office machinery and data processing machinery.	Enterprise or local unit.
I 2000	Statistical sample survey.	Sections C to E. Groups 12.0, 13.1, 23.3, 35.1, 35.2 and 35.3 are excluded.	Enterprise. Price data are collected for representative products.
L 2000	Statistical survey (shuttle-survey). Nearly exhaustive.	Sections C and D excluding Divisions 10 to 13, 23 and 37.	KAU. Data is collected for a basket of products.
NL 2002	Statistical sample survey.	Sections C to E excluding Division 22, Class 35.11 and Group 35.3.	The enterprise and parts of enterprises (presumed to be KAUs).
A 2002	Statistical sample survey. The index is compiled from unit values and wholesale price indices.	Sections C to E.	Establishment ("Betrieb" as local KAU).
P 2000	Statistical sample survey.	Sections C to E. Some Groups are not covered.	KAU.
FIN 2000	Statistical sample survey. Administrative sources. Trade associations. Part of the prices of raw-material based imports and exports are measured by the unit value prices obtained from the board of customs.	The domestic output price index covers Sections C to E. Defence production is not covered. The basic price index for domestic supply covers Sections A to F. The wholesale price index covers Sections A to E. The export price index covers Sections A (agriculture only), C, D and E. The import price index covers Sections A to D and part of E (electricity only).	Enterprise. Price data is collected for a basket of products.
S 2002	Statistical sample survey.	Sections A to E excluding Division 37. Section E is also excluded for non-domestic prices.	Enterprise.
UK 1999	Statistical panel sample survey. Other sources, for example the London Metal Exchange. Energy data are collected by the DTI.	Divisions 14 to 37	The enterprise or the activities of a specified list of local units belonging to an enterprise.

Calculations made

	Calculations made	Type of index	Method of weighting
DK 2000	Procedure X11 is used to adjust seasonal variations.	The domestic output price index is a Laspeyres index. 1995 base year.	The weighting at a relatively detailed level of activity, around 70 groupings of DB93, is based on deflated turnover from the Prodcum survey of the corresponding quarter of the preceding year. These approximate Paasche indices are used for deflation purposes, notably for the production index. These indices are then weighted by domestic turnover (grossed up values in the base year from the monthly turnover index) to form Laspeyres indices for the final published domestic output price indices.
D 2000	No seasonal or working day adjustment.	Laspeyres indices. 1995 base year.	Different prices within a product group are weighted according to the arithmetical average. The aggregation to branches is done according to the gross production of the product groups. The aggregation of branches is done according to the domestic turnover of the branches.
EL 2000	None.	Simple Laspeyres index. 1990 base year.	The basic indices are weighted by the sales values of the products.
E 2000	No seasonal or working day adjustment.	Laspeyres index with a fixed base year. 1990 base year.	At the product level the value of production is used for weighting. At the 4-digit level of the CNAE, the index is weighted according to the value of turnover on the domestic market.

	Calculations made	Type of index	Method of weighting
F 2000	No seasonal or working day adjustment.	Laspeyres index with a fixed base year. 1995 base year.	The weights are proportional to the sales on the domestic market. This information is obtained from national accounts at the 2-digit level and, for more detailed levels, from a statistical survey. The weights take account of transactions within the same activity as long as the transaction is carried out at the market price. The same principle applies to transactions occurring between two units belonging to the same enterprise.
IRL 2000	None.	Laspeyres index. 1995 base year.	The basic indices are weighted by the value of sales of each activity.
I 2000	No seasonal or working day adjustment.	The index is a Laspeyres type index. 1995 base year.	The weights of products are based on the turnover related to the domestic market. The calculation of weights is based on a "gross sector approach", which takes into account transactions between enterprises from the same activity. The values for the weights are taken from the product survey.
L 2000	Indices are calculated in a gross form.	Laspeyres index. 1995 base year.	The basic indices are weighted by the enterprise's turnover (excluding industrial services and products resold without further processing). The information is drawn from the annual industrial census. The weights are calculated according to a "gross sector approach", that is, transactions between two enterprises belonging to the same activity branch are taken into account.
NL 2002	No seasonal or working day adjustment.	Laspeyres index with a fixed base year. 1995 base year.	The commodity group price indices are calculated as chained price indices by using two weighting-factors. At the lowest level of calculation an internal-weight is used (internal weight: the importance of a reporting unit within a Prodcum group and statistical code derived from the production statistics). External-weights are used when aggregates of commodities are calculated (external weight: the importance of a Prodcum group in relation to the other Prodcum groups per statistical code derived from the input/output tables). The aggregation to activities is made on the basis of matrices of input/output tables. Within a unit different prices of products (of one branch) are weighted according to the arithmetic average. The average prices of the units are then weighted according to the gross production of the units.
A 2002	No seasonal or working day adjustment.	Laspeyres index. 1996 base year.	The weights of the different Prodcum positions (on the national 10-digit-level) are calculated as a share of the sold production value of Sections C, D and E. The wholesale price data are weighted and integrated into the weighting system for the unit value indices.
P 2000	No seasonal or working day adjustment.	Laspeyres index with a fixed base year. 1995 base year.	Sales of products from Portuguese industrial producers on the domestic market that can be obtained from the Prodcum Survey.
FIN 2000	No seasonal or working day adjustment. For activities that are seasonally sensitive, prices are quoted only in those months in which the commodity is typically bought, the last observation being carried forward.	Laspeyres index with a fixed base year. 1995 base year.	The weight structure is based on the values of deliveries of domestic production, export and imports in 1995. The coefficients for domestic products come from industrial structural statistics and national accounts for 1995. For exported and imported goods, the weights come from foreign trade statistics for 1995.
S 2002	No seasonal adjustment.	Chain indices calculated from yearly index links (base December previous year). The base year is 1990.	Year t-2 weights for i) CN categories or CPA aggregates of CN categories according to external trade statistics and ii) Prodcum (minus exports).
UK 1999	Seasonally adjusted using X11 ARIMA Census II, ONS version.	Laspeyres index with a fixed base year. 1995 base year.	The basic prices are weighted by turnover. Indices are weighted by grossed-up product sales from Prodcum using domestic or non-domestic sales as appropriate. Data for the domestic market is weighted on a "gross sector" basis, the calculation of the weights includes intra-sectoral transactions. The weights for input price indices are derived from the purchases of the annual business inquiry and other sources.

10.3.7 Technical annexes

Lowest level of aggregation

Consider a (NACE) Class³⁶ (k) consisting of H observation units. A single member of this Class is denoted by h. The set of all products produced by observation unit h for the domestic or non-domestic market is denoted by C_h . A product is defined as having a precise specification together with a specified kind of transaction³⁷. In fact, the basic economic units are the individual transactions. However, for statistical purposes some aggregation of these basic units is unavoidable.

It can safely be assumed that for two different observation units h and h' the sets C_h and $C_{h'}$ do not overlap. A single product will be denoted by i. The domestic or non-domestic output price index for a single observation unit will be calculated by the Laspeyres formula³⁸. Thus the price index (pI) for period t relative to period 0 for observation unit h is given by the following expression:

$$(1) \quad {}_p I_h(t) \equiv \frac{\sum_{i \in C_h} v_i(0) \times (p_i(t) / p_i(0))}{\sum_{i \in C_h} v_i(0)}$$

where:

$v_i(0)$ = base period value of the sales of product i;

$p_i(0)$ = base period price of product i.

$p_i(t)$ = reference period price of product i.

The summation is over all products produced by observation unit h for the market.

Notice that:

$$(2) \quad v_h(0) \equiv \sum_{i \in C_h} v_i(0)$$

is the base period value of the total sales of products by the observation unit h to the market.

³⁶ For the purposes of this manual it is assumed that the indices are calculated first at the Class level of NACE and then aggregated to higher levels. The explanation given below is equally true if the indices are calculated first at a higher NACE level, such as the Group.

³⁷ Thus products for the non-domestic market are according to this definition per se different commodities than domestic sales. In this case the kind of transaction is an important specification of the commodity.

³⁸ In fact, the domestic and the non-domestic output price indices are sub-indices of the (total) output price index. Within the micro-economic theory of the firm the output price index is based on the revenue function (or restricted profit function). Under appropriate conditions it can be shown that the Laspeyres output price index is a lower bound of the (true) output price index.

An output price index for the Class (k) of observation units H can now be obtained as a weighted average of the output price indices for each observation unit. If the base year sales values $v_h(0)$ are used as weights, the output price index for Class k is defined as:

$$(3) \quad {}_p I_k(t) \equiv \frac{\sum_{h \in k} v_h(0) \times {}_p I_h(t)}{\sum_{h \in k} v_h(0)}$$

If we define C_k as the set of all products produced for the market by the observation units in Class k, we can rewrite this as:

$$(4) \quad {}_p I_k(t) \equiv \frac{\sum_{i \in C_k} v_i(0) \times (p_i(t) / p_i(0))}{\sum_{i \in C_k} v_i(0)}$$

Thus ${}_p I_k(t)$ is also a Laspeyres price index. The domestic output price index includes the transactions between a $h \in k$ and any other $h' \in k$, since the domestic market for observation unit h includes all other observation units belonging to k. Thus this index follows the so-called gross concept.

The following approach is proposed as a basis for estimating the Laspeyres output price index given above (4).

Assume that all products can be classified into disjoint product groups³⁹ G_1, \dots, G_j . Notice that:

$$(5) \quad C_k \subset \bigcup_{j=1}^J G_j$$

The intersection of C_k and G_j is the set of all products belonging to product group G_j and produced by observation units within Class k. Notice that this set can be empty. The corresponding product group price index is

$$(6) \quad {}_p I_{kj}(t) \equiv \frac{\sum_{i \in C_k \cap G_j} v_i(0) \times (p_i(t) / p_i(0))}{v_{kj}(0)}$$

We can therefore rewrite the Laspeyres output price index given above (4) as:

³⁹ The CPA can be used as a product classification or the more detailed Prodcod list.

$$(7) \quad {}_P I_k(t) = \frac{\sum_{j=1}^J v_{kj}(0) \times {}_P I_{kj}(t)}{\sum_{j=1}^J v_{kj}(0)}$$

Thus the output price index for the Class k can be written as a weighted average of product group price indices. The same is true for each observation unit h within Class k. We can therefore rewrite (6) (the product group price index for Class k) as:

$$(8) \quad {}_P I_k(t) = \frac{\sum_{h \in k} v_{hj}(0) \times {}_P I_{hj}(t)}{\sum_{h \in k} v_{hj}(0)}$$

Thus each product group price index for Class k can be written as a weighted average of the product group price indices for each observation unit h.

The proposed strategy for estimating ${}_P I_k(t)$ runs as follows. Usually ${}_P I_j(t)$ is estimated from a sample of observation units from Class k. Ideally this should be a stratified sample. For each observation unit in the sample the estimation of ${}_P I_{hj}(t)$ is based on a sample of products. Ideally, the set of all products belonging to product group G_j and produced by observation unit h must be decomposed into Hicksian aggregates, in other words groups of products showing the same price behaviour. From each of these groups it is sufficient to select only one representative product. The values $v_i(0)$, or the sums of these values for the Hicksian aggregates, must be obtained from the selected observation unit.

In the above model it was assumed that the set of observation units H within Class k and the set of products C_h ($h \in k$) are fixed during the time interval from 0 to t. In reality observation units appear and disappear, the output mix of observation units changes, some products disappear from the market, and new products are introduced. Especially in areas with frequent technological changes this will have the effect that a direct Laspeyres price index is unable to track current price changes adequately. In some cases it is even impossible to construct such a price index because products existing in the base period are no longer produced in the comparison period. In order to take account of these phenomena the calculation of the product group price indices entering (7) as chained indices⁴⁰ is encouraged. Thus expression (8) is replaced by:

$$(9) \quad {}_P I_{kj}^c(t) \equiv \prod_{\tau=1}^T \frac{\sum_{h \in k(\tau)} v_{hj}(\tau) \times {}_P I_{hj}(\tau, \tau-1)}{\sum_{h \in k(\tau)} v_{hj}(\tau)}$$

where we define:

$$(10) \quad v_{hj}(\tau) \equiv \sum_{i \in C_h(\tau) \cap G_j} v_i(\tau)$$

and:

$$(11) \quad {}_P I_{hj}(t, t-1) \equiv \sum_{i \in C_h(t) \cap G_j} \frac{v_i(t) \times (p_i(t)/p_i(t-1))}{v_{hj}(t)}$$

In these expressions $v_i(\tau)$, $v_{hj}(\tau)$, $k(\tau)$ and $C_h(\tau)$ correspond to a certain period prior to τ . This period can be the same for a number of "chains". Expressions (9) and (11) form the starting-point for sampling. They enable the sample of observation units and products to be refreshed, and the associated weights (value shares) to be updated whenever necessary. Samples and weights can be kept fixed as long as they are considered to be "characteristic" for the Class.

Expression (9) is known to suffer from upward drift (overestimating bias) for mathematical reasons.

The domestic (and in parallel the non-domestic) output price index for a Class can be calculated as a weighted average of product group price indices. The weights are the base period domestic (or non-domestic) sales values. The product group price indices are calculated as fixed based or preferably chained price indices, based on samples of observation units and samples of representative products. These samples and the associated weights should be adapted whenever necessary.

Higher levels of aggregation

Suppose a Group consists of K Classes ($k = 1, \dots, K$). The base period domestic or non-domestic sales value of each k is defined as:

$$(12) \quad v_k(0) \equiv \sum_{h \in k} v_h(0)$$

Then the domestic or non-domestic output price index for the Group (g) is defined as:

⁴⁰ It is assumed that during the time period between base year revisions there is no need to introduce new product groups into the output price index or to delete product groups from it.

$$(13) \quad {}_pI_g(t) \equiv \frac{\sum_{k=1}^K v_k(0) \times {}_pI_k(t)}{\sum_{k=1}^K v_k(0)}$$

that is a weighted arithmetic average of the Class price indices.

11. Construction indicators

11.1 Production

11.1.1 Introduction

Name, synonyms and code numbers

The STS-R requires short-term statistics on production (110, hereafter IPC) under the provisions of Annex (A and) B. For construction it requires information on production of building construction (115, hereafter IPC^B) and production of civil engineering (116, hereafter IPC^{CE}). The distinction between building and civil engineering is based on the CC (see point 5.2.3 for more information on the CC and 16.4.3 for the classification itself).

Purpose of the indicator - theoretical concept

The purpose of the production indicator is similar for construction as it is for industry (see sub-chapter 10.1), namely to measure, on a short-term basis, the price-change-adjusted own performance of construction and its most important parts. As with the IPI, the aim is to have a value added index but in practice the index is compiled using alternative series.

Definition and reference period

Value added at factor cost⁴¹ can be calculated from turnover (excluding VAT and other similar deductible taxes directly linked to turnover), plus capitalised production, plus other operating income plus or minus the changes in stocks, minus the purchases of goods and services, minus other taxes on products which are linked to turnover but not deductible, minus the duties and taxes linked to production.

Income and expenditure classified as financial or extraordinary in company accounts is excluded from value-added.

⁴¹ National accounts have introduced the concept of 'value added at basic prices'. In comparison to value added at factor costs, it includes taxes linked to production, but operating subsidies on production are excluded. The alignment with the national accounts may introduce some advantages, so Member States may use the concept of value added at basic prices as a proxy for value added at factor costs.

Subsidies on products and on production are included in value added at factor cost, whereas all taxes on products and on production are excluded.

Value-added at factor cost is calculated "gross" as value adjustments (such as depreciation) are not subtracted.

Dependent on the approximation method used, the index of production should take account of:

- variations in type and quality of the commodities and of the input materials;
- changes in stocks of finished goods and work in progress on goods and services;
- changes in technical input-output relations (processing techniques);
- services related to the achievement of value added, such as the assembling of production units, mounting, installations, repairs, planning, engineering, creation of software.

11.1.2 Population

Classifications & coverage

The coverage of this indicator is limited solely by NACE Rev. 1. The STS-R requires a coverage of Section F (Division 45).

Despite the coverage being determined using NACE Rev. 1, the use of information based on products rather than observing the activity of observation units, may involve the use of the CC. Equally the two sub-indicators, namely production of building construction and production of civil engineering are limited not by NACE Rev. 1 but by CC. The coverage of the indicator of production of building construction is CC Section 1 and the coverage of the indicator of production of civil engineering is CC Section 2.

Units

The STS-R requires the use of the KAU as the observation unit for this indicator.

To the extent that information based on products is used, there is no observation unit in the sense foreseen by the STS-R.

Difficulties with the theoretical concept/definition

The compilation of the IPC faces similar problems to the compilation of the IPI but to a greater extent. If it is accepted that value added is not going to be measured on a sub-annual basis, an alternative has to be used. As with the IPI there are several possible alternative methods and these are described below.

See also point 6.4.3 which describes some of the general characteristics of construction activity which lead to difficulties measuring output.

How to measure

An IPC may be compiled from gross output data (quantity, production value or turnover) or input data (hours worked, employment or materials used). An alternative specific to construction is the use of administrative declarations such as building permits.

The outputs of the production process in construction are new structures and extensions on the one hand and repair, maintenance and improvement on the other hand. Structures are classified according to the CC. In this context the IPC can be considered as an aggregation of the two sub-indicators the IPC^B and the IPC^{CE} which are distinguished by their coverage of different constructions. There is no direct link to the activity classification NACE Rev. 1 for these two sub-indicators but it is accepted that the development of the construction activity is described representatively by an IPC based on the combination of the two sub-indices.

The main problem using gross output data is that general production statistics like the Prodcom survey are not available for construction. However, there are some countries which have short-term surveys of production in construction. These surveys should provide information about types of construction according to the CC classification, at least separating building construction and civil engineering.

Alternative methods/variables

Output quantities as the basic data

Output quantity information on structures can be given in square meters of area or cubic meters of volume. The advantage is that deflation is not necessary and the index could be calculated quite easily. The big disadvantage is that structures are very heterogeneous and this approach may not take account of different qualities of structures. Another disadvantage of this method it is that it is hard to imagine how an output quantity measure could be constructed that shows accurately the development of production activity in a particular reference period. It is unclear whether any country uses this method in practice. The Handbook on price and volume measures in national

accounts classifies this approach as an unacceptable method.

Gross production value as the basic data

From a methodological point of view this approach is preferable to some others because it is closer to value added and takes into account different qualities and quality changes of structures (assuming that quality is expressed accurately in the value). However, there are some obstacles to be overcome.

- The valuation of structures is very difficult. It could be based either on costs or on the final price of the structure.
- At the same time it has to be ensured that the data actually reflect activity in the reference period. This is particularly difficult since production in construction can last over longer periods (sometimes even years) and the whole value (or costs, which are sometimes vague at the beginning of a project) has to be assigned to different reference periods. The consequence may be rough estimates with loose correlation to the real production process.
- When working with gross production value data there may be a danger of double counting because subcontracting is very important in construction in most countries.
- Index calculation with values makes it necessary to deflate the data. So appropriate price indices have to be available in the course of index calculation - see sub-chapter 11.2. In this context it should be noted that the Handbook on price and volume measures in national accounts regards the deflation of output measures with input prices as an unacceptable method.
- The value of production should also comprise work on repair, maintenance and improvement.

If it is not possible to deal with these problems in a satisfactory way there is the danger that the IPC is not linked enough to the production process in the reference period which could result in a misinterpretation of the economic development in construction.

Turnover as the basic data

Usually construction firms receive either payments upon completion of work or regular progress or stage payments. So the short-term development of turnover in construction is determined to a high extent by agreements or contracts and the link to actual economic activity is rather loose. There are some serious doubts whether the development of turnover in construction could representatively describe economic development on a short-term basis and hence this is not really an alternative. The problems of deflation are common to those for the value of gross production.

From the three alternatives above the method based on the value of production can be recommended. It has

advantages from a methodological point of view because it is close to the concept of value added and includes information about different qualities of products. However, this approach is very demanding and most countries will not be able to give the required short-term information on production value in construction in sufficient quality.

Work input as the basic data

Work input is continuously required during the production process and, in terms of time, is very closely linked to the production process. So, with construction's long production cycles and difficulties in observing production process continuously with output data, work input is a very good alternative for updating the IPC. An advantage of the work input series is that they are generally available and relatively easy to measure, including in the short term. There are two alternatives to quantify work input, the number of persons employed and hours worked. The number of persons employed is not suitable as basic data as this is a rather stable series which is often influenced by legal regulations and normally follows changes in production activity with a time lag, especially in the case of unexpected developments. The working hours actually performed during the reference period (taking into account overtime and short-time work) are next in the actual production process. In this sense hours worked are the best alternative to compile the IPC. It would also be preferable to use the hours actually worked on construction sites as an input variable because these should be the primary focus. However, hours worked for example in administrative tasks should normally not distort or conceal the trend too much. When collecting the data it has to be ensured that hours worked are assigned correctly to the different types of construction, at least between building construction and civil engineering. It is also important to ensure that the data is representative of all observation units in construction, also small ones, and that repair, maintenance and improvements are covered as well.

By using hours worked to update the IPC a close correlation between the development of work input and the development of production activity is assumed. Obviously this is only correct if changes in labour productivity are taken into account. So it is crucial to modify the updating series of hours worked with some productivity factor. There are two aspects of productivity, a purely technical one and a cyclically determined one. Technical productivity is induced by technical progress or organisation optimisation and is normally positive. Cyclically-determined productivity changes, on the other hand, are induced by business cycles and may also be negative. This may be the case when in times of downward economic trends less output is produced with the same labour input. The productivity factor should take into account both aspects of productivity change. Of course an estimation of the development of productivity is quite difficult. In practice

the normal procedure will be to observe productivity development in the past and to assume that the same pattern is more or less applicable to the current reference period. It should be measured by output in relation to hours worked. It is important to consider that productivity development has to be distributed over the whole year (all reference periods) and gaps when changing to the next year have to be avoided (for example by using moving averages). Modification with a productivity factor is necessary but also has a negative consequence. Obviously the IPC calculated by means of a productivity estimation can no longer be used to determine labour productivity.

Hours actually worked on construction sites are a good alternative to calculate the IPC with its long production cycles. It is linked closely to the production process in the reference period and relatively easy to establish. The disadvantages are that it can not be used to calculate labour productivity and changing qualities of the output are not taken into account. A problem in calculating the index is the necessity to estimate the development of labour productivity.

Building materials used as the basic data

Another approach applying to the input side is building materials used in the construction process. This method may apply to construction in principle because there are some typical, important and rather homogenous input materials used in building construction or civil engineering, for example concrete, cement or bricks. However, before using this method each national statistical authority has to check whether it is applicable to construction in its own country. Additionally the following criteria have to be taken into account: substitutive relationships with other input factors should be as low as possible; the link between input used and the production process should be quite stable because units tend to try to reduce the input used; in order to interpret the results correctly there has to be an idea of the functional relation between the input used and the production process or the quantity of output. It is crucial to survey the raw materials actually used in the reference period, not the raw materials purchased; here lies a special difficulty, because an observation unit usually only has an approximate idea of the quantities of the inputs processed in the current reference period. It might be necessary to observe stocks of input materials in order to check the plausibility of the data.

Because of the large number of units in the frame population and the large share of small units it may prove to be very difficult to survey input materials used. Therefore an alternative is to look on the output side - the production and distribution of building materials. This has the advantages that information on the production of building material is generally available from production statistics and the number of producers and distributors of these goods is much lower. The preconditions for this approach are:

- the typical building materials that are generally used in building construction and civil engineering and that are suitable for compiling the index have to be identified;
- up-to-date and short-term information on the production and distribution of these goods needs to be available;
- there has to be information about which part of the total production of building materials in the reference period is used in construction in the same reference period - from producers or via distributors; additionally the individual shares of building construction and civil engineering has to be known; a source for this information could be input-output tables used in national accounts or estimations based on consultations of professional organisations;
- the part of production which is stored in stocks and sold ex-stock by producers and distributors has to be observed; The series need to be adjusted accordingly if stock keeping is important and varies over time;
- it is assumed that stocks of input materials held in construction are low and do not change substantially over time.

Another source of distortion could be changing quantities of external trade of building materials.

The approach, via producers of input materials, is generally easier to achieve than trying to quantify inputs used directly by the construction activity itself. However, there are some critical points. The development of the production of building materials and the development of production activity are not necessarily the same in a given reference period (problem of stocks). The assignment of the part of production of building materials to building construction and civil engineering is particularly difficult and the quotas may also change over time. Changing patterns of external trade of building materials may also distort the calculation of the IPC.

It is difficult to implement appropriately the approach focusing on building materials used. Therefore the hours worked approach is to be preferred because it can be implemented more easily and has closer links to the production process.

Administrative information - building permits as the basic data

To gather existing information from administrative sources is attractive because it is relatively low cost and does not impose any additional burden on enterprises. However, the kind of information available from administrative sources is specific to each country and hence its suitability and quality to calculate an IPC varies.

In most countries, but not all, information on building permits is available. If building permits are used to

calculate the IPC (or a part of it) some questions have to be clarified. Is only building construction covered or also civil engineering? Do building permits cover only new buildings or also repair, maintenance and improvement? Which unit applies for building permits? Is it possible to isolate work done by construction firms and assign the information according to the CC, at least building construction and civil engineering? Is there any information on the time at which production activity actually starts? Is there any information on how the work is distributed over time? For the IPC, data on actual construction activity in the reference period is necessary. When permits are used in practice they are used to identify what type of work is going on or what work has been carried out (in other words at what stage is the construction activity, for example site preparation, foundations, main building or roofing).

Because the data situation is very specific to each country no general assessment of this approach can be given. However, it is a problem that building permits are generally not linked closely to the actual production process in the reference period.

11.1.4 Compilation of the index

Methods to combine the raw data

The method of compiling the basic data into indices varies according to the source used.

The method of index calculation using gross production value is similar to the one described in the chapter on the IPI with the difference that structures have to be assigned to building construction and civil engineering according to the CC. The IPC^B and the IPC^{CE} can be aggregated to the IPC using value added at factor costs in the base year as weights, however this may not be available broken down according to the CC.

Index calculation using hours worked can be roughly described as follows. At first, quantity relatives of hours worked in the reference period in relation to hours worked in the base period (calculated as an average of the base year) have to be calculated. This has to be done for building construction and civil engineering. The resulting quantity relatives must be modified by a productivity factor. In fact this modified quantity relative represents the IPC for building construction and civil engineering. In a more refined approach the quantity relatives could also be calculated for more detailed levels of the CC although it is unclear whether any country does this in practice. In this case the indices have to be calculated using the shares of production values in the reference period as weighting factors. As a last step the two sub indices are aggregated to an index of construction as a whole using weights based on the shares of gross value added at factor costs in the base year of building construction and civil engineering.

The technique of index calculation using building materials as the basic data is similar to that described in the sub-chapter on the IPI and could be done with quantities (quantity relatives) or values (value relatives) of input materials used in the production process. In the latter case deflation is necessary. The results are representative series of building materials (in quantity or

value) for building construction and civil engineering. These series can be aggregated to indices of building construction and civil engineering. The shares of gross production value in the base year of each series have to be used as weights. The two sub indices can be combined to an IPC using the shares of gross value added in the base year as weights.

Details of the compilation required

The precise description of the series to be compiled for the production indicators can be seen in the following table.

		Activity coverage NACE Rev. 1	Type of construction coverage	Level of activity detail	Compulsory forms	Index or absolute figures	Frequency	Dead-lines
110	production	45	Total	Division	Working day adjusted	Index	Quarterly	2 months
115	production of building construction	45	CC Section 1	Division	Working day adjusted	Index	Quarterly	2 months
116	production of civil engineering	45	CC Section 2	Division	Working day adjusted	Index	Quarterly	2 months

Special note on deadlines

In Annex B the STS-R permits smaller Member States an extension to the deadline of 15 calendar days. A smaller Member State is defined as one with value added in Section F of NACE Rev. 1 in a given base year that

represents less than 3% of the value added of Section F in the EU. As with the deadlines themselves, the extension represents a maximum and national statistical authorities are encouraged to provide data earlier than permitted under the extension.

11.1.5 Overview of national methods

Population coverage

	Type of source	Coverage	Observation unit(s)
B 2000	Statistical surveys and administrative data. Census.	Section F.	Local KAU.
DK 2000	A number of statistical sources are used in the calculation. The central sources are BBR (Register of Buildings and dwellings), employment in construction and SBS (account statistics).	Enterprises in Section F as well as enterprises having their main activity outside of Section F but with a significant construction activity.	Enterprise.
D 2000	Statistical survey. Census.	Monthly: Groups 45.1 and 45.2. Quarterly: Groups 45.3, 45.4 and 45.5. [Ausbaugewerbe].	Local unit.
E 2000	Statistical sample survey.		Enterprise.
F 2000	Monthly: Statistical sample survey. Quarterly: Census above 20 persons employed. Data for electricity and gas production and distribution are directly received from the national electricity company EDF. Data for arms production are received from the "Ministère de l'armement".	Section F.	Reporting unit: local unit or enterprises.
I 2000	For building: exhaustive declaration from municipal authorities. For civil engineering: exhaustive data collection from public administrations and related activities.	CC Sections 1 and 2.	Buildings. Public works declared by the relevant administration collecting information on public works.
L 2000	Statistical sample survey.	Classes 45.21 and 45.23. The remaining Classes are covered from	KAU.

	Type of source	Coverage	Observation unit(s)
		the 2000 base year.	
NL 2001	Statistical sample survey for turnover data. Statistical survey (census) for production data (from building permits).	Section F.	For turnover data: enterprise and parts of enterprises (KAUs). For production data from building permits: Municipalities.
A 2002	Statistical sample survey.	Section F (and C to E).	Establishment ("Betrieb" as local KAU).
P 2000	Statistical sample survey.	Section F. The survey covers mainland Portugal.	Enterprise.
FIN 2000	For building: combination of more detailed production indices for new building construction and for building renovation. For civil engineering a mixture of sources is used: administrative source (VAT); statistical survey (Census) of large enterprises; structural business statistics; civil engineering price index.	Headings 451, 45211, 45219, 4522, 4523, 4524, 4525, 453, 454, 455 of the national activity classification.	Administrative source: enterprise. Statistical survey: enterprise/KAU.
UK 1999	Statistical sample surveys: output and employment survey of contractors providing data on total new work and repair and maintenance; project based survey providing data on work done on sampled projects from the new orders survey enabling estimates to be made of how the total new work is broken down by type of work; DLO (Direct Labour Organisations in the public sector) output and employment survey.	Section F. Note: The geographical area covered is Great Britain.	Close to a KAU.

Definitions

	Definition
B 2000	The production index is based on the deflated value of production (55% of activities in Sections C to F), deflated value of sold production (25%), productivity-corrected hours worked (20%) or inputs in quantities (<1%). Deflation is carried out at the 8-digit Prodcom product level for each responding unit, using unit prices based on values and quantities sold.
DK 2000	The main variables used in the production index are: number of persons employed in repair and maintenance; number of persons employed in civil engineering; new buildings started in m ² (administrative source); VAT statistics; prices per m ² . The number of persons employed is collected in the survey "number of persons employed in repair and maintenance". New buildings started is a statistic taken from the BBR.
D 2000	The raw figures collected monthly correspond to the number of hours worked on building sites in enterprises employing 20 persons or more. Data are first extrapolated for all enterprises (regardless of the size) on the basis of the annual survey. Productivity factors are then applied to the pattern of hours worked to calculate the indices.
E 2000	The production concerns the value of the work carried out by the enterprises during the reference period. It includes new work, repair and restoration. It does not include the value of land nor VAT but it includes taxes paid on purchases. The enterprises are asked to declare their operating income. They also declare separately the production they subcontracted to others. In order to obtain the value of the production by the enterprise itself the production as main contractor and as subcontractor are added together and the value of the production that the enterprise has subcontracted to others is deducted.
F 2000	For the production index in industry and construction as a whole, 41% of the series measure production in physical units, 18.1% in delivered quantities and 25% in deflated turnover.
I 2000	For building the quantity of residential building is measured in volume (m ³) and that of non-residential buildings in area (m ²). For civil engineering information is collected on works started and work carried-out. Information is not collected on maintenance works.
L 2000	The index shows the development of hours worked in the activities covered. The hours worked are basically multiplied on the KAU-level by a coefficient calculated by dividing the gross added value at factor cost by turnover.
NL 2001	The volume and price changes of the production of construction produced for national accounts are based on various sources: turnover in construction, progress of works, output prices, productive hours and number of persons employed. The published figures of the production of construction index are a result of the quarterly accounts.
A 2002	Definitions are according to Commission Regulation No. 588/2001. In the monthly STS-survey the "production in the reporting period" is collected as follows: 1. own production (with reference to commodity list 1); 2. subcontract work carried out by the observation unit as a subcontractor (referring to commodity list 1); 3. subcontract work carried out by a foreign enterprise as a subcontractor for the observation unit as a subcontractor (referring to

	Definition
	<p>commodity list 1);</p> <p>4. production sold (in accordance to commodity lists 1 and 2);</p> <p>5. production intended for sale (in cases of Prodcod references);</p> <p>6. in case of establishments of the multi-establishment enterprises "deliveries and performance within the enterprise" are also surveyed.</p> <p>The first 2 of these headings are referred to as "technical production" and are the basis for calculating the industrial production index.</p>
P 2000	The number of hours worked is used to compile the index.
FIN 2000	<p>For building the index is calculated by aggregating the volume index for new building construction and the volume index for renovation. 1995 base year.</p> <p>For civil engineering: VAT on domestic sales comes from an administrative source and this is then converted into domestic turnover. From the statistical survey information is collected on domestic sales and production for own use. The sum of the two variables is the equivalent of the domestic turnover derived from the VAT on domestic sales.</p>
UK 1999	This value of construction work carried out corresponds to the value of building, civil engineering and associated work, excluding VAT, done by the firm's directly employed staff (including working proprietors) and which is chargeable to customers. It includes: the value of materials used, labour costs, overheads and profits; the value of articles made by the firm and used in the construction work carried out during the reference quarter; the value of any materials supplied by the firm free of charge to any subcontractor. It excludes: the value of work done by subcontractors; the value of articles made for sale or materials sold; the value of payments made to labour-only subcontractors; the value of materials supplied to the firm free of charge by other firms in construction; the value of land; architects' or consultants' fees. Construction work that is passed on to sub-contracting firms is only specified by the subcontractor to avoid double counting.

Calculations made

	Calculations made	Type of index	Method of weighting
B 2000	Gross indices are transformed consecutively into indices per working day, seasonally adjusted indices and trend figures, using TRAMO SEATS.	Laspeyres chain index. For calculations the previous year is the base year. For publication (after chaining) 1995 is the base year.	Value added at factor cost of the last available year (usually t-2) for Divisions as well as for some Groups and Classes. For the other Groups and Classes the data for the Divisions are split up using the total value of production sold in the previous year.
DK 2000		Simple value index. 1995 base year.	The weights are based on the production value in basic prices from national accounts.
D 2000	The adjustment coefficients take account of the number of working days in a month and of public holidays, considering also regional aspects. The adjustment coefficients are based on series of previous periods. The "Berliner Verfahren", version 4 (BV4) is used for seasonal adjustment.	Laspeyres index. 1995 base year.	Gross value added taken from the SBS (for enterprises with 20 persons employed or more) is extrapolated. The weighting schemes are calculated for a reference year (1995 currently) and are projected with the aid of the number of hours worked.
E 2000	The following series on the value of production are compiled: value of production; value of production realised as "main contractor"; value of production realised under subcontracting; value of production subcontracted to others. The results are broken down into building (residential and non-residential) and civil engineering (by type). Value and volume indices are compiled; construction costs indices are used as deflators.	1990 base year.	
F 2000	In order to compensate for variations in gross production between months, the monthly series are corrected to a standard number of working days depending on the normal work schedule of the activity. The indices corrected for working days are then adjusted for seasonal variations using the X11-ARIMA procedure.	Laspeyres index with a fixed base year. 1995 base year.	Weighted average of the basic indices of products or groups of products. Each basic information (product quantity) is weighted by the corresponding gross value added at factor cost for the base year.
I 2000	For building the index is a synthesis between the residential buildings index and the non-residential buildings index. There is no seasonal or working day adjustment.	For building: 1995 base year. For civil engineering: Laspeyres index. 1995 base year.	For building: production value in the base year.
L 2000	Proportional corrections are made by applying coefficients for variations in the number of working days in the month, public and religious holidays and the number of days per	Laspeyres index. 1995 base year.	Gross value added at factor costs.

	Calculations made	Type of index	Method of weighting
	week worked by the enterprise. There is no seasonal adjustment.		
NL 2001	Adjustment is made for the number of working days and public holidays but not for strikes and holidays.	Laspeyres chain index. 1995 base year.	Value added at basic prices of construction in the quarterly accounts divided between the production of new work, repair and maintenance for building (residential and non-residential) and civil engineering.
A 2002	The calendar adjustment method takes into account the number of working days in the month, public holidays and fractions of working days in the month. There is no seasonal adjustment.	Laspeyres index. 1995 base year.	Net production value (without excise duties).
P 2000		Laspeyres type index. 2000 base year.	Base year value added from SBS.
FIN 2000	For building the index is compiled from the volume indices for new building construction and for renovation. For civil engineering the index is calculated using a panel of enterprise data of domestic turnover minus subcontracts during the latest reference period. This is compared to the same period of the previous year and the percentage change calculated. This is then used to calculate the production index at current prices and then deflated. The index is seasonally adjusted.	1995 base year.	For building: data from the national accounts for the base year are used as weights for aggregating data. For civil engineering: domestic turnover (minus subcontracts) for a given month.
UK 1999	A constant prices series is compiled. The series are seasonally adjusted according to the X11 ARIMA method on the basis of a multiplicative model. Three types of construction output (production) quarterly series are produced: the volume of construction output at constant (1990) prices; the value of construction output at current prices; a volume index of construction output (1990 = 100).	Laspeyres indices. 1990 base year.	

11.2 Construction costs and prices

11.2.1 Introduction

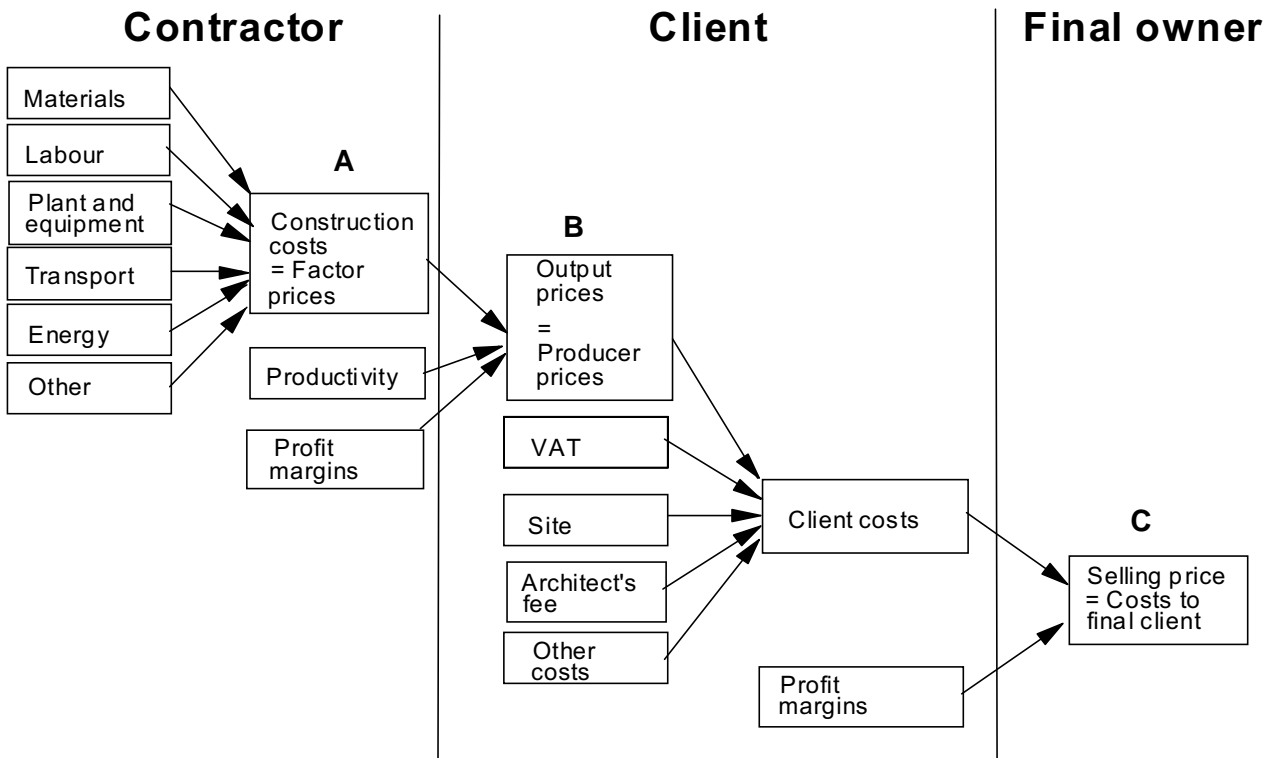
Name, synonyms and code numbers

The STS-R requires short-term statistics on construction costs (320) under the provisions of Annex B. It also requires information on material costs (321) and labour costs (322). It also foresees that this may be approximated by an output price index (310). Note that Eurostat uses output prices not only as a proxy for construction costs but also as an indicator in their own right. The Handbook on price and volume measures in

national accounts expresses a preference for output prices as the deflator for compiling volume measures of output.

The construction cost index can be considered as a combination of component costs indices (material costs and labour costs) which show the price developments of the main production factors of construction.

The terms "Cost index" and "Price index" are frequently used and are open to confusion and hence it is necessary to clarify the terminology.



In the context of construction statistics, the focus of attention is on the evolution of prices in the construction activity as it is defined in Division 45 of NACE Rev. 1. For this reason, the terms "Cost index" and "Price index" will be considered from the point of view of contractors, for the actual construction process lies in their hands. The terms "Client" and "Final owner" in the above diagram are also seen from the point of view of the contractor.

A construction cost index (see A in the diagram) shows the evolution of costs incurred by the contractor to carry out the construction process; it is also referred to as a factor price index or a construction input price index. An output price index (see B in the diagram) shows the evolution of prices paid by the client to the contractor; it is also referred to as a producer price index. A construction cost index measures the relationship between costs, at constant technology and constant input mix, that are associated with the implementation of a fixed amount of construction work.

Such an index differs from an output price index which measures movements in prices charged to clients of construction work. This is specially true when the price index is calculated from tender prices which can vary from time to time and place to place depending on the state of competition and market conditions. Output price indices include both changes in productivity and in the contractor's margins. This corresponds to item B in the diagram above.

These two indices can be distinguished from the "selling price index" (item C in the diagram above) that measures changes in the prices paid by the final owner of the output to the client. It includes the price of the land, architect's fees and client's margins. These items are particularly hard to value, notably because their purchase may take place at a time considerably separated from the time of construction.

Purpose of the indicator - theoretical concept

The STS-R requires the provision of construction cost index series. It also requires the provision of an index of production (IPC). To be of most value the latter should be presented in volume terms. To achieve this, data collected originally as values have to be deflated. An output price index would be an appropriate price deflator. In its absence the construction cost index series could be regarded as an alternative, however it should be noted that the Handbook on price and volume measures in national accounts classifies this as an unacceptable way to produce volume measures.

It is the objective of the construction cost indices to show the evolution of costs incurred by the contractor to carry out the construction process. Ideally a construction cost index will measure the movements in the costs incurred by the contractor/producer carrying out the construction work, in other words the costs of labour, materials and plant and overheads. As will be noted below this is not easily done in practice and approximations are made.

Definition and reference period

Costs that constitute components of the construction costs as well as labour and materials are plant and equipment, transport, energy and other costs. Architect's fees are not part of the construction costs.

The material costs index is generally calculated using material prices. Prices of materials should be based on actual prices rather than list prices. Prices should be based on a sample of products and suppliers. Prices are valued excluding VAT.

The labour cost index should cover wages and salaries and social security charges for all persons employed. Social security charges include i) statutory social contributions payable by the employer ii) collectively agreed, contractual and voluntary social contributions payable by the employer and iii) imputed social contributions (social benefits paid directly by the employer)⁴².

11.2.2 Population

Classifications & coverage

The coverage of this indicator is limited solely by the CC. The STS-R requires a coverage of CC Groups 111 and 112, and this in turn limited to new building work.

Units

The STS-R requires the use of the KAU as the observation unit for this indicator. As explained elsewhere, the construction cost index is not compiled from the output prices related to the construction activity, but from the input prices. These input prices are in turn output prices for products (or product groups) from upstream activities and hence the use of the KAU is difficult to interpret.

11.2.3 Collection

How to measure

The construction cost index is made up of aggregated price indices for material, labour costs and other types of costs.

Prices may be collected specially for this index or the index may be compiled by combining data that has been collected for other primary purposes, for example as

output prices of branches supplying construction or as labour input indices for construction.

Sampling of units/products

Measuring prices should, as far as possible, be based on actual prices (net prices), given the fact that price information about a certain material sometimes varies, even from the same supplier. This is explained by the fact that a price is the result of negotiation. Many factors affect the negotiation process for example the market situation, quantity involved and the size of previously placed orders. The estimator should take these conditions into account.

The estimates should be based on a probability sample of goods and of observation units. Lacking a suitable sampling frame, it may be necessary to use a biased sample of representative goods, based on the advice of construction experts. It can be useful to consider the possibility of basing the cost index calculations on a probability sample of construction materials (representative goods).

Alternative methods/variables

In general, special surveys are not undertaken in order to calculate the construction cost index. As already noted it is possible to use other indices already available from different sources. The following table gives examples of the different sources used in some European countries.

	Sources
Materials	Price lists, PPI, statistical offices of trade chambers, wholesale prices
Labour	Collective agreements, labour cost survey
Equipment	PPI for machinery
Energy	PPI, wholesale price index

Data collection difficulties

The measurement of changes in the prices or costs of construction work presents great difficulties. The output of the activity in any period includes a great variety of structures and types of work. The pattern of work - buildings of all types, repair and maintenance work - varies from period to period and from year to year. Each building is, in some way, unique. The construction costs of seemingly identical buildings can vary quite considerably because of variations in ground or site conditions and, hence, in foundation and working costs.

Quantity, quality and price

The value of a given product can be divided into two components:

- the price component;

⁴² Note that this definition is different from the definition used for the wages and salaries index.

- the quantity component.

Relevant quality aspects are included in the quantity component.

The "quality" of a road depends partly on the "extent" to which each of these different kinds of components appears and partly on how one values these components but also how these interrelate in making up the total value.

11.2.4 Compilation of the index

Methods to combine the raw data

In principle, the weight system intended for a construction cost index should be based on the final costs incurred for materials, wages and so on during a certain reporting period. In practice, however, it is only possible to establish this cost when a project is completed. In setting up a sampling frame, we could then use the statistics from completed projects during a certain year as a starting point.

Data from the SBS can also be useful for the weight system for material prices, labour costs and other types of costs.

Calculation of the cost indices

The construction cost index is made up of aggregated price indices for materials, labour costs and other types of costs. For any given reference period, the construction cost index can be compiled from the sub-indices:

$$I = w^M \cdot I^M + w^L \cdot I^L + \dots$$

where:

I = the construction cost index
 I^M = the index for materials
 I^L = the index for labour costs
 w^M = the weight for materials
 w^L = the weight for labour costs

It is assumed that neither the construction technique, nor the building organisation have undergone any change, and consequently, the calculations pay no regard to factors such as productivity improvements, more efficient utilisation of materials, etc. which can influence cost development. Nor have any changes in the profit margins be taken into account, which also affect an output price index.

Details of the compilation required

The precise description of the series to be compiled for the construction costs indicators and the material costs

and labour costs sub-indicators can be seen in the following table.

Type of construction coverage	CC 111, 112
Level of detail	Aggregate of CC Groups 111+112
Compulsory forms	Gross
Index or absolute figures	Index
Frequency	Quarterly
Deadlines	3 months

Special note on deadlines

In Annex B the STS-R permits smaller Member States an extension to the deadline of 15 calendar days. A smaller Member State is defined as one with value added in Section F of NACE Rev. 1 in a given base year that represents less than 3% of the value added of Section F in the EU. As with the deadlines themselves, the extension represents a maximum and national statistical authorities are encouraged to provide data earlier than permitted under the extension.

11.2.5 Approximation/alternative indices

The STS-R permits the construction costs indicators to be approximated by an indicator of output prices. The use of this approximation is unlimited in time. In this case it is recommended that VAT should be excluded as well as the price of land and architect's or engineer's fees. The Handbook on price and volume measures in national accounts suggests three methods for estimating output price indices for construction. These are:

- the actual prices method taking data from real projects undertaken during the reference period;
- model pricing based on a theoretical model project using tender price data from standard price lists or surveys;
- the hedonic method (see sub-chapter 10.3 for more information).

For repair and maintenance work it proposes hourly rates or quotes for "model" jobs from contractors.

11.2.6 Overview of national methods

Construction costs - population coverage

	Type of source	Coverage
DK 2000	Statistical survey. For residential buildings the data is collected from professional cost surveyors.	Section F. Note: Residential buildings covers new construction, installation and the completion of residential buildings. [An index for civil engineering is also produced and covers highways and main roads including various sub-categories of these.]
E 2000	Statistical sample survey.	
F 2001	Mixed sources: statistical survey; wages survey of the French building trade association; construction products price survey; other sources.	Buildings (CC Section 1). There are a number of sub-indices.
I 2000		Residential building. [An index is also calculated for buildings for industrial use and also one for road works.]
NL 2002	Statistical sample surveys of output prices and labour costs.	Residential buildings.
A 2002	Mixed sources: industrial wholesale price index; wages structural survey; collective agreements; social costs (provided by "Bundesinnung der Baugewerbe").	Housing and estate building covers only residential buildings based on three types of building: single-family houses, terraced houses and multi-storey apartment buildings. [A road construction costs index is also calculated.]
P 2000	This index is not compiled.	
FIN 2000	Statistical sample survey.	Covered are new construction, (public and private) of four main building types: blocks of flats, row houses, office and commercial buildings, industrial buildings and warehouses, plus renovation. Separately commercial building and own-account building are covered.
S 2000	Statistical sample survey.	New construction of multi-dwelling buildings, collectively built one- or two-dwelling buildings and agricultural buildings.
UK 1999	Statistical sample survey and data from trade associations.	Material cost: covers new house building, other new work, repair and maintenance and the whole range of the construction activity. Earnings: covers total wages and salaries for employees of enterprises in Section F. Note: The geographical area covered is Great Britain.

Construction costs - definitions

	Definition
DK 2000	<p>The construction cost index for residential buildings is a weighted aggregate of indices for material costs and labour costs. The material prices are calculated on the basis of list prices or output prices excluding general discounts such as quantity discounts. Cash discounts are not deducted. The labour costs are calculated on the basis of collective agreement wages, plus compulsory employers' contributions minus subsidies to employers for the payment of these contributions. Profits, fees, VAT and employers' payments of employees' first and second days of unemployment are not included in the index. The cost of land is not included in the index. The construction cost index refers to the start of the quarter.</p> <p>Data are collected for: prices on specific materials and specific quantities; collective agreements on wages and supplements to wages; social contributions paid by the employer.</p>
E 2000	<p>The construction cost index shows the evolution of the costs for the constructor to carry out the construction activity. The cost components are intermediate consumption, labour costs and gross operating surplus. The value of land is not included. The structure of the intermediate consumption is obtained from the results of the structural survey of the reference year (1990). For practical reasons, the "price index of intermediate consumption" includes only raw materials. This index shows the evolution of the prices of the raw materials and is calculated by weighting the output price indices (source INE) according to the structure obtained from the results of the structural survey of the reference year (1990). The labour cost index is calculated from the tables of wages present in the collective agreements of each "provincia".</p>
F 2001	<p>The costs considered relate to raw materials, energy, transport and other charges related to materials or equipment used for construction activity. The wage costs are collected using a survey and then adjusted to take account of the social security charges. The material costs come from the regular survey of output prices. This is supplemented by a monthly survey of producers of raw materials used in construction in order to have a more complete and representative set of raw materials prices. VAT is not included in the cost index, nor are the costs of land, design and marketing.</p>
I 2000	<p>The indices do not include the costs of land, planning, job management and connections to various services. Nor do they include the contractor's profits and margins. They are not price indices, but rather indices of the costs relating to the inputs of goods and services purchased from activities outside of building, and to the labour employed at every stage of construction. The indices are broken down into group indices respectively called i) labour ii) materials and iii) transport and hire. The groups in turn contain several categories which</p>

	Definition
	<p>vary in name and number.</p> <p>The indices of the materials and transport and hire categories are in turn obtained from the aggregation of the elementary indices respectively of each product and of each service.</p> <p>The calculation of the labour group index is based on the hourly costs of the following categories of worker qualifications used in building: specialised worker, skilled worker and labourer.</p> <p>Prices of materials for residential (or industrial) buildings are recorded as average monthly factor prices for goods delivered "free to site", excluding VAT. The factor prices of the installations include the equipment installed and operating, in other words they incorporate the installation costs (excluding the building work).</p>
NL 2002	<p>The indices are a weighted average of two input factors:</p> <ul style="list-style-type: none"> — indices of hourly labour costs of workers in construction; — output price indices of materials. These cover the building materials used for an average residential building. The indices used are an aggregate of several output price indices.
A 2002	<p>Definitions are according to Commission Regulation No. 588/2001.</p> <p>The housing and estate building costs indices show the evolution of the costs of construction of residential buildings from the enterprise's point of view. They are measured as a weighted average of the prices of two input factors needed to construct a building: labour and materials. The index does not include productivity, margins and taxes linked to the activity of construction.</p> <p>The price indices entering in the composition of the index all refer to domestic prices.</p>
FIN 2000	<p>Materials costs for typical inputs are collected. Products and their definitions vary according to the reporting unit. Product specifications vary according to the reporting unit. A research report in Finnish (Rakennuskustannusindeksi 2000) is available on the internet (http://www.inf.vtt.fi/pdf/tiedotteet/1999/T2003.pdf). Prices for commercial building are without VAT whereas price quotations for own-account building include VAT. Prices are net of discounts. Price quotations are given for the 15th of the reference month.</p>
S 2000	<p>The price index estimates the relative change of cost elements involved in the building process. The index does not measure productivity changes such as better utilisation of materials or other factors, nor does it reflect profit margins.</p> <p>The indices for residential buildings are calculated in two versions, one including wage drift, the other excluding wage drift. The index including wage drift is calculated both with and without VAT. The index covers both house and foundation work. The cost elements are: material costs, labour costs, machinery costs, transportation and similar costs (for example electric power and fuel), other expenses of the contractor and the investor's costs (architect's fees, installation costs, interest costs, the investor's costs for administration etc.).</p> <p>The prices for materials are obtained from suppliers dealing directly with the contractor.</p> <p>The labour costs are calculated both with and without wage drift. In the version without wage drift the wages are calculated on the basis of collective agreements. In the other version wages are calculated on the basis of wage statistics from the federations of trade unions. In both versions social security contributions paid by the employer and similar costs are considered. The version including wage drift is the one sent to Eurostat.</p> <p>The data refer to the 15th of the month.</p>
UK 1999	<p>The material cost indices are produced by combining a wide range of output price indices for building materials and components, using weights reflecting the relative value of purchases for new house building, other new work, repair and maintenance and for the whole range of construction activity.</p> <p>The index of average earnings covers the total wages and salaries for manual and non-manual employees. The index reflects such changes as the number of hours worked overtime, short-time, payments by results, the numbers of employees and different occupations, as well as changes in rates of wages.</p>

Construction costs - calculations made

	Calculations made	Type of index	Method of weighting
DK 2000	No seasonal adjustments are made.	Laspeyres indices. 1987 base year.	The weighting system refers to a specific building project. For each category of building work the share of each cost component (material or labour) is defined according to the shares observed for this given construction project. In the same way, the weights attached to each category of building work for the calculation of the total index were observed on the specific project in January 1987.
E 2000	The construction cost index is calculated from the "price index of intermediate consumption" and the "labour cost index" which are also Laspeyres indices.	Laspeyres index. 1990 base year.	<p>The weights are obtained from the 1990 SBS. The weights correspond to intermediate consumption and wages and salaries and are available for the total of construction as well as for the breakdown into building and civil engineering.</p> <p>A list of 35 raw materials are used as weights to calculate the "price index of intermediate consumption" and are also obtained from the results of the SBS. These weights are also available for the breakdown into building and civil engineering.</p> <p>In order to calculate the labour cost index, the elements of the gross salary are weighted according to the number of annual working days and to 12 professional categories (architect, foreman, specialist, manual worker, ...) in order to obtain an index for each "provincia". These indices are weighted by the number of persons employed in each "provincia".</p>
F 2001		Chained indices. National base year is 1974, data provided to Eurostat uses January 2000 as the base year.	The weights used are regularly updated to take account of changes in the methods of production and sales.
I 2000		Laspeyres indices. 1995 base year.	Factor prices for a residential building: the aggregate index of several cost items is given by the weighted arithmetical average of the elementary indices of each cost specified by the design of the building whose weight is represented by its incidence in the total cost of the work done in the base period. The weights differ from province to province because of the variability of the prices found, for the same physical quantity. The weight of each province which contributes with the others to the calculation of the national general index is represented by the value of the investment in housing made in 1995 in the region to which it belongs.
NL 2002	The construction cost index is calculated from the price index of output prices and the hourly labour costs.	Laspeyres indices. 1995 base year.	Weightings are obtained from production statistics for construction for the base year: material 56% and labour costs 44%.
A 2002	No working day or seasonal adjustment.	Laspeyres indices. The price basis for the components is the annual average of 2000.	<p>Housing and estate building costs indices:</p> <p>The "wages costs" component is a weighted average of the following:</p> <ul style="list-style-type: none"> — the contractor's wage component; — the auxiliary and related trades wage component; — the wage component for electrical installations and metalworking. <p>The contractor's wage component is obtained on the basis of the collectively agreed wage (CAW) for building, the average hourly wage (AHW) is calculated in accordance with the Statistics Austria wage structure surveys and levelled out on the basis of the average overpayment factor (ratio of AHW and CAW). The auxiliary and related trades wage component correspond to the collective agreement for the carpenter master trade. In the wage component for electrical installations and metalworking, the collective agreement for the iron and metal producing and processing activities is used for 46% of the component and the collective agreement for the iron and metalworking trade for 54% of the value.</p> <p>The "other costs" component is calculated on the basis of the weighted figures for the products represented in the wholesale price index.</p> <p>The weighting for the housing and estate construction cost index is based on the 1986/87 housing construction statistics and refers to the components needed to build a theoretical building that is a combination of three typical buildings.</p>
FIN 2000	A 12 month moving average is calculated from	Laspeyres index with fixed weights. 2000 base	The weights were determined according to each item's share of total construction cost in the base year. The weights are reviewed every 5 years,

	Calculations made	Type of index	Method of weighting
	the gross index.	year.	along with the selection of factors included in the indices.
S 2000	Construction costs, Material costs and Labour costs. (Factor price index).	Laspeyres index with a fixed base. 1984 base year.	All input cost indices are aggregated to a total construction cost index. The weights are based on housing cost studies from the early 1980s.
UK 1999	Construction cost indices.	Laspeyres indices. 1990 base year.	The weighting scheme reflects the relative value of purchases for new house building, other new work, repair and maintenance and for the whole range of construction activity. The composition and weight of the material cost indices are rebased to reflect materials currently being used.

Output prices - population coverage

	Method used	Coverage
D 2000	Component cost	For the conventional constructions a coverage roughly equivalent to Section F. Reporting units may also be enterprises with a secondary activity in Section F. Price indices for structures of conventional design and for the maintenance of residential buildings cover the new construction and repairs of a selection of important types of buildings and other construction. For the "standard house" price indices, only the main construction, installation and completion of residential single-family buildings are covered.
EL 2000	Component cost	New residential buildings, installation and completion of residential buildings. Note: only covers buildings constructed in the Greater Athens area.
F 2000	Schedule of prices	New residential buildings (mainly non-communal).
L 2000	Component cost	Construction of residential and semi-residential buildings.
A 2002	Component cost	Residential building sub-index covers both public and private construction of both houses and apartment blocks. Sub-index for "other building construction work" encompasses all buildings not intended primarily for residential purposes. "Other civil engineering" covers all civil engineering work that cannot be attributed specifically to road or bridge engineering work (apart from power plants which are not covered directly in this series of indices). Price observation for "other civil engineering" is restricted to the construction of water supply and sewage treatment plants as this is the largest part.
UK 1999	All indices are compiled on the basis of the "Schedule of prices method" except for the Public Sector House building price index that is compiled according to the component cost method.	Public sector house building limited to England and Wales. Public sector non-housing building and road construction cover England, Scotland and Wales but not Northern Ireland. Commercial and industrial buildings covers United Kingdom. Price indices cover main building activities as well as installations and completions, but not repair and maintenance, alterations and extensions. The infrastructure series are estimated on the basis of the road construction tender prices (75%) and of the tender prices for industrial buildings (25%). Prices for other types of infrastructure (for example bridges, sports fields, tunnels, air fields) are not directly measured.

Output prices – definitions

	Definition and calculation
D 2000	The construction price indices are compiled for a choice of selected important products (type of construction) that can be divided into two groups according to the method used to calculate the construction price indices: — the constructions of conventional design and the maintenance of residential building (quarterly) referred to as "conventional construction" price indices; — the single-family houses of prefabricated design (half-yearly) referred to as "standard house" price indices or "system-built". The second type of index was created in 1968 at a time when the construction of prefabricated single-family houses experienced a boom and reached a market share of 10% in the mid-1970s. In 1998, "system-built" houses still represented 14.8% of the market in Germany, especially because of their great importance in the New Länder (24.8%). The price indices for conventional construction are output price indices not of the construction activity but of selected types of buildings

	Definition and calculation
	<p>and other constructions. However, because each "product" is linked to a specific contract, they can also be regarded as purchase price indices. The price indices for the standard house are more usual output price indices because the producer can build a number of similar houses and decide to sell them on the market afterwards. In this case, the output price can differ from the purchasing price and the methods used to calculate the indices are similar to those used for manufacturing. The prices are market prices on award of the contract (not tender prices) excluding VAT.</p> <p>The Landesämter (regional statistical offices) first calculate for each price notification the enterprise's index figure: the ratio, multiplied by 100, of the current price of an item of construction work categories to the corresponding average price in the base year. These index figures for an item are then averaged and the resulting 220 "Land index figures" are compiled into the "federal index figure". As prices are surveyed excluding VAT, the last stage is to increase (or decrease) the price indices by the change in the rate of tax.</p> <p>For the standard house price indices the prices refer to 1st of April and 1st of October.</p>
EL 2000	<p>Price indices of new building dwelling construction. These indices comprise the:</p> <ul style="list-style-type: none"> — price index of work categories for the construction of new residential buildings (output price index); — price index of construction cost of new residential buildings. <p>The price index of construction cost consists of the following individual price indices: price index of materials, price index of labour cost and price index of other expenditure.</p> <p>The prices paid for the individual works which compose the index of "work categories" of new residential buildings refer to the prices which are actually paid to subcontractors and which usually cover expenditure for materials, labour, depreciation of fixed assets and profit. Payment agreements for the construction of several sections of the building are made according to work units, and hence prices refer to the units of construction work such as m² or m³ according to the kind of work done.</p> <p>The prices taken into account in the index refer to the prices paid by constructors for materials, labour and other expenditure. The prices collected for materials refer to prices actually paid by building enterprises for materials delivered at the site of work and include transport and other expenses (VAT etc.) charged to the purchaser. They refer to all transactions made during the reference month. The labour costs refer to the prices actually paid by the construction enterprises as labour remuneration. This remuneration is usually agreed between the building enterprise and workers of a certain profession according to the volume of work, in other words for "contract" work and not wages. So, use is made of the "contract" prices that are collected quarterly and refer to the agreements made during the quarter concerned. Prices of other expenditure are collected quarterly from competent services and organisations.</p>
F 2000	<p>For each of the 320 construction projects in the sample the market price is compared with a theoretical price obtained by the valuation of each element of the project at a fixed reference date in 1987; this valuation is done by quantity surveyors. Quality changes are taken into account. The index does not take account the price of land, demolition, various infrastructure or networks, architect's or design office's fees, or property development costs. It therefore reflects the trend in the production prices of new houses, not that of their selling prices.</p>
L 2000	<p>The price includes all factor prices as well as the margins and productivity changes. The method used to calculate the index is based on the observation of the real prices of typical categories of building operations.</p> <p>A basket of 140 typical categories of building operations is defined and each reporting unit is asked to notify the real price received for each of the typical operations performed in the previous six months. Each typical category of building operation is weighted according to its importance in the total cost of a typical building in order to calculate a synthetic index.</p> <p>Price changes due to quality changes in the typical operation should be removed. When a category of operation is provided for one or two periods in a form that does not correspond to its definition, its price should be estimated by the respondent. If the fulfilment of a category of work provided changes dramatically, its definition should be modified accordingly and the new corresponding series linked to the former one statistically. When an enterprise of the sample disappears it is replaced by another one whose activities cover as well as possible the typical categories of building operations of the former.</p> <p>The prices are those relating to typical operations performed in the previous six months.</p>
A 2002	<p>The index of construction output prices is made up of 5 broadly similar quarterly sub-indices for:</p> <ul style="list-style-type: none"> — construction of residential buildings; — other building construction work; — construction of roads; — bridge building; — other civil engineering work. <p>The prices collected are based on concluded contracts. These may not be the final prices, but they reflect the prices at the moment of observation. The indices include the costs of materials (including transport to site), labour, equipment hire, the installation costs of water, gas and electricity and internal fittings. Excluded are land purchase and preparations costs, telephone installation costs, external fittings, professional fees, trade margins, overheads and profits. The prices are net of discounts, and generally do not include VAT. The labour costs elements are based on rates set in collective wage agreements and include social contributions paid by employers.</p> <p>The method of standard components is used on the basis of prices for representative types of construction operations. For each sub-index a list of types of construction operations is drawn up. Price indices are calculated by forming an average price from the (maximum of eight) price reports received for each individual operation in each Federal State. The prices should be collected for types of construction operations consistently-defined from period-to-period wherever possible. Where a change in the detailed specification of the work is unavoidable, the change is reported on the questionnaire (with a figure on the new basis also being reported for the previous period) and</p>

Definition and calculation	
	taken into account by making base adjustments when calculating the current index values.
UK 1999	<p>Tender price indices are calculated for:</p> <ul style="list-style-type: none"> — public sector house building price index; — public sector non house building price index; — road construction price index (new and renovation). <p>On the basis of these indicators and of new orders received data, the composite output price index for construction is calculated.</p> <p>In addition quarterly Commercial and Industrial building indices are compiled.</p>

Output prices - calculations made

	Type of index	Method of weighting
D 2000	Laspeyres indices. 1995 base year.	<p>The weights come from billing records and invoices for building construction categories on given types of structure which were performed during the base year. For each billing record, the prices of all construction work categories that can be allocated to a specific collection item are summed and this is then divided by the total price of the structure to obtain the relative weight of the collection item in question.</p> <p>The weights of the collection items for the other types of building (and other constructions) are updated according to the price development for the respective types of buildings (and other constructions) since the latest base year.</p> <p>The weights used for the "standard house" indices correspond to the proportion of the turnover of the category of reporting firms.</p> <p>The Land index figures for each construction work category are weighted with the turnover in construction of the Länder in the base year to arrive at federal indices. The federal indices by category are weighted by means of structure-specific weighting schemes.</p>
EL 2000	Laspeyres indices. 1990 base year.	Coefficients were obtained from the analysis of 150 building enterprises' accounts for the period 1988 to 1990.
F 2000	Chained Paasche index. Fourth quarter 1953 is the base period.	The weights for each element that has been priced come from the General Evaluation Form (BGE) established in 1987 for houses and for apartment blocks. Each project in the sample is then weighted by the relative volumes (the index is grossed to the population of housing starts during the reference quarter with strata by type of construction and by region). Note that the index for the third quarter of each year is the result of an econometric model as the survey is only carried out for the first, second and fourth quarters.
L 2000	Laspeyres indices with fixed weights. 1970 base year.	The basic index for each typical category of building operation is weighted according to its respective importance in the total cost of a typical building. These weights are obtained every 10 years from a general survey of architects, building contractors and real estate developers.
A 2002	Laspeyres index. Changes in quality are taken into account by adjusting the prices for variations of the most important price-determining characteristics. 2000 base year. Sub-indices may have older base years.	<p>The weighting is based on production values. These values are taken from the census of construction.</p> <p>Price index for Road construction, Bridge construction and Other civil engineering: for these indices, the weights take into account the nature of the ground as well as the region. The same number of projects are drawn randomly for each type of ground. From these are determined the shares of the work category groups in each project as well as the share of the work categories within these groups. Thus for each ground type the average share of each category and group is determined. These results are weighted using the share of each ground type in each province to give average weightings of categories and category groups for Austria. These regional weights are based on the shares of the value of road production in the base year.</p>
UK 1999	<p>Public sector house building price index: Laspeyres price index.</p> <p>Public sector non-housing building price index: Paasche index.</p> <p>Road construction tender price index: Paasche index.</p> <p>Commercial and industrial building tender price index: Paasche index.</p> <p>1990 base year.</p>	

11.3 Building permits

11.3.1 Introduction

Name, synonyms and code numbers

The STS-R requires short-term statistics on building permits under the provisions of Annex B in terms of the number of dwellings (411) and in terms of a size measure (412).

Purpose of the indicator - theoretical concept

It is the objective of the building permit indicators to show the future development of construction activity. The tracking of building permits provides a relatively simple indication of the short-term future workload of the building side of construction. To maximise the value of such series, however, it is essential that they should be further quantified to provide accurate data on the number of dwellings and on the habitable or usable floor area authorised.

Data on the number of dwellings authorised is valuable to EU and national policy makers for the purposes of social policy as well as for the purposes of policy related to building. It is also in itself directly useful to specialists in residential building and to their material and component suppliers in that, uniquely within construction, the concept of the "average" house or apartment does have some meaning. However, data on the habitable floor area authorised is a far more accurate and directly useful indicator.

For non-residential construction data on the usable floor area authorised is the only truly useful indicator which can be derived from the building authorisation process. Non-residential buildings vary so enormously in their nature and size that data purely on the number of permits granted, can be useful only as a very broad indicator.

Definition and reference period

Normally a building permit is defined as an authorisation, in response to an application, granted to a principal, to start work on a building project according to a plan.

The building planning and authorisation procedures of the Member States, whilst following similar principles, vary at the detailed level and this has to be borne in mind when aggregating data from individual countries. Despite the differences, nowhere can an authorisation to start work be a requirement to start, hence a building permit does not necessarily imply that the project specified in the plan will be completed. Subject to this proviso, however, it is clear that the data required for this set of

indicators is that deriving from the final stage of national planning and building authorisation procedures.

Building permits: number of dwellings

Indicators of the number of permits are compiled for one-dwelling residential buildings and residential buildings with two and more dwellings. A dwelling is a room or suite of rooms and its accessories in a permanent building or structurally separated part thereof which, by the way it has been built, rebuilt, converted and so on, is intended for private habitation. It should have separate access to a street (direct or via a garden or grounds) or to a common space within the building (staircase, passage, gallery, and so on). Detached rooms for habitation which are clearly to be used as a part of the dwelling should be counted as part of the dwelling. A dwelling may thus be constituted of separate buildings within the same enclosure, provided they are clearly intended for habitation by the same private household.

Building permits: square metres of useful floor area or alternative size measure

This indicator is compiled from the square metres of useful floor area of buildings for which permits have been granted. The useful floor area of a building is measured within its external walls, excluding:

- construction areas (for example areas of demarcation components, supports, columns, pillars, shafts, chimneys);
- functional areas for ancillary use (for example areas occupied by heating and air-conditioning installations, or by power generators);
- thoroughfares (for example areas of stairwells, lifts, escalators).

The part of the overall useful area of a building used for residential purposes includes the area used for kitchens, living rooms, bedrooms and ancillary rooms, cellars and common rooms used by the owners of the residential units.

Other size measures may be used as long as they are unambiguously and consistently used by the national statistical authorities.

11.3.2 Population

Classifications & coverage

The coverage of these indicators is limited solely by the CC. The STS-R requires a coverage of Groups 111 and 112 for building permits in terms of the number of dwellings, and a coverage of Section 1 for building permits in terms of a size measure.

Units

The STS-R requires the use of the KAU as the observation unit for these indicators. As has been noted elsewhere this is in fact not practical. As the information used is based on products, there is no observation unit in the sense foreseen by the STS-R.

11.3.3 Collection

Difficulties with the theoretical concept/definition

A building permit is an authorisation to start work on a building project. As such a permit is the final stage of planning and building authorisations from public authorities, prior to the start of work. An index based on these permits should provide a good indication of the workload for building in the near future, although this may not be the case when a large proportion of permits are not used or when there is a long time lag between permits and building starts.

In some Member States the existing building planning and authorisation procedures include other developments than the authorisation to start work on a building project. In these cases, Member States are encouraged to provide Eurostat with the necessary estimations in order to approach as much as possible the concept described above.

How to measure

Construction is unique in that a statistical survey is not the only source of information on production operations. The production operations are also subject to control by and are governed by public authorities. The collection of data on the number of residential and non-residential building permits is normally done from the appropriate part(s) of the public administration.

Sampling of units/products

In practice sampling is not used to collect information on permits. Given the need to have information on this indicator quickly if it is to play its leading role, the use of sampling may be a suitable method to speed up the availability of the indicator, particularly when the administrative management of permits is highly decentralised.

Data collection difficulties

The collection of data on residential and non-residential building permits should present no great difficulty to national statistical authorities as the information is generated by the public administration. However, the statistical systems of the Member States do not always foresee the obligation of other parts of the public administration to provide national statistical authorities with data on building permits at the level of detail and at the frequency required by the STS-R nor within the delay foreseen. It should be stressed that the use of administrative sources for data collection implies a very good relationship between the different authorities concerned.

11.3.4 Compilation of the index

Methods to combine the raw data

The data required is obtained by a count of all building permits or the sum of the appropriate size measure. Assuming that a common size measure is used for all of the different types of classifications to be covered, then there is no need for weights to be used.

Details of the compilation required - level of detail; frequency; decomposition.

The precise description of the series to be compiled for the building permits indicators can be seen in the following table.

		Type of construction coverage	Level of detail	Compulsory forms	Index or absolute figures	Frequency	Deadlines
411	building permits: number of dwellings	111, 112	CC Group	Gross	Absolute figure	Quarterly	3 months
412	building permits: square meters of useful floor area or alternative size measure	1	CC Groups of Division 11, Group 122 and sum of other Groups of Division 12	Gross	Absolute figure	Quarterly	3 months

Level of detail

The level of detail described in the table above corresponds to the following headings:

Indicator 411 building permits: number of dwellings
 CC 111 one dwelling residential buildings
 CC 112 two and more dwelling residential buildings

Indicator 412 building permits: square meters of useful floor area or alternative size measure

CC 111 one dwelling residential buildings
 CC 112 two and more dwelling residential buildings
 CC 113 residencies for communities
 CC 122 office buildings
 CC 121 + CC 123 to CC 127 other buildings

The category "other buildings" includes the following categories in the CC classification:

CC 121 hotels and similar buildings;
 CC 123 wholesale and retail trade buildings;
 CC 124 traffic and communication buildings;
 CC 125 industrial buildings and warehouses;
 CC 126 public entertainment, education, hospital or institutional care buildings;

CC 127 other non-residential buildings.

Special note on deadlines

In Annex B the STS-R permits smaller Member States an extension to the deadline of 15 calendar days. A smaller Member State is defined as one with value added in Section F of NACE Rev. 1 in a given base year that represents less than 3% of the value added of Section F in the EU. As with the deadlines themselves, the extension represents a maximum and national statistical authorities are encouraged to provide data earlier than permitted under the extension.

11.3.5 Approximation/alternative indices

Member States that can not provide data on building permits are allowed to estimate it from building starts if they are available.

Instead of square metres of useful floor area, other measures of size may be used as long as they are unambiguously and consistently used by the Member States. For example these measures may be the volume (m³) of construction or a deflated value.

11.3.6 Overview of national methods

Population coverage

	Type of source	Coverage	Type of index
DK 2000	Administrative source: BBR (Register of Buildings and Dwellings).	The classification of buildings used in the BBR is, with a few exceptions, comparable with the Buildings Section of the CC.	Absolute figures.
D 2000	Administrative source.	Building construction only. Monthly: residential and non-residential building construction.	Absolute figures.
E 1999	Administrative source.	Part of Section F including the construction of new plant, refurbishment of buildings and total or partial demolition. Small works that do not require a permit are not included.	
F 2001	Administrative source.	New building projects (residential and non-residential) having received permission to build.	Absolute figures.
I 2000	Statistical survey as part of an administrative source.	CC Section 1 (building).	
L 2001	Administrative source.	All construction projects for which building permits are required.	Absolute figures.
NL 2001	Short-term information on building permits are compiled but no methodological details are available.		
A 2002	Administrative source.	Up to the 2nd quarter of 2003 it covers buildings with at least one dwelling (residential buildings). From the 3rd quarter 2003 the coverage is all buildings including non-residential ones. Buildings of less than 20m ² are excluded. Non-residential farm buildings are excluded.	Absolute figures.
P 2000	Administrative source.	Section F.	Absolute figures.

	Type of source	Coverage	Type of index
FIN 2000	Administrative source.	Housing construction (believed to be residential construction). All new buildings and extensions of old buildings. Some small buildings which can be built without building permits are excluded. Repairs and buildings for military purposes are excluded.	Absolute figures.
S 2000	Administrative source and statistical survey for further information about the building process.	New construction, extension and vertical extension of buildings where building permits are granted or building notifications are reported. Extensions of less than 50 m ² are excluded. Civil engineering is not included.	Absolute figures.

12. Services indicators (including retail trade)

12.1 Turnover

12.1.1 Introduction

Name, synonyms and code numbers

The STS-R requires short-term statistics on turnover (120) under the provisions of Annexes (A) C and D.

Purpose of the indicator - theoretical concept

Turnover is an important short-term indicator for distribution and all services, simply because there are very few indicators available for these activities. The objective of the turnover index is to show the evolution of the market for goods and services.

This indicator is particularly pertinent for distribution activities as selling rather than producing is generally the main part of their activity. Furthermore, monthly data on retail turnover provides an indicator of quarterly household consumption in national accounts, which is the largest element of expenditure.

The concept of turnover is quite different in services compared to industry and distribution as in many services activities there is no sale or re-sale of a good and the products sold are essentially services provided to third parties.

Definition and reference period

The definition of turnover for STS follows the definition of SBS and in this respect follows to a large extent the ESA 95.

The definition of turnover is relatively straight forward. In case of doubts concerning the eventual inclusion or not of any item in turnover the definition specifies that "items may be included if they generate turnover in the principle field of operation of the observation unit".

Turnover comprises the totals invoiced by the observation unit during the reference period, and this

corresponds to market sales of goods or services supplied to third parties. Turnover includes all duties and taxes on the goods or services invoiced by the unit with the exception of the VAT invoiced by the unit vis-à-vis its customer and other similar deductible taxes directly linked to turnover. Turnover also includes all other charges (for example transport, packaging) passed on to the customer, even if these charges are listed separately in the invoice. Reduction in prices, rebates and discounts as well as the value of returned packing must be deducted. Price reductions, rebates and bonuses conceded later to clients, for example at the end of the year, are not taken into account. Income classified as other operating income, financial income and extraordinary income in company accounts is excluded from turnover. Subsidies received from public authorities or the institutions of the European Union are also excluded.

According to this definition, the items generally included are:

- sales of manufactured products;
- sales of products manufactured by subcontractors;
- sales of goods purchased for resale in the same condition as received;
- invoiced services provided;
- sales of by-products;
- invoiced charges for packaging and transport;
- hours worked invoiced to third parties for labour only subcontracting;
- invoiced mounting, installations and repairs;
- invoiced instalments (stage payments);
- invoiced development of software and software licences;
- sales of supplied electric power, gas, heat, steam and water;
- sales of waste and scrap materials.

Subject to the treatment of income classified as "other operating income, financial income and extraordinary income" in company accounts, the items generally excluded are:

- commissions;
- leases and rentals;
- leases for own production units and machines if used by third parties;

- leases of company-owned dwellings;
- receipts for license-fees;
- receipts from staff facilities (for example from a factory canteen);
- the supply of products and services within the observation unit;
- sales of own land and fixed assets;
- sales or leases of own properties;
- sales of shares;
- interest receipts and dividends;
- subsidies;
- other extraordinary income.

This definition should be used by national statistical authorities, but accounting rules in force in each country should be used as guiding principles of what to include and to exclude. The reality of each activity should be taken into account when measuring turnover, for example in some activities with large products with long production cycles turnover is likely to be more volatile.

VAT

The treatment of VAT in turnover is a controversial issue, some consider that VAT should be included in the definition of turnover. The definition adopted for STS excludes VAT which is consistent with the definition adopted for SBS. There are some reasons for not including VAT in the turnover definition:

- the aim of STS is to follow developments over time and VAT does not have any impact on the tendency unless the rate of the tax is changed. In fact, if there is a change in the tax of different products this could introduce an artificial element into the evolution of the turnover indicator;
- if VAT is included in the weights, it can distort the share of each activity; bearing in mind that the tax differs from product to product, the impact of VAT on these weights can have a negative impact on the quality of the index;
- the tax for domestic or non-domestic markets may differ;
- the tax differs between Member States.

Note on turnover for distribution

In the case of distribution the most important component of turnover is the sale of goods purchased for resale in the same condition as received and the invoiced services provided. Nevertheless, some other items can be included in turnover. It should be stressed that the “reduction in prices, rebates and discounts as well as the value of returned packing must be deducted from turnover”. This is important as in some retail trade activities enterprises record discounts under sales.

Note on turnover for non-distribution services

In some service activities income is not directly linked with the definition proposed as enterprises may consider income as commissions but in fact it they correspond to turnover in the sense that they represent the operational income of the ordinary activity of the enterprise.

12.1.2 Population

Classifications & coverage

The coverage of this indicator is limited solely by NACE Rev. 1. The STS-R requires a coverage of Sections G, H, I and Divisions 72 and 74.

Units

The STS-R requires the use of the enterprise as the observation unit for this indicator.

12.1.3 Collection

How to measure

Traditionally the main method of collecting information on turnover is through the use of a statistical survey.

Sampling of units

In the case of statistical surveys either a sample survey or a census can be used.

Alternative methods/variables

Bearing in mind the aim of the turnover indicator, it should be decided whether it is possible or preferable to use administrative data or conduct a statistical survey instead. As turnover is recorded in accounts by all units, information concerning turnover does not need to be collected through a statistical survey and administrative sources can be used. The main administrative source for turnover is the VAT declarations made by enterprises regarding their purchases and sales.

Nevertheless, some attention should be paid to the definition used by the administrative authorities compared to that used in the implementation of the STS-R - some consistency problems may arise. The use of VAT registers may also lead to difficulties concerning the respect of delays as, for some enterprises, VAT authorities concede a delay for making declarations that is incompatible with the delay required under the provisions of the STS-R. It should also not be forgotten that each Member State determines the levels of turnover below which VAT declarations do not need to be made and may also allow different frequencies for declarations (monthly, quarterly or annually) according to enterprise size.

The main advantage of the use of administrative sources is that it reduces the burden of data collection on enterprises.

12.1.4 Compilation of the index

Methods to combine the raw data

The STS-R requires this indicator to be transmitted to Eurostat as either an index or as absolute figures. The turnover index is a simple value index (price multiplied by quantity/volume), and is a direct index in that it compares the current period with the fixed period in the base year.

In order to compile turnover indices at higher levels of NACE, the indices at the lowest level have to be aggregated. This aggregation is done by using weights based on the turnover share of each activity in the base year.

It is recommended to use SBS data for the weights in order to provide the maximum of consistency between different indicators. There are other sources that can be used, however attention must be paid to the consistency of the basic data, notably the definition of turnover used.

Details of the compilation required

The precise description of the series to be compiled for the turnover indicator can be seen in the following table.

Annex	Activity coverage NACE Rev. 1	Compulsory forms	Index or absolute figures	Frequency	Level of activity detail	Deadlines
C	52	Gross and working day adjusted	Either	Monthly	Division level: Division Aggregated level: sum of 52.1 to 52.6 52.11+52.2 52.12+52.3+52.4+52.5+52.6 Detailed level: 52.11 52.12 52.2 52.3 52.41+52.42+52.43 52.44+52.45+52.46 52.47+52.48, 52.61	2 months 2 months 3 months
D	50, 51, H, I, 72, 74	Gross and working day adjusted	Either	Quarterly	Divisions: 55, 60, 61, 62, 63, 72 Groups (of): 50.2, 50.5, 51, 64, 74.4 to 74.8 Sum of Groups: 50.1+50.3+50.4 74.2+74.3 Sum of Classes: 74.11+74.12+74.13+74.14	3 months

Special note on deadlines

In Annex C the STS-R permits smaller Member States an extension to the deadline of 1 month. A smaller Member State is defined as one with value added in Division 52 of NACE Rev. 1 in a given base year that represents less than 3% of the value added of Division 52 in the EU. As with the deadlines themselves, the extension represents a maximum and national statistical authorities are encouraged to provide data earlier than permitted under the extension.

Note concerning working days adjustment

In the case of retail trade (and some other services) it is quite difficult to use working days adjustment. In fact, it can be possible in a particular activity to find units that are open 7 hours a day, 5 days a week, and other units that are open 14 hours a day, 365 days a year - for example in some shopping centres. Due to this kind of situation it could be debated whether it is reasonable to use working day adjustment. However, there are working day factors and the STS-R requires this correction to the gross data.

12.1.5 Overview of national methods

Population coverage

	Type of source	Coverage	Observation unit(s)
DK 2000	Statistical sample survey for distribution. Administrative source for other services. Census.	For distribution, Section G with some exceptions. For other services, all activities except 50.1 (part of), 60.1, 60.21, 60.22, 60.23, 61.1 (part of), 61.2, 62.1, 62.2 (part of), 63.21 (part of), 63.3, 64.11 (part of), 64.12 (part of) and 74.5 (part of). These are activities not liable to VAT.	For distribution KAU. For other services administrative unit in the tax authorities register of units liable to VAT (in most cases equal to the legal unit).
D 2000	Statistical sample survey.	Sections G and H excluding Groups 51.1 and 52.7.	Enterprise.
EL 2000	Statistical sample survey.	Groups 52.1 to 52.6.	Enterprise.
E 2000	Sample survey.	Division 52 excluding Groups and Classes 52.31, 52.32, 52.5, 52.6 and 52.7. Note: excluding Ceuta and Melilla. Only covers enterprises in municipalities with at least 2,000 inhabitants.	Enterprise.
F 2001	Administrative source supplemented by a statistical sample survey for units not covered on a monthly basis by the administrative source.	Sections G, (part of) H, I and K and Divisions 90 and (part of) 92.	Enterprise.
I 1999	Statistical sample survey.	Groups 52.1, 52.2, 52.3, 52.4 and Class 52.61, excluding national activity classification heading 52.11.5. Note: sales by internet excluded.	Stores.
NL 2000	For retail trade and services: statistical sample survey.	For retail trade: Division 52 except Class 52.31. For services: Divisions 50, 55, 72 and 74 (from 2002).	For retail trade: enterprise (legal unit). For services: enterprise.
A 2002	Statistical sample survey.	Section G excluding Group 52.7.	Enterprise.
P 2000	Statistical sample survey.	Sections G, H, I, J, K, M, N and O. Mainland Portugal only.	Enterprise.
FIN 2000	Statistical sample survey and administrative sources (census).	Sections G, H, I, K and O, excluding Group 52.7 and Class 74.15.	Administrative source: enterprises. Statistical survey: enterprises/KAUs.
S 2001	Statistical sample survey and administrative sources (census). In retail trade only the survey is used.	Sections G to I, Divisions 70, 71, 72, 74 and 90, Groups 92.1 to 92.4, Class 92.72 and Division 93.	Enterprise.
UK 1999	Statistical sample survey.	Sections G, H, I, K, M, N and O except for: 60.1, 60.3, 61, 62, 63.23, 64.11, 70, 80.1, 80.21, 85.12, 85.13, 85.3, 91, 92.5, 92.6, 92.7. Note: Great Britain only.	Enterprise or list of local units. Very often the latter of these is close to the KAU.

Calculations made

	Calculations made	Type of index	Method of weighting
DK 2000	No working day adjustment. For distribution series are seasonally adjusted (using Procedure X11) and deflated. For the other services, the turnover statistics are seasonally adjusted but only at an aggregate level.	Simple value index for distribution. No index for the other services.	No fixed weights are used. The base values are published.
D 2000	Decomposition into all components is done using Berlin procedure, version 4. Value and volume sales are calculated by deflation using appropriate price indices.	The volume index is a Laspeyres index based on 1991 for distribution and 1995 for hotels and restaurants.	Sales value in 1995 from the SBS.
EL 2000	Working day adjustment.	Chained index. 1995 base year.	
E 2000	No seasonal or working day adjustment. Deflated figures are only provided for Eurostat and are not published nationally.	Chained index. 1994 base year.	The weights are calculated from the business register.

	Calculations made	Type of index	Method of weighting
F 2001	The indices are working day and seasonally adjusted.	Laspeyres index with a fixed base year. 1995 base year.	Enterprise turnover.
I 1999	Seasonal adjustment is not carried out because of the short time series available - it is expected to start this after March 2001 when data for 5 complete years are available. For working day adjustment several methods are being tested.	Laspeyres index. 1995 base year.	Turnover weights from SBS data, the survey itself, external sources, or estimates.
NL 2000	For retail trade: no seasonal or working day adjustment. A volume series is calculated. For services: no working day adjustment.	For retail trade: composite-weighted value index. 1995 base year for retail trade and 2000 for wholesale trade. For services: Laspeyres index. 1995 base year.	For retail trade and services: turnover.
A 2002	There is no seasonal or working day adjustment. The volumes of sales is calculated.	The indices measure the turnover for each reference month and each subgroup as a percentage of the average monthly value of the base year. 1995 base year.	Turnover of the base period.
P 2000	No adjustment.	A value index with a fixed base year is used for the aggregated levels. For the 3-digit level of NACE Rev. 1 a simple value index is applied. The evolution of the present month with respect to the same month of the preceding year is calculated on a constant sample of firms. These evolutions are chained to compile the series. 1995 base year for retail trade and 2000 for other services.	Turnover from SBS.
FIN 2000	For the services other than retail trade, the turnover indices are trading day corrected and seasonally adjusted using X11 of SAS.	The index is calculated using a panel of enterprise turnover data. The sum of turnover during the latest reference period is compared to the same period of the previous year and the year-on-year percentage change is calculated. The change is then used to calculate the index number of the latest reference period. This index number is corrected by the index of recently established enterprises (established since the same reference period of the previous year) and by the index of enterprises that have closed. 1995 base year.	Turnover
S 2001	Adjustment for the number of working days in the month is done. The seasonal adjustment method used is X11. Outliers are corrected by manual revisions. The volume of sales is calculated. For retail trade the CPI is used for deflating.	Simple value index. 1995 base year.	Turnover from the base year survey.
UK 1999	Retail trade turnover index is presented as a weekly average and also seasonally adjusted.	Weighted Laspeyres index for retail trade. 1995 base year. Absolute figures for other services.	Turnover from the SBS for retail trade.

12.1.6 Technical annexes

The calculation of value indices for turnover in distribution and services is the same as for industry (see point 10.2.6).

12.2 Deflator of sales

12.2.1 Introduction

Name, synonyms and code numbers

The STS-R requires short-term statistics on a deflator of sales (330) under the provisions of Annex C. It also foresees that alternatively the volume of sales (123) may be provided. It should be noted that the volume of sales is different from the volume of (retail) trade services. The latter takes account of changes in the quality of the trade *service* supplied. As such the volume of sales is conceptually different from the index of production which takes account of quality changes.

Purpose of the indicator - theoretical concept

In order to eliminate the price effect on turnover in retail trade, the STS-R requires a deflator of sales. The deflator of sales is an index with a similar methodology to that of the PPI (see sub-chapter 10.3) adapted to the particularities of retail trade but refelecting price changes in the goods retailed rather than the retail service provided.

Definition and reference period

As noted above the deflator of sales in retail trade is a deflator not of the service provided but of the goods sold. The prices used to calculate the deflator for an activity are calculated as a weighted average of the relevant price indices of the goods sold by that activity. It is essential that all price-determining characteristics of the products are taken into account, including quantity of units sold, transport provided, rebates, guarantee conditions and destination. The specification must be such that in subsequent reference periods, the observation unit is able uniquely to identify the good and to provide the appropriate price per unit. In order to show the true evolution of price movements, it should be an actual transaction price, and not a list price. The collected price information refers preferably to a specific date during the month.

12.2.2 Population

Classifications & coverage

The coverage of this indicator is limited solely by NACE Rev. 1. The STS-R requires a coverage of Division 52.

Units

The STS-R requires the use of the enterprise as the observation unit for this indicator. To the extent that information based on products is used, there is no observation unit in the sense foreseen by the STS-R.

12.2.3 Collection

Difficulties with the theoretical concept/definition

A deflator of sales is, regardless of the method to compile it, essentially a product based index whereas the turnover data with which the deflator is ultimately to be combined is based on sectors (enterprises classified to their principal activity).

How to measure

A survey of prices for a sample of products is one possible way of collecting information to compile a deflator of retail trade turnover and this is the preferred method from a methodological point of view. However a specific survey would involve supplementary costs and in practice this approach is not used.

In theory, prices in retail trade measured from the point of view of retailers are the same as the ones from the point of view of customers (with the exception of deductible taxes on products). Based on this consumer price indices (or specifically the Harmonized Index of Consumer Prices - HICP) can be used instead to compile the deflator of sales. This has the advantage that it is already available in all Member States with a very good delay.

Data collection difficulties

The main disadvantage of using the HICP is that VAT is included in the definition of price while it should not be considered in the deflator for retail trade turnover⁴³.

12.2.4 Compilation of the index

Methods to combine the raw data

From the Class level of the HICP it is possible to transform the HICP to NACE Rev. 1 and hence produce a price index by activity.

Household expenditure from the household budget survey (HBS) can be used for weights. These weights can be validated using other surveys of retail trade, for example CPA product breakdown of turnover foreseen on a five-yearly basis for SBS.

⁴³ See point 10.3.1 for the implications of VAT in output prices.

Details of the compilation required - level of detail; frequency; decomposition.

The precise description of the series to be compiled for the deflator of sales indicator can be seen in the following table.

Annex	C	Deadlines
Activity coverage NACE Rev. 1	52	
Compulsory forms	Gross and working day adjusted	
Index or absolute figures	Either	
Frequency	Monthly	
Level of activity detail	Division level: Division	2 months
	Aggregated level: sum of 52.1 to 52.6 52.11+52.2 52.12+52.3+52.4+52.5+52.6	2 months
	Detailed level: 52.11 52.12 52.2 52.3 52.41+52.42+52.43 52.44+52.45+52.46 52.47+52.48, 52.61	3 months

Special note on deadlines

In Annex C the STS-R permits smaller Member States an extension to the deadline of 1 month. A smaller Member State is defined as one with value added in Division 52 of NACE Rev. 1 in a given base year that represents less than 3% of the value added of Division 52 in the EU. As with the deadlines themselves, the extension represents a maximum and national statistical authorities are encouraged to provide data earlier than permitted under the extension.

12.2.5 Approximation/alternative indices

The STS-R permits the deflator of sales indicator to be substituted by an indicator of the volume of sales. The use of this substitution is unlimited in time. This alternative indicator can be derived by combining the deflator and the value turnover index. As the value turnover index can be expressed as:

$${}_v I = \frac{{}_p I \times {}_{VOL} I}{100}$$

the volume index can be expressed as:

$${}_{VOL} I = \frac{{}_v I}{{}_p I} \times 100$$

Section E

Transmission to dissemination

13. National Data transmission to Eurostat

13.1 Preparation: identification of confidential data, data robustness

The law

Much of the information about individual people or the business population collected by the national statistical authorities is considered to be confidential. Statistical confidentiality is necessary in order to gain and keep the trust of those required to respond to statistical surveys. There is currently no single definition of confidentiality, different rules have been constructed in different statistical domains to identify confidential data and prevent its disclosure. Eurostat's outputs depend to a large degree on the quality and completeness of the data supplied by the Member States. In the past, this flow of data was impeded by national confidentiality rules which made it impossible for certain Member States to transmit some of the data needed for the compilation of Community statistics. Two pieces of legislation address this problem directly.

- Council Regulation No 1588/90, on transmission of data subject to statistical confidentiality (SC-R), authorises national authorities to send confidential data to Eurostat. It also guarantees that the Commission will take all necessary measures to respect the confidentiality of such data. Confidentiality is defined in this Regulation as "Data declared by Member States in line with national legislation or practices governing statistical confidentiality". National definitions differ to the extent that data that is confidential in one Member State may be publicly accessible. National rules on statistical confidentiality can not, however, be used to prevent transmission of specific data required under a Regulation. Confidential data in Eurostat's possession may only be disseminated when it has been combined with other data to ensure that individual units cannot be identified either directly or indirectly. This Regulation also provides for a Committee on Statistical Confidentiality (CSC), which defines data protection norms and ensures that all regulatory, technical and organisational measures are taken to guarantee the confidentiality of data transmitted to Eurostat.
- In Chapter V of the statistical law the definition of confidentiality is given as "Data should be considered confidential when they allow statistical units to be identified either directly or indirectly and thereby disclosing individual information".

To determine whether a statistical unit is identifiable, account shall be taken of all means that might reasonably be used by a third party to identify it.

Chapter V of the statistical law introduced significant changes in the scope of the statistical confidentiality regime defined under the SC-R. Both legal acts being in force, Chapter V of the statistical law must be taken as the basis and Regulation 1588/90 as a complement, providing together a comprehensive legal framework for the identification and treatment of confidential data.

Article 2(1) of the SC-R left to the Member States the competence to define which statistical data were confidential, in line with national legislation or practices. As a consequence, Eurostat was obliged to comply with the confidentiality rules as they are in the Member States concerned. However, Article 13 of the statistical law has now replaced this provision and it is no longer up to Member States to decide which data are confidential. This decision is now based on the "objective" criteria, in other words the "identifiability" of statistical units, taking into account "all the means that might reasonably be used by a third party to identify the said statistical unit".

The Committee on Statistical Confidentiality was set up by the SC-R with very limited competence. However, Article 20 of the statistical law gives it responsibility "for the adoption of the measures necessary for the implementation of Chapter V", making it a fundamental forum for the development of statistical confidentiality.

The principles involved in statistical confidentiality are:

- statistical data are to be considered confidential when they allow direct or indirect identification of the statistical units concerned;
- confidential data are to be used exclusively for statistical purposes, unless the respondents have given their consent to the use for any other purposes;
- confidential data are not to be made accessible to non-statistical administrative bodies or to users in general, with limited exceptions concerning scientific research;
- all the necessary regulatory, administrative, technical and organisational measures shall be taken to ensure the physical and logical protection of confidential data against unlawful disclosure and non-statistical use, including penal sanctions, if necessary, in order to prevent violations. Officials and other servants of Eurostat and the national authorities having access to confidential

data shall also be subject to this rule, even after the cessation of their functions.

What is statistical confidentiality

Two forms of confidential data need to be identified, primary and secondary. Data is primary confidential if its dissemination would permit the identification of the data for a unit. Secondary confidentiality concerns data which is not primary confidential, but whose dissemination, when combined with other data permits the identification of a unit. In simple terms it can be said that secondary confidential data may be used to protect primary confidential data.

All national statistical authorities have some data which they regard as confidential. The number of confidential cells depends on several factors: the degree of detail in the data set (level of activity classification for example), the size of the Member State and its economic structure; and the degree of severity of the national confidentiality rules.

The two main reasons for declaring data to be primary confidential are:

- too few units in a cell;
- dominance of one or two units in a cell.

In the past some national statistical authorities have not transmitted confidential data to Eurostat and hence at the stage of compiling the data series have not only identified the confidential data but have treated it themselves. Primary confidentiality has been treated principally in two different ways.

The most common practice is to aggregate the primary confidential heading with another heading, primary or not and then to disseminate information only for the aggregate and not for the two individual activities. Effectively the activity that has been used to protect the primary confidential activity becomes secondary confidential (unless it was primary confidential itself). This often results in groupings of activities which are between two different NACE levels and the profile of these ad hoc aggregates may vary between the Member States, over time and between indicators.

Alternatively some national statistical authorities simply suppress primary confidential data. Suppressing one Class for example means that the total for the Group to which that Class belongs can not be calculated unless there happens to be another confidential Class in the same Group. Consequently the calculation of higher levels of NACE is impossible.

National treatment of confidential data has two consequences:

- it is often impossible to calculate EU totals for most NACE headings.

- NACE aggregates produced by the national statistical authorities are unstable over time which considerably limits the opportunities for long time series analysis.

Flags

Because of these problems the STS-R, like most other modern business statistics Regulations, requires Member States to identify confidential data but to transmit it untreated to Eurostat. The national statistical authorities must mark confidential data for example with a confidentiality flag.

The Member States may also use a flag “not very reliable” on appropriate data. Although this data is not confidential for statistical purposes, the data will effectively be treated in the same way and will not be publicly disseminated.

13.2 Transmission: format and media

It should not be forgotten that, until very recently, Eurostat received a significant proportion of data in paper form, requiring manual input which increased the risk of errors. Although improvements have been made, albeit slowly, the situation tends to be mixed from one country to another, and even from one indicator to another. More generally, the procedures for electronic data transmission are less expensive now than in the past. The use of electronic data transmission enables database managers to pay more attention to verify data.

National statistical authorities are encouraged to use GESMES/CB. The advantage of GESMES coding and transmitting of data is that is already used in other areas, and the aim in the short term is for this method to be used for all transmission of information within the European statistical system. For STS the second half of 2001 was due to be a transition period during which GESMES/CB should become widely used, but other methods of data transmission would still be permitted. It was planned that from January 2002 all information transmitted other than through GESMES/CB would no longer be accepted by Eurostat.

In order to assist persons responsible for providing STS data, Eurostat has prepared a guide to the use of GESMES/CB for the transmission of Short-Term Statistics (STS) data to Eurostat. It contains the list of statistical concepts, the definition of the key family structure, a cross-reference to code lists, some practical guidelines and an outline of an interim text file option.

For technical matters concerning GESMES/CB the contact person is (at the time of writing):

Mr. Ray Conlon
EUROSTAT
Joseph Bech building A3/132
5 rue Alphonse Weicker

L-2721 Luxembourg
Tel.: (352) 4301 32931
Fax: (352) 4301 32139
e-mail: ray.conlon@cec.eu.int

For more information see:
Short-Term Statistics (STS), Data Transmission, GESMES/CB.
Version 2.7. 9 August 2001;
GESMES/CB. The time series data exchange message. User Guide.
Release 2.0. 30 July 2000. This document describes the use of
GESMES/CB subset of GESMES message for time series data
exchange. This guide can be downloaded from the European Central
Bank's site <http://www.ecb.int + Statistics + GESMES/CB>.

13.3 Data transmission timetable

A high-quality statistical information service for STS has to be efficient since there is a need for quick information on changes in the business cycle, which is the very nature of STS. It is important to value the timeliness in connection with other aspects of the quality of data. In producing statistical information there is usually a trade-off between the timeliness with which the information is given and the accuracy and level of detail of the published data.

The permitted delay for data transmission⁴⁴ to Eurostat depends on the indicators. The delays are stated as the maximum delay with which the country can supply data from the end of the reference period. Regarding the labour input indicators in industry and distribution and all the indicators in construction and other services, the STS-R requires "at least" quarterly figures, which means that national statistical authorities are free to transmit monthly or quarterly data. The timetable foresees a later transmission for quarterly data than for monthly data.

In reality the delays in data transmission are continuously shortening, nevertheless, there is still progress to be made.

It should be emphasised that the deadlines are maximum deadlines and, consequently, if the information is available earlier it should be sent immediately. In this way it may be possible to calculate geographical aggregates ahead of the deadline laid down in the STS-R. The STS-R is unclear whether the deadlines given are to be respected each and every month or should be seen as an average to be met over a longer period, such as a year. It is clear that, whichever interpretation is followed, there are some periods in a year when it is harder to respect the deadlines than others, because of slower responses or because of less working days for the national statistical authorities producing the results.

Delay in calendar days	
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Code	Indicator	Delay in calendar days	
		Larger Member States	Smaller Member States
A110	production	1 month 15 days	2 months
A120	turnover	2 months	2 months 15 days
A121	domestic	2 months	2 months 15 days
A122	non-domestic	2 months	2 months 15 days
A130	new orders received	1 month 20 days	2 months 5 days
A131	domestic	1 month 20 days	2 months 5 days
A132	non-domestic	1 month 20 days	2 months 5 days
A210	number of persons employed	3 months	3 months 15 days
A220	hours worked	3 months	3 months 15 days
A230	gross wages and salaries	3 months	3 months 15 days
A310	output prices	1 month 15 days	2 months
A311	domestic market	1 month 5 days	1 month 20 days
A312	non-domestic market	1 month 5 days	1 month 20 days
B110	production	2 months	2 months 15 days
B115	building construction	2 months	2 months 15 days
B116	civil engineering	2 months	2 months 15 days
B130	new orders received	3 months	3 months 15 days
B135	building construction	3 months	3 months 15 days
B136	civil engineering	3 months	3 months 15 days
B210	number of persons employed	3 months	3 months 15 days
B220	hours worked	3 months	3 months 15 days
B230	gross wages and salaries	3 months	3 months 15 days
B320	construction costs	3 months	3 months 15 days
B321	material costs	3 months	3 months 15 days
B322	labour costs	3 months	3 months 15 days
B411	building permits (number of dwellings)	3 months	3 months 15 days
B412	building permits (square metres)	3 months	3 months 15 days

⁴⁴ Despite being called transmission delays, the stage of transmission itself only contributes partly, perhaps even negligibly, to the overall delay, which is in fact dependent on all stages in the production of the statistics.

		Delay in calendar days	
C120	turnover (aggregated level of activity)	2 months	3 months
C120	turnover (detailed level of activity)	3 months	4 months
C210	number of persons employed	3 months	4 months
C330	deflator (aggregated level of activity)	2 months	3 months
C330	deflator (detailed level of activity)	3 months	4 months
D120	turnover	3 months	3 months
D210	number of persons employed	3 months	3 months

Why is timeliness important and do users really care?

The STS-R has been in place for a few years although the transition period for its full implementation is still running. The question has already arisen as to whether the current STS-R and its implementation in operational practice will be adequately geared to users' requirements. Reactions from the media and political makers⁴⁵ would suggest that this is not yet the case. It also emerges from an international user survey⁴⁶ that the demand for short-term data appreciably exceeds the relatively limited supply currently provided by national statistical authorities. Where short-term statistics are found particularly wanting from the users' perspective, however, is on the timeliness front.

The challenge facing EU STS at the time of writing is how to meet the markedly increased demand for up-to-date statistical data on economic developments. On the timeliness front, a number of methods are considered - some of them highly developed, others at the conceptual stage - which could be used for the compilation of national data series (see also sub-chapter 15.4 for information on methods concerning the compilation of EU indices). It is recommended that measures to speed up national STS be phased in over time, starting with those which can be launched without a prohibitively high level of investment and which more or less fit in with normal practice.

⁴⁵ In response to what the monetary authorities consider to be the inadequate implementation of the STS-R, the ECOFIN Council has been pushing hard for its accelerated introduction by Member States and European short-term statistics have been described by Reuters as "too few, too late".

⁴⁶ See findings of the international survey "User needs with respect to short-term statistics on trade and services", Voorburg Group working paper of the Rome seminar, 1998.

Current dissemination practice

In keeping with sound statistical practice, an effort is usually made during the data collection process to ensure that data for units of major importance are included in the results at the earliest possible stage. A parallel can be drawn in the STS whereby the largest countries have shorter deadlines to respect than the smaller ones. However, this distinction between the size of units and the size of countries may not be the most useful one for users. Most national statistical authorities have hitherto rarely differentiated in their dissemination policies between different user objectives, notably aggregate figures are published at the same time and in a similar way to detailed underlying activity figures. During the statistical process to collect and compile the indices the same operations are used.

The bottom line of the "all at once" dissemination policy generally⁴⁷ followed at present is that the dissemination of aggregate activity figures is held up by the less rapid availability statistics at more detailed levels for national data and the aggregate geographical figures are held up by the slowest providers of national data. What measures can be taken to bridge the gap between demand for the more rapid provision of aggregated figures and their current availability, while at the same time paying attention to reliability and credibility? The gap between the current publication of detailed figures and the desired rapid aggregates - as expressed by the ECB - is illustrated in the table below.

⁴⁷ During the preparatory work on the STS conceptual design, a proposal was put forward to the effect that a shorter deadline be set for aggregated data than for breakdown figures. At the time, however, this did not receive sufficient support from Member States, with the exception of the Retail module of the Regulation.

Time lag (year 2000), (calendar days)

	Current time lag	STS-R deadlines	ECB requirement*)	Timeliness gap**)
Industrial production index	55	45	35	20
Industrial output prices	35	35	35	0
Retail turnover	63 *)	60	35	28
Persons employed	90	90	45	45

*) mid-point of an interval (range)

***) gap between current time lag and ECB requirements.

Strikingly, the gap is widest for the value, volume and labour market variables, there being hardly any gap in the case of prices. The gap will be partly narrowed down over the years 2001 to 2003 as the derogations granted to Member States on these points expire. If no further measures are taken, however, the gap between STS deadlines and the requirements of main users will persist over the medium term.

Measures to improve timeliness

In principle, there are two types of measures which can be taken in order to improve timeliness. The first package of measures are of a legislative nature and involve “simply” shortening the official deadlines, possibly combined with an increased frequency, for example from a quarterly to a monthly basis. This package of proposals is not discussed further here, nor is the possibility of setting up data collection and processing directly at the EU level rather than via the individual national statistical authorities. The second package of measures are procedural or methodological in nature and do not rely on a modification to the EU legal basis.

Re-design of the sampling frame with the primary aim of fast reliable aggregates

Generally speaking, the traditional sampling approach is geared towards obtaining reliable detailed stratified data, and according to statistical theory the aggregates produced will then offer at least the same reliability. However, the procedure does not guarantee that reliability for the aggregates will be achieved at an earlier stage than for the underlying details. One way to overcome this is to speed up the collecting and editing process for the strata which are most relevant for the aggregates⁴⁸. Another way to achieve aggregate reliability sooner is to increase sample size for strata which are

⁴⁸ Speeding up the larger firms' strata is not the same thing as speeding up the production of data on larger firms within the strata. The latter process is likely to have some statistical drawbacks (i.e. bias) where the growth trends of larger firms within a stratum differ from those of smaller firms within the same stratum. The former process will also cause biased averages if the calculation across strata is done without a proper weighting system.

relatively more important for the aggregated figures⁴⁹. All in all, the suggested re-designing exercise should aim to place more emphasis on strata (and activities) which have a relatively greater bearing on the business cycle.

Switching the observation time-frame from an end-of-period survey to a mid-period one

This applies to input and output prices where timeliness can be significantly improved by adopting a mid-period approach. This has already been effectively implemented by several national statistical authorities. For variables such as turnover, new orders and production, however, such an approach is inappropriate both from a theoretical and practical point of view.

Redesigning the questionnaires

The style and contents of a questionnaire appear to have a bearing on response rates. The use of terminology or definitions not commonly used in the business environment hinders the speedy return of forms and also reduces the quality of the results.

For more information on questionnaire design see sub-chapter 3.5 of: Handbook on design and implementation of business surveys, Eurostat, edited by Ad Willeboordse.

Earlier sending of questionnaires and tighter official deadlines for responses

This approach is effective only if firms are both willing and able to respond earlier. Therefore, the message has to get across that a timely response is crucial for national and EU figures. This calls for closer co-operation between national statistical authorities and observation units and their representatives. To this end, national statistical authorities could also offer technical assistance, for example in the form of software which facilitates fast and easy retrieval from company accounts.

⁴⁹ In the case of index-type statistics, the sampling procedure might be improved even further by basing allocation on (the variance of) first differences of a variable instead of (the variance of) absolute figures.

For data coming from administrative sources similar efforts can be made to try to improve cooperation.

Reducing the time it takes to return forms by using more efficient means of data transmission

This basically means avoiding the postal transmission of forms. Besides more traditional media such as fax or CATI, the Internet nowadays provides new and fast alternatives, for example the transmission of encrypted electronic questionnaires⁵⁰ by e-mail. These measures for reducing postal delays also apply for the transmission of reminders to non-responding firms. Experience shows that timeliness and efficiency can be enhanced significantly by sending reminders by fax or e-mail (instead of paper), especially where options include automatic retrieval from a database and subsequent transmission in bulk.

Efficient and effective data-entry by the national statistical authorities

Besides data-entry in bulk, scanning paper forms with an Optical Character Reader (OCR) has proved to be highly efficient, especially when organised in a central unit (economies of scale). In addition to the efficiency gain, the quality of the raw input can be improved at the data-entry stage by automatic correction of obvious and simple statistical errors such as scalar errors (the so-called "1000-error").

Re-design of the editing process - top-down editing

Re-design is aimed at automatic detection and classification of outliers. Top priority is attached to those outliers which are most in need of editing for the sake of reliable aggregates. Lower priority goes to those which are mainly significant with respect to more detailed levels of classifications. The approach for detecting high priority cases starts with the identification of more detailed activities that have a significantly above-average bearing on the aggregated mean. The procedure is repeated for each selected sub-aggregate down to the lowest activity level, where the usual procedure for detecting outliers (individual units) comes into play. Following automatic detection, the editing process should of course solve the highest-priority problems first before addressing the lower-priority ones. Lead-time for the compilation of results at aggregated levels can be further reduced if the top-down procedure also incorporates the identification and solving of significant non-response. For monitoring the decreasing change in outcomes and for determining the moment where editing does not contribute significantly anymore, it is important

that, during the editing phase, the system provides feedback on the extent to which the required aggregates change during outlier editing.

Introducing approximations

This can be done by using information that is more quickly available and that is highly correlated with the set of statistics concerned, for example electricity consumption figures, business opinion data on turnover, production, new orders, employment and prices. This may be combined with auto-regressive modelling. In fact, the STS-R expressly foresees the use of these associated variables for a number of indicators, although normally for a limited period of time. This approach might improve timeliness but it should be used with the utmost caution for reasons of quality. In practice, the forecasting capability of associated variables is limited to the trend cycle of the variable estimated. If such approximation were used on a permanent basis, this would not pose any real problems in terms of revisions. However, if it is only employed temporarily as a first nowcast, revisions are bound to occur as soon as "hard" data enter, especially for highly volatile variables such as turnover and production. As well as providing less quantitative accuracy, varying national approximation methods are a further impediment to EU-wide harmonisation.

Re-design of dissemination scheme

There are basically two approaches here, one where aggregated and more detailed figures are disseminated at the same time, and the other where there is a split in the production process between aggregates (released first) and breakdowns (released later). In the first approach the publication lead-time can be reduced by the use of fast electronic dissemination tools for detailed data and even faster press or Internet releases for the aggregates avoiding the time-consuming process of printing and physical distribution. If, however, sufficient reliability at the aggregated level is reached at an earlier stage, earlier dissemination can be considered. This second approach should be clearly communicated to the public, since credibility is at stake and small revisions of the aggregated data are likely to appear in subsequent releases. The earlier dissemination of aggregated data is encouraged by Eurostat. It should however be noted that some national statistical authorities may have coherent dissemination policies that constrain the extent to which dissemination methods can be modified.

Earlier transmission of national aggregates to Eurostat under strict embargo

This measure has already been proposed by Eurostat together with the guarantee that such national data will be used only for the calculation of geographical aggregates, not to be published or otherwise disseminated outside Eurostat's STS unit. This approach also offers the flexibility that is occasionally needed when official

⁵⁰ Electronic questionnaires basically appear in two different forms: either as a flat document or as some sort of data-entry machine possibly combined with some simple error detection functions.

deadlines cannot be met due to unforeseen national circumstances. It ensures that EU deadlines set well in advance can be respected even if the compilation and transmission of unrestricted regular national data are affected by temporary interruptions.

Assigning more personnel more efficiently.

The production cycle for short-term statistics often contains several peaks and troughs. Given the limited resources available, operational practice is subject to the risk of delay due to a sudden drop in the number of available statisticians (illness or holidays, or general understaffing) during periods when they are needed most. In this respect, staff assignment definitely affects timeliness, although this effect is difficult to quantify. Balancing out peaks and troughs usually involves some sort of economies of scale, where the tasks assigned to each statistician encompass several areas of statistics spread out over time. Even though economies of scale can be achieved in any type of organisation (product versus process orientated, hierarchical versus matrix approach), an actual yield is delivered only if the production cycles of the sets of statistics involved have different peak and trough patterns. In order to facilitate this to some extent the time pattern of release dates for STS can be adjusted.

Assessment and conclusion

In the short term, the end of derogations in connection with the implementation of the STS-R will mean that EU statistics should keep the promise of meeting statutory deadlines. It is already clear however, that this will not go far enough towards meeting users' requirements for up-to-date information. As an alternative to legislation, several options are available to provide the further impetus needed to improve timeliness. Not all the above-mentioned alternatives are of equal standing in terms of their theoretical and practical feasibility. A quick assessment by the ECB and a selection of national statistical authorities highlighted the fact that three groups of measures⁵¹ can be singled out.

1. High-feasibility measures: re-design of dissemination scheme; reducing the time it takes to return forms; efficient and effective data-entry⁵².
2. Lower-feasibility measures: earlier transmission of questionnaires; introducing approximations at the national level; earlier transmission of national aggregates.

⁵¹ The "switching the observation time-frame" measure is not taken into account here as it relates almost exclusively to prices.

⁵² While the measure designed to achieve efficient and effective data-entry was not included in the assessment, it is also regarded as highly feasible, as it is of a similar nature to measures for "reducing the time it takes to get forms to NSIs"

3. Scarcely feasible measures: re-design of the sampling frame; redesign of the editing process; assigning more personnel more efficiently; narrowing down differences in release dates across countries.

The package of measures regarded as being the most feasible approach to actually speeding up short-term statistics calls for an appropriate effort on the part of all involved. This involves above all the use of more rapid methods for data collection and dissemination.

The lower feasibility measures pose policy-related questions, for example as to whether the straightforward earlier transmission of data and use of approximations can take place in such a way as to pose no risk to the credibility of the statistics and of the statistical authorities. The first steps have been taken with the aim of obtaining more definite findings; in 2000 a pilot project was launched with the aim of substantially reducing the production-index lead-time through the earlier supply of data under embargo and/or with the aid of national approximations or just by speeding up the regular statistical process.

At the lowest end of the feasibility scale are major business-process redesigns which go to the very heart of statistical processing and the associated organisational set-up. In the short term these are not regarded as particularly promising, also on account of the uncertainties and major investment associated with them.

Attention should be paid to the fact that many of the changes that could be introduced would lead to a break in series.

13.4 Data revisions

The date on which the statistician decides to make data public is always a compromise between two major factors: the quality of the data against their operational use. Too early, and the data are probably available with low coverage, which makes them likely to be heavily revised. Too late, and the series lose their interest regarding the economic use which can be made of them. It is the statistician's responsibility not to make data public if they could be subject to substantial revision.

What causes revisions

The question of revisions is not considered anywhere in the STS-R. The STS-R neither foresees nor excludes the possibility to revise data. Consequently it says nothing about how and when revisions should be made. This issue has already been touched on briefly concerning changes in the base year and the weights used (see sub-chapter 8.5) but these are not the only reasons for revisions. The management of other revisions differs considerably from one country to another. From the point of view of the production cycle, in other words taking account of late responses, certain countries

consider the data to be final early on (after 2 or 3 months) while others revise them several years afterwards. The treatment of exceptional revisions, not linked to the sub-annual production cycle, also differ considerably from one country to another. Strictly speaking there are no definitive series in the sense that a series may be revised at any time and for any period.

Transmitting revisions

Whilst the majority of national statistical authorities systematically revise indicators, not all are so systematic in their dissemination of the revisions. The STS-R has no provisions concerning the transmission of revised data to Eurostat and from one transmission to the next countries may vary the length and detail of the series that they transmit. Thus, for the same index a country can send one day the data for the latest month and the next day a long series. Some provide several transmissions to Eurostat, possibly with a higher frequency than the index itself - for example a first transmission respecting the required deadlines followed by a revision after 10 days, rather than waiting until the first transmission of the data for the next period before sending the revised data. This diversity in approaches poses a problem of consistency for the resulting series in Eurostat's database, insofar as it corresponds to a succession of batches, thus complicating any verification. The irregularity also increases the risk of a mistake in transmission going unnoticed.

14. Compiling EU indices

14.1 Data reception

Transparency in data transmission reduces the need for data control, however mistakes and misunderstandings occur. It is quite rare for a control to highlight the existence of problems with certainty and for the most part, data control will only make it possible to identify that there is a potential problem, for example the unannounced presence of substantial revisions, change in the length of the series or very high growth rates. It is then important for Eurostat to check with the national statistical authorities whether or not there is an explanation. The information feedback from users also makes it possible to improve controls. However, problems should be dealt with from the bottom up so as to ensure that such situations remain the exception. The European Central Bank plays a crucial role in monitoring data since it is a regular user and receives a complete extraction of non-confidential data from the production database every day.

14.2 Compiling EU indices and decomposition

The EU indices (EU-15 or euro-zone) are calculated from national indices, taking into account the relative share of each Member State in the appropriate

geographical aggregate, for the gross and working day adjusted forms. This is done at each and every level of the activity classification level. Only after calculation at all levels of classifications are the EU indices analysed to produce seasonally adjusted and trend series.

Alternatives, that are not used, would be:

- to make the geographical aggregation at the lowest level of the activity classification and then aggregate the results for the geographical aggregate up through the activity classification;
- to geographically aggregate the national data for each of the different forms independently.

However, the data received from each country may need a certain amount of pre-treatment before the EU indices can be calculated. Three necessary stages can be identified as well as one extra stage that is not directly needed for the calculation of EU indices. Firstly data in absolute figures need to be compiled as indices. Secondly base years need to be harmonised. Thirdly missing activity aggregates need to be calculated. Finally any of the required forms (for example seasonally adjusted) that are missing are produced, although these are not used for compiling geographical aggregates. The aim of this pre-treatment is that all the indicators will be available for the most complete possible list of activities for as many countries as possible. Only then can the geographical aggregation procedures be carried out.

14.2.1 Calculating national gross indices and harmonising base years

Before the EU indices can be made data that has been transmitted by national statistical authorities have to be harmonised in order to ensure that they are all represented as an index with the same base period. The calculation of indices from absolute figures is a regular occurrence but rebasing tends to be concentrated around the change to a new base period as individual countries change at different times.

14.2.2 Weights for EU indices

Eurostat's weights

The weighting system used by Eurostat plays a double role, to carry out geographical aggregation and, when national statistical authorities choose not to provide higher levels of activity classifications, to make activity aggregation as well.

Revision of weights

The weights used by Eurostat tend to be revised at the same time as Member States adapt their own system of activity weights and hence the weights for the 1995 base year were first calculated from somewhat incomplete

information at the beginning of 1999. A steadily improving, although incomplete implementation of the SBS-R has made more and more information available since then and the weights, still for the 1995 base year, have been re-estimated during 2001. National statistical authorities have been implicated in the development of the revised system of 1995 weights - either they have directly provided the figures or they have verified them. Despite this collaborative effort, the weights used by Member States often differ for reasons which are sometimes difficult to identify. There is an urgent need for the same weighting system to be used, otherwise there are risks of inconsistencies between the national series published by the national statistical authorities and those published by Eurostat.

Apart from generally improving the accuracy of the aggregation procedures carried out by Eurostat, this revision has increased the number of activities for which EU indices can be compiled for some indicators. For example the index of new orders was previously only available for the manufacturing total but the majority of the activities required at lower levels of aggregation are now also available.

Confidentiality of weights

The weights are sometimes confidential. This can be due to the fact that the weights are in general based on SBS data which itself may be confidential. Furthermore, by not publishing the weights an extra safeguard is introduced to avoid accidental disclosure in aggregates.

Activity aggregation

It should be noted that, following the principle of subsidiarity, Eurostat only makes activity aggregations of national data where the national statistical authorities have not provided them. This is equally true for the standard levels of NACE as for the MIGS. Such an approach underlines the importance of the harmonisation of national methods and concepts. If done by Eurostat, the activity aggregation of national indices follows in principal the same procedures as explained in sub-chapter 8.5. The approach adopted by Eurostat does not require a full set of lower level indices to be available in order to produce a higher level aggregate, as it permits a degree of estimation. The approach is based around so called "Branch lists" that are specific to each country and each indicator and list the activities for which data are transmitted and their weights. These make it possible to try to construct, in an entirely dynamic way, any activities (other than the lowest level) of the NACE classification or any headings of the MIGS which have not been provided by a particular country. These missing activities or MIGS will be compiled if the component activities at the lower classification levels that are available account for at least 80% of the weight. Note that these activity aggregations are carried out only for gross or working day adjusted data, never seasonally adjusted series or trends.

The missing data is estimated in the following way: for each period, for each indicator/country pair, the most recent date for which transmitted data is available is identified for each activity. Then for this indicator/country pair, estimates based on the use of ARIMA models are used in order to ensure that numerical values are available for each classification level up to this date. If the weighting exceeds 80% for non-estimated information, the branch list makes it possible to aggregate the data by using the estimated values when necessary.

Branch lists have a number of advantages which make them an important tool for the system used by Eurostat. They are entirely dynamic, in the sense that the resulting series develop alongside the source series. Moreover, they are less rigid than simple formulas, for which, in particular, "permanent" weights must be defined in formulas. In contrast, when weights change the series resulting from branch lists are affected directly. Finally, they display great flexibility of use insofar as they correspond to definitions that can be dealt with according to a well-defined set of priorities. Thus, if an aggregate should be constructed using the 4-digit level, but for which it is possible to have a correct estimate using the 3-digit or even 2-digit levels, one could have three branch lists to try to construct it. The system will seek to construct the aggregate using the best definition (4-digits), but if the 80% is not achieved, it will then turn to the next best alternative using the alternative lists.

Geographical aggregation

Each index requires its own specific weights based on an appropriate indicator. The same weights are used for geographical aggregation as for activity aggregation - the list of variables used for each indicator is shown in sub-chapter 8.5. In most cases the information needed for the weights for geographical aggregation are taken from the SBS database. As for the activity aggregation, the sum of the weights (when expressed as shares) for the geographical aggregation must be equal to 100%, in other words the sum for the euro-zone must be 100% and the sum for EU-15 must be 100%. The formula for geographical aggregation is the same as for activity aggregation, simply substituting the appropriate country list for the activity list.

The procedure for compiling the geographical aggregation starts with the gross and working day adjusted series. The EU series start from the reference period for which the country with the shortest time series begins (see point 14.2.3 below). The geographical aggregation is only performed when data is available for sufficient countries that their combined weight is 60% or more of the total weight for the geographical aggregate concerned. If, for a given reference period, the 60% threshold is reached but there is no data for some countries that are normally included in the aggregate and therefore contribute to the determination of the shortest

time series, their data is estimated using ARIMA models. Note that this is only done when a series stops not when data for a country was not available at the beginning of the series. This geographical aggregation procedure is normally performed daily.

14.2.3 Decomposition

On the basis of the gross or working day adjusted EU series, procedures compile the seasonally adjusted series and trends. These series are calculated each time the geographical aggregation procedure is performed. It should be noted that the seasonally adjusted series are calculated independently for each activity from the unadjusted EU series (direct method) not by aggregating the seasonally adjusted series of the countries. The latter are therefore not used for the calculation of EU indices aggregates. See sub-chapter 8.6 concerning decomposition.

14.2.4 Length of time series

As noted above the length of the series for EU indices corresponds to the shortest length among all the countries that contribute to the composition of those indices. During the transition period foreseen for the STS-R, national statistical authorities that did not provide some indicators will start to do so and each time data for one new Member State is added to the geographical aggregation process this will cut the time series again. In the medium and long term this problem may be repeated if and when candidate countries join the EU.

Some national statistical authorities have long series but are not aware of Eurostat's need for these series and they are encouraged to provide these.

When a long series does not exist for a particular indicator, the solution which appears the most natural is to project the short series backward. However, such a backward projection requires having one or more indicators with long series which, over the common period, are good proxies of the series that is to be project backwards. Having a good proxy is a necessary yet insufficient condition as it is also necessary to have a sufficiently long common period in order to be able to establish a stable relationship between the indicator to be projected and the proxy, a relationship whose validity will be assumed over the period when only the proxy series is available. It is not recommended to backward project based exclusively on the characteristics particular to the series itself (by ARIMA modelling for example).

At the time of writing it appears unlikely that these backward-projected series can be acquired in a systematic way for all the series responsible for a detrimental shortening of the EU aggregates. In this case, when the possibility of backward projecting have been exhausted, successive aggregation can be carried out. This involves a

geographical aggregation whose profile in terms of component countries changes with time. For example, for an indicator whose time series begins in January 1990 for 14 Member States and in January 1998 for the remaining country, the EU aggregate is compiled using the available data for 14 Member States up to 1998 and then with the 15 Member States from January 1998. It is clear that when an EU aggregate of this kind is built there is a break in the series insofar as it does not correspond to the same macroeconomic reality throughout its time period. Using a time series comprising breaks in the series poses considerable statistical problems but it may be preferable to accept this than to compile aggregates only for very short periods.

Eurostat is developing procedures to automate the production of series with such breaks and clearly it is essential that users are also provided with information on the methodology used as well as the date and the reason for a possible break in the series. The value of series for the EU compiled in this way are the same, for common periods, as the value for series that are compiled using only a stable list of component Member States. In addition to these common values, the best information available is also compiled over periods when the list is not stable. Looking at this procedure in another way the assumption is that series for Member States that are absent for part of the period concerned are assumed, during the periods for which they are missing, to have evolved in the same way as the weighted average of the series for the Member States that are available during the same periods. As a basic rule, EU aggregates are created only when the weights of the Member States for which series are available exceed 60% of the total weight.

The two solutions presented here, backward projecting and successive aggregation, are used or planned at the time of writing and are likely to become increasingly necessary because of the enlargement process.

15. Dissemination of results by Eurostat

15.1 Identification of confidential data for geographical aggregates

Eurostat guarantees Member States that their data will be treated with the same confidentiality as applied by the national statistical authorities. The confidential data that the national statistical authorities provide to Eurostat are used in the calculations of activity and geographical aggregates. The data are not publicly disseminated, nor transmitted to the ECB without the national statistical authority's permission. Confidential data are only disseminated when combined with other data in a form that ensures that the confidential data can not be identified directly or indirectly.

15.2 Choice of data for compilation: indices and growth rates

The dissemination of absolute figures for STS is common in several Member States and are of high interest for users. However, the STS data for the EU are generally published as indices or growth rates, rarely as absolute figures; for some indicators, such as car registrations or construction permits the dissemination of absolute values can be of particular interest. Cyclical statistics are often seen in the form of growth rates. They constitute a natural instrument for analysis, which makes it possible to draw conclusions about the development over time of economic events. As far as monthly data in particular are concerned, there are various types of growth rates from which a selection can be made.

Various aspects must be considered. The form of the data: gross data, working day adjusted, seasonally adjusted or trend-cycle data? Is it necessary to stick to a growth rate based on a given month or must the data be smoothed (for example, by using a moving growth rate of the latest three months over the three months before). Which time horizon should be referred to: should comparisons be made in relation to the previous month ($t/t-1$), in relation to the previous quarter ($t/t-4$) or in relation to the same month of the previous year ($t/t-12$)? Although there may be no absolute "correct" answer, in the interest of consistency for users, priority can be given to certain representations of the data.

It should first be noted that form of data and the time horizon are very closely linked to each other. If a growth rate of a month in relation to the same month of the previous year is to be calculated, it seems inappropriate to use seasonally adjusted or trend-cycle series, insofar as the purpose of a seasonal adjustment is only to make it possible to compare different months of the same year.

As far as comparison with the previous month are concerned, seasonally adjusted and trend-cycle data are the appropriate forms to be used, since gross data and

working day adjusted data are still marked by seasonal phenomena such that comparison from one month to another would be meaningless. But which of the two should be preferred? The difference between these two forms of data is that the seasonally adjusted series are still affected by irregular components, whereas, in the case of the trend-cycle data, specific fluctuations have been eliminated. There are valid arguments for both forms. In favour of the trend-cycle is the fact that the rates based on seasonally adjusted data show fairly considerable jumps from one month to another, which are sometimes difficult to interpret since disturbed by the irregular components. Growth rates based on the trend-cycle convey a clearer economic message. Conversely, although the growth rates based on seasonally adjusted indexes are less readable, they are much more reactive. This constitutes a very strong argument insofar as the identification of reversal points is one of the priorities of short-term statistics. Certainly, these indices are somewhat disturbed by irregular elements, but this irregular component can correspond to genuine macroeconomic reality. It is easier to reconstitute the trend-cycle series (at least roughly) from the seasonally adjusted series than the reverse. Trend-cycle representation is a help for studying long-term developments. It does not help a lot for analysis of the last 2-3 periods.

Eurostat has recently modified its dissemination policy for STS to give priority to seasonally adjusted series, in particular for the dissemination of growth rates in the form of tables of figures. Trend-cycle indices are useful for graphical representation of series that fluctuate greatly. The combination of these two types of growth rates ($t/t-1$ seasonally adjusted, $t/t-12$ in gross or working day adjusted data) gives a particularly interesting insight as regards short-term statistics. The first makes it possible to have the most recent development, the second makes it possible to place it within an annual framework in addition to having a somewhat structural development. As such the reactivity of the indicators is given preference to the clarity of the economic message. The emergence of increasingly well informed users (the ECB being among the foremost of these) has contributed to such changes. This must be taken into account in the analysis and use which is made of these growth rates. For example, a seasonally adjusted $t/t-1$ rate must be placed in the context of the previous months, and therefore of the immediately previous rates, as well as in relation to the annual situation.

The harmonisation of Member States' presentation of indices and growth rates would help users to interpret the data and would assist checking that the figures disseminated by Eurostat are coherent with the national ones. At the time of writing this is often not possible.

15.3 Choice of dissemination format/media

A key to the usefulness of statistics is of course the availability of the statistics and hence an extensive

dissemination of data. European business statistics are disseminated both on-line, on CD-ROMs and in paper publications. Most publications are available in English, French and German. The main STS publications are described here.

Monthly Panorama of European Business (MPEB)

As its title indicates, this is a monthly publication that provides an activity-focused analysis using European business statistics. This is the main off-line dissemination tool for detailed STS and for their analysis. It focuses on a standard set of information for all industrial and service activities within the European Union. The Monthly Panorama is a very widespread reference document. The publication includes:

- developments in the Triad;
- monthly statistics on the evolution of the business cycle in mining, manufacturing and energy;
- a commentary and statistics concerning construction;
- comments tables and graphs on retail trade, new car registrations and tourism;
- an in-depth study of (a rotating list of) two economic activities (industrial or services) within the European Union;
- methodological notes.

The MPEB started in January 1994 as the Short-term supplement to the annual Panorama of EC industry. This 60-page bimonthly publication concentrated on manufacturing. In 1997 the publication was renamed the Monthly Panorama of EU Industry - the MPEI. It was given a fresh cover and layout, an accompanying data diskette of business statistics, and was released on a monthly basis. In November 1998 the publication passed 100 pages, the coverage including service sectors for the first time and in January 1999 the publication's name changed to the Monthly Panorama of European Business. The diskette was replaced with a CD-ROM and the length of time-series distributed increased significantly.

During the year 2000 the MPEB was further transformed to achieve a close alignment with the STS-R. More economic activities have been included with longer time series and also the presentation of the growth rate was changed in line with standardised practices.

Statistics in Focus

The purpose of the Statistics in Focus (SiF) is to provide the user with high quality up-to-date information by showing the latest developments in the EU statistics. This collection is published regularly by Eurostat and

provides summaries of the main results of statistical surveys, studies and analyses. It covers all themes and consists of four or eight pages per issue. The range of SiFs available on short-term statistics has changed recently. Every quarter five different SiFs are published, each focusing on a particular group of indicators or range of activities. They contain a standardised set of tables and/or graphs and a very limited analysis highlighting the main points.

News releases

News releases are issued at 12 noon CET on the web and they are free of charge. These publications release each month the new EU aggregates for the main industrial groupings, together with selected data from the Member States. The news releases are currently made for output prices, retail trade and the production index. There are plans to review the list of news releases. There is scope for a coordination of news releases by national statistical authorities and Eurostat in format as well as in timing.

NewCronos

The disadvantage of paper publications is that the freshness of data is never optimal, for example, a Statistics in Focus is released more than two weeks after the reference period. The solution to this problem is on-line publications, and for Eurostat this is done using the NewCronos reference database. Tailor-made extractions can be made from NewCronos by Eurostat's network of datashops. Access is partly restricted, subject to payment.

The home of the short-term statistics on NewCronos is the European Business Trends (EBT) domain of theme 4. The domain is updated daily and has the most extensive supply of information. In principle, all short-term statistics that are not confidential are published in theme4/EBT. The domain is divided into three subgroups; industry, construction, and trade and other services. For some users EBT offers too much choice and Eurostat has developed a number of specialist domains on NewCronos combining many different types of short-term data in order to meet particular targeted users. The multi-source datasets can be found in theme 1, which is the theme for general statistics.

- Theme1/euro the availability of STS data is basically limited to the main industrial groupings and the European aggregates.
- Theme1/e-sics is, at the time of writing, also a rather limited domain, restricted to certain users. There are plans to open it up to more users and for it to be also more focused on the main industrial groupings.

15.4 Timetable for compilation and dissemination

Eurostat's two principal operations to update the database - entering national data and aggregating/decomposing data - take place at different intervals. Entering data into the database is a simple

operation, carried out several times per day with the target that data transmitted by national statistical authorities is entered into the database within 24 hours of arrival. Aggregating and decomposing the data is a more complex operation and is carried out globally once per day. As a result, there is sometimes a short discrepancy between the national series entered into the database and the EU series whose calculation is based on an older version of the national series. The period of transmission between the production database and the various reference databases needs to be reduced further, so that users always have access to the most recent data possible, and again the aim is that this is done on a daily basis.

Reducing delays

A number of methods are considered - some of them highly developed, others at the conceptual stage - which could be used at the EU level (see also sub-chapter 13.3 for information on methods at the national level).

The following table illustrates the origin of the concerns raised by some users of EU indices.

Time lag (days) for output prices and production indices (year 2000)

	EU	USA	Japan
Production index	55	15	< 30
Output prices	35	15	8 - 10

All other things being equal, early data dissemination generally means reduced reliability. For the user, on the other hand, it is also a question of credibility. The main criterion for regarding data as credible is that they should be produced in an indisputably sound manner, with any subsequent revisions being so minimal that affected users need make little or no adjustment to their economic assessments or decisions.

As already noted, users on the monetary and economic policy side have pointed to the urgent need for up-to-date meso- and macro-economic statistics, in particular overall figures for industry, possibly broken down over a limited number of aggregates, as well as for construction, retailing and other services. At the other end of the user spectrum are the business representatives, who naturally call for more detailed data on their own specific activities and those of their members.

As regards dissemination policy, Eurostat (like most national statistical authorities) have hitherto scarcely differentiated between the various user objectives although recently a significant effort has been made to release aggregate figures in advance of detailed activity figures. During the compilation process for EU indices data are collected, aggregated and analysed in the same

production operations. In sub-chapter 13.3 the gap between demand for the more rapid provision of aggregated figures and their actual availability was presented and a number of measures applicable for national statistical authorities were discussed. Eurostat can also play a role in trying to reduce the time taken to release EU indices.

Estimating missing national data solely for the purpose of calculating EU totals

It is already standard Eurostat practice to estimate missing values by ARIMA modelling. However, this approach is tenable only where occasional figures are all that is missing and sufficient hard data are available from non-missing countries. Revisions should be limited, and Eurostat's hard-data threshold is well above 60%. If, on the other hand, missing values of a particular country are more persistent, for example if values are not forthcoming over a prolonged period of time or are not available at all, ARIMA methods become most doubtful given the fluctuations of the business cycle. The more or less "straight-line" approach of ARIMA cannot keep track of this and tends to deviate from reality exponentially as time goes on. The problem here is more crucial than the relatively small revision problems in the case of some occasionally missing values. In fact, it significantly biases the European figures. The use of additional correlating variables might improve this situation. If pursued at an EU level, this might also guarantee some degree of methodological harmonisation. From a practical point of view, however, it puts a major burden on Eurostat because it means a substantial increase in the volume of data that has to be additionally collected outside the STS framework. It is therefore suggested that the national STS data already available at Eurostat should also be taken into consideration, as they are likely to be influenced by the same national business cycle as the missing variables. Given the general perception that short-term economic movements interrelate more and more⁵³ across Member States, approximations for one country could also be modelled⁵⁴ using existing STS for other countries and for the EU as a whole.

Narrowing down differences in release dates across countries

This measure improves the mass in terms of coverage of countries and therefore improves the quality of initial

⁵³ Comprehensive empirical evidence of significant correlation between EU Member States in terms of output, employment and prices is given by Wyne and Koo's *Business Cycles under Monetary Union: A Comparison of the EU and US*, published in *Economica* (2000) 67, 347-374.

⁵⁴ Besides the nowcasting of missing national data, the same model-based approach can be employed for backcasting purposes. The accuracy of backcast estimates might even be better than the forecasted ones since hard additional information from the annual structural business statistics - if incorporated in the model - constrains the outcomes to yearly "reality".

results. For reasons of timeliness, the point of convergence taken should be that of the fastest (larger) countries. Albeit purely imaginary, taking the fastest country from the sub-group of Germany, France, Italy and the United Kingdom would, at this moment, result in the following deadlines and timeliness “gaps”.

Time lags (days)

	Based on fastest larger country	Timeliness gap*)
Industrial production index	36 (D)	1
Output prices	27 (D)	-8
Retail turnover	14 (UK)	-21
Persons employed	46 (D)	1

*) gap between time lag of the fastest larger country and ECB requirements

However, care should be taken to ensure that the points of convergence across the various sets of short-term statistics are not crowded together in a tight timeframe, as this could well pose problems to manage the operational cycle and detract from national efficiency.

Eurostat can act as a catalyst, stimulating and facilitating countries' effective implementation of measures at the national level. This can be done for example, by providing harmonised techniques and methodologies, as well as expertise, and by setting up working groups and seminars with a view to spreading national best practices with respect to measures for improving timeliness.

Besides the measures set out above, Eurostat has a pronounced facilitating capability in general, and further impetus for improving the timeliness of European statistics can be provided by way of targeted financial and technical support. Eurostat has also been working with all Member States to develop a European sample for retail trade whereby each Member States is effectively one strata in a common sample and it is hoped that such an approach will make it possible to disseminate results for the EU within 30 days from the end of a reference period.

15.5 Revisions of EU indices

Apart from revisions brought about by seasonal adjustment (see sub-chapter 14.2), the revisions of EU indices come directly from revisions in national series. The fact that there are 15 countries with different revision policies means that it is extremely common for EU indices to be revised. Work needs to be done to try to reduce the confusion caused by the (currently) excessively dynamic nature of the aggregates. To achieve this, a consistent revision policy needs to be established.

A distinction can be made between revisions due to errors and those due to the incorporation of new information. The general idea is that it is preferable to integrate new information on a regular, but not continuous basis in order to make the series more stable. In this area, as in many others, Eurostat cannot impose a solution but must seek one which is acceptable to all and which makes it possible to improve the credibility of the EU indices.

15.6 Quality and national practices

15.6.1 Quality

Quality issues have become more and more important over recent years. In order to focus on the quality of short-term statistics, this point is mainly based on the results of the European Leadership Group on Quality, on the guidelines of the International Monetary Fund (IMF) and on the STS-R itself.

The Leadership Group on Quality

In 1999, the SPC installed a leadership group on quality. In its first final report, the Group mentions a number of quality issues that are relevant for STS. It observes that accuracy, the traditional statistical quality measure, is no longer enough. Nowadays, a broader concept of quality is used. No exact definition of quality is given, since there is no full academic agreement on the subject. In any case, quality is seen as a relative concept: the quality aspects of a product or process have to be compared to a set of standards, specifications, user needs and so on. Quality is also a subjective concept: every user may have his or her own standards. Against this background, the ISO defines quality as "the totality of features and characteristics of a product or service that bear on its ability to satisfy a given need". Another often quoted quality definition elaborates on that: "fit for purpose". Things have to be optimal rather than perfect, especially since some desirable attributes are mutually exclusive (for instance detailed breakdowns and timeliness).

Dealing with quality of STS requires a process of monitoring the statistical outcomes, in order to evaluate whether the results meet the organisations goals and the user needs. The statistical production processes should also provide the necessary information for such an evaluation. If the required level of quality is not reached, the statistical processes have to be improved.

The leadership group on quality distinguishes seven dimensions to measure the quality of statistics:

1. the relevance of the statistical concept;
2. the accuracy of the estimates;
3. timeliness and punctuality in dissemination;
4. accessibility and clarity of the information;
5. comparability across space and time;
6. coherence with other statistics;
7. completeness.

To this list, an additional dimension may be added because of the requirements of the STS-R itself:

8. costs.

These eight dimensions are discussed in more detail below.

The leadership group mentions various ways to improve the quality of the statistical processes. One is the adoption of total quality management, in which the entire organisation and management is systematically focussed on improving quality. Another way is the establishment and implementation of current best methods, based on for instance statistical theory and comparisons with other statistical institutes. Still another possibility is business process redesign, in which case a part of the statistical process is re-engineered in order to improve quality.

The IMF's standards

The International Monetary Fund (IMF) has designed two quality standards for statistics. One is the General Data Dissemination Standard (GDSD). The other, more elaborated one is the Special Data Dissemination Standard (SDDS). The emphasis of these standards is on integrity, accessibility and transparency. The SDDS for instance requires that important data are released to all interested parties at the same time, according to previously published release calendars. Advance releases, if any, for instance to government bodies, should be notified to other users.

The STS-R

The STS-R itself explicitly mentions a number of quality aspects.

Article 10 states first of all that Member States are responsible for the representativeness of their data. Secondly, the quality of the data will be measured, according to common criteria. Thirdly, quality should be tested regularly by comparing data with other statistical information and by internal consistency checks. Finally, the quality will be evaluated by comparing benefits with "the costs of collection and the burden on businesses".

Article 14 requires amongst other things, that a report is submitted by the Commission to the European Parliament and the Council "on the statistics compiled pursuant to this Regulation and in particular on their relevance and quality and the burden on business" - see point 15.6.4.

Finally, Article 17 states that measures shall be determined for the implementation of the STS-R, with item (g) being "the criteria for the measurement of quality". At the time of writing no actual proposals in the area of quality have been presented.

Measurability of quality

In order to evaluate quality, information is needed for the statistics on the various quality dimensions. In practice, most of the dimensions have to be measured in a more or less qualitative way. For instance relevance, accessibility, comparability and coherence can not be described in an objective, quantitative way. Only aspects like accuracy and delay can be measured in a purely quantitative way. But even then, the interpretation of the data (good or poor quality) requires the opinion of users. See point 15.6.2 below for an example of the way some of these dimensions can be assessed.

One of the problems experienced in practice is that the various quality dimensions are not always consistent with each other. Like for many business statistics, for short-term statistics there is a clear tension between timeliness on the one hand and accuracy, the level of detail and the number of revisions on the other. In the end, it is the users that decide what the balance between the various dimensions should be.

Product quality -8 dimensions

The relevance of the statistical concept

Relevance plays a role for the STS as a whole (the program) and not so much for specific STS-R variables. The question of relevance is part of the Commission's three-yearly report. To assure relevance three primary processes need to be in place: monitoring user needs, program review and priority determination.

The relevance of a statistical concept is highly dependent on contacts with main user communities, both for their current information needs as well as to anticipate new and future needs. These information needs are rarely formulated in strictly statistical terms.

Additional to the monitoring of user needs, a program review is required regularly to assess whether it still satisfies user needs. This may cover the topics addressed as well as the accuracy and timeliness of the information being produced. With such a program review the continued existence of the current program is questioned periodically, which helps identifying investment options.

After determining the information from users and program reviews, priorities have to be established due to limited funds. Measures of performance in the domain of relevance can be collected by getting evidence that the processes mentioned above are fit to achieve the goals, and by collecting measures of user satisfaction and usage.

The accuracy of the estimates

Historically, the quality of statistics was the equivalent of accuracy, where accuracy was defined as the mean squared error of the estimator. Nowadays accuracy is

used as just one aspect of quality. Accuracy can be measured using several indicators:

- random sampling errors
- non random sampling errors
- statistical frame errors
- measuring errors
- process errors
- non-response errors
- model errors

Measuring is not always possible due to financial and methodological constraints. Beyond that, measuring accuracy is not equally relevant for all statistics.

During the design phase, accuracy targets are usually not specified. Only the key quantities are estimated together with the level of detail, but the definition of accuracy is often vague. However, the objective of survey design is to find an optimal balance between various dimensions of accuracy and timeliness within constraints imposed by budgets and respondent burden considerations. Two examples of such dimensions are: explicit consideration of alternative sources of data (including the availability of existing data or administrative records) and adequate measures in place for encouraging response, following up non-response and dealing with missing data.

Timeliness and punctuality in dissemination

An increasingly important aspect of quality is timeliness and punctuality in dissemination. Timeliness refers to the time between the end of the reference period and the moment of dissemination, and varies per statistic. The sooner after the end of the reference period dissemination takes place, the greater the value for the users.

Dissemination should also take place according to release calendars, so all the users know exactly in advance which statistics will be released on which date. The release according to advance calendars is an important issue of the SDDS. Countries committed to the SDDS should provide certain information to the IMF about its practices in disseminating economic and financial data.

Accessibility and clarity of the information

All users must be treated equally in having access to (new) information. There are four points in this:

- the need for a catalogue system to allow users to find what information is available, and where to find it;
- the provision of access to the information in a format suitable for the users;
- the coverage of statistical information in corporate catalogue systems;

- obtaining and acting upon user satisfaction measures for the catalogue and delivery systems.

The SDDS therefore requires advance dissemination of release calendars and simultaneous release to all interested parties.

Users should also be able to understand the information correctly. The statistical authority is responsible for providing the necessary meta information for users to understand the data, in particular by providing:

- concepts and classifications that underlie the data;
- the methodology used to collect and compile the data;
- measures of accuracy of the data.

This provides the user with information about what was measured, how it was measured and how well it was measured. In addition the statistical authorities should comment their releases with the main conclusions that can be drawn. The SDDS requires dissemination of documentation on statistical methodology and dissemination of component detail, reconciliation with related data, and frameworks that facilitate cross-checks and checks of reasonableness.

Comparability across space and time

The statistical results become more valuable when reliable comparisons can be made, for example with earlier results or with other geographical areas. This is possible when the underlying data process used is identical, in other words where identical concepts and classifications, identical data collection and compiling methods, and identical measures of accuracy are developed and used. When the same data process is used in different countries, statistical results from several countries can be compared.

The possibility to aggregate results to European totals is fundamental for the statistics foreseen by the STS-R.

Coherence with other statistics

When originating from a single source, statistics are coherent, in that elementary concepts can be combined in more complex ways for example between preliminary and definitive results. Statistics originating from different sources or even different periodicity, are coherent if they are based on common definitions, classifications and methodological standards for example quarterly and annual Accounts.

For short-term statistics, coherence is especially important:

- between preliminary and definitive results;
- with annual statistics (national accounts, SBS);
- with production statistics (Prodcom);

- with quarterly national accounts;
- between domestic and non-domestic output prices.

Completeness

It is of great value that the requirements of users are completely covered. This includes the needs and priorities expressed by users as a group. This will avoid that users make false assumptions on the given information, or that they themselves investigate to get answers, and thereby use incorrect data or methods.

Costs

The costs item is strongly related to the various dimensions of accuracy, and with priorities. High accuracy will demand greater financial sources, but with a lot of projects this will exceed the allotted budget, and priorities have to be set. Each statistical authority must be able to demonstrate wise and careful management of existing funds. For respondents the main burden is time to fill in the various surveys that are submitted to them. Several initiatives can be taken to check if the information requested is already known as a result of another survey or an alternative source.

Process quality

If product quality is not sufficient in one or more respects, process quality can be enhanced to improve product quality. Two important quality dimensions, accuracy and timeliness, will be used to assess processes, in order to focus on possible improvements. Some examples will be given, and where possible references will be made to other chapters in the manual.

Measures to improve quality

The product can not be separated from the process. Therefore with improvements in the process the product quality may improve as well. A number of specific ideas are dealt with in various parts of this manual, in particular the following:

- editing, sub-chapter 8.1;
- improving response rates and timeliness, sub-chapters 13.3 and 15.4.

For more information see:
Doc. Eurostat/A4/Quality/98/Business Statistics/Short term/Standard report/Proposal rev.2: Assessment of the Quality in Statistics, Proposal for a standard quality report on short-term statistics, November 1998.

15.6.2 National quality measurement

In the previous point the various references to quality in the STS-R were laid out and the relevant dimensions of quality explained in the context of the STS-R. In this

point the results of a preliminary, internal study in 2000 by Statistics Netherlands are discussed. These are limited to accuracy and coherence on the grounds that i) relevance is not applicable on the level of individual STS-statistics, but for the STS-R across the EU as a whole and ii) timeliness, accessibility, completeness, comparability and costs are equally applicable to all statistics.

Annex A: Industry

For the majority of indicators of Industry information about accuracy and coherence is possible to gather, and for a number of items information is readily available.

Accuracy

For the production index, information about non-random sampling errors, statistical frame errors, measuring errors and response level is available whereas information about process errors, response and model errors should be possible to obtain. For turnover and new orders received only response level information is available; about other aspects of accuracy no information is available. For energy turnover, information for all aspects should be theoretically possible. For output prices, information about random-sampling errors is possible; information about statistical frame errors, measuring errors, process errors, response errors and model errors is already available. For labour accounts no information is available.

Coherence

For the production index, information about coherence between preliminary and definitive results is available, but for coherence with other statistics some possible bottlenecks exist. For energy turnover, information about coherence with national accounts is available, whereas for output prices data on coherence between preliminary-definitive results and with national accounts is available. For labour accounts both information about coherence with national and quarterly accounts and between production and Prodcom statistics is available.

Annex B: Construction

The accuracy information for the indicators in Annex B is limited to some information about response and bias (with random sampling). Other information for this dimension is not available. Information about coherence between preliminary and definitive results is available for the majority of the indicators, and to a lesser degree coherence with Annual Accounts is available.

Accuracy

Accuracy measurements for New orders for civil engineering are theoretically possible. For production in construction, on all accuracy aspects possible bottlenecks are foreseen, while non-random sampling is not applicable. For New orders received for building construction and building permits, only information about response and bias (with random sampling) is available; for the other aspects the possibilities are unknown. For material costs, no accuracy information is available, only the bias (with random sampling). For new orders received in construction, together with construction costs and labour accounts, no information about accuracy indicators is available.

Coherence

For the production, information on coherence with annual and quarterly accounts exists already and coherence between preliminary and definitive results is possible. For both new received orders in construction and material costs, data on coherence with annual statistics and between preliminary and definitive results exists already. For new orders for building construction and construction costs, only coherence between preliminary and definitive results is available; other information is not available or not applicable. For new orders received in civil engineering, describing coherence on all 5 aspects should be possible, but nothing is implemented yet. For building permits, coherence between preliminary and definitive results exists; for the other 4 coherence aspects no information about the possibilities is available. For the labour accounts, coherence with annual and quarterly accounts, and between production and Prodcum statistics exists; coherence between preliminary and definitive results is theoretically possible.

Annex C: Retail trade and repair

On the statistics belonging to this Annex accuracy information is not currently available. For retail trade and repair information about accuracy and coherence is however theoretically possible. For labour accounts some coherence aspects are already available.

Accuracy

For both retail trade and repair and labour statistics, information about random sampling is not applicable. For the retail trade and repair additional information about accuracy is only theoretically possible. For the labour statistics no additional information about measuring is available.

Coherence

In this Annex for the labour statistics, information on coherence with annual and quarterly national accounts

and coherence between production and Prodcum is already available; coherence between preliminary and definitive results is theoretically possible. Measuring coherence in retail trade and repair is theoretically possible, but not implemented.

Annex D: Other Services

For other services, some accuracy aspects for turnover are available.

For the two indicators in this Annex the majority of aspects of coherence information are already implemented.

A few accuracy aspects are available for turnover only.

Accuracy

For both turnover and labour accounts random sampling is not applicable, while for only turnover information about non-random sampling errors is available although there are some bottlenecks remaining. For the turnover theoretically information about most non sampling errors is possible to obtain and information about statistical frame errors and measuring errors is already available; model errors and non-response still contain some bottlenecks. For the labour accounts no information about other accuracy aspects is available.

Coherence

Information on coherence between preliminary and definitive results, with annual and between production and Prodcum is available for turnover.

For labour accounts, coherence information is available on annual and quarterly accounts and between production and Prodcum. For both turnover and labour accounts, on other coherence aspects information should be possible but it is not implemented yet.

15.6.3 STS Sources

STS Sources is Eurostat's methodological database containing information on how short-term business statistics are compiled in the EU Member States.

Main aim of the product

STS Sources was developed in order to store methodological information from different countries in a structured and consistent manner with a view to then disseminating this information to users and other experts in the field. This facilitates the presentation of information in a fully comparable manner between countries and over time. The database functions permit any subset of the stored information to be extracted in a

variety of output formats. Once created, these output products exist independently from the database and can be further edited or, due to their media, widely disseminated.

STS Sources has grown out of a project to document the data collection methods for industrial and construction short-term indicators that was carried out during the mid-1990s. Each year methodological information was collected for a subset of indicators and then published, starting with the core indicators of industrial production and output (producer) prices. This exercise was repeated over a four-year period until practically all of the indicators had been documented.

The adoption of the STS-R and the interest in national methodologies provided the impetus for a re-launch of this project. It was decided to simultaneously update the information concerning the indicators for industry and construction and to expand coverage to include new indicators for retail trade and other services. Technological developments since the creation of the first database in the mid-1990s, notably the increased use of the Internet for disseminating information, led to a complete review of the techniques used for storing and disseminating this information and the result was name STS Sources⁵⁵.

Database

The methodological information in STS Sources is organised into two main categories:

- an overview of legislation, classifications, units and registers used for short-term statistics which tend to be common across many or all indicators; this is referred to in STS Sources as the "statistical system" of the Member State;
- information more or less specific to individual short-term indicators (sometimes information is given on a multi-indicator survey or administrative source rather than a single indicator).

⁵⁵ Existing information on national methodologies from the old database (called Mona Lisa) was transferred into STS Sources. It was from this basis that Member States were invited, in April 2000, to update the information for industry and construction and to extend it to distribution and services.

Top heading	Sub-headings	Broken down further into	
Statistical system	Institution		
	Legal basis		
	National classifications	Activity classifications	
		Regional classification	
		Other classifications	
	Units		
	Business statistics register	General information	
		Population coverage	
		Record contents	
		Updating	
Dissemination			
Planned changes to the register			
Summary of indicators			
Indicator	General information	Administrative information	
		Summary of questionnaires	
	Population coverage		
	Information collected on each unit	List and definition of variables	
		Time span covered by data	
		Planned changes in information collected	
	Primary data collection method		
	Production of results		
	Quality		
	Dissemination	National dissemination	
Transmission to Eurostat and further use of the statistics			

Information is recorded for each country for one statistical system and as many different short-term indicators as relevant for that country. A time stamp (reference year) is associated with each indicator so that information can simultaneously exist in the database for multiple years for the same indicator and hence updates can be recorded as and when the national statistical authorities inform Eurostat of changes in their methods. Each of these unique combinations of indicators and years has approximately 70 methodological sub-headings assigned to them, according to a uniform hierarchical tree structure. A summary of the main headings are shown in the table above; note that these headings are broken down into further detail in the database.

The information contained in each of the methodological sub-headings is treated by the database as a unique record or building block. Each one of these can be uniquely defined by its context:

- country;
- statistical system or name of indicator;
- year;
- hierarchical item (methodological sub-heading);

- language (as the database can store information in more than one language).
- country;
- statistical system or name of indicator;
- year;
- hierarchical item (methodological sub-heading);
- language (as the database can store information in more than one language).

As the database has been constructed/designed in this way, information can be compared between countries and over time and can be extended to new countries and indicators, as well as being simply updated.

Country and short-term indicator coverage

Information on the basic tools used for STS (the "statistical system" part of STS Sources) is available for most EU Member States for 1999 or 2000. Eurostat plans to regularly ask the Member States to update this information.

Dissemination of STS Sources information

An important design goal of the STS Sources database was the possibility to generate multiple output formats, depending upon the needs of the end user. As such it is possible using the database interface to extract tailor-made information for a user-driven selection of countries, years, indicators and methodological sub-headings. Once generated these extractions can be made available as separate products.

There are two different output formats available:

- MS Word output;
- HTML output.

Of course, the MS Word output can be converted easily and conveniently to other formats, for example PDF.

Eurostat has produced a CD-ROM with the title “Short-term Statistics - National Methodologies” using the HTML output from the database. Specialist users working intensively with the information may receive a copy of this CD-ROM directly from Eurostat. An MS Word file has been created with the documentation available for each Member State and this is available from

Eurostat, or for registered users, from the STS Sources directory of the Library of the EBT Interest Group on CIRCA.

15.6.4 Three-yearly report on the STS-R

The STS-R requires the Commission to provide a report to the European Parliament and the Council every 3 years. The first of these was due for 19 May 2001. The STS-R expressly states that the report should cover relevance, quality and respondent burden. Apart from the requirement to cover at least these three related elements the Commission is free in terms of the content of the report within the basic guideline that it concerns the "statistics compiled pursuant to this Regulation". In practise Eurostat has worked in cooperation with the Member States to draft the first of these reports. The main subjects covered by the first report are: data availability; data relevance; timeliness; meta-information; comparability; coherence between provisional and revised data; sampling errors; non-sampling errors; burden on business; cost for the National Statistical System

Part II

The Manual as a reference tool

Section F

Reference

16. Reference documents

16.1 Contacts and coordinators

Surname	First name	Institute	Country	e-mail
Mr Hooyberghs	Koen	Institut National de Statistique	Belgium	Koen.hooyberghs@statbel.fgov.be
Mr Larsen	Casper	Statistics Denmark	Denmark	cla@dst.dk
Mr Weisbrod	Joachim	Statistisches Bundesamt	Germany	gruppe-ivd@destatis.de
Mrs Tyfoxylou	Theano	Statistical Service	Greece	theaty@statistics.gr
Mrs Gonzalez Villa	Margarita	INE	Spain	mgonzalez@ine.es
Mr Euriat	Michel	INSEE	France	michel.euriat@insee.fr
Mr McMahon	Thomas	CSO	Ireland	tom.mcmahon@cs.ie
Mr Politi	Mauro	ISTAT	Italy	politi@istat.it
Mr Hansen	Frank	STATEC	Luxembourg	frank.hansen@statec.etat.lu
Mr Buiten	Gert	CBS	Netherlands	gbtn@cbs.nl
Mr Katzbeck	Gerald	STATISTIK AUSTRIA	Austria	gerald.katzbeck@statistik.gv.at
Mr Pereira	Humberto Jorge	INE	Portugal	humberto.pereira@ine.pt
Mr Molnar	Kari	Statistics Finland	Finland	Kari.molnar@stat.fi
Ms Ullberg	Anita	Statistics Sweden	Sweden	anita.ullberg@scb.se
Mrs Collins	Claire	ONS	UK	claire.collins@ons.gov.uk

I

(Acts whose publication is obligatory)

COUNCIL REGULATION (EC) No 1165/98
of 19 May 1998
concerning short-term statistics

THE COUNCIL OF THE EUROPEAN UNION,

Having regard to the Treaty establishing the European Community, and in particular Article 213 thereof,

Having regard to the draft Regulation submitted by the Commission ⁽¹⁾,

Having regard to the opinion of the European Parliament ⁽²⁾,

Having regard to the opinion of the Economic and Social Committee ⁽³⁾,

Having regard to the opinion of the European Monetary Institute ⁽⁴⁾,

- (1) Whereas Council Directive 72/211/EEC of 30 May 1972 concerning coordinated statistics on the business cycle in industry and small craft industries ⁽⁵⁾ and Council Directive 78/166/EEC of 13 February 1978 concerning coordinated statistics on the business cycle in building and civil engineering ⁽⁶⁾ which aimed to provide a body of coherent statistics, have not been able to take account of economic and technical changes;
- (2) Whereas the European Union has in the meantime made further progress towards integration; whereas new economic, competition, social, environmental and enterprise policies and guidelines call for initiatives and decisions based on valid statistics; whereas the information provided for under existing Community legislation or available in the various Member States is partly inadequate or insufficiently comparable to serve as a reliable basis for the work of the Communities;
- (3) Whereas the future European Central Bank needs rapid short term statistics in order to assess economic development in the Member States in the context of a single European monetary policy;

- (4) Whereas standardisation is required to meet Community needs for information concerning economic convergence;
- (5) Whereas it is necessary to have reliable and rapid statistics available in order to report on the economic development in each Member State of the Union within the framework of the economic policy of the Union;
- (6) Whereas businesses and their professional associations need such information in order to understand their markets and to know their activity and performance relative to their sector, at national and international level;
- (7) Whereas the compilation of national accounts according to Council Regulation (EC) No 2223/96 of 25 June 1996 on the European system of national and regional accounts in the Community ⁽⁷⁾ requires the development of comparable, complete and reliable statistical sources;
- (8) Whereas by Decision 92/326/EEC ⁽⁸⁾ the Council adopted a two-year programme (1992 to 1993) for the development of European statistics on services; whereas this programme includes the compilation of harmonised statistics at national and regional levels, particularly for the distributive trades;
- (9) Whereas in accordance with the principle of subsidiarity the creation of common statistical norms that permit the production of harmonised statistics is an action which can only be undertaken efficiently at Community level and whereas they will be applied in each Member State under the authority of the bodies and institutions in charge of compiling official statistics;
- (10) Whereas the best method of ascertaining the business cycle consists of compiling statistics which conform to common methodological principles and with common definitions of characteristics; whereas it is only from coordinated compilation that harmonised statistics can be drawn up with reliability, speed, flexibility and the level of detail required to

⁽¹⁾ OJ C 267, 3. 9. 1997, p. 1.

⁽²⁾ Opinion delivered on 20 February 1998 (OJ C 80, 16.3.1998).

⁽³⁾ OJ C 19, 21. 1. 1998, p. 125.

⁽⁴⁾ Opinion delivered on 11 September 1997 (not yet published in the Official Journal).

⁽⁵⁾ OJ L 128, 3. 6. 1972, p. 28.

⁽⁶⁾ OJ L 52, 23. 2. 1978, p. 17.

⁽⁷⁾ OJ L 310, 30. 11. 1996, p. 1.

⁽⁸⁾ OJ L 179, 1. 7. 1992, p. 131.

meet the needs of the Commission and of enterprises;

- (11) Whereas seasonal adjustment and the calculation of trend-cycle series for national data can best be carried out by the national statistical authorities; whereas the transmission to the Commission (Eurostat) of seasonally adjusted data and trend-cycle series will increase the coherence between data disseminated nationally and at an international level;
- (12) Whereas kind-of-activity units (KAU) correspond to one or more operational subdivisions of the enterprise; whereas for a KAU to be observable, the enterprise's information system must be capable of indicating or calculating for each KAU at least the value of production, intermediate consumption, manpower costs, the operating surplus and employment and gross fixed capital formation; whereas KAUs falling within a particular heading in the statistical classification of economic activities in the European Community (NACE Rev.1) can produce products outside the homogeneous group, on account of secondary activities connected with them which cannot be separately identified from available accounting documents; whereas the enterprise and the KAU are identical when it proves impossible for an enterprise to indicate or calculate information on all of the variables listed in this recital for one or more operational subdivisions;
- (13) Whereas the statistical data compiled within the Community system must be of a satisfactory quality and this quality, as well as the burden it entails, must be comparable from one Member State to another, and whereas it is therefore necessary to establish jointly the criteria enabling these requirements to be met; whereas short-term statistics must be consistent with the results transmitted in accordance with Council Regulation (EC, Euratom) No 58/97 of 20 December 1996 concerning structural business statistics⁽¹⁾;
- (14) Whereas Council Regulation (EC) No 322/97 of 17 February 1997 on Community statistics⁽²⁾ constitutes the reference framework for the provisions of this Regulation, in particular those which cover access to administrative data sources and statistical confidentiality;
- (15) Whereas it is necessary to simplify the administrative procedures for enterprises, particularly smaller enterprises, including the promotion of new technologies for data collection and compilation; whereas the use

of existing administrative data for statistical purposes is one of the measures to decrease the burden on enterprise; whereas if a direct data collection from businesses is indispensable for compiling the statistics, the methods and techniques must ensure that the data are reliable and up to date, without giving rise for the parties concerned, in particular for small and medium sized businesses, to a burden out of proportion to the results which users of the said statistics can reasonably expect;

- (16) Whereas it is necessary to have a legal framework common to all business activities and domains of business statistics covering also the activities and domains for which statistics are not yet developed; whereas the scope of the statistics to be compiled can be defined by reference to Council Regulation (EEC) No 696/93 of 15 March 1993 on the statistical units for the observation and analysis of the production system in the Community⁽³⁾ and Council Regulation (EEC) No 3037/90 of 9 October 1990 on the statistical classification of economic activities in the European Community (NACE Rev.1)⁽⁴⁾;
- (17) Whereas, in order to enable the rules for the collection and statistical processing of data and for processing and transmission of the variables to be clarified further, it is necessary to confer upon the Commission, assisted by the Statistical Programme Committee set up by Council Decision 89/382/EEC, Euratom⁽⁵⁾, the power to adopt measures for the application of this Regulation;
- (18) Whereas the Statistical Programme Committee has been consulted in accordance with Article 3 of Decision 89/382/EEC, Euratom,

HAS ADOPTED THIS REGULATION:

Article 1

General aims

1. The objective of this Regulation is to establish a common framework for the production of short-term Community statistics on the business cycle.
2. The statistics comprise information (variables) necessary to provide a uniform basis for the analysis of the short-term evolution of supply and demand, production factors and prices.

⁽³⁾ OJ L 76, 30. 3. 1993, p. 1.

⁽⁴⁾ OJ L 293, 24. 10. 1990, p. 1. Regulation as amended by Commission Regulation (EEC) No 761/93 (OJ L 83, 3. 4. 1993, p. 1).

⁽⁵⁾ OJ L 181, 28. 6. 1989, p. 47.

⁽¹⁾ OJ L 14, 17. 1. 1997, p. 1.

⁽²⁾ OJ L 52, 22. 2. 1997, p. 1.

Article 2

Scope

1. This Regulation shall apply to all market activities in Sections C to K and M to O of the statistical classification of economic activities in the European Community (NACE Rev.1) as established by Regulation (EEC) No 3037/90.

2. Statistical units of the types listed in Section I of the Annex to Regulation (EEC) No 696/93 and classified under one of the activities referred to in paragraph 1 shall be included in the scope of this Regulation. The use of particular units for the compilation of statistics is specified in the Annexes to this Regulation.

Article 3

Annexes

1. The specific requirements for the variables are described in the Annexes.

2. The following information is laid down in each Annex where relevant:

- (a) the specific activities for which the statistics are to be compiled;
- (b) the types of statistical unit to be used for the compilation of the statistics;
- (c) the lists of variables;
- (d) the form of the variables;
- (e) the reference period of the variables;
- (f) the level of detail of the variables;
- (g) the deadlines for data transmission;
- (h) the list of voluntary pilot studies;
- (i) the first reference period;
- (j) the length of the transition period which may be conceded.

Article 4

Collection of data

1. Member States shall obtain the necessary data for the compilation of the variables listed in the Annexes.

2. Member States may acquire the necessary data using a combination of different sources specified below, applying the principle of administrative simplification:

- (a) compulsory surveys: the legal units as defined in Regulation (EEC) No 696/93, to which the statistical units called upon by the Member States belong or of

which they are composed, shall be obliged to give timely, accurate and complete information;

- (b) other appropriate sources, including administrative data;

- (c) appropriate statistical estimation procedures.

3. Member States and the Commission within their respective fields of competence shall promote the conditions for increased use of electronic data collection and automatic data processing.

Article 5

Periodicity

All variables shall be produced more frequently than annually. The frequency for each variable is specified in the Annexes.

Article 6

Level of detail

The variables shall be produced in accordance with the prevailing classifications at the level of detail specified in the Annexes.

Article 7

Processing

Member States shall process the completed data acquired in accordance with Article 4(2) into comparable variables following the rules laid down in the Annexes. Member States shall also take account of the guidance provided by the advisory methodological manual referred to in Article 12.

Article 8

Transmission

Member States shall transmit the variables provided for in Article 7, including confidential data, to Eurostat by electronic or other appropriate means within a period of time from the end of the reference period which is laid down in the Annexes. In any case, the variables shall be transmitted to the Commission (Eurostat) not later than the day they are disseminated by the national authority.

Article 9

Treatment of confidential data

The treatment of confidential data and the transmission of such data as provided for in Article 8 shall be carried out in accordance with the existing Community provisions governing statistical confidentiality.

*Article 10***Quality**

1. Member States shall ensure that the transmitted variables reflect the population of units. For this purpose, the data acquired in accordance with Article 4(2) must cover as many units as necessary to ensure a sufficient degree of representativeness.
2. The quality of the variables shall be measured by each Member State according to common criteria.
3. The quality of the variables shall be tested regularly by comparing them with other statistical information. In addition they shall be checked for internal consistency.
4. Quality evaluation shall be carried out comparing the benefits of the availability of the data with the costs of collection and the burden on businesses, especially on small enterprises. For the purpose of this evaluation, Member States shall transmit to the Commission, at its request, the necessary information.

*Article 11***Change of weightings and base year**

1. Member States shall adapt where necessary the weighting system of composite indices at least every five years. The weights used in the adapted weighting systems shall be transmitted to the Commission within three years after the end of the new base year.
2. Every five years, Member States shall rebase the indices using as base years the years ending with a 0 or a 5. All indices must be rebased on the new base year within three years after the end of this new base year.

*Article 12***Methodological manual**

1. The Commission, after consulting the Statistical Programme Committee, shall publish an advisory methodological manual which explains the rules set out in the Annexes and also contains guidance concerning short term statistics.
2. The manual shall be revised at regular intervals.

*Article 13***Transition period and derogations**

1. Transition periods may be conceded, not extending more than five years from the date of entry into force of this Regulation.
2. During the transition periods derogations from the provisions of this Regulation may be accepted by the Commission in so far as the national statistical systems require major adaptations.

*Article 14***Reports**

1. Member States shall transmit to the Commission, at its request, any relevant information with regard to the implementation of this Regulation in the Member States.
2. The Commission shall, within three years of the date of entry into force of this Regulation and again every three years thereafter, submit a report to the European Parliament and the Council on the statistics compiled pursuant to this Regulation and in particular on their relevance and quality and the burden on business.

*Article 15***Coordination in the Member States**

In each Member State one national authority shall coordinate:

1. the transmission of variables (Article 8),
2. the quality measurement (Article 10),
3. the transmission of relevant information (Article 14(1)).

*Article 16***Pilot studies**

1. The Commission shall, in accordance with the procedure laid down in Article 18, institute a series of voluntary pilot studies to be carried out by Member States. These pilot studies are specified in the Annexes.
2. The pilot studies shall be carried out in order to assess the relevance and feasibility of obtaining data, taking into account the benefits of the availability of the data in relation to the cost of collection and the burden on business.
3. The Commission shall inform the Council of the results of the pilot studies.

*Article 17***Implementation**

The Commission shall determine, in accordance with the procedure laid down in Article 18, the measures for implementing this Regulation, including the measures to accommodate economic and technical developments concerning the collection and statistical processing of data and the transmission of the variables. In doing so, consideration shall be given to the principle that the benefits of the measure must outweigh its cost, and to the principle that major additional resources are not involved either for Member States or for enterprises as compared with the original provisions of this Regulation. In particular the measures for implementing this Regulation shall include:

- (a) the use of particular units (Article 2);
- (b) the updating of the list of variables (Article 3);
- (c) the definitions and the appropriate forms of the transmitted variables (Article 3);
- (d) the frequency of compilation of the statistics (Article 5);
- (e) the levels of breakdown and aggregation to be applied to the variables (Article 6);
- (f) the transmission deadlines (Article 8);
- (g) the criteria for the measurement of quality (Article 10);
- (h) the transition periods and derogations granted during the transition period (Article 13);
- (i) the institution of pilot studies (Article 16).

Article 18

Committee procedure

1. The Commission shall be assisted by the Statistical Programme Committee, hereinafter referred to as 'the committee'.
2. The representative of the Commission shall submit to the committee a draft of the measures to be taken. The committee shall deliver its opinion on the draft within a time limit which the chairman may lay down according to the urgency of the matter. The opinion shall be delivered by the majority laid down in Article 148(2) of the

This Regulation shall be binding in its entirety and directly applicable in all Member States.

Done at Brussels, 19 May 1998.

Treaty in the case of decisions which the Council is required to adopt on a proposal from the Commission. The votes of the representatives of the Member States within the committee shall be weighted in the manner set out in that Article. The chairman shall not vote.

3. The Commission shall adopt the measures envisaged if they are in accordance with the opinion of the committee. If the measures envisaged are not in accordance with the opinion of the committee, or if no opinion is delivered, the Commission shall without delay submit to the Council a proposal relating to the measures to be taken. The Council shall act by a qualified majority.

If on the expiry of a period of three months from the date of the referral to the Council, the Council has not acted, the proposed measures shall be adopted by the Commission.

Article 19

Repealing provisions

Directives 72/211/EEC and 78/166/EEC are hereby repealed.

Article 20

Entry into force

This Regulation shall enter into force on the 20th day following its publication in the *Official Journal of the European Communities*.

For the Council

The President

G. BROWN

ANNEX A

INDUSTRY

(a) Scope

This Annex applies to all activities listed in Sections C to E of NACE Rev.1.

(b) Observation unit

1. Unless otherwise stated in paragraph 2 or decided otherwise according to the procedure in paragraph 3, the observation unit for all variables in this Annex is the kind-of-activity unit.
2. For enterprises with few persons employed in secondary activities the local unit or the enterprise may be used as the observation unit.
3. The use of other observation units can be decided in accordance with the procedure laid down in Article 18.

(c) List of variables

1. The statistics in this Annex comprise the following variables:

Variable	Name
110	Production
120	Turnover
121	Domestic turnover
122	Non-domestic turnover
130	New orders received
131	Domestic new orders
132	Non-domestic new orders
210	Number of persons employed
220	Hours worked
230	Gross wages and salaries
310	Output prices
311	Output prices of the domestic market
312	Output prices of the non-domestic market

2. Only if output prices of the non-domestic market (No 312) are not available, then this variable may be approximated by the unit value index (No 313).
3. Starting from the beginning of the first reference period the information on new orders (Nos 130, 131, 132) may be approximated by an alternative leading indicator, which may be calculated from business opinion survey data. This approximation is permitted for a period of five years from the date of entry into force of the Regulation. This period shall be extended for up to five more years unless decided differently in accordance with the procedure laid down in Article 18.
4. Starting from the beginning of the first reference period the information on persons employed (No 210) may be approximated by the number of employees (No 211). This approximation is permitted for a period of five years from the date of entry into force of the Regulation. This period shall be extended by up to five more years unless decided differently in accordance with the procedure laid down in Article 18.
5. The term 'domestic' means the territorial area of the Member State in question.
6. The information on production (No 110) is not required for Division 41 and Group 40.3 of NACE Rev.1.
7. The information on turnover (Nos 120, 121, 122) is not required for NACE Rev.1, Section E.

8. The information on orders (Nos 130, 131, 132) is only required for the following divisions of NACE Rev.1: 17, 18, 21, 24, 27, 28, 29, 30, 31, 32, 33, 34, 35. The list of NACE divisions could be modified within three years from the date of entry into force of the Regulation in accordance with the procedure laid down in Article 18.
9. The information on output prices or the unit value index (Nos 310, 311, 312 or 313) is not required for the following groups of NACE Rev.1: 12.0, 22.1, 23.3, 29.6, 35.1, 35.3. The list of groups could be modified within three years from the date of entry into force of the Regulation in accordance with the procedure laid down in Article 18.

(d) Form

1. All of the variables except production (No 110) are to be transmitted in an unadjusted form.
2. The production variable (No 110) is to be transmitted in a working-day adjusted form.
3. In addition Member States may transmit the variables seasonally adjusted and may also transmit the variables in the form of trend-cycles. Only if data are not transmitted in these forms, then the Commission (Eurostat) may produce seasonally adjusted and trend cycle series for these variables.
4. The variables Nos 110, 310, 311, 312 and 313 are to be transmitted as an index. All other variables are to be transmitted either as an index or as absolute figures.

(e) Reference period

The following reference periods shall apply:

Variable	Reference period
110	month
120	month
121	month
122	month
130	month
131	month
132	month
210	at least quarter
220	at least quarter
230	at least quarter
310	month
311	month
312 or 313	month

(f) Level of detail

1. All variables are to be transmitted at the 2-digit level of NACE Rev.1.
2. In addition, for Section D of NACE Rev.1, the index of production (No 110) and the index of output prices (Nos 310, 311, 312 or 313) are to be transmitted at the 3-digit and 4-digit levels of NACE Rev.1. The transmitted indices at the 3-digit and 4-digit levels must represent at least 90 % of the total value added for each Member State of Section D of NACE Rev.1 in a given base year. These variables need not be transmitted at these detailed levels by those Member States whose total value added of Section D of NACE Rev.1 in a given base year represents less than 5 % of the European Community total.
3. The variables transmitted at the 3-digit and 4-digit levels of NACE Rev.1 are used to produce aggregated indicators at these levels for the Community as a whole and for the group of Member States participating in the single currency. These indicators may also be disseminated at 3-digit and 4-digit levels for individual Member States and other groupings of Member States, where the Member States concerned have indicated that the data are of sufficient quality.
4. In addition, all variables are to be transmitted for main industrial groupings, the definition of which (reference to NACE Rev.1 activities) shall be decided in accordance with the procedure laid down in Article 18.

(g) Deadlines for data transmission

- The variables shall be transmitted by the following deadlines after the end of the reference period:

Variable	Deadlines
110	1 month and 15 calendar days
120	2 months
121	2 months
122	2 months
130	1 month and 20 calendar days
131	1 month and 20 calendar days
132	1 month and 20 calendar days
210	3 months
220	3 months
230	3 months
310	1 month and 15 calendar days
311	1 month and 5 calendar days
312	1 month and 5 calendar days
313	1 month and 15 calendar days

- The deadline may be up to 15 calendar days longer for those Member States whose value added in Sections C, D and E of NACE Rev.1 in a given base year represents less than 3 % of the European Community total.

(h) Pilot studies

The priorities for the pilot studies are as follows:

- assess the possibilities of earlier data transmission;
- collect output prices of the non-domestic market;
- break down the non-domestic market variables into 'Monetary Union', 'intra-EC' and 'extra-EC';
- collect short-term information concerning births and deaths of enterprises;
- produce monthly employment information;
- collect data on inventories;
- provide information for more activities than listed in paragraphs 6 to 9 of Section C;
- collect short-term investment information;
- collect data on the stock of orders.

(i) First reference period

The first reference period for which all variables are to be transmitted is January 1998 for monthly data and the first quarter for quarterly data.

(j) Transition period

- For the production variable (No 110), persons employed and the hours worked variables (Nos 210, 220) and the domestic output prices variable (No 311) a transition period of no longer than three years from the date of entry into force of the Regulation may be conceded in accordance with the procedure laid down in Article 18. This transition period may be extended by a further two years in accordance with the procedure laid down in Article 18.
- For all other variables a transition period of no longer than five years from the date of entry into force of the Regulation may be conceded in accordance with the procedure laid down in Article 18.

ANNEX B

CONSTRUCTION

(a) Scope

This Annex applies to all activities listed in Section F of NACE Rev. 1.

(b) Observation unit

1. Unless otherwise stated in paragraph 2 or 3 or decided otherwise according to the procedure in paragraph 4, the observation unit for all variables in this Annex is the kind-of-activity unit.
2. For enterprises with few persons employed in secondary activities the local unit or the enterprise may be used as the observation unit.
3. Where appropriate, the statistics may be derived from information produced according to the classification of constructions (CC).
4. The use of other observation units can be decided in accordance with the procedure laid down in Article 18.

(c) List of variables

1. The statistics in this Annex comprise the following variables:

Variable	Name
110	Production
115	Production of building construction
116	Production of civil engineering
130	New orders received
135	New orders received for building construction
136	New orders received for civil engineering
210	Number of persons employed
220	Hours worked
230	Gross wages and salaries
320	Construction costs
321	Material costs
322	Labour costs
411	Building permits: number of dwellings
412	Building permits: square metres of useful floor area or alternative size measure

2. Starting from the beginning of the first reference period, the information on new orders (No 130) may be approximated by an alternative leading indicator, which may be calculated from business opinion survey data. This approximation is permitted for a period of five years from the date of entry into force of the Regulation. The period shall be extended for up to five more years unless decided differently in accordance with the procedure laid down in Article 18.
3. Starting from the beginning of the first reference period the information on persons employed (No 210) may be approximated by the number of employees (No 211). This approximation is permitted for a period of five years from the date of entry into force of the Regulation. The procedure shall be extended for up to five more years unless decided differently in accordance with the procedure laid down in Article 18.
4. The information on new orders variables (Nos 130, 135, 136) may be approximated by information on building permits. Further approximations for these and other variables can be defined in accordance with the procedure laid down in Article 18.
5. Only if construction costs variables (Nos 320, 321, 322) are not available, then they may be approximated by the output prices variable (No 310).

(d) Form

1. All of the variables except production (No 110) are to be transmitted in an unadjusted form.
2. The production variable (No 110) is to be transmitted in a working-day adjusted form.
3. In addition Member States may transmit the variables seasonally adjusted and may also transmit the variables in the form of trend-cycles. Only if data are not transmitted in these forms, then the Commission (Eurostat) may produce seasonally adjusted and trend-cycle series for these variables.
4. The variables Nos 110, 115, 116, 320, 321 and 322 are to be transmitted as an index. The variables Nos 411 and 412 are to be transmitted in absolute figures. Other variables are to be transmitted either as an index or as absolute figures.

(e) Reference period

A reference period of at least a quarter shall apply to all variables in this Annex.

(f) Level of detail

1. The variables Nos 110, 130, 210, 220 and 230 are to be transmitted at least at the two-digit level of NACE Rev. 1.
2. The new orders variables (Nos 130, 135 and 136) are required only for groups 45.1 and 45.2 of NACE Rev. 1.
3. Construction costs variables (Nos 320, 321 and 322) are only mandatory for new residential buildings excluding residencies for communities.
4. The building permits variable (No 411) covers only new residential buildings (excluding residencies for communities) and is to be broken down between:
 - (i) one-dwelling residential buildings;
 - (ii) two- and more dwelling residential buildings.
5. The building permits variable (No 412) covers only buildings and is to be broken down between:
 - (i) one-dwelling residential buildings;
 - (ii) two- and more dwelling residential buildings;
 - (iii) residencies for communities;
 - (iv) office buildings;
 - (v) other buildings.

(g) Deadlines for data transmission

1. The variables shall be transmitted by the following deadlines after the end of the reference period:

Variable	Deadline
110	2 months
115	2 months
116	2 months
130	3 months
135	3 months
136	3 months
210	3 months
220	3 months
230	3 months
320	3 months
321	3 months
322	3 months
411	3 months
412	3 months

2. The deadline may be up to 15 calendar days longer for those Member States whose total value added in Section F of NACE Rev.1 in a given base year represents less than 3 % of the Community total.

(h) Pilot studies

The priorities for the pilot studies are as follows:

1. provide output prices information;
2. break down production (No 110) into new work and repair and maintenance;
3. provide monthly data;
4. break down the variables Nos 210, 220 and 230 into building and civil engineering;
5. provide cost information (Nos 320, 321 and 322) for other types of construction than residential buildings as well as for repair and maintenance work;
6. break down the production of building construction (No 115) into residential and non-residential buildings;
7. provide short-term investment information;
8. provide short-term information concerning births and deaths of enterprises.

(i) First reference year

The first reference period for which all variables are to be transmitted is January 1998 for monthly data and the first quarter 1998 for quarterly data.

(j) Transition period

1. For the production variable (No 110) and the persons employed and hours worked variables (Nos 210 and 220) a transition period of no longer than three years from the date of entry into force of the Regulation may be conceded in accordance with the procedure laid down in Article 18. This transition period may be extended by a further two years in accordance with the procedure laid down in Article 18.
2. For all other variables a transition period of no longer than five years from the date of entry into force of the Regulation may be conceded in accordance with the procedure laid down in Article 18.

ANNEX C

RETAIL TRADE AND REPAIR

(a) Scope

This Annex applies to the activities listed in Division 52 of NACE Rev.1.

(b) Observation unit

1. The observation unit for all variables in this Annex is the enterprise.
2. The use of other observation units can be decided in accordance with the procedure laid down in Article 18.

(c) List of variables

1. The statistics in this Annex comprise the following variables:

Variable	Name
120	Turnover
210	Number of persons employed
330	Deflator of sales

2. The information on the volume of sales (No 123) may be produced instead of the deflator of sales (No 330).
3. Starting from the beginning of the first reference period the information on persons employed (No 210) may be approximated by the number of employees (No 211). This approximation is permitted for a period of five years from the date of entry into force of the Regulation. This period shall be extended for up to five more years unless decided differently in accordance with the procedure laid down in Article 18.

(d) Form

1. All variables are to be transmitted in an unadjusted form.
2. The turnover variable (No 120) and the volume of sales variable (No 123) are also to be transmitted in a working-day adjusted form.
3. In addition Member States may transmit the variables seasonally adjusted and may also transmit the variables in the form of trend-cycles. Only if data are not transmitted in these forms, then Eurostat may produce seasonally adjusted and trend-cycle series for these variables.
4. All variables are to be transmitted either as an index or as absolute figures.

(e) Reference period

The following reference periods shall apply:

Variable	Reference period
120	month
210	quarter
330 or 123	month

(f) Level of detail

1. The turnover variable (No 120) and the deflator of sales/volume of sales variables (No 330/123) are to be transmitted according to the levels of detail defined in paragraphs 2, 3 and 4. The persons employed variable (No 210) is to be transmitted according to the levels of detail defined in paragraphs 3 and 4.

2. Detailed level regrouping NACE Rev.1 classes and groups:
 - Class 52.11;
 - Class 52.12;
 - Group 52.2;
 - Group 52.3;
 - sum of Classes 52.41, 52.42 and 52.43;
 - sum of Classes 52.44, 52.45 and 52.46;
 - sum of Classes 52.47 and 52.48;
 - Class 52.61.
3. Aggregate levels regrouping NACE Rev.1 classes and groups:
 - sum of Class 52.11 and Group 52.2;
 - sum of Class 52.12 and Groups 52.3 to 52.6;
 - sum of Groups 52.1 to 52.6.
4. Division 52
 - Member States whose value added for Group 52.7 represents less than 5 % of their value added for Division 52 in a given base year may approximate Division 52 by the sum of Groups 52.1 to 52.6.

(g) Deadlines for data transmission

1. The variables shall be transmitted within three months after the end of the reference period. The variables shall be transmitted for turnover (No 120) and the deflator of sales/volume of sales (No 330/123) within two months at the levels of detail specified in paragraphs 3 and 4 of Section F.
2. The deadline may be up to one month longer for those Member States whose value added in Division 52 in a given base year represents less than 3 % of the European Community total.

(h) Pilot studies

The priorities for the pilot studies are as follows:

1. provide a more detailed activity breakdown;
2. assess the possibilities of earlier data transmission;
3. collect information on the number of employees;
4. collect wages and salary information;
5. use the kind-of-activity unit as observation unit;
6. collect short-term information on the births and deaths of enterprises.

(i) First reference year

The first reference period for which all variables are to be transmitted is January 1998 for monthly data and the first quarter 1998 for quarterly data.

(j) Transition period

1. For the persons employed variable (No 210) a transition period of no longer than three years may be conceded in accordance with the procedure laid down in Article 18. This transition period may be extended by a further two years in accordance with the procedure laid down in Article 18.
2. For the turnover variable (No 120) at the levels of detail specified in paragraph 3 of Section F a transition period of no longer than two years may be conceded in accordance with procedures laid down in Article 18.
3. For the turnover variable (No 120) at the level of detail specified in paragraphs 2 and 4 of Section F and the deflator of sales/volume of sales (No 330/123) a transition period of no longer than five years may be conceded from the date of entry into force of the Regulation in accordance with the procedure laid down in Article 18.

ANNEX D

OTHER SERVICES

(a) **Scope**

This Annex applies to all activities listed in Divisions 50 and 51 and Sections H, I, J, K, M, N and O of NACE Rev. 1.

(b) **Observation unit**

1. The observation unit for all variables in this Annex is the enterprise.
2. The use of other observation units can be decided in accordance with the procedure laid down in Article 18.

(c) **List of variables**

1. The statistics in this Annex comprise the following variables:

Variables	Name
120	Turnover
210	Number of persons employed

2. Starting from the beginning of the first reference period the information on persons employed (No 210) may be approximated by the number of employees (No 211). This approximation is permitted for a period of five years from the date of entry into force of the Regulation. The period shall be extended by up to five more years unless decided differently in accordance with the procedure laid down in Article 18.

(d) **Form**

1. All of the variables are to be transmitted in an unadjusted form.
2. The turnover variable (No 120) is also to be transmitted in a working-day adjusted form.
3. In addition Member States may transmit the variables seasonally adjusted and may also transmit the variables in the form of trend cycles. Only if data are not transmitted in these forms, may the Commission (Eurostat) produce seasonally adjusted and trend-cycle series for these variables.
4. All variables are to be transmitted either as an index or as absolute figures.

(e) **Reference period**

A reference period of a quarter shall apply to all variables in this Annex.

(f) **Level of detail**

1. The turnover variable (No 120) is to be transmitted according to the following groupings of NACE Rev. 1:
 - sum of 50.1, 50.3, 50.4;
 - 50.2;
 - 50.5;
 - 51, 64 each at three-digit;
 - 50, 60, 61, 62, 63, 72 each at two-digit;
 - sum of 74.11, 74.12, 74.13, 74.14;
 - sum of 74.2, 74.3;
 - 74.4 to 74.8 each at three-digit.
2. The persons employed variable (No 210) is to be transmitted at the two-digit level of NACE Rev. 1 for Divisions 50, 51, 55, 60, 61, 62, 63, 64, 72 and 74.

3. For Divisions 50, 51, 64 and 74 of NACE Rev. 1, the turnover variable need only be transmitted at the two-digit level by those Member States whose value added in those divisions of NACE Rev. 1 in a given base year represents less than 5 % of the European Community total.
4. For Section I of NACE Rev. 1, the persons employed variable (No 120) need only be transmitted at Section level by those Member States whose total value added in Section I in a given base year represents less than 5 % of the European Community total.

(g) Deadlines for data transmission

The variables shall be transmitted within three months after the end of the reference period.

(h) Pilot studies

The priorities for the pilot studies are as follows:

1. collect wages and salary information;
2. collect information on deflators;
3. assess the feasibility and relevance of collection data on:
 - (i) travel agents NACE Rev. 1 Group 63.3;
 - (ii) real estate NACE Rev. 1 Division 70;
 - (iii) renting activity NACE Rev. 1 Division 71;
 - (iv) research and development NACE Rev. 1 Division 73;
 - (v) management activities of holding companies NACE Rev. 1 Class 74.15;
 - (vi) NACE Rev. 1 Sections J, M, N and O;
4. produce a more detailed breakdown;
5. assess the possibility of earlier data transmission;
6. collect information on the number of employees;
7. use the kind-of-activity unit as observation unit;
8. collect short-term information on the births and deaths of enterprises.

(i) First reference period

The first reference period for which all variables are to be transmitted is the first quarter 1998.

(j) Transition period

For all variables a transition period of five years may be conceded from the date of entry into force of the Regulation in accordance with the procedure laid down in Article 18.

16.3 Definitions

COMMISSION REGULATION (EC) No 588/2001
of 26 March 2001
implementing Council Regulation (EC) No 1165/98 concerning short-term statistics as regards the
definition of variables

THE COMMISSION OF THE EUROPEAN COMMUNITIES,

Having regard to the Treaty establishing the European Community,

Having regard to Council Regulation (EC) No 1165/98 of 19 May 1998 concerning short-term statistics ⁽¹⁾, and in particular Article 3 and Article 17(c) thereof,

Whereas:

- (1) Regulation (EC) No 1165/98 established a common framework for the production of short-term Community statistics on the business cycle.
- (2) In accordance with Article 17(c) of Regulation (EC) No 1165/98, implementing measures are necessary concerning the definition of variables to be provided.
- (3) The measures provided for in this Regulation are in accordance with the opinion delivered by the Statistical Programme Committee, established by Council Decision 89/382/EEC, Euratom ⁽²⁾,

HAS ADOPTED THIS REGULATION:

Article 1

Definition of the variables

Regulation (EC) No 1165/98 specifies in Annex A(c)(1), Annex B(c)(1), Annex C(c)(1) and Annex D(c)(1) the variables to be covered by short-term statistics. The definitions of the variables, as well as the objectives, characteristics and calculation of the relevant indices, are set forth in the Annex.

This Regulation shall be binding in its entirety and directly applicable in all Member States.

Done at Brussels, 26 March 2001.

For the Commission

Pedro SOLBES MIRA

Member of the Commission

Article 2

Implementation of the definitions

Member States shall apply the definitions set forth in the Annex for the collection of statistical data covered by Regulation (EC) 1165/98 not later than one year after the present Regulation enters into force.

Member States shall comply with the definition of statistical data covered by Regulation (EC) 1165/98 to definitions set forth in the Annex not later than in the next revision of the base year foreseen in Article 11 of Regulation (EC) 1165/98.

Member States shall, in the implementation of the definitions set forth in the Annex, take the necessary measures to assure that existing statistical data covered by Regulation (EC) 1165/98 will be revised by recalculation or estimation to satisfy these definitions.

Results for a variable which differ by no more than 0,2 % from the results of a variable which conforms with the definitions of the variable laid down in the Annex shall be deemed conforming.

Article 3

Information on conformance to the definitions

Each Member State shall transmit to the Commission, at its request, any relevant information on the conformance of statistical data within that Member State to the definitions set forth in the Annex.

Article 4

Entry into force

This Regulation shall enter into force on the 20th day following its publication in the *Official Journal of the European Communities*.

⁽¹⁾ OJ L 162, 5.6.1998, p. 1.

⁽²⁾ OJ L 181, 28.6.1989, p. 47.

ANNEX

DEFINITION OF OBJECTIVES AND CHARACTERISTICS OF VARIABLES

Variable 110: Production

It is the objective of the production index to measure changes in the volume of output at close and regular intervals. It provides a measure of the volume trend in value added at factor cost over a given reference period ⁽¹⁾.

The production index is a theoretical measure that must be approximated by practical measures.

Value added at factor cost ⁽²⁾ can be calculated from turnover (excluding VAT and other similar deductible taxes directly linked to turnover), plus capitalised production, plus other operating income plus or minus the changes in stocks, minus the purchases of goods and services, minus other taxes on products which are linked to turnover but not deductible, minus the duties and taxes linked to production.

Income and expenditure classified as financial or extraordinary in company accounts is excluded from value-added.

Subsidies on products and on production are included in value added at factor cost, whereas all taxes on products and on production are excluded.

Value-added at factor cost is calculated 'gross' as value adjustments (such as depreciation) are not subtracted.

Note: indirect taxes can be separated into three groups.

- (i) The first comprises VAT and other deductible taxes directly linked to turnover which are excluded from turnover. These taxes are collected in stages by the enterprise and fully borne by the final purchaser.
- (ii) The second group concerns all other taxes and duties linked to products which are either: (1) linked to turnover and not deductible, or (2) taxes on products not linked to turnover. Included here are taxes and duties on imports and taxes on the production, export, sale, transfer, leasing or delivery of goods and services or as a result of their use for own consumption or own capital formation.
- (iii) The third group concerns taxes and duties linked to production. These are compulsory, unrequited payments, in cash or in kind which are levied by general government, or by the institutions of the European Union, in respect of the production and importation of goods and services, the employment of labour, the ownership or use of land, buildings or other assets used in production irrespective of the quantity or the value of goods and services produced or sold.

The theoretical formula for an index of production (Q) is a Laspeyres-type volume index, i.e.

$$Q_t^L = \frac{\sum_{i=1}^N p_{i,0} \times q_{i,t} - \sum_{j=1}^{M(t)} \alpha_{j,0} \times \delta_{j,t}}{\sum_{i=1}^N p_{i,0} \times q_{i,0} - \sum_{j=1}^{M(0)} \alpha_{j,0} \times \delta_{j,0}}$$

with	q = output quantity
	p = output price
	α = input material prices
	δ = input material quantities
	i = one of N commodities
	j = one of M input materials
	0 = base period
	t = current period

⁽¹⁾ The common understanding of the term 'production index' as an 'evolution of value added' contradicts the definition of 'production' in the framework of national accounts or structural business statistics, but nonetheless is the correct term traditionally used in this area of business statistics. The term 'value added index' is never used in practice. As the index follows the evolution of production at constant prices, sometimes the term 'production volume index' is used. The term production index is always used in this text as a quantity index, in other words at constant prices.

⁽²⁾ National accounts have introduced the concept of 'value added at basic prices'. In comparison to value added at factor costs, it includes taxes linked to production, but operating subsidies on production are excluded. The alignment with the national accounts may introduce some advantages, so Member States may use the concept of value added at basic prices as a proxy for value added at factor costs.

The data necessary for the compilation of such an index are, however, not available on a monthly basis. In practice, suitable proxy values for the continuation of the indices are:

- continuation with gross production values (deflated),
- continuation with volumes,
- continuation with turnover (deflated),
- continuation with work input,
- continuation with raw material input,
- continuation with energy input.

Dependent on the approximation method used, the index of production should take account of:

- variations in type and quality of the commodities and of the input materials,
- changes in stocks of finished goods and work in progress on goods and services,
- changes in technical input-output relations (processing techniques),
- services related to the achievement of value added, such as the assembling of production units, mounting, installations, repairs, planning, engineering, creation of software.

Variable 115: Production of building construction

Variable 116: Production of civil engineering

The objectives and characteristics of indices for variable 110 (production) also apply to the indices for the variables on building construction and civil engineering.

The division of production between building construction and civil engineering is based on the classification of types of construction (CC). These indices aim to show the evolution of value added for each of the two main sections in construction, namely buildings and civil engineering works. These indices are calculated by assigning the basic information (deflated output, hours worked, authorisations/permits) to products in the CC and then aggregating the product indices in accordance with the CC to the section level.

Variable 120: Turnover

It is the objective of the turnover index to show the evolution of the market for goods and services.

Turnover⁽¹⁾ comprises the totals invoiced by the observation unit during the reference period, and this corresponds to market sales of goods or services supplied to third parties.

Turnover includes all duties and taxes on the goods or services invoiced by the unit with the exception of the VAT invoiced by the unit vis-a-vis its customer and other similar deductible taxes directly linked to turnover.

Turnover also includes all other charges (transport, packaging, etc.) passed on to the customer, even if these charges are listed separately in the invoice.

Reduction in prices, rebates and discounts as well as the value of returned packing must be deducted. Price reductions, rebates and bonuses conceded later to clients, for example at the end of the year, are not taken into account.

Income classified as other operating income, financial income and extraordinary income in company accounts is excluded from turnover. Subsidies received from public authorities or the institutions of the European Union are also excluded.

According to this definition, the items generally included are:

- sales of manufactured products,
- sales of products manufactured by subcontractors,
- sales of goods purchased for resale in the same condition as received,
- invoiced services provided,
- sales of by-products,
- invoiced charges for packaging and transport,

⁽¹⁾ The expressions 'turnover', 'sales', 'deliveries' and 'shipments' are often used as synonyms in the context of short-term statistics.

- invoiced hours worked to third parties for labour only subcontracting,
- invoiced mounting, installations and repairs,
- invoiced instalments (stage payments),
- invoiced development of software and software licences,
- sales of supplied electric power, gas, heat, steam and water,
- sales of waste and scrap materials.

Subject to the treatment of income classified as other operating income, financial income and extraordinary income in company accounts ⁽¹⁾, the items generally excluded are:

- commissions,
- leases and rentals,
- leases for own production units and machines if used by third parties,
- leases of company-owned dwellings,
- receipts for licence-fees,
- receipts from staff facilities (for example from a factory canteen),
- the supply of products and services within the observation unit,
- sales of own land and fixed assets,
- sales or leases of own properties,
- sales of shares,
- interest receipts and dividends,
- subsidies,
- other extraordinary income.

The above items may be included if they generate turnover in the principle field of operation of the observation unit.

Variable 121: Domestic turnover

Variable 122: Non-domestic turnover

The objectives and characteristics of indices for variable 120 (turnover) also apply to the indices for the distinction between domestic and non-domestic turnover.

The indices of domestic and non-domestic turnover require turnover to be split according to the first destination of the product based on the change of ownership (whether or not there are also corresponding physical movements of goods across frontiers). The destination is determined by the residency of the third party that purchased the goods and services. The domestic market is defined as third parties resident in the same national territory as the observation unit.

Variable 123: Volume of sales

The volume of sales represents the value of turnover in constant prices and as such is a quantity index. It can be calculated as turnover at current prices, deflated by the deflator of sales, or as a quantity index derived directly from the quantity of goods sold.

The information on the volume of sales (variable 123) can be used instead of the deflator of sales (variable 330) in Annex C (retail trade and repair) of Regulation (EC) No 1165/98.

Variable 130: New orders received

It is the objective of the new orders received index to show the development of demand for products and services as an indication of future production. It is also suitable to indicate whether the demand originates from the domestic or non-domestic market.

An order is defined as the value of the contract linking a producer and a third party in respect of the provision by the producer of goods and services. The order is accepted if, in the producer's judgement, there is sufficient evidence for a valid agreement.

New orders refer to goods and services to be provided by the observation unit, including those originating from sub-contractors.

The following items should be deducted from the value of orders:

- VAT and other similar deductible taxes directly linked to turnover,
- reduction in prices, rebates and discounts when they are given at the moment of order as well as the value of packing that is expected to be returned after the delivery,
- subsidies received from public authorities or the institutions of the European Union.

⁽¹⁾ National accounting rules should be used as guiding principles of what to include and to exclude.

Orders of previous periods that have been cancelled during the observation period are not to be deducted from the new orders received nor is the index for previous periods revised due to cancellations.

New orders include all duties and taxes on the goods or services that will be invoiced by the unit with the exception of the VAT and other similar deductible taxes directly linked to turnover.

The value of new orders also includes all other charges (transport, packaging, etc.) passed on to the customer, even if these charges will be listed separately in the invoice.

Variable 131: Domestic new orders

Variable 132: Non-domestic new orders

The objectives and characteristics of indices for variable 130 (new orders received) also apply to the indices for the distinction between domestic and non-domestic new orders.

The indices of domestic and non-domestic new orders received require the new orders received to be split according to the origin of the order based on the change of ownership. The origin is determined by the residency of the third party that has made the order. The domestic market is defined as third parties resident in the same economic territory (see definition of economic territory at the end of this annex) as the observation unit.

Variable 135: New orders for building construction

Variable 136: New orders received for civil engineering

The objectives and characteristics of indices for variable 130 (new orders received) also apply to the indices for the variables on new orders received for building construction and civil engineering.

The division of new orders received between building construction and civil engineering is based on the classification of types of construction (CC). These indices aim to show the future production possibilities for each of the two main sections in construction namely buildings and civil engineering works. These indices are calculated by assigning basic information on orders to products in the CC and then aggregating the product indices in accordance with the CC to the section level.

Variable 210: Number of persons employed

It is the objective of the index of number of persons employed to show the development of employment in industry, construction and services.

The number of persons employed is defined as the total number of persons who work in the observation unit (inclusive of working proprietors, partners working regularly in the unit and unpaid family workers), as well as persons who work outside the unit who belong to it and are paid by it (e.g. sales representatives, delivery personnel, repair and maintenance teams). It includes persons absent for a short period (e.g. sick leave, paid leave or special leave), and also those on strike, but not those absent for an indefinite period. It also includes part-time workers who are regarded as such under the laws of the country concerned and who are on the payroll, as well as seasonal workers, apprentices and home workers on the payroll.

The number of persons employed excludes manpower supplied to the unit by other enterprises, persons carrying out repair and maintenance work in the observation unit on behalf of other enterprises, as well as those on compulsory military service.

Unpaid family workers refer to persons who live with the proprietor of the unit and work regularly for the unit, but do not have a contract of service and do not receive a fixed sum for the work they perform. This is limited to those persons who are not included on the payroll of another unit as their principal occupation.

According to this definition, the groups included are:

- all paid employees, including the following categories as long as they are included on the payroll:
 - homeworkers,
 - apprentices/trainees,
 - paid working proprietors and paid family workers,
 - persons on temporary leave (maternity, sickness leave, strike, lock-out, etc.) for a definite period,
 - part time workers,
 - temporary workers,
 - seasonal workers,

- unpaid persons employed:
 - unpaid working proprietors (owners),
 - unpaid family workers ⁽¹⁾.

The groups excluded are:

- agency workers (except for the activity in which such employment agencies are classified),
- persons on indefinite leave (e.g. long term sickness, military service or social service),
- persons carrying out repair or maintenance work on behalf of other observation units and other staff borrowed from other observation units,
- family workers included on the payroll of another unit as their principal occupation.

The number of persons employed should be determined as a representative figure for the reference period.

Variable 211: Number of employees

The number of employees is used as a temporary approximation of the number of persons employed.

The number of employees is defined as those persons who work for an employer and who have a contract of employment and receive compensation in the form of wages, salaries, fees, gratuities, piecework pay or remuneration in kind.

The relationship of employer to employee exists when there is an agreement, which may be formal or informal, between an enterprise and a person, normally entered into voluntarily by both parties, whereby the person works for the enterprise in return for remuneration in cash or in kind.

A worker is considered to be a wage or salary earner of a particular unit if he or she receives a wage or salary from the unit regardless of where the work is done (in or outside the production unit). A worker from a temporary employment agency is considered to be an employee of the temporary employment agency and not of the unit (customer) in which they work.

According to this definition, the groups included are:

- paid working proprietors,
- students who have a formal commitment whereby they contribute to the unit's process of production in return for remuneration and/or education services,
- employees engaged under a contract specifically designed to encourage the recruitment of unemployed persons,
- homeworkers if there is an explicit agreement that the homeworker is remunerated on the basis of the work done and they are included on the payroll.

The number of employees includes part-time workers, seasonal workers, persons on strike or on short-term leave, but excludes persons on long-term leave.

The number of employees does not include voluntary workers.

The number of employees should be determined as a representative figure for the reference period.

Variable 220: Hours worked

It is the objective of the hours worked index to show the development in the volume of work done.

The total number of hours worked by employees represents the aggregate number of hours actually worked for the output of the observation unit during the reference period.

This variable excludes hours paid but not actually worked such as for annual leave, holidays and sickness leave. It also excludes meal breaks and commuting between home and work.

Included are hours actually worked during normal working hours; hours worked in addition to those; time which is spent at the place of work on tasks such as preparing the site and time corresponding to short periods of rest at the work place.

If the exact number of hours actually worked is not known, it may be estimated on the basis of the theoretical number of working hours and the average rate of absences (sickness, maternity, etc.).

⁽¹⁾ The unpaid family workers have been added as a matter of principle although accurate figures may be difficult to obtain.

According to this definition, the items included are:

- the total amount of all hours actually worked:
 - during regular working hours,
 - overtime, whether paid or unpaid ⁽¹⁾,
 - during nights, Sundays or public holidays,
- the time spent on tasks such as work preparation, preparing, maintaining and cleaning tools and machines and writing up work cards and reports,
- time spent at the place of work during which no work is done owing to, for example, machine stoppages, accidents or occasional lack of work but for which payment is made in accordance with the employment contract,
- short rest periods at the place of work, including tea and coffee breaks.

The items excluded are:

- hours paid but not worked due to leave, sickness, accidents, strikes, lock outs, slack time, etc.,
- time spent for meal breaks,
- commuting between home and work.

Variable 230: Wages and salaries

It is the objective of the wages and salaries index to approximate the development of the wage and salaries bill.

Wages and salaries are defined as the total remuneration, in cash or in kind, payable to all persons counted on the payroll (including homeworkers), in return for work done during the accounting period, regardless of whether it is paid on the basis of working time, output or piecework and whether it is paid regularly.

Wages and salaries include the values of any social contributions, income taxes, etc. payable by the employee even if they are actually withheld by the employer and paid directly to social insurance schemes, tax authorities, etc. on behalf of the employee. Wages and salaries do not include social contributions payable by the employer.

Wages and salaries include: all gratuities, bonuses, ex gratia payments, 13th month payments, severance payments, lodging, transport, cost-of living, and family allowances, tips, commission, attendance fees, etc. received by employees, as well as taxes, social security contributions and other amounts payable by employees and withheld at source by the employer.

Payments for agency workers are not included in wages and salaries.

According to this definition, the items included are:

- all basic wages and salaries payable at regular intervals,
- enhanced rates of pay for overtime, nightshift, weekend work, etc.,
- any allowances, gratuities or bonuses paid by the employer, such as:
 - cost of living, housing, local or expatriation allowances,
 - food allowances,
 - allowances for travelling to and from work,
 - holiday bonuses, 13th month pay,
 - allowances actually paid for annual holidays not taken,
 - output, production or productivity bonuses,
 - extra allowances for extreme working conditions like dust, dirt, temperature, smoke, danger, etc.,
 - redundancy payments actually paid to laid-off employees,
 - allowances for improvement proposals and patent fees paid to the person employed,
 - directors' and employees' fees,
 - family allowances paid by the employer under a collective agreement,
- commissions,
- value of bonus shares distributed free to the employees,
- payments made by employers to employees under saving schemes or other schemes,
- taxes, contributions and other sums payable by employees and deducted by employers,
- any payment in kind.

⁽¹⁾ Unpaid overtime work is difficult to obtain in various Member States but is, nevertheless, included as a matter of principle.

The items excluded are:

- statutory social contributions payable by the employer,
- collectively agreed, contractual and voluntary social contributions payable by the employer,
- imputed social contributions (social benefits paid directly by the employer),
- allowances paid to employees for the purchase of tools, equipment and special clothing needed for their work or that part of their wages and salaries which under their contracts of employment are required to devote such purchases,
- taxes paid by the employer on the total wages and salaries paid,
- reimbursement of employees for travelling, removal, separation, hotel and entertaining expenses, telephone fees etc. incurred in the course of their duties,
- expenditure for vocational training (training costs), excluding apprentices wages and salaries,
- wages and salaries which the employer continues to pay in the event of illness, occupational accident, maternity leave or short-time working,
- other labour cost expenditure payable by the employer:
 - recruitment costs,
 - social expenditure such as the reimbursement of current expenditure on the transport of employees to and from work, whether this is carried out by the enterprises' own means of transport or by third parties on behalf of the enterprise, payments to trade union funds,
- stock options ⁽¹⁾.

For the evaluation of payments in kind the following rule applies: payments in kind produced by the employer should be valued at producer prices; payments in kind bought by the employer should be valued at market prices.

Variable 310: Output prices

It is the objective of the output price index to measure the monthly development of transaction prices of economic activities.

The domestic output price index for an economic activity measures the average price development of all goods and related services resulting from that activity and sold on the domestic market. The non-domestic price index shows the average price development (converted to local currency) of all goods and related services resulting from that activity and sold outside the domestic market. When combined, these two indices show the average price development of all goods and related services resulting from an activity.

It is essential that all price-determining characteristics of the products are taken into account, including quantity of units sold, transport provided, rebates, service conditions, guarantee conditions and destination. The specification must be such that in subsequent reference periods, the observation unit is able uniquely to identify the product and to provide the appropriate price per unit.

The following rules apply for the definition of prices:

- the appropriate price is the ex-factory ⁽²⁾ price that includes all duties and taxes on the goods on services invoiced by the unit but excludes VAT invoiced by the unit vis-a-vis its customer and similar deductible taxes directly linked to turnover,
- if transport costs are included, this should be part of the product specification,
- in order to show the true evolution of price movements, it should be an actual transaction price, and not a list price,
- the output price index should take into account quality changes in products,
- the price collected in period t should refer to orders booked during period t (moment of order), not the moment when the commodities leave the factory gates,
- for output prices of the non-domestic market, the price should be calculated at national frontiers, fob (free on board).

The collected price information refers preferably to a particular day in the middle of the reference period. If no price information is available for the day in question, the price may represent an average over the whole period.

Output price indices for construction can be used as an approximation for the construction cost variables. They measure the evolution of residential buildings excluding residences for communities, non-residential buildings, land prices and architect's and other fees. They reflect the prices paid by the client to the construction company. They therefore do not only reflect the variations in the cost factors of construction, but also the changes in productivity and profit margins. In addition, a temporal difference exists between the output price and the corresponding costs of production.

⁽¹⁾ Stock options have been excluded mainly for practical reasons linked to the difficulties of a harmonised definition and data collection although it is often considered as a compensation for work linked to the overall performance of the company.

⁽²⁾ Or equivalent for activities outside of manufacturing.

Variable 311: Output prices of the domestic market**Variable 312: Output prices of the non-domestic market**

The objectives and characteristics of indices for variable 310 (output prices) also apply to the indices for the distinction between domestic and non-domestic output prices.

The indices of domestic and non-domestic prices require separate output price indices to be compiled according to the destination of the product. The destination is determined by the residency of the third party that has ordered or purchased the product. The domestic market is defined as third parties resident in the same national territory as the observation unit.

Variable 313: Unit value index

The unit value index may be used as an approximation for non-domestic output prices.

For the purpose of this index, unit values are calculated as the value of sales of a product divided by the quantity sold derived from foreign trade data. This unit value is then treated as the average price of the product and the index calculated in the same way as for the traditional output price indices.

Variable 320: Construction costs

It is the objective of the construction cost index to show the evolution of costs incurred by the contractor to carry out the construction process.

The component costs index (material costs and labour costs) shows the price developments of production factors used in the construction industry.

The construction cost index is calculated as:

$$I = \sum_{i=1}^n (w_i^M * M_i + w_i^L * L_i + \dots)$$

with	I	= Construction index
	M_i	= Material costs index
	L_i	= Labor costs index
	w_i^M	= weight for materials
	w_i^L	= weight for labour costs

Costs that constitute components of the construction costs are also plant and equipment, transport, energy and other costs.

Architect's fees are not part of the construction costs.

Variable 321: Material costs

The material costs index is generally calculated using material prices. Prices of materials should be based on actual prices rather than list prices. Prices should be based on a sample of products and suppliers. Prices are valued excluding VAT.

Variable 322: Labour costs

The labour cost index should cover wages and salaries and social security charges for all persons employed. Social security charges include: (i) statutory social contributions payable by the employer, (ii) collectively agreed, contractual and voluntary social contributions payable by the employer and (iii) imputed social contributions (social benefits paid directly by the employer).

Variable 411: Building permits: number of dwellings

It is the objective of the number of dwellings building permit index to show the future development of construction activity in terms of unit numbers.

A building permit is an authorisation to start work on a building project. As such, a permit is the final stage of planning and building authorisations from public authorities, prior to the start of work.

An index based on these permits should provide a good indication of the workload for the building industry in the near future, although this may not be the case when a large proportion of permits are not used or when there is a long time lag between permits and building starts.

Indices of the number of permits are compiled for one-dwelling residential buildings and residential buildings with two and more dwellings. A dwelling is a room or suite of rooms and its accessories in a permanent building or structurally separated part thereof which by the way it has been built, rebuilt, converted and so on, is intended for private habitation. It should have separate access to a street (direct or via a garden or grounds) or to a common space within the building (staircase, passage, gallery, and so on). Detached rooms for habitation which are clearly to be used as a part of the dwelling should be counted as part of the dwelling. A dwelling may thus be constituted of separate buildings within the same enclosure, provided they are clearly intended for habitation by the same private household.

Variable 412: Building permits: square metres of useful floor area or alternative size measure

It is the objective of the useful floor area building permit index to show the future development of construction activity in terms of volume.

A building permit is an authorisation to start work on a building project. As such a permit is the final stage of planning and building authorisations from public authorities, prior to the start of work.

An index based on these permits should provide a good indication of the workload for the building industry in the near future, although this may not be the case when a large proportion of permits are not used or when there is a long time lag between permits and building starts.

This index is compiled from the square metre of useful floor area of buildings for which permits have been granted. The useful floor area of a building⁽¹⁾ is measured within its external walls, excluding:

- construction areas (e.g. areas of demarcation components, supports, columns, pillars, shafts, chimneys),
- functional areas for ancillary use (e.g. areas occupied by heating and air-conditioning installations, or by power generators),
- thoroughfares (e.g. areas of stairwells, lifts, escalators).

The part of the overall useful area of a building used for residential purposes includes the area used for kitchens, living rooms, bedrooms and ancillary rooms, cellars and common rooms used by the owners of the residential units.

Other measures may be used as long as they are unambiguously and consistently used by the Member States as allowed by Annex B(c)(1) to Regulation (EC) No 1165/98.

Regulation (EC) No 1165/98 refers to the CC classification in requesting data about building permits for different categories of buildings. The category 'other buildings' of Regulation (EC) No 1165/98 includes the following categories in the CC classification:

- hotels and similar buildings,
- wholesale and retail trade buildings,
- traffic and communication buildings,
- industrial buildings and warehouses,
- public entertainment, education, hospital or institutional care buildings,
- other non-residential buildings.

Variable 330: Deflator of sales

It is the objective of the deflator of sales to adjust turnover for the impact of price changes.

The deflator of sales in retail trade is a deflator not of the service provided but of the goods sold.

The prices used to calculate the deflator for an activity are calculated as a weighted average of the relevant goods price indices for that activity. It is essential that all price-determining characteristics of the products are taken into account, including quantity of units sold, transport provided, rebates, guarantee conditions and destination.

The specification must be such that in subsequent reference periods, the observation unit is able uniquely to identify the good and to provide the appropriate price per unit.

In order to show the true evolution of price movements, it should be an actual transaction price, and not a list price.

The collected price information refers preferably to a specific date during the month.

⁽¹⁾ The definition of useful floor area is aligned with the Classification of Types of Construction which itself refers to the Statistical Standards and Studies, No 40 United Nations, New York 1987, and Statistical Standards and Studies, No 43 United Nations, New York 1994.

Definition of economic territory

The economic territory includes the following items:

- the geographic territory administered by a national government within which persons, goods, services and capital move freely,
- any free zones, including bonded warehouses and factories under customs control,
- the national airspace, territorial waters and the continental shelf lying in international waters, over which the country enjoys exclusive rights,
- territorial enclaves, i.e. geographic territories situated in the rest of the world and used, under international treaties or agreements between States, by general government agencies of the country (embassies, consulates, military bases, scientific bases, etc.),
- deposits of oil, natural gas, etc. in international waters outside the continental shelf of the country, worked by units resident in the territory as previously defined.

The economic territory excludes the following items:

- extraterritorial enclaves (i.e. the parts of the country's own geographic territory used by general government agencies of other countries, by the institutions of the European Union or by international organisations under international treaties or agreements between States).

This definition follows the European System of Accounts (ESA) 1995, paragraphs 2.05-2.06.

The difference between domestic and non-domestic markets is to be interpreted for the purpose of short-term statistics according to the territory of the Member States. This definition may be revised in the future in order to take specific account of European and/or monetary integration in line with other relevant regulations.

16.4 Classifications

16.4.1 NACE Rev.1

	Description
A	Agriculture, hunting and forestry
01	Agriculture, hunting and related service activities
01.1	Growing of crops; market gardening; horticulture
01.11	Growing of cereals and other crops n.e.c.
01.12	Growing of vegetables, horticultural specialities and nursery products
01.13	Growing of fruit, nuts, beverage and spice crops
01.2	Farming of animals
01.21	Farming of cattle, dairy farming
01.22	Farming of sheep, goats, horses, asses, mules and hinnies
01.23	Farming of swine
01.24	Farming of poultry
01.25	Other farming of animals
01.3	Growing of crops combined with farming of animals (mixed farming)
01.30	Growing of crops combined with farming of animals (mixed farming)
01.4	Agricultural and animal husbandry service activities, except veterinary activities
01.41	Agricultural service activities
01.42	Animal husbandry service activities, except veterinary activities
01.5	Hunting, trapping and game propagation including related service activities
01.50	Hunting, trapping and game propagation including related service activities
02	Forestry, logging and related service activities
02.0	Forestry, logging and related service activities
02.01	Forestry and logging
02.02	Forestry and logging related service activities
B	Fishing
05	Fishing, operation of fish hatcheries and fish farms; service activities incidental to fishing
05.0	Fishing, operation of fish hatcheries and fish farms; service activities incidental to fishing
05.01	Fishing
05.02	Operation of fish hatcheries and fish farms
C	Mining and quarrying
CA	Mining and quarrying of energy producing materials
10	Mining of coal and lignite; extraction of peat
10.1	Mining and agglomeration of hard coal
10.10	Mining and agglomeration of hard coal
10.2	Mining and agglomeration of lignite
10.20	Mining and agglomeration of lignite
10.3	Extraction and agglomeration of peat
10.30	Extraction and agglomeration of peat
11	Extraction of crude petroleum and natural gas; service activities incidental to oil and gas extraction excluding surveying
11.1	Extraction of crude petroleum and natural gas
11.10	Extraction of crude petroleum and natural gas
11.2	Service activities incidental to oil and gas extraction excluding surveying
11.20	Service activities incidental to oil and gas extraction excluding surveying
12	Mining of uranium and thorium ores
12.0	Mining of uranium and thorium ores
12.00	Mining of uranium and thorium ores
CB	Mining and quarrying except energy producing materials
13	Mining of metal ores
13.1	Mining of iron ores
13.10	Mining of iron ores
13.2	Mining of non-ferrous metal ores, except uranium and thorium ores
13.20	Mining of non-ferrous metal ores, except uranium and thorium ores
14	Other mining and quarrying
14.1	Quarrying of stone
14.11	Quarrying of stone for construction
14.12	Quarrying of limestone, gypsum and chalk
14.13	Quarrying of slate
14.2	Quarrying of sand and clay
14.21	Operation of gravel and sand pits
14.22	Mining of clays and kaolin
14.3	Mining of chemical and fertilizer minerals
14.30	Mining of chemical and fertilizer minerals
14.4	Production of salt
14.40	Production of salt
14.5	Other mining and quarrying n.e.c.
14.50	Other mining and quarrying n.e.c.

	<i>Description</i>
D	Manufacturing
DA	Manufacture of food products; beverages and tobacco
15	Manufacture of food products and beverages
15.1	Production, processing, preserving of meat, meat products
15.11	Production and preserving of meat
15.12	Production and preserving of poultrymeat
15.13	Production of meat and poultrymeat products
15.2	Processing and preserving of fish and fish products
15.20	Processing and preserving of fish and fish products
15.3	Processing and preserving of fruit and vegetables
15.31	Processing and preserving of potatoes
15.32	Manufacture of fruit and vegetable juice
15.33	Processing and preserving of fruit and vegetables n.e.c.
15.4	Manufacture of vegetable and animal oils and fats
15.41	Manufacture of crude oils and fats
15.42	Manufacture of refined oils and fats
15.43	Manufacture of margarine and similar edible fats
15.5	Manufacture of dairy products
15.51	Operation of dairies and cheese making
15.52	Manufacture of ice cream
15.6	Manufacture of grain mill products, starches and starch products
15.61	Manufacture of grain mill products
15.62	Manufacture of starches and starch products
15.7	Manufacture of prepared animal feeds
15.71	Manufacture of prepared feeds for farm animals
15.72	Manufacture of prepared pet foods
15.8	Manufacture of other food products
15.81	Manufacture of bread; manufacture of fresh pastry goods and cakes
15.82	Manufacture of rusks and biscuits; manufacture of preserved pastry goods and cakes
15.83	Manufacture of sugar
15.84	Manufacture of cocoa; chocolate and sugar confectionery
15.85	Manufacture of macaroni, noodles, couscous and similar farinaceous products
15.86	Processing of tea and coffee
15.87	Manufacture of condiments and seasonings
15.88	Manufacture of homogenized food preparations and dietetic food
15.89	Manufacture of other food products n.e.c.
15.9	Manufacture of beverages
15.91	Manufacture of distilled potable alcoholic beverages
15.92	Production of ethyl alcohol from fermented materials
15.93	Manufacture of wines
15.94	Manufacture of cider and other fruit wines
15.95	Manufacture of other non-distilled fermented beverages
15.96	Manufacture of beer
15.97	Manufacture of malt
15.98	Production of mineral waters and soft drinks
16	Manufacture of tobacco products
16.0	Manufacture of tobacco products
16.00	Manufacture of tobacco products
DB	Manufacture of textiles and textile products
17	Manufacture of textiles
17.1	Preparation and spinning of textile fibres
17.11	Preparation and spinning of cotton-type fibres
17.12	Preparation and spinning of woollen-type fibres
17.13	Preparation and spinning of worsted-type fibres
17.14	Preparation and spinning of flax-type fibres
17.15	Throwing and preparation of silk, including from noils, and throwing and texturing of synthetic or artificial filament yarns
17.16	Manufacture of sewing threads
17.17	Preparation and spinning of other textile fibres
17.2	Textile weaving
17.21	Cotton-type weaving
17.22	Woollen-type weaving
17.23	Worsted-type weaving
17.24	Silk-type weaving
17.25	Other textile weaving
17.3	Finishing of textiles
17.30	Finishing of textiles
17.4	Manufacture of made-up textile articles, except apparel
17.40	Manufacture of made-up textile articles, except apparel
17.5	Manufacture of other textiles
17.51	Manufacture of carpets and rugs
17.52	Manufacture of cordage, rope, twine and netting

	<i>Description</i>
17.53	Manufacture of non-wovens and articles made from non-wovens, except apparel
17.54	Manufacture of other textiles n.e.c.
17.6	Manufacture of knitted and crocheted fabrics
17.60	Manufacture of knitted and crocheted fabrics
17.7	Manufacture of knitted and crocheted articles
17.71	Manufacture of knitted and crocheted hosiery
17.72	Manufacture of knitted and crocheted pullovers, cardigans and similar articles
18	Manufacture of wearing apparel; dressing; dyeing of fur
18.1	Manufacture of leather clothes
18.10	Manufacture of leather clothes
18.2	Manufacture of other wearing apparel and accessories
18.21	Manufacture of workwear
18.22	Manufacture of other outerwear
18.23	Manufacture of underwear
18.24	Manufacture of other wearing apparel and accessories n.e.c.
18.3	Dressing and dyeing of fur; manufacture of articles of fur
18.30	Dressing and dyeing of fur; manufacture of articles of fur
DC	Manufacture of leather and leather products
19	Tanning, dressing of leather; manufacture of luggage
19.1	Tanning and dressing of leather
19.10	Tanning and dressing of leather
19.2	Manufacture of luggage, handbags and the like, saddler
19.20	Manufacture of luggage, handbags and the like, saddler
19.3	Manufacture of footwear
19.30	Manufacture of footwear
DD	Manufacture of wood and wood products
20	Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials
20.1	Sawmilling and planing of wood, impregnation of wood
20.10	Sawmilling and planing of wood, impregnation of wood
20.2	Manufacture of veneer sheets; manufacture of plywood, laminboard, particle board, fibre board and other panels and boards
20.20	Manufacture of veneer sheets; manufacture of plywood, laminboard, particle board, fibre board and other panels and boards
20.3	Manufacture of builders' carpentry and joinery
20.30	Manufacture of builders' carpentry and joinery
20.4	Manufacture of wooden containers
20.40	Manufacture of wooden containers
20.5	Manufacture of other products of wood; manufacture of articles of cork, straw and plaiting materials
20.51	Manufacture of other products of wood
20.52	Manufacture of articles of cork, straw and plaiting materials
DE	Manufacture of pulp, paper and paper products; publishing and printing
21	Manufacture of pulp, paper and paper products
21.1	Manufacture of pulp, paper and paperboard
21.11	Manufacture of pulp
21.12	Manufacture of paper and paperboard
21.2	Manufacture of articles of paper and paperboard
21.21	Manufacture of corrugated paper and paperboard and of containers of paper and paperboard
21.22	Manufacture of household and sanitary goods and of toilet requisites
21.23	Manufacture of paper stationery
21.24	Manufacture of wallpaper
21.25	Manufacture of other articles of paper and paperboard n.e.c.
22	Publishing, printing, reproduction of recorded media
22.1	Publishing
22.11	Publishing of books
22.12	Publishing of newspapers
22.13	Publishing of journals and periodicals
22.14	Publishing of sound recordings
22.15	Other publishing
22.2	Printing and service activities related to printing
22.21	Printing of newspapers
22.22	Printing n.e.c.
22.23	Bookbinding and finishing
22.24	Composition and plate-making
22.25	Other activities related to printing
22.3	Reproduction of recorded media
22.31	Reproduction of sound recording
22.32	Reproduction of video recording
22.33	Reproduction of computer media
DF	Manufacture of coke, refined petroleum products and nuclear fuel
23	Manufacture of coke, refined petroleum products and nuclear fuel
23.1	Manufacture of coke oven products
23.10	Manufacture of coke oven products
23.2	Manufacture of refined petroleum products

	<i>Description</i>
23.20	Manufacture of refined petroleum products
23.3	Processing of nuclear fuel
23.30	Processing of nuclear fuel
DG	Manufacture of chemicals, chemical products and man-made fibres
24	Manufacture of chemicals and chemical products
24.1	Manufacture of basic chemicals
24.11	Manufacture of industrial gases
24.12	Manufacture of dyes and pigments
24.13	Manufacture of other inorganic basic chemicals
24.14	Manufacture of other organic basic chemicals
24.15	Manufacture of fertilizers and nitrogen compounds
24.16	Manufacture of plastics in primary forms
24.17	Manufacture of synthetic rubber in primary forms
24.2	Manufacture of pesticides and other agro-chemical products
24.20	Manufacture of pesticides and other agro-chemical products
24.3	Manufacture of paints, varnishes and similar coatings, printing ink and mastics
24.30	Manufacture of paints, varnishes and similar coatings, printing ink and mastics
24.4	Manufacture of pharmaceuticals, medicinal chemicals and botanical products
24.41	Manufacture of basic pharmaceutical products
24.42	Manufacture of pharmaceutical preparations
24.5	Manufacture of soap and detergents, cleaning and polishing preparations, perfumes and toilet preparations
24.51	Manufacture of soap and detergents, cleaning and polishing preparations
24.52	Manufacture of perfumes and toilet preparations
24.6	Manufacture of other chemical products
24.61	Manufacture of explosives
24.62	Manufacture of glues and gelatines
24.63	Manufacture of essential oils
24.64	Manufacture of photographic chemical material
24.65	Manufacture of prepared unrecorded media
24.66	Manufacture of other chemical products n.e.c.
24.7	Manufacture of man-made fibres
24.70	Manufacture of man-made fibres
DH	Manufacture of rubber and plastic products
25	Manufacture of rubber and plastic products
25.1	Manufacture of rubber products
25.11	Manufacture of rubber tyres and tubes
25.12	Retreading and rebuilding of rubber tyres
25.13	Manufacture of other rubber products
25.2	Manufacture of plastic products
25.21	Manufacture of plastic plates, sheets, tubes and profiles
25.22	Manufacture of plastic packing goods
25.23	Manufacture of builders' ware of plastic
25.24	Manufacture of other plastic products
DI	Manufacture of other non-metallic mineral products
26	Manufacture of other non-metallic mineral products
26.1	Manufacture of glass and glass products
26.11	Manufacture of flat glass
26.12	Shaping and processing of flat glass
26.13	Manufacture of hollow glass
26.14	Manufacture of glass fibres
26.15	Manufacture and processing of other glass, including technical glassware
26.2	Manufacture of non-refractory ceramic goods other than for construction purposes; manufacture of refractory ceramic products
26.21	Manufacture of ceramic household and ornamental articles
26.22	Manufacture of ceramic sanitary fixtures
26.23	Manufacture of ceramic insulators and insulating fittings
26.24	Manufacture of other technical ceramic products
26.25	Manufacture of other ceramic products
26.26	Manufacture of refractory ceramic products
26.3	Manufacture of ceramic tiles and flags
26.30	Manufacture of ceramic tiles and flags
26.4	Manufacture of bricks, tiles and construction products
26.40	Manufacture of bricks, tiles and construction products
26.5	Manufacture of cement, lime and plaster
26.51	Manufacture of cement
26.52	Manufacture of lime
26.53	Manufacture of plaster
26.6	Manufacture of articles of concrete, plaster, cement
26.61	Manufacture of concrete products for construction purposes
26.62	Manufacture of plaster products for construction purposes
26.63	Manufacture of ready-mixed concrete
26.64	Manufacture of mortars

	<i>Description</i>
26.65	Manufacture of fibre cement
26.66	Manufacture of other articles of concrete, plaster and cement
26.7	Cutting, shaping and finishing of stone
26.70	Cutting, shaping and finishing of stone
26.8	Manufacture of other non-metallic mineral products
26.81	Production of abrasive products
26.82	Manufacture of other non-metallic mineral products n.e.c.
DJ	Manufacture of basic metals and fabricated metal products
27	Manufacture of basic metals
27.1	Manufacture of basic iron and steel and of ferro-alloys (ECSC)
27.10	Manufacture of basic iron and steel and of ferro-alloys (ECSC)
27.2	Manufacture of tubes
27.21	Manufacture of cast iron tubes
27.22	Manufacture of steel tubes
27.3	Other first processing of iron and steel and production of non-ECSC ferro-alloys
27.31	Cold drawing
27.32	Cold rolling of narrow strip
27.33	Cold forming or folding
27.34	Wire drawing
27.35	Other first processing of iron and steel n.e.c.; production of non-ECSC20 ferro-alloys
27.4	Manufacture of basic precious and non-ferrous metals
27.41	Precious metals production
27.42	Aluminium production
27.43	Lead, zinc and tin production
27.44	Copper production
27.45	Other non-ferrous metal production
27.5	Casting of metals
27.51	Casting of iron
27.52	Casting of steel
27.53	Casting of light metals
27.54	Casting of other non-ferrous metals
28	Manufacture of fabricated metal products, except machinery and equipment
28.1	Manufacture of structural metal products
28.11	Manufacture of metal structures and parts of structures
28.12	Manufacture of builders' carpentry and joinery of metal
28.2	Manufacture of tanks, reservoirs and containers of metal; manufacture of central heating radiators and boilers
28.21	Manufacture of tanks, reservoirs and containers of metal
28.22	Manufacture of central heating radiators and boilers
28.3	Manufacture of steam generators, except central heating hot water boilers
28.30	Manufacture of steam generators, except central heating hot water boilers
28.4	Forging, pressing, stamping and roll forming of metal; powder metallurgy
28.40	Forging, pressing, stamping and roll forming of metal; powder metallurgy
28.5	Treatment and coating of metals; general mechanical engineering
28.51	Treatment and coating of metals
28.52	General mechanical engineering
28.6	Manufacture of cutlery, tools and general hardware
28.61	Manufacture of cutlery
28.62	Manufacture of tools
28.63	Manufacture of locks and hinges
28.7	Manufacture of other fabricated metal products
28.71	Manufacture of steel drums and similar containers
28.72	Manufacture of light metal packaging
28.73	Manufacture of wire products
28.74	Manufacture of fasteners, screw machine products, chain and springs
28.75	Manufacture of other fabricated metal products n.e.c.
DK	Manufacture of machinery and equipment n.e.c.
29	Manufacture of machinery and equipment n.e.c.
29.1	Manufacture of machinery for the production and use of mechanical power, except aircraft, vehicle and cycle engines
29.11	Manufacture of engines and turbines, except aircraft, vehicle and cycle engines
29.12	Manufacture of pumps and compressors
29.13	Manufacture of taps and valves
29.14	Manufacture of bearings, gears, gearing and driving elements
29.2	Manufacture of other general purpose machinery
29.21	Manufacture of furnaces and furnace burners
29.22	Manufacture of lifting and handling equipment
29.23	Manufacture of non-domestic cooling and ventilation equipment
29.24	Manufacture of other general purpose machinery n.e.c.
29.3	Manufacture of agricultural and forestry machinery
29.31	Manufacture of agricultural tractors
29.32	Manufacture of other agricultural and forestry machinery
29.4	Manufacture of machine-tools

	<i>Description</i>
29.40	Manufacture of machine-tools
29.5	Manufacture of other special purpose machinery
29.51	Manufacture of machinery for metallurgy
29.52	Manufacture of machinery for mining, quarrying and construction
29.53	Manufacture of machinery for food, beverage and tobacco processing
29.54	Manufacture of machinery for textile, apparel and leather production
29.55	Manufacture of machinery for paper and paperboard production
29.56	Manufacture of other special purpose machinery n.e.c.
29.6	Manufacture of weapons and ammunition
29.60	Manufacture of weapons and ammunition
29.7	Manufacture of domestic appliances n.e.c.
29.71	Manufacture of electric domestic appliances
29.72	Manufacture of non-electric domestic appliances
DL	Manufacture of electrical and optical equipment
30	Manufacture of office machinery and computers
30.0	Manufacture of office machinery and computers
30.01	Manufacture of office machinery
30.02	Manufacture of computers and other information processing equipment
31	Manufacture of electrical machinery and apparatus n.e.c.
31.1	Manufacture of electric motors, generators and transformers
31.10	Manufacture of electric motors, generators and transformers
31.2	Manufacture of electricity distribution and control apparatus
31.20	Manufacture of electricity distribution and control apparatus
31.3	Manufacture of insulated wire and cable
31.30	Manufacture of insulated wire and cable
31.4	Manufacture of accumulators, primary cells and primary batteries
31.40	Manufacture of accumulators, primary cells and primary batteries
31.5	Manufacture of lighting equipment and electric lamps
31.50	Manufacture of lighting equipment and electric lamps
31.6	Manufacture of electrical equipment n.e.c.
31.61	Manufacture of electrical equipment for engines and vehicles n.e.c.
31.62	Manufacture of other electrical equipment n.e.c.
32	Manufacture of radio, television and communication equipment and apparatus
32.1	Manufacture of electronic valves and tubes and other electronic components
32.10	Manufacture of electronic valves and tubes and other electronic components
32.2	Manufacture of television and radio transmitters and apparatus for line telephony and line telegraphy
32.20	Manufacture of television and radio transmitters and apparatus for line telephony and line telegraphy
32.3	Manufacture of television and radio receivers, sound or video recording or reproducing apparatus and associated goods
32.30	Manufacture of television and radio receivers, sound or video recording or reproducing apparatus and associated goods
33	Manufacture of medical, precision and optical instruments, watches and clocks
33.1	Manufacture of medical and surgical equipment and orthopaedic appliances
33.10	Manufacture of medical and surgical equipment and orthopaedic appliances
33.2	Manufacture of instruments and appliances for measuring, checking, testing, navigating and other purposes, except industrial process control equipment
33.20	Manufacture of instruments and appliances for measuring, checking, testing, navigating and other purposes, except industrial process control equipment
33.3	Manufacture of industrial process control equipment
33.30	Manufacture of industrial process control equipment
33.4	Manufacture of optical instruments and photographic equipment
33.40	Manufacture of optical instruments and photographic equipment
33.5	Manufacture of watches and clocks
33.50	Manufacture of watches and clocks
DM	Manufacture of transport equipment
34	Manufacture of motor vehicles, trailers and semi-trailers
34.1	Manufacture of motor vehicles
34.10	Manufacture of motor vehicles
34.11	Manufacture of motor vehicles for professional use
34.12	Manufacture of motor vehicles for private use
34.2	Manufacture of bodies (coachwork) for motor vehicles; manufacture of trailers and semi-trailers
34.20	Manufacture of bodies (coachwork) for motor vehicles; manufacture of trailers and semi-trailers
34.3	Manufacture of parts, accessories for motor vehicles
34.30	Manufacture of parts, accessories for motor vehicles
35	Manufacture of other transport equipment
35.1	Building and repairing of ships and boats
35.11	Building and repairing of ships
35.12	Building and repairing of pleasure and sporting boats
35.2	Manufacture of railway, tramway locomotives, rolling stock
35.20	Manufacture of railway, tramway locomotives, rolling stock
35.3	Manufacture of aircraft and spacecraft
35.30	Manufacture of aircraft and spacecraft
35.4	Manufacture of motorcycles and bicycles

	<i>Description</i>
35.41	Manufacture of motorcycles
35.42	Manufacture of bicycles
35.43	Manufacture of invalid carriages
35.5	Manufacture of other transport equipment n.e.c.
35.50	Manufacture of other transport equipment n.e.c.
DN	Manufacturing n.e.c.
36	Manufacture of furniture; manufacturing n.e.c.
36.1	Manufacture of furniture
36.11	Manufacture of chairs and seats
36.12	Manufacture of other office and shop furniture
36.13	Manufacture of other kitchen furniture
36.14	Manufacture of other furniture
36.15	Manufacture of mattresses
36.2	Manufacture of jewellery and related articles
36.21	Striking of coins and medals
36.22	Manufacture of jewellery and related articles n.e.c.
36.3	Manufacture of musical instruments
36.30	Manufacture of musical instruments
36.4	Manufacture of sports goods
36.40	Manufacture of sports goods
36.5	Manufacture of games and toys
36.50	Manufacture of games and toys
36.6	Miscellaneous manufacturing n.e.c.
36.61	Manufacture of imitation jewellery
36.62	Manufacture of brooms and brushes
36.63	Other manufacturing n.e.c.
37	Recycling
37.1	Recycling of metal waste and scrap
37.10	Recycling of metal waste and scrap
37.2	Recycling of non-metal waste and scrap
37.20	Recycling of non-metal waste and scrap
E	Electricity, gas and water supply
40	Electricity, gas, steam and hot water supply
40.1	Production and distribution of electricity
40.10	Production and distribution of electricity
40.2	Manufacture of gas; distribution of gaseous fuels through mains
40.20	Manufacture of gas; distribution of gaseous fuels through mains
40.3	Steam and hot water supply
40.30	Steam and hot water supply
41	Collection, purification and distribution of water
41.0	Collection, purification and distribution of water
41.00	Collection, purification and distribution of water
F	Construction
45	Construction
45.1	Site preparation
45.11	Demolition and wrecking of buildings; earth moving
45.12	Test drilling and boring
45.2	Building of complete constructions or parts thereof; civil engineering
45.21	General construction of buildings and civil engineering works
45.22	Erection of roof covering and frames
45.23	Construction of highways, roads, airfields and sport facilities
45.24	Construction of water projects
45.25	Other construction work involving special trades
45.3	Building installation
45.31	Installation of electrical wiring and fittings
45.32	Insulation work activities
45.33	Plumbing
45.34	Other building installation
45.4	Building completion
45.41	Plastering
45.42	Joinery installation
45.43	Floor and wall covering
45.44	Painting and glazing
45.45	Other building completion
45.5	Renting of construction or demolition equipment with operator
45.50	Renting of construction or demolition equipment with operator
G	Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods
50	Sale, maintenance and repair of motor vehicles
50.1	Sale of motor vehicles
50.10	Sale of motor vehicles
50.2	Maintenance and repair of motor vehicles

	<i>Description</i>
50.20	Maintenance and repair of motor vehicles
50.3	Sale of motor vehicle parts and accessories
50.30	Sale of motor vehicle parts and accessories
50.4	Sale, maintenance and repair of motorcycles and related
50.40	Sale, maintenance and repair of motorcycles and related
50.5	Retail sale of automotive fuel
50.50	Retail sale of automotive fuel
51	Wholesale trade and commission trade, except of motor and motorcycles
51.1	Wholesale on a fee or contract basis
51.11	Agents involved in the sale of agricultural raw materials live animals, textile raw materials and semi-finished goods
51.12	Agents involved in the sale of fuels, ores, metals and industrial chemicals
51.13	Agents involved in the sale of timber and building materials
51.14	Agents involved in the sale of machinery, industrial equipment ships and aircraft
51.15	Agents involved in the sale of furniture, household goods, hardware and ironmongery
51.16	Agents involved in the sale of textiles, clothing, footwear and leather goods
51.17	Agents involved in the sale of food, beverages and tobacco
51.18	Agents specializing in the sale of particular products or ranges of products n.e.c.
51.19	Agents involved in the sale of a variety of goods
51.2	Wholesale of agricultural raw materials, live animals
51.21	Wholesale of grain, seeds and animal feeds
51.22	Wholesale of flowers and plants
51.23	Wholesale of live animals
51.24	Wholesale of hides, skins and leather
51.25	Wholesale of unmanufactured tobacco
51.3	Wholesale of food, beverages and tobacco
51.31	Wholesale of fruits and vegetables
51.32	Wholesale of meat and meat products
51.33	Wholesale of dairy produce, eggs and edible oils and fats
51.34	Wholesale of alcoholic and other beverages
51.35	Wholesale of tobacco products
51.36	Wholesale of sugar and chocolate and sugar confectionery
51.37	Wholesale of coffee, tea, cocoa and spices
51.38	Wholesale of other food including fish, crustaceans and molluscs
51.39	Non-specialized wholesale of food beverages and tobacco
51.4	Wholesale of household goods
51.41	Wholesale of textiles
51.42	Wholesale of clothing and footwear
51.43	Wholesale of electrical household appliances and radio and television goods
51.44	Wholesale of china and glassware, wallpaper and cleaning materials
51.45	Wholesale of perfume and cosmetics
51.46	Wholesale of pharmaceutical goods
51.47	Wholesale of other household goods
51.5	Wholesale of non-agricultural intermediate products, waste and scrap
51.51	Wholesale of solid, liquid and gaseous fuels and related products
51.52	Wholesale of metals and metals ores
51.53	Wholesale of wood, construction materials and sanitary equipment
51.54	Wholesale of hardware, plumbing and heating equipment and supplies
51.55	Wholesale of chemical products
51.56	Wholesale of other intermediate products
51.57	Wholesale of waste and scrap
51.6	Wholesale of machinery, equipment and supplies
51.61	Wholesale of machine tools
51.62	Wholesale of construction machinery
51.63	Wholesale of machinery for the textile industry and of sewing and knitting machines
51.64	Wholesale of office machinery and equipment
51.65	Wholesale of other machinery for use in industry, trade and navigation
51.66	Wholesale of agricultural machinery and accessories and implements, including tractors
51.7	Other wholesale
51.70	Other wholesale
52	Retail trade, except of motor vehicles, motorcycles; repair of personal and household goods
52.1	Retail sale in non-specialized stores
52.11	Retail sale in non-specialized stores with food beverages or tobacco predominating
52.12	Other retail sale in non-specialized stores
52.2	Retail sale of food, beverages, tobacco in specialized stores
52.21	Retail sale of fruit and vegetables
52.22	Retail sale of meat and meat products
52.23	Retail sale of fish, crustaceans and molluscs
52.24	Retail sale of bread, cakes, flour confectionery and sugar confectionery
52.25	Retail sale of alcoholic and other beverages
52.26	Retail sale of tobacco products
52.27	Other retail sale of food, beverages and tobacco in specialized stores

	<i>Description</i>
52.3	Retail sale of pharmaceutical, medical goods, cosmetic
52.31	Dispensing chemists
52.32	Retail sale of medical and orthopaedic goods
52.33	Retail sale of cosmetic and toilet articles
52.4	Other retail sale of new goods in specialized stores
52.41	Retail sale of textiles
52.42	Retail sale of clothing
52.43	Retail sale of footwear and leather goods
52.44	Retail sale of furniture, lighting equipment and household articles n.e.c.
52.45	Retail sale of electrical household appliances and radio and television
52.46	Retail sale of hardware paints and glass
52.47	Retail of books, newspapers and stationery
52.48	Other retail sale in specialized stores
52.5	Retail sale of second-hand goods in stores
52.50	Retail sale of second-hand goods in stores
52.6	Retail sale not in stores
52.61	Retail sale via mail order houses
52.62	Retail sale via stalls and markets
52.63	Other non-store retail sale
52.7	Repair of personal and household goods
52.71	Repair of boots, shoes and other articles of leather
52.72	Repair of electrical household goods
52.73	Repair of watches clocks and jewellery
52.74	Repair n.e.c.
H	Hotels and restaurants
55	Hotels and restaurants
55.1	Hotels
55.11	Hotels and motels, with restaurant
55.12	Hotels and motels, without restaurant
55.2	Camping sites, other provision of short-stay accommodation
55.21	Youth hostels and mountain refuges
55.22	Camping sites, including caravan sites
55.23	Other provision of lodgings n.e.c.
55.3	Restaurants
55.30	Restaurants
55.4	Bars
55.40	Bars
55.5	Canteens and catering
55.51	Canteens
55.52	Catering
I	Transport, storage and communication
60	Land transport; transport via pipelines
60.1	Transport via railways
60.10	Transport via railways
60.2	Other land transport
60.21	Other scheduled passenger land transport
60.22	Taxi operation
60.23	Other land passenger transport
60.24	Freight transport by road
60.3	Transport via pipelines
60.30	Transport via pipelines
61	Water transport
61.1	Sea and coastal water transport
61.10	Sea and coastal water transport
61.2	Inland water transport
61.20	Inland water transport
62	Air transport
62.1	Scheduled air transport
62.10	Scheduled air transport
62.2	Non-scheduled air transport
62.20	Non-scheduled air transport
62.3	Space transport
62.30	Space transport
63	Supporting and auxiliary transport activities; activities of travel agencies
63.1	Cargo handling and storage
63.11	Cargo handling
63.12	Storage and warehousing
63.2	Other supporting transport activities
63.21	Other supporting land transport activities
63.22	Other supporting water transport activities
63.23	Other supporting air transport activities

	<i>Description</i>
63.3	Activities of travel agencies and tour operators; tourist assistance activities n.e.c.
63.30	Activities of travel agencies and tour operators; tourist assistance activities n.e.c.
63.4	Activities of other transport agencies
63.40	Activities of other transport agencies
64	Post and telecommunications
64.1	Post and courier activities
64.11	National post activities
64.12	Courier activities other than national post activities
64.2	Telecommunications
64.20	Telecommunications
J	Financial intermediation
65	Financial intermediation, except insurance and pension funding
65.1	Monetary intermediation
65.11	Central banking
65.12	Other monetary intermediation
65.2	Other financial intermediation
65.21	Financial leasing
65.22	Other credit granting
65.23	Other financial intermediation n.e.c.
66	Insurance and pension funding, except compulsory social security
66.0	Insurance and pension funding, except compulsory social security
66.01	Life Insurance
66.02	Pension funding
66.03	Non-life insurance
66.04	Reinsurance specialist
67	Activities auxiliary to financial intermediation
67.1	Activities auxiliary to financial intermediation, except insurance and pension funding
67.11	Administration of financial markets
67.12	Security broking and fund management
67.13	Activities auxiliary to financial intermediation n.e.c.
67.2	Activities auxiliary to insurance and pension funding
67.20	Activities auxiliary to insurance and pension funding
K	Real estate, renting and business activities
70	Real estate activities
70.1	Real estate activities with own property
70.11	Development and selling of real estate
70.12	Buying and selling of own real estate
70.2	Letting of own property
70.20	Letting of own property
70.3	Real estate activities on a fee or contract basis
70.31	Real estate agencies
70.32	Management of real estate on a fee or contract basis
71	Renting of machinery and equipment without operator and of personal and household goods
71.1	Renting of automobiles
71.10	Renting of automobiles
71.2	Renting of other transport equipment
71.21	Renting of other land transport equipment
71.22	Renting of water transport equipment
71.23	Renting of air transport equipment
71.3	Renting of other machinery and equipment
71.31	Renting of agricultural machinery and equipment
71.32	Renting of construction and civil engineering machinery and equipment
71.33	Renting of office machinery and equipment including computers
71.34	Renting of other machinery and equipment n.e.c.
71.4	Renting of personal and household goods n.e.c.
71.40	Renting of personal and household goods n.e.c.
72	Computer and related activities
72.1	Hardware consultancy
72.10	Hardware consultancy
72.2	Software consultancy and supply
72.20	Software consultancy and supply
72.3	Data processing
72.30	Data processing
72.4	Data base activities
72.40	Data base activities
72.5	Maintenance and repair of office, accounting and computing machinery
72.50	Maintenance and repair of office, accounting and computing machinery
72.6	Other computer related activities
72.60	Other computer related activities
73	Research and development
73.1	Research and experimental development on natural sciences and engineering

	<i>Description</i>
73.10	Research and experimental development on natural sciences and engineering
73.2	Research and experimental development on social sciences and humanities
73.20	Research and experimental development on social sciences and humanities
74	Other business activities
74.1	Legal, accounting, book-keeping and auditing activities; tax consultancy; market research and public opinion polling; business and management consultancy; holdings
74.11	Legal activities
74.12	Accounting, book-keeping and auditing activities; tax consultancy
74.13	Market research and public opinion polling
74.14	Business and management consultancy activities
74.15	Management activities of holding companies
74.2	Architectural and engineering activities and related technical consultancy
74.20	Architectural and engineering activities and related technical consultancy
74.3	Technical testing and analysis
74.30	Technical testing and analysis
74.4	Advertising
74.40	Advertising
74.5	Labour recruitment and provision of personnel
74.50	Labour recruitment and provision of personnel
74.6	Investigation and security activities
74.60	Investigation and security activities
74.7	Industrial cleaning
74.70	Industrial cleaning
74.8	Miscellaneous business activities n.e.c.
74.81	Photographic activities
74.82	Packaging activities
74.83	Secretarial and translation activities
74.84	Other business activities n.e.c.
L	Public administration and defence; compulsory social security
75	Public administration and defence; compulsory social security
75.1	Administration of the State and the economic and social policy of the community
75.11	General (overall) public service activities
75.12	Regulation of the activities of agencies that provide health care, education, cultural services and other social services, excluding social security
75.13	Regulation of and contribution to more efficient operation of business
75.14	Supporting service activities for the government as a whole
75.2	Provision of services to the community as a whole
75.21	Foreign affairs
75.22	Defence activities
75.23	Justice and judicial activities
75.24	Public security, law and order activities
75.25	Fire service activities
75.3	Compulsory social security activities
75.30	Compulsory social security activities
M	Education
80	Education
80.1	Primary education
80.10	Primary education
80.2	Secondary education
80.21	General secondary education
80.22	Technical and vocational secondary education
80.3	Higher education
80.30	Higher education
80.4	Adult and other education
80.41	Driving school activities
80.42	Adult and other education n.e.c.
N	Health and social work
85	Health and social work
85.1	Human health activities
85.11	Hospital activities
85.12	Medical practice activities
85.13	Dental practice activities
85.14	Other human health activities
85.2	Veterinary activities
85.20	Veterinary activities
85.3	Social work activities
85.31	Social work activities with accommodation
85.32	Social work activities without accommodation
O	Other community, social, personal service activities
90	Sewage and refuse disposal, sanitation and similar activities
90.0	Sewage and refuse disposal, sanitation and similar activities

	<i>Description</i>
90.00	Sewage and refuse disposal, sanitation and similar activities
91	Activities of membership organization n.e.c.
91.1	Activities of business, employers, professional organizations
91.11	Activities of business and employers organizations
91.12	Activities of professional organizations
91.2	Activities of trade unions
91.20	Activities of trade unions
91.3	Activities of other membership organizations
91.31	Activities of religious organizations
91.32	Activities of political organizations
91.33	Activities of other membership organizations n.e.c.
92	Recreational, cultural and sporting activities
92.1	Motion picture and video activities
92.11	Motion picture and video production
92.12	Motion picture and video distribution
92.13	Motion picture projection
92.2	Radio and television activities
92.20	Radio and television activities
92.3	Other entertainment activities n. e. c.
92.31	Artistic and literary creation and interpretation
92.32	Operation of arts facilities
92.33	Fair and amusement park activities
92.34	Other entertainment activities n.e.c.
92.4	News agency activities
92.40	News agency activities
92.5	Library, archives, museums, other cultural activities
92.51	Library and archives activities
92.52	Museums activities and preservation of historical sites and buildings
92.53	Botanical and zoological gardens and nature reserves activities
92.6	Sporting activities
92.61	Operation of sports arenas and stadiums
92.62	Other sporting activities
92.7	Other recreational activities
92.71	Gambling and betting activities
92.72	Other recreational activities n.e.c.
93	Other service activities
93.0	Other service activities
93.01	Washing and dry-cleaning of textile and fur products
93.02	Hairdressing and other beauty treatment
93.03	Funeral and related activities
93.04	Physical well-being activities
93.05	Other service activities n.e.c.
P	Private households with employed persons
95	Private households with employed persons
95.0	Private households with employed persons
95.00	Private households with employed persons
Q	Extra-territorial organizations and bodies
99	Extra-territorial organizations and bodies
99.0	Extra-territorial organizations and bodies
99.00	Extra-territorial organizations and bodies

COMMISSION REGULATION (EC) No 586/2001
of 26 March 2001
on implementing Council Regulation (EC) No 1165/98 concerning short-term statistics as regards
the definition of Main Industrial Groupings (MIGS)

THE COMMISSION OF THE EUROPEAN COMMUNITIES,

Having regard to the Treaty establishing the European Community,

Having regard to Council Regulation (EC) No 1165/98 of 19 May 1998 ⁽¹⁾ concerning short-term statistics, and in particular Article 3 and Article 17(c) thereof,

Whereas:

- (1) Regulation (EC) No 1165/98 established a common framework for the production of short-term Community statistics on the business cycle.
- (2) In accordance with Article 3 and Article 17(c) of Regulation (EC) No 1165/98, implementing measures are necessary concerning the definition of Main Industrial Groupings (MIGS).
- (3) The definition of Main Industrial Groupings (MIGS) is based on the statistical classification of economic activities in the European Community, Council Regulation (EEC) No 3037/90 ⁽²⁾, as last amended by Commission Regulation (EEC) No 761/93 ⁽³⁾, (NACE rev. 1). It uses the level of Groups (3 digits) for distinguishing between the Main Industrial Groupings (MIGS).
- (4) The measures provided for in this Regulation are in accordance with the opinion delivered by the Statistical Programme Committee, established by Council Decision 89/382/EEC, Euratom ⁽⁴⁾,

HAS ADOPTED THIS REGULATION:

Article 1

Definition of Main Industrial Groupings (MIGS)

The allocation of NACE rev. 1 Groups to the Main Industrial Groupings (MIGS) is defined in the Annex to this Regulation.

This Regulation shall be binding in its entirety and directly applicable in all Member States.

Done at Brussels, 26 March 2001.

Article 2

Non-availability of data on NACE rev. 1 Group level

Member States that do not calculate the statistical data covered by Regulation (EC) No 1165/98 to the level of detail of NACE rev. 1 Groups are allowed to calculate national weights for the Groups within a Division in order to do the split-up of the Division-based data into Groups.

The Member States that apply the allocation to Main Industrial Groupings (MIGS) in part or in total on the basis of NACE rev. 1 Divisions shall inform Eurostat on the weights used for the split-up into NACE rev. 1 Groups.

Article 3

Implementation of the definitions

Member States shall apply the definitions set forth in the Annex for statistical data communicated pursuant to Regulation (EC) No 1165/98, not later than three months after the present Regulation enters into force; Member States shall, in applying the definitions set forth in the Annex, take the necessary measures to assure that existing statistical data covered by Regulation (EC) No 1165/98 will be revised by means of recalculation or estimation to satisfy these definitions.

Article 4

Information on conformance to the definitions

Each Member State shall transmit to the Commission, at its request, any relevant information on conformance within that Member State to the definitions set forth in the Annex.

Article 5

Entry into force

This Regulation shall enter into force on the 20th day after its publication in the *Official Journal of the European Communities*.

For the Commission

Pedro SOLBES MIRA

Member of the Commission

⁽¹⁾ OJ L 162, 5.6.1998, p. 1.

⁽²⁾ OJ L 293, 24.10.1990, p. 1.

⁽³⁾ OJ L 83, 3.4.1993, p. 1.

⁽⁴⁾ OJ L 181, 28.6.1989, p. 47.

ANNEX

ALLOCATION OF NACE HEADINGS TO CATEGORIES OF AGGREGATE CLASSIFICATION

NACE	NACE description	Aggregate classification
13	Mining of metal ores	Intermediate goods
14	Other mining and quarrying	Intermediate goods
15.6	Manufacture of grain mill products, starches and starch products	Intermediate goods
15.7	Manufacture of prepared animal feeds	Intermediate goods
17.1	Preparation and spinning of textile fibres	Intermediate goods
17.2	Textile weaving	Intermediate goods
17.3	Finishing of textiles	Intermediate goods
17.6	Manufacture of knitted and crocheted fabrics	Intermediate goods
20	Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	Intermediate goods
21	Manufacture of pulp, paper and paper products	Intermediate goods
24.1	Manufacture of basic chemicals	Intermediate goods
24.2	Manufacture of pesticides and other agro-chemical products	Intermediate goods
24.3	Manufacture of paints, varnishes and similar coatings, printing ink and mastics	Intermediate goods
24.6	Manufacture of other chemical products	Intermediate goods
24.7	Manufacture of man-made fibres	Intermediate goods
25	Manufacture of rubber and plastic products	Intermediate goods
26	Manufacture of other non-metallic mineral products	Intermediate goods
27	Manufacture of basic metals	Intermediate goods
28.4	Forging, pressing, stamping and roll forming of metal; powder metallurgy	Intermediate goods
28.5	Treatment and coating of metals; general mechanical engineering	Intermediate goods
28.6	Manufacture of cutlery, tools and general hardware	Intermediate goods
28.7	Manufacture of other fabricated metal products	Intermediate goods
31.2	Manufacture of electricity distribution and control apparatus	Intermediate goods
31.3	Manufacture of insulated wire and cable	Intermediate goods
31.4	Manufacture of accumulators, primary cells and primary batteries	Intermediate goods
31.5	Manufacture of lighting equipment and electric lamps	Intermediate goods
31.6	Manufacture of electrical equipment n.e.c.	Intermediate goods
32.1	Manufacture of electronic valves and tubes and other electronic components	Intermediate goods

NACE	NACE description	Aggregate classification
37	Recycling	Intermediate goods
28.1	Manufacture of structural metal products	Capital goods
28.2	Manufacture of tanks, reservoirs and containers of metal; manufacture of central heating radiators and boilers	Capital goods
28.3	Manufacture of steam generators, except central heating hot water boilers	Capital goods
29.1	Manufacture of machinery for the production and use of mechanical power, except aircraft, vehicle and cycle engines	Capital goods
29.2	Manufacture of other general purpose machinery	Capital goods
29.3	Manufacture of agricultural and forestry machinery	Capital goods
29.4	Manufacture of machine-tools	Capital goods
29.5	Manufacture of other special purpose machinery	Capital goods
29.6	Manufacture of weapons and ammunition	Capital goods
30	Manufacture of office machinery and computers	Capital goods
31.1	Manufacture of electric motors, generators and transformers	Capital goods
32.2	Manufacture of television and radio transmitters and apparatus for line telephony and line telegraphy	Capital goods
33.1	Manufacture of medical and surgical equipment and orthopaedic appliances	Capital goods
33.2	Manufacture of instruments and appliances for measuring, checking, testing, navigating and other purposes, except industrial process control equipment	Capital goods
33.3	Manufacture of industrial process control equipment	Capital goods
34	Manufacture of motor vehicles, trailers and semi-trailers	Capital goods
35.1	Building and repairing of ships and boats	Capital goods
35.2	Manufacture of railway and tramway locomotives and rolling stock	Capital goods
35.3	Manufacture of aircraft and spacecraft	Capital goods
29.7	Manufacture of domestic appliances n.e.c.	Consumer durables
32.3	Manufacture of television and radio receivers, sound or video recording or reproducing apparatus and associated goods	Consumer durables
33.4	Manufacture of optical instruments and photographic equipment	Consumer durables
33.5	Manufacture of watches and clocks	Consumer durables
35.4	Manufacture of motorcycles and bicycles	Consumer durables
35.5	Manufacture of other transport equipment n.e.c.	Consumer durables
36.1	Manufacture of furniture	Consumer durables
36.2	Manufacture of jewellery and related articles	Consumer durables
36.3	Manufacture of musical instruments	Consumer durables
15.1	Production, processing and preserving of meat and meat products	Consumer non-durables

NACE	NACE description	Aggregate classification
15.2	Processing and preserving of fish and fish products	Consumer non-durables
15.3	Processing and preserving of fruit and vegetables	Consumer non-durables
15.4	Manufacture of vegetable and animal oils and fats	Consumer non-durables
15.5	Manufacture of dairy products	Consumer non-durables
15.8	Manufacture of other food products	Consumer non-durables
15.9	Manufacture of beverages	Consumer non-durables
16	Manufacture of tobacco products	Consumer non-durables
17.4	Manufacture of made-up textile articles, except apparel	Consumer non-durables
17.5	Manufacture of other textiles	Consumer non-durables
17.7	Manufacture of knitted and crocheted articles	Consumer non-durables
18	Manufacture of wearing apparel; dressing and dyeing of fur	Consumer non-durables
19	Tanning and dressing of leather; manufacture of luggage, handbags, saddlery, harness and footwear	Consumer non-durables
22	Publishing, printing and reproduction of recorded media	Consumer non-durables
24.4	Manufacture of pharmaceuticals, medicinal chemicals and botanical products	Consumer non-durables
24.5	Manufacture of soap and detergents, cleaning and polishing preparations, perfumes and toilet preparations	Consumer non-durables
36.4	Manufacture of sports goods	Consumer non-durables
36.5	Manufacture of games and toys	Consumer non-durables
36.6	Miscellaneous manufacturing n.e.c.	Consumer non-durables
10	Mining of coal and lignite; extraction of peat	Energy
11	Extraction of crude petroleum and natural gas; service activities incidental to oil and gas extraction, excluding surveying	Energy
12	Mining of uranium and thorium ores	Energy
23	Manufacture of coke, refined petroleum products and nuclear fuel	Energy
40	Electricity, gas, steam and hot water supply	Energy
41	Collection, purification and distribution of water	Energy

16.5 Summary of the STS to be compiled

		Activity coverage NACE Rev. 1	Unit	Compulsory forms	Index or absolute figures	Frequency	Level of activity detail	Deadlines
A110	production	C, D, 40.1, 40.2	KAU	Working day adjusted	Index	Monthly	Divisions and MIGS; Classes in Section D for large Member States	1 month 15 days
A120 A121 A122	turnover domestic turnover non-domestic turnover	C, D	KAU	Gross	Either	Monthly	Divisions and MIGS	2 months
A130 A131 A132	new orders received domestic new orders non-domestic new orders	17, 18, 21, 24, 27 to 35	KAU	Gross	Either	Monthly	Divisions and MIGS	1 month 20 days
A210 A220 A230	number of persons employed hours worked gross wages and salaries	C to E	KAU	Gross	Either	Quarterly	Divisions and MIGS	3 months
A310	output prices	C to E excluding 12.0, 22.1, 23.3, 29.6, 35.1, 35.3	KAU	Gross	Index	Monthly	Divisions and MIGS; Classes in Section D for large Member States	1 month 15 days
A311 A312	output prices of the domestic market output prices of the non-domestic market	C to E excluding 12.0, 22.1, 23.3, 29.6, 35.1, 35.3	KAU	Gross	Index	Monthly	Divisions and MIGS; Classes in Section D for large Member States	1 month 5 days
B110 B115 B116	production production of building construction production of civil engineering	45 (=Section F)	KAU	Working day adjusted	Index	Quarterly	Division	2 months
B130 B135 B136	new orders received new orders received for building construction new orders received for civil engineering	45.1, 45.2	KAU	Gross	Either	Quarterly	Aggregate of Groups 45.1+45.2	3 months
B210 B220 B230	number of persons employed hours worked gross wages and salaries	45	KAU	Gross	Either	Quarterly	Division	3 months
B320 B321 B322	construction costs material costs labour costs	CC 111, 112	KAU	Gross	Index	Quarterly	Aggregate of CC 111+112	3 months
B411	building permits: number of dwellings	CC 111, 112	KAU	Gross	Absolute figure	Quarterly	CC Groups	3 months
B412	building permits: square meters of useful floor area or alternative size measure	CC 1	KAU	Gross	Absolute figure	Quarterly	CC Groups of Division 11, Group 122 and sum of other Groups of Division 12	3 months
C120 C330	turnover - aggregated level of NACE deflator of sales - aggregated level of NACE	52	Enterprise	Gross and working day	Either	Monthly	Sum of Groups and Classes: 52, sum of 52.1 to 52.6, 52.11+52.2,	2 months

		Activity coverage NACE Rev. 1	Unit	Compulsory forms	Index or absolute figures	Frequency	Level of activity detail	Deadlines
				adjusted			52.12+52.3+52.4+52.5+52.6	
C120 C330	turnover - detailed level of NACE deflator of sales - detailed level of NACE	52	Enterprise	Gross and working day adjusted	Either	Monthly	Classes and sum of Classes: 52.11, 52.12, 52.2, 52.3, 52.41+52.42+52.43, 52.44+52.45+52.46, 52.47+52.48, 52.61	3 months
C210	number of persons employed	52	Enterprise	Gross	Either	Quarterly	Sum of Groups and Classes: 52, sum of 52.1 to 52.6, 52.11+52.2, 52.12+52.3+52.4+52.5+52.6	3 months
D120	turnover	50, 51, H, I, 72, 74	Enterprise	Gross and working day adjusted	Either	Quarterly	Divisions 55, 60 to 63, 72 Groups (of) 50.2, 50.5, 51, 64, 74.4 to 74.8 Sum of Groups: 50.1+50.3+50.4, 74.2+74.3 Sum of Classes: 74.11+74.12+74.13+74.14	3 months
D210	number of persons employed	50, 51, H, I, 72, 74	Enterprise	Gross	Either	Quarterly	Divisions	3 months

Notes

The STS-R refers to gross data as unadjusted. For A110, A310, A311, A312 large Member States are those whose value added in Section D in the base year represents 5% or more of the equivalent value for the EU