

Compilation Manual for an Index of Services Production



2007

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FOREWORD

The main objective of the OECD *Compilation Manual for an Index of Services Production* is to fill a gap in existing international statistical standards for guidelines and recommendations on the compilation of output indicators for the services sector of OECD Member countries.

As the Introduction to the Manual notes, over the last several decades there has been significant growth in the services sector in all OECD economies and a growing recognition that indexes of industrial production (IIPs) alone are no longer adequate to perform their historical role of tracking most variations in total economic output over the course of the business cycle. IIPs need to be accompanied by similar information for the services sector.

There has been an improvement over recent years in the availability of annual (structural) and short-term economic indicators (for example, producer price indices and turnover data) for services in many OECD Member countries. However, the range of short-term indicators for the service sector and their coverage are still narrow and there remains a need for additional indicators that reflect overall short-term economic phenomena in that sector. To a large extent cost and the imperative to minimise the reporting burden of respondents have been major barriers. There is also the fact that indicators representing the services sector receive less attention by economic analysts and policy makers who tend to treat such data as supplementary sources of information rather than as key indicators in their own right.

In fulfilling its main objective, this Manual aims to provide both conceptual and practical recommendations (based on available input series) for the compilation of a production index to measure short-term economic activity in the services sector, an index of services production (ISP). An ISP would provide economic analysts with information that would complement an IIP on the short-term movements of an economy, and national accountants with relevant and timely information on the performance of the services sector that could be used to compile quarterly national accounts. In this context, the current Manual is designed to complement the *Methodological Guide for Developing Producer Price Indices for Services* recently published jointly by the OECD and Eurostat.

This Manual was prepared by members of the OECD Short-term Economic Statistics Working Party (STESWP) task force on services. Although it has benefited from input received from many OECD Member countries, key contributions were provided by Mr Rob Pike (United Kingdom), Mr Thomas Zabelsky (United States) and Mr Bernard Lefrançois (Canada). On the OECD side, Mr Eun-Pyo Hong and Mr Benoit Arnaud were the principal authors.

It is hoped that the Manual will advance the development of output indicators for services in the OECD region and beyond. An electronic version is available on the OECD website. It is a "living" document that will be amended and updated to incorporate relevant new national experiences in the development of such indicators and / or key input series. To this end, the OECD would be willing to provide technical advice to assist Member countries and non-member economies within the OECD programme of work undertaking such developments.

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SECTION 1: INTRODUCTION

1.1 Need and aims for indicators of short-term services production

1. Indexes of industrial production and related capacity indexes and utilization rates, have traditionally been used to track short-term changes in economic activity. As the industrial sector and construction have historically accounted for most variations in total output over the course of the business cycle, policy makers and business analysts have used these measures to objectively assess the need for, and impact of, a wide range of public policy decisions.

2. A fundamental shift, however, has occurred in the economies of OECD Member countries over the last several decades. Fuelled by the growth of new technologies and an increasingly liberal global trading environment, services are accounting for a larger and ever increasing share of total economic activity. The externalization of routine services by manufacturers and the development of new high value-added business services have further fuelled this transition and have increased each sector's dependence on the other. As a result, there is a growing recognition that indexes of industrial production (IIPs) alone are no longer adequate to evaluate the short-term performance of an entire economy and need to be accompanied by similar information for the services sector.

3. Flowing on from this, the two main aims for compiling a short-term indicator for services production are to provide:

- economic analysts with information that would complement an IIP on the short-term movement of an economy; and

- national accountants with relevant and timely information on the performance of the services sector to be used in compiling quarterly national accounts.

1.2 International efforts to measure short-term services production activities

4. In general, services data are less detailed and available less frequently than data for the goods-producing sector of the economies of OECD Member countries. This imbalance has its origins from a period when goods production is the larger and more rapidly growing part of Members' non-farm economies. The more cyclical nature of goods production, the rapid pace of technological change in manufacturing, and the importance of merchandise trade in international transactions prolonged this situation.

5. Many OECD Member countries, however, have recently made significant efforts to obtain a more accurate view of short-term economic phenomena in their services sectors. Some have developed more detailed statistics for services and enhanced the quality of existing series. The United Kingdom (UK), for instance, has introduced an experimental monthly index of services (IoS) by expanding its Index of Distribution, which covers Category G of ISIC Rev. 3.1. The Republic of Korea (Korea) has revised their monthly Services Activity Index (SAI) which had been introduced in the late 1980s. Canada has worked to improve the quality of monthly GDP by enhancing its services data; and the United States recently introduced a new quarterly services survey covering information, communications, and technology–intensive industries – its first new principle economic indicator in over thirty years. Finally, the Statistical Office of the European Communities, Eurostat, now requires

European Union member states to collect a wide range of turnover data for the services sector on a regular basis.

6. Despite these and other similar efforts elsewhere, indicators representing the services sector have, to date, received less attention by economic analysts and policy makers. Such users tend to treat these data as supplementary sources of information. Possible explanations include:

- The types and range of indicators available for the services sector are still very limited and vary significantly from country to country.

- Service indicators are less comparable between countries than those for the industrial sector, due in part to an absence of international guidelines for their development.

- There is a long lag in enhancing the statistical environment to collect the necessary information for the services sector since services cover a wide range of economic activities. This arises from inherent characteristics of the services sector itself, such as the large proportion of small and medium sized establishments that enter and leave the market frequently, making it difficult to identify and maintain an accurate population frame. Similarly, services may be performed as a secondary activity of manufacturing or by other non-service establishments.

- The belief that indicators of this type do not "really" approximate the monthly value added of these sectors.

7. The OECD Short-term Economic Statistics Working Party (STESWP) task force on services (TFS) was created in 2002 to work on the issues outlined above. Although it touched on a wide range of issues concerning supply and demand indicators for short-term services activities in OECD Member countries, the TFS was particularly interested in issues related to the compilation of a production index to measure short-term economic activities in the services sector. In this Manual the indicator is referred to as an “Index of Services Production (ISP)”.

8. The TFS sought to identify the most preferred and practical methodologies for the compilation of a monthly ISP. It identified the most suitable variables to measure various services activities, and formulated recommendations to harmonise the definitions and titles of key variables for a monthly ISP. The outcomes from this work are embodied in this Manual. As for the IIP, the ISP is a gross output index with value-added weights. Since coherence and consistency with the national accounts is a high-priority objective of the ISP, aggregations of real gross value added would be the conceptually preferred measure rather than real gross output in constructing the index. The Manual, however, recognizes the general lack of available short-term measures of gross value added by industry in making its recommendations.

9. The Manual also recommends the use of a wide variety of gross output price indexes for computing the preferred deflated gross output measures. Again, for consistency with the national accounts, the preferred deflator would ordinarily be a gross value added price index that reflects the difference between gross output prices and intermediate input prices. Gross output price indexes generally are good proxies for gross value added price indexes, however, since gross output and intermediate input price indexes are highly correlated. Some distortions could however arise with sharp fluctuations in the price of energy inputs or other raw materials that are not fully reflected in the gross output price index. In making its recommendations, the Manual recognizes the difficulty in developing monthly gross value added price indexes and the general absence of these measures.

10. Concepts and terminology used throughout the Manual conform to existing international standards to the greatest extent possible. In the absence of existing international standards, the Manual recommends use of the most common practices.

11. In addition to the TFS, other groups of statisticians are also currently working on related issues for the services sector. The most relevant of these are the Joint OECD-Eurostat Task Force on Services Prices, and the Voorburg Group. The TFS worked closely with these two groups and has presented its work at their meetings and visa versa. Since its first attendance in 2003, the TFS has become a regular member of the Voorburg Group.

12. As will be seen below, the work of the Eurostat-OECD Task Force on Services Prices is quoted extensively in this Manual, as many monetary variables are recommended as a means of collecting basic information on services production. The TFS is also indebted to work of the Voorburg Group with respect to key methodological, classification and technical issues.

1.3 Purpose and use of the Manual

13. This Manual was prepared primarily to provide official statisticians with practical guidelines to compile a short-term ISP, rather than to merely discuss various methodological aspects for measuring services activities. While the development of a monthly index is envisaged and preferred, the TFS recognizes that the availability of services data within Member countries may constrain the development of a monthly indicator. The Manual's recommendations are therefore just as relevant for the compilation of a quarterly ISP.

14. As a by-product it is intended that this Manual will also be a useful aid for the design of monthly (or quarterly) surveys to measure the production of services industries. It therefore necessarily draws from or makes direct use of text from a number of sources, such as the *SNA 1993* (European Commission *et al* 1993)*;* various Eurostat manuals (*e.g. The Methodology of Short-term Business Statistics* (Eurostat 2002) and *The Handbook on Price and Volume Measures in National Accounts* (Eurostat 2001); the IMF *Handbook on Quarterly National Accounts* (IMF 2001); the *OECD Glossary of Statistical Terms* (OECD 2002a), and US Census Bureau's *Quarterly Services Survey* (US Census Bureau). At the same time, as has already been mentioned, the Manual utilises the outputs of other related groups such as the Joint OECD-Eurostat Task Force on Services Prices and the Voorburg Group. As a result, the Manual has been prepared in a cost-efficient way, minimising duplication with related work.

15. Throughout the discussion on the sources and methods for compiling an ISP (in Section 4), the Manual recommends the use of a wide range of quarterly or annual sources to compile a monthly ISP. This is partly due to the lack of basic monthly data, but more importantly, the intention is to reduce the need for collecting monthly information for less- or non-cyclical components, and for small services sectors.

16. At the same time, Member countries should adopt the recommendations presented in the Manual with some flexibility according to their statistical environment. For example, the levels of index compilation can be divided into two groups: elementary and intermediate level on one hand, and dissemination level on the other. The former allows more national flexibility and independence in index compilation. For the latter, however, harmonisation among national ISPs is necessary to enable international comparisons**.**

1.4 Organisation of the Manual

17. This Manual is organised into six Sections. Sections 1 and 2 discuss general issues and infrastructure regarding the services sector and its production activities. Sections 3 deals with terminologies and methods should be considered in the compilation of an ISP. Section 4 deals with input data and their deflators to be used in the compilation of a monthly ISP, and presents recommended variables and deflators, and their sources for all services activities as defined in this Manual, *i.e.* Section G through P of ISIC Rev. 3. Detailed technical issues regarding the compilation of a monthly ISP along with useful tips for various compilation stages are presented in Section 5. Brief remarks for implementation and dissemination of the index are given in Section 6. Annex 1 briefly proposes a list of deflators using UK practice as an example.

SECTION 2: INFRASTRUCTURE

18. In this Section, statistical units, classifications and coverage of the services sector as defined in international publications are reviewed in order to produce a set of harmonized definitions to be used in the compilation of a short-term Index of Services Production.

2.1 Statistical units

19. In this Section, definitions for various types of statistical units presented in international publications are reviewed in order to identify optimal definition(s) for each statistical unit. At the same time, the Section recommends the preferred statistical unit(s) from which data for services activities can be collected.

2.1.1 Definition

20. The International Standard Industrial Classification, Revision 3.1 (ISIC Rev. 3.1) defines the Statistical unit as "The entities for which information is sought and for which statistics are ultimately compiled." (United Nations 1990, paras 63 and 76) The European Commission (EC) on the other hand, describes a unit as "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." (Eurostat 2002, para. 5.1.2, page 14).

21. ISIC Rev. 3.1 provides a general definition for statistical units but the EC focuses on more practical aspects. Thus, both definitions are used as they complement each other.

Statistical units

22. Both ISIC Rev. 3.1 and Eurostat provide a list of the types of statistical units which satisfy the definitions of statistical units provided above. Statistical units in ISIC Rev. 3.1 comprise:

- enterprise;
- enterprise group;
- kind-of-activity unit (KAU);
- local unit;
- establishment;
- homogeneous unit of production.

23. Eurostat mentions two additional units, *i.e.* the local KAU and the Local unit of homogeneous production, but excludes the establishment. As outlined below in the discussion on the

establishment (see Eurostat 2003, Section 2.1.2), the local KAU corresponds to the operational definition of the establishment. It is therefore recommended to use the types of statistical units listed in ISIC Rev. 3.1.

2.1.2 Various types of statistical units

24. In this Section, detailed descriptions for various types of statistical units (*i.e.* enterprise, kind-of-activity unit, local unit, establishment, and homogenous unit of production) extracted from international publications are presented and compared in order to identify the most appropriate definition for each unit. These definitions can also be found in the *OECD Glossary of Statistical Terms* (OECD 2002a) which presents Eurostat[1], ISIC Rev. 3.1 and / or 1993 SNA definitions for the enterprise, enterprise group, kind-of-activity unit (KAU), local unit, and the establishment.

Enterprise

25. The definition of an enterprise can be found in European Commission regulation (1993), ISIC Rev. 3, and the 1993 SNA. The following definition from the European Commission is recommended:

> "An 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." (European Commission 1993)

26. The above definition should be complemented by that from ISIC Rev 3.1:

> "An enterprise is an institutional unit or the smallest combination of institutional units that encloses and directly or indirectly controls all necessary functions to carry out its production activities. An enterprise may be a corporation, a quasi-corporation, a non-profit institution, or an unincorporated enterprise." (United Nations 1990, para. 79)

Kind-of-activity unit

27. Definitions for the kind-of-activity are available in the European Commission Regulation, ISIC Rev. 3 and the 1993 SNA. Definitions from the three sources complement each other, *i.e.* each definition provides precision or clarification on aspects not included in the others. The Commission definition lists various quantitative indicators which are available for each KAU. The SNA definition introduces the notion of 'principal productive activity'. The ISIC describes KAU as not being restricted by the geographic area in which the activity is being carried out.

> European Commission: The kind of activity unit (KAU) groups all the parts of an enterprise contributing to the performance of an activity at class level (4-digit) of the Nomenclature générale des Activités économiques dans les Communautés Européennes (NACE) Rev. 1 and corresponds to one or more operational subdivisions of the enterprise. The enterprise's information system must be capable of indicating or calculating for each KAU at least the production value, intermediate consumption, manpower costs, the operating surplus and employment and gross fixed capital formation. (European Commission 1993)

[1] Source: Council Regulation (EEC), No. 696/93, on the statistical units for the observation and analysis of the production system in the Community.

1993 SNA: A KAU is an enterprise, or a part of an enterprise, which engages in only one kind of (non-ancillary) productive activity or in which the principal productive activity accounts for most of the value added. (European Commission *et al* 1993, para. 5.19)

ISIC Rev. 3.1: A KAU is an enterprise, or a part of an enterprise, which engages in one kind of economic activity without being restricted to the geographic area in which that activity is carried out. (United Nations 1990, para 91)

Local unit

28. Definitions for the local unit are available in the European Commission Regulation, ISIC Rev. 3 and the 1993 SNA. The three definitions are very similar. Thus, the definition from Eurostat can be used.

"The local unit is an enterprise or part thereof (*e.g.* a workshop, factory, warehouse, office, mine or depot) situated in a geographically identified place. At or from this place economic activity is carried out for which - save for certain exceptions - one or more persons work (even if only part-time) for one and the same enterprise." (European Commission 1993)

Establishment

29. Definitions for the establishment are available in the European Commission Regulation, ISIC Rev. 3 and the 1993 SNA. Although the ISIC and SNA definitions are similar, the ISIC definition explicitly emphasises the availability of necessary data to evaluate the production activities of the establishment which, for example, allow the calculation of operating surplus. The ESA (European System of Accounts) notes that an establishment corresponds to a local KAU operationally.

ISIC Rev. 3.1: An establishment is an enterprise, or part of an enterprise, which engages in one, or predominantly one, kind of economic activity at or from one location or within one geographic area, for which data are available, or can meaningfully be compiled, that allow the calculation of the operating surplus. (United Nations 1990)

ESA: According to the European Commission Regulation on statistical units, the local kind-of-activity unit (local KAU) corresponds to the operational definition of the establishment. According to the European System of Accounts (ESA) the local KAU is called the establishment in the 1993 System of National Accounts (SNA) and ISIC Rev. 3.1. ([European Commission – Eurostat 1995] and [European Commission 1993])

Homogeneous unit of production

30. The 1993 SNA provides the following definition for the homogeneous unit of production**:**

"A unit of homogeneous production is a producer unit in which only a single (non-ancillary) productive activity is carried out; this unit is not normally observable and is more an abstract or conceptual unit underlying the symmetric (product-by-product) input-output tables." (European Commission *et al* 1993, para. 15.14)

2.1.3 Preferred statistical units

31. Unlike the situation in the industrial sector, services activities are often carried out by a large number of small and medium sized firms. It is therefore rather difficult to collect information on services production activities on a regular basis and to keep the statistical population constant for an extended period. Similarly, a firm can engage in multiple activities in various sectors. At the same time a service activity may be the secondary activity of a firm whose predominant activity belongs to either another service activity or a non-service activity such as manufacturing.

32. Therefore, the establishment is a preferred source for collecting information. An alternative could be the enterprise or kind-of-activity unit as a primary or a secondary information source, if it is more compatible with statistical environment of a country.

2.2 Classification

33. This Section compares classifications that are currently used by more than one OECD Member country to enable identification of differences for the services sector. This Section also outlines the differences between ISIC Rev 3 and ISIC Rev 4.

2.2.1 Classifications used by OECD countries

34. The three main relevant international industrial classifications currently in use in the OECD area are the:

- ISIC Rev. 3.1 (International Standard Industrial Classification of All Economic Activities, Revision 3.1): This is the reference industry/activity classification of the United Nations. National classifications such as those for Australia, Japan, Korea and New Zealand[2] are related to ISIC Rev. 3.1;

- NACE 1.1 (Statistical Classification of Economic Activities in the European Community): This is derived from ISIC Rev. 3.1. This classification is used in most European-OECD countries;

- NAICS 2002 (North American Industry Classification System): This is an ISIC Rev. 3.1 related classification and is used in Canada, Mexico and the United States.

2.2.2 Preferred classifications

35. The industry / activity classifications used by all OECD Member countries are either derived from or related to ISIC Rev. 3.1. Some use ISIC unchanged, whilst others derive their national classifications from ISIC and others are related more or less closely to ISIC. Therefore, this Manual takes ISIC Rev 3.1 as the reference classification. Other regional or national classifications could alternatively be used with relevant adjustments similar to Table 1 below.

[2] The ANZSIC 1993 (Australian and New Zealand Standard Industrial Classification) is an ISIC Rev. 3.1 related classification used in Australia and New Zealand.

2.2.3 Concordance between ISIC Rev. 3.1 and ISIC Rev. 4

36. Although the definitions and recommendations provided in this Manual are based on ISIC Rev. 3.1, ideally they should also be valid for the revised version of ISIC (*i.e.* ISIC Rev. 4), currently being developed and which is expected to be finalised by the end of 2007. To this end, it is important to examine how the two versions of ISIC will correspond to each other, especially for services activities. Current concordance information can be found at http://unstats.un.org/unsd/cr/registry/isic-4.asp.

Table 1: Industries to be included in an Index of Service Production (approximate concordance)

Industry descriptions based on ISIC Rev. 3.1		ISIC Rev 3.1		NAICS 2002	NACE 1.1
		Section codes included	Differences		
Wholesale and Retail Trade (G)		G	None	41, 44, 45, 81 pt	G
Accommodation and Food Services (H)		H	None	72	H
Transportation and Warehousing (I)		A part of I (60-63 and 641)	- 642	48, 49 + 5615	61-63 and 64.1
Finance, Insurance and Management of Companies (J)		J	None	52, 55 pt	J
Real estate, renting and business activities (K)	Real Estate and Rental and Leasing	A part of K (70 and 71)	None	53	70 and 71
	Information and Cultural Industries	A part of K (72)	+ 642 from I, + 9213, 922, and 9231 from O	515, 516, 517, 5415, 8112 pt	64.2, 72, 92.1, 92.2, 92.4, 92.5
	Professional, Scientific, Technical, Administrative and Support Services	A part of K (73 and 74)	None	54 pt, 55 pt, 561	73 and 74
Public Administration (L and Q)		L and Q	None	91 (Can) 92 (U.S.) 93 (MX)	L and Q
Educational Services (M)		M	None	61	M
Health Care and Social Assistance (N)		N	None	62, 54194	N
Other community, social and personal service activities (O) and private household with employed persons (P)	Waste Management and Remediation Services	A part of O (90)	None	562	90
	Arts, Entertainment and Recreation	A part of O (92)	- 9213 and 9231	71, 512	92.3, 92.6, and 92.7
	Other Services (except Public Administration)	A part of O (91 and 93) and P	+ P	81 +P	91, 93, and P

SECTION 3: TERMINOLOGIES FOR INDEX OF SERVICES PRODUCTION

37. This Section outlines key concepts and terminologies used in the compilation of an Index of Services production (ISP) using the sources and methods described in Section 4 below. The current Section deals primarily with the boundary of the services sector and concepts related to market and non-market services. It also discusses definitions of the ISP and its input variables such as turnover, sales, physical quantities, etc. This Section utilizes some of the units concepts outlined in Section 2 above.

38. With the closer integration of the global economy, the need to arrive at a set of internationally harmonised terminology and related definitions for services sector terms is an important issue when considering the comparability of a monthly or quarterly Index of Services Production (ISP) compiled on the basis of recommendations outlined in this Manual. This Manual therefore proposes a set of harmonised definitions for key terms and concepts used in the context of the ISP.

39. At the moment, there isn't a common set of terminologies or definitions that describe the various types of services activities across the OECD area. This stems mainly from the heterogeneous nature of the services sector itself and varying national practices resulting from the diverse statistical, regulatory or social environment across countries, and in some cases, within a country. For example, the public sector is the main provider of inland transportation (*e.g.* train services) in France, whilst the UK privatized train services companies in the late 1980s. Similarly, a major courier company is operated by the Korean central government, while similar activities are carried out by the private sector in the US. As a result, services activities classified as market and non-market can differ between France, Korea, the UK and the US. As further discussed in the following Sections, in some cases, such differences can be quite significant and strongly influence the comparability of statistical information derived for the services sector.

40. In order to avoid adding yet another set of "international" concepts, etc., the definitions presented in this Section have been derived to the maximum extent possible from existing international guidelines and recommendations. To some extent there exists some inconsistency between concepts and definitions at the international level and in such situations the recommended definition in this Manual are based on the most common formulation derived from various international publications and sources. The definitions presented below were largely derived from the *System of National Accounts 1993* (European Commission *et al* 1993) and the *European System of Accounts 1995* (European Commission- Eurostat 1995). Each concept and their variants are available in Eurostat's CODED glossary and the *OECD Glossary of Statistical Terms*.

41. Although it is preferable to present a single harmonised definition for all the variables and concepts discussed in this Section, in some instances this has not proven possible or practical in terms of implementation. In this situation a range of terms are presented.

3.1 Terminologies related to ISP

42. Key terminologies related to the actual definition of an ISP are presented in this Sub-section. Although many of these terms have a widely accepted understanding, there are variations which are highlighted and compared.

3.1.1 Services activities

Services

43. The following 1993 SNA definition for services includes information about the coverage of the services sector (*i.e.* the inclusion of both market and non-market activities):

> "Services are not separate entities over which ownership rights can be established. They cannot be traded separately from their production. Services are heterogeneous outputs produced to order and typically consist of changes in the conditions of the consuming units realized by the activities of producers at the demand of the consumers. By the time their production is completed they must have been provided to the consumers (…). The service sector covers both market and non-market services." (European Commission *et al* 1993, paras. 6.8-6.9)

Services sector

44. While services can be defined as above, activities included in the services sector vary with the classification used. NACE and ISIC present the 1993 SNA definition for services as follows:

> NACE Rev. 1: The terms services industry(ies), services sector(s) or simply service(s) are generally used to refer to economic activities covered by Sections G to K and M to O of NACE Rev. 1, and the units that carry out those activities.
>
> ISIC Rev. 3: In terms of International Standard Industrial Classification (ISIC) Rev. 3 services are defined loosely in terms of the following Sections:
>
> - wholesale and retail trade, repair of motor vehicles, motorcycles and personal and household goods (G);
> - hotels and restaurants (H);
> - transport, storage and communications (I);
> - financial intermediation (J);
> - real estate, renting and business activities (K);
> - public administration and defence, compulsory social security (L);
> - education (M);
> - health and social work (N);
> - other community, social and personal activities (O);
> - private households with employed persons (P).

45. Note that NACE Rev. 1 does not provide a definition for the Services sector on the basis of ISIC Rev. 3.1. However, given the similarities between NACE and ISIC, the Services sector should be identical. Thus, this Manual recommends that the boundaries of the Services sector be defined to include ISIC Codes from G to P[3].

3.1.2 Market and Non-market services

Market establishments

46. There are only slight variations between the 1993 SNA and the ESA 1995 accounting standards in their definitions for "market producers", "market output", and "market services". However, there is no difference for "market establishment" concept whose SNA definition is:

> "Market establishments produce mostly goods and services for sale at prices which are economically significant." (European Commission *et al* 1993, para. 2.46)

Market and non-market producers

47. ESA 1995 provides two relevant definitions, one for "market producers", the other for "market/non-market producers". A similar related definition is provided in the 1993 SNA. The difference between the two standards is that ESA 1995 provides a more operational definition for market producers. This difference is clearly stated under "market/non-market producers" for ESA 95[4], which is therefore preferable:

> ESA 1995 (market/non-market producers): Market producers are producers that sell their output at economically significant prices. Non-market producers are producers that provide most of their output to others free or at prices that are not economically significant. Moreover, the ESA95 provides additional rules for the distinction between market and non-market producers. In distinguishing market and other non-market producers by means of the 50% criterion, "sales" and "production costs" are defined as detailed in the corresponding CODED definitions. (Eurostat 2002)

Market output

48. Both the 1993 SNA and ESA 1995 present definitions for market output. More precision, however, is given in ESA 1995 compared to the 1993 SNA with regard to the definition of "market output". Thus, the ESA 1995 definition is preferable.

> ESA 1995: Market output consists of output that is disposed of on the market or intended to be disposed of on the market. Market output includes:
>
> - products sold at economically significant prices;
> - products bartered;

[3] It should also be noted that the three main industry classifications (ISIC, NACE, and NAICS) do not always clearly identify each industry class as either a goods-producing or a services-producing industry.

[4] Similar definitions can be found in the 1993 SNA (European Commission et al 1993, para. 4.58 [6.52] and 4.60 [6.52])

- products used for payments in kind (including compensation of employees in kind and mixed income in kind);

- products supplied by one local KAU to another within the same institutional unit to be used as intermediate inputs or for final uses;

- products added to the inventories of finished goods and work-in-progress intended for one or other of the above uses (including natural growth of animal and vegetable products and uncompleted structures for which the buyer is unknown). (European Commission – Eurostat 1995, paras. 3.17 and 3.18)

Economically significant prices

49. Similar differences can be found for the definition of "economically significant prices" between ESA 1995 and the 1993 SNA, though the definition in ESA 1995 is more precise.

> ESA 1995: In ESA, the economically significant price of a product is defined partly in relation to the institutional unit and local KAU that has produced the output (see paragraphs 3.27. - 3.40). For example, by convention, all the output of unincorporated enterprises owned by households sold to other institutional units is sold at economically significant prices, *i.e.* to be regarded as market output. For the output of some other institutional units, output is only sold at economically significant prices when more than 50% of the production cost is covered by sales (see paragraphs 3.32. - 3.37). (European Commission – Eurostat 1995)

Market and non-market services

50. Market services are generally provided by market producers and non-market services by non-market producers. Thus, for example, market services could include such services as repair services, wholesale and retail trade services, and lodging and catering services. On the other hand, non-market services comprise branches covering general public services, non-market services of education and research provided by general government and private non-profit institutions, non-market services of health provided by general government and private non-profit institutions, domestic services and other non-market services.

51. At present, there are no internationally agreed definitions that clearly delineate these services. This arises from the wide heterogeneity in services provision by the public sectors in different countries. For example, the major part of education and health services are generally provided by public sectors in European countries. On the other hand, in the United States the private sector is responsible for a larger portion of services provision in these areas.

52. Nevertheless, this Manual attempts to make distinctions between market and non-market services for the main services activities in order to facilitate the compilation of ISP only for market services, for instance. Market services should comprise all the services activities listed in Section G to P of ISIC Rev. 3 less non-market services activities described below:

- general public services of national defence, of compulsory social security;

- non-market services of refuse disposal, sanitation, cemeteries, provided by general government;

- non-market services of social welfare, hostels, tourist offices, employers' and professional associations, economic organisations provided by general government;

- non-market services of recreational and cultural activities provided by general government (entertainment's, sports grounds and clubs, libraries, public archives, museums, botanical and zoological gardens);

- non-market services of education provided by general government and private non-profit institutions;

- non-market services of research and development provided by general government and private non-profit institutions;

- non-market services of health provided by general government and private nonprofit institutions;

- non-market services of social welfare, hostels, tourist offices, trade unions, employers' associations, religious organisations and learned societies, political parties, consumers' and civic organisations etc. provided by private non-profit institutions;

- non-market services of recreational and cultural activities (entertainments, sports grounds and clubs, libraries, public archives, museums) provided by private non-profit institutions; and

- domestic services.

3.1.3 Definition of ISP

Index of Services Production

53. As the primary aim of compiling an Index of Services Production (ISP) is to measure short-term movements in the production activity of the services part of an economy, the ISP should be defined as a weighted average of the real output of these industries, where the weights are based on their shares in the value added of the Services sector[5].

54. One can adapt the description of the Index of Industrial Production given by Hong & Chavoix-Mannato (2000) to obtain the following definition of the ISP:

> "An ISP measures changes over time in the volume of output of the Services sector. More precisely, it is defined as the ratio of the volume of output produced by the services industries in a given time period to the volume produced by the same industries in a specified base period. The products included are all those that contribute to the gross output of the services industries, and may include products that are not primary to the industries; products may either be goods or services."

55. It is also preferable that the ISP is presented together with its main industrial components, and is also disaggregated by market and non-market activities. However, there are slight variations

[5] In most cases real output refers to gross output, thus implying that any deflators should relate to gross output.

between standards with regard to the definition of market and non-market activities. These differences are now examined to determine the extent to which they could affect international comparability.

Index of Market Services Production and Index of Non-Market Services Production

56. The fact that industrial classifications currently used do not generally distinguish between market and non-market establishments explains the use of "tailored" classifications where this distinction is made. Although the relative importance of market and non-market establishments by industry class varies between countries, market establishment production is likely to undergo economic cycles that differ from those for non-market establishments.

57. It is therefore recommended that the ISP should be presented together with two sub-indexes, one for Market Services Production and the other for Non-market Services Production. This breakdown cannot be mapped precisely with current industry classifications, but is recommended for the whole economy by both the 1993 SNA and ESA 1995 national account standards.

58. For international comparability, there are slight differences between the two standards with regard to establishments to be considered as market or non-market. However, it is very likely that the differences between countries will be largely explained by differences in the institutional environment than by differences in standards. In addition, for many countries the bulk of non-market activities occur in ISIC Section M, N, L and Q.

3.2 Types and definitions of variables to measure services production

59. The output of services production can be measured directly from the amount of services production or indirectly from inputs that are used for the production. Although output variables are always preferable, there are many situations where information on input measures is the only readily available source. Thus, in this Section, the types and definitions of variables to measure services production will be reviewed and compared.

3.2.1 Deflated gross output

60. There are a number of related concepts used in the evaluation of output, which differ in terms of their component items. These concepts include "sales", "turnover", "revenue", "receipts", and "gross output". These concepts are reviewed in this Section. As the concepts are mostly expressed in value terms, they need to be deflated in the compilation process using a set of price indices so that the resulting ISP can reflect volume changes in services production during the reference period.

Output (Gross output)

61. As noted previously, an ISP should include the value of the output of all products of the industries covered. Since these products may include goods, changes in inventories of these goods should be part of the output for the services sector. The following definition is derived from the 1993 SNA. This states that output should be:

- sold;
- entered into the producer's inventories prior to sale, barter, etc;
- supplied to other establishments belonging to the same enterprise for use as intermediate inputs;

- retained by their owners for own final consumption or own gross fixed capital formation;
- supplied free, or sold at prices that are not economically significant to other institutional units;
- provided to their employees as compensation in kind or used for other payments in kind; and
- bartered in exchange for other goods, services or assets. (European Commission *et al*, para. 6.38).

Turnover / sales

62. As noted in the OECD Glossary, there is currently wide variation between countries in the definition of turnover and sales. The Council Regulation on structural business statistics of the European Union provides a definition of turnover. At the same time, definitions for sales can be found in the ESA 95 manual on government deficit and debt (Eurostat 2002)**,** and *the Manual on Statistics of International Trade in Services,* (Eurostat *et al* 2002, Annex II, Glossary). As the definitions in various sources are not fully comparable in terms of the component items described, it is not obvious whether there are in fact any significant conceptual differences between the turnover and sales concepts in the international context.

63. At the national level, different terms may be used for different economic activities, *e.g.* sales for goods and turnover for services. However, it is not clear whether practical differences in data collection exist due to the availability of information or accounting practices. In addition, in some countries, *e.g.* Canada and the United States, the term turnover is not used at all, and the terms "sales" and "receipts" are used to refer to similar concepts.

64. In order to avoid the creation of any "artificial" distinction between the "turnover" and "sales" concepts at the international level which may not be reflected in reality at the national level, this Manual therefore recommends the interchangeable use of the terms for the compilation of the ISP. The following definition on turnover is derived from the definition of turnover included in the European Council Regulation on structural business statistics. Some of the detail in this definition has been expanded to provide further clarification:

> "Turnover comprises the totals invoiced by the observation unit during the reference period, and this corresponds to gross 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 VAT invoiced by the unit vis-à-vis its customer and other similar deductible taxes directly linked to turnover.
>
> It includes all other charges (shipping and handling, installation, maintenance and repair, alteration, storage, etc.) passed on to the customer, even if these charges are listed separately in the invoice. It also includes receipts from the rental of vehicles, equipment, instruments, tools, and other merchandise; commissions from the arrangement of financing; payments for work in progress; and market value of compensation received in lieu of cash. In addition, it includes gross sales from departments, concessions, and amusements and vending machines operated by others; and amounts received from work subcontracted to others.
>
> Reduction in prices, rebates and discounts as well as the value of returned packing must be deducted. Income classified as other operating income, financial income and extra-ordinary

income in company accounts is excluded from turnover. Operating subsidies received from public authorities [or the institutions of the European Union are also excluded][6]."

65. In addition to turnover / sales, another set of output variables are also used to collect basic information at the country level, the principal additional terms being "revenue" and "receipts". The relationship between the concepts of turnover, sales, revenue and receipts in terms of their component items are summarized in Table 2 below.

Table 2: Comparison between turnover / sales, revenue and receipts concepts

Component item	Turnover / Sales	Operating Revenue	Total Revenue	Total Receipts
Gross sales of goods	yes	yes	yes	yes
Provision of services	yes	yes	yes	yes
Shipping and handling	yes	yes	yes	yes
Installation	yes	yes	yes	yes
Maintenance and repair	yes	yes	yes	yes
Alteration	yes	yes	yes	yes
Storage	yes	yes	yes	yes
Receipts from the rental of vehicles, equipment, instruments, tools, and other merchandise	yes	yes	yes	yes
Commissions from the arrangement of financing	yes	yes	yes	yes
Payments for work in progress	yes	yes	yes	yes
Market value of compensation received in lieu of cash	yes	yes	yes	yes
Gross sales from departments, concessions, and amusement and vending machines operated by others	yes	no	no	yes
Units share of sales from departments, concessions, and amusement and vending machines operated by others	no	yes	yes	no

[6] Note that 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. [*Source:* Definitions of SBS Regulation variables (12 11 0)]

Component item	Turnover / Sales	Operating Revenue	Total Revenue	Total Receipts
Amounts received from work subcontracted to others	yes	no	no	yes
Consumption, sales, and value added taxes	no	no	no	yes
Proceeds from the sale of real estate, investments, or other assets held for resale	no	no	no	yes
Income from interest and dividends	no	no	yes	yes
Rental of real estate	no	no	yes	yes
Contribution, gifts, loans and grants	no	no	yes	yes
Reduction in prices, rebate, discounts and returned packing	no	no	no	no
All duties and taxes on the goods or services invoiced by entity	no	no	no	no
Operating subsidies received from public authorities	no	no	no	no

Note: "yes" stands for inclusion; "no" stands for exclusion.

3.2.2 Other relevant variables

Output volume indicators

66. Physical quantity is a typical volume indicator. It refers to the volume of quantity unit in which a service can be measured. This unit is either discrete or continuous. The quantity of services provided in discrete units is obtained simply by counting the number of units, *e.g.* number of haircuts, cars washed or customers to be served in a bank to obtain loans. The quantity of services provided in continuous units, on the other hand, varies continuously with respect to characteristics such as weight, volume, power, duration, distance, etc. Examples of quantity indicators are readily found in the transportation industry.

67. Thus, output volume indicators should be used when there is a lack of information on turnover / sales or of their price measures.

Input indicators

68. Employment is one of the main variable groups included in structural business statistics. It is readily available for most services sectors on a monthly (or at least quarterly) basis for most countries. Although it is related to inputs of production, it can be used as a proxy measure of production activities where no other variables for the sectors are readily available.

69. Employment is defined as the sum of civilian employment and members of the armed forces. Persons in civilian employment include all those employed above a specified age who during a specified brief period, either one week or one day, were in paid employment; employers and self-employed; and unpaid family worker.

70. The 1993 SNA state that "Hours worked are the aggregate numbers of hours actually worked during the period in employee and self-employment jobs (SNA 15.102)." Thus, use of hours worked is recommended when no other indicators are readily available.

Other variables

71. The compilation of an ISP requires a great deal of information from a variety of sectors at different levels of activity disaggregations. At the same time, a number of composite or synthetic indicators exist for specific individual services sub-sectors to measure those activities. It is therefore recommended to use pre-existing information as long as they are comparable or consistent with recommended variables presented in Section 4 below, until a country is in a position to develop all the necessary statistics that are required to compile a more reliable (*i.e.* methodologically acceptable) ISP. For example, retail trade and wholesale trade indices can be used directly as components to form an overall ISP with proper weights.

SECTION 4: SOURCES AND METHODS FOR COMPILING AN ISP

72. This Section presents data sources and methods which, if adopted, would optimise the comparability of the Index of Services Production (ISP) within and outside the OECD area. The discussion recognises the challenges of measuring short-term change in the services sector, and national constraints with respect to data availability, etc..

73. The Section describes the approach of classifying variables as "preferred" (representing best practice), "alternative", and "other". The Section also discusses a framework and criteria to assess the quality of the variables to be used. For example, a variable that is regarded as best practice conceptually may not be sufficiently timely, or it may not be sufficiently accurate. In this case it would be preferable to use another variable that scores more highly against other assessment criteria in an overall evaluation of suitability for use in compiling a monthly ISP.

74. The Section concludes with the presentation of a set of preferred, alternative and other variables for each ISIC Rev. 3 category along with their deflators and sources, based on the recommended terminologies and definitions identified in Sections 2 and 3 above.

75. Because of the very heterogeneous nature of the services sector, the compilation of a monthly aggregated production index for this sector is far less straightforward than for the industrial sector. As a consequence, a wide range of practices are currently being used by OECD Member countries to evaluate the economic performances of the services sector, depending on national needs and the availability of basic information. For example, Japan compiles a monthly index for tertiary industry. Canada does not publish a separate index for a services industry but instead compiles a monthly GDP by economic activities which can be regrouped into a production index for services industry. Many European countries, on the other hand, collect monthly or quarterly information on production for various services sectors but do not aggregate them into a single index.

76. A major difficulty encountered in the services sector by data compilers is the non-availability of a single type of variable or source from which various services production activities can be measured. Only output measures in current prices may be available without an appropriate deflator. Also, statistical information at lower frequencies (*e.g.* annual or quarterly) may be available but nothing for higher frequency (*i.e.* monthly). Collecting basic information for a monthly index implies additional reporting burden and compilation resources. Furthermore, due to the 'non-material nature' of many service outputs, there are some services categories for which the choice of the most appropriate variable to measure their evolution may not be obvious (*e.g.* the financial sector) and as a consequence the choice adopted can vary across countries. As a result, there are considerable differences in approaches to the measurement of short-term services production between OECD countries.

4.1 Description of "Preferred", "Alternative" and "Other" methods for compiling an ISP

77. If just one "recommended variable" for each ISIC category, representing the best approach conceptually, were to be presented in this Manual the result could be a set of recommendations

relating to data that many countries would not have available and would not have the resources to collect. On the other hand, if the recommended variables were those that are easiest to collect, there could be some compromise in quality. As the aim of this Manual is to provide support and assistance in the collection and presentation of services sector data, it presents a range of possible variables that could be used for each ISIC Rev. 3 activity. For each ISIC activity a table is described in Section 4.4.3 below, that presents three options:

- preferred data source(s);
- alternative acceptable data source(s); and
- other data sources that might be used, accepting that they will produce a less precise measure.

78. The actual tables for each ISIC activity are presented below in Annex 2 at the end of this Manual.

79. The Eurostat *Handbook on price and volume measures in national accounts* (Eurostat 2001) provides guidance on compiling annual data. The broad principles from the Eurostat Handbook will be referenced to assess the conceptual appropriateness and hence whether a data source or method should be categorised as "preferred", alternative" or "other". Although some of the recommendations are not practical for monthly or quarterly data, much of the Handbook's text on compiling output is relevant.

80. In addition to providing suggested sources and methods, this Section outlines quality measures for assessing the appropriateness of suggested data sources as proxies for short-term change in gross value added (GVA).

81. The preferred approach presents the data sources and methods that are considered to be most appropriate conceptually as a short-term indicator. However, they are only suitable if the data sources also meet the general conditions for short-term indicators (as outlined below in Section 4.2). If this preferred data source is not available, or does not meet the general conditions, the use of alternative data sources should be considered. The 'other data sources' column presents alternative data sources that produce a less precise measure but, in the absence of other data sources, could reasonably be used to compile a monthly ISP at least until a preferred (or even an “alternative”) data source becomes available.

4.2. Evaluation of the suitability of data sources and methods

82. This Section describes issues that should be considered in evaluating the suitability of data sources used in the compilation of an ISP. The issues discussed are consistent with the dimensions of quality outlined below in Section 5.3.4 in the discussion on the overall quality assessment of ISPs. Overall assessment includes issues relating not only to input variables but also the index compilation issues described in Section 5 below.

83. The six issues relevant to an assessment of the suitability of input variables focus specifically on the requirements for short-term indicators. Such an assessment uses a subjective approach rather than a quantitative evaluation. The statistician or "industry expert" may wish to use a simple scoring system to assess a data source/method, assigning marks 1 to 5 for each of the following six issues.

Coverage: An indicator that estimates short-term change in value-added should cover, in some representative fashion, the full range of businesses or other types of organisations or activity that are included within the industry or sector category in question. A proxy or indicator should ideally relate exactly to the relevant part of the ISIC. Nevertheless, at times indicators can be used where this match is not exact; for instance if an indicator is only available which covers more than the industry in question, the indicator might still be used, as a necessary compromise.

Timeliness: As the purpose is to estimate short-term change in GVA of the services sector, a short-term proxy or indicator is required to be made available quickly - delivering early estimates, say, within a month or two from the end of the period to which they relate. Punctuality is closely related to timeliness. Data sources should be made available in accordance with any agreed delivery dates.

Periodicity/frequency: To reflect monthly (or quarterly) GVA, an indicator should ideally consist of independent monthly (or quarterly) observations. A quarterly indicator interpolated to provide monthly data is less suitable but may be acceptable if the series is not volatile or indeed if the intention is to produce a quarterly ISP.

Accuracy: The level of accuracy of the indicator itself should be acceptable. Accuracy can be assessed in terms of the degree to which the data correctly estimate or describe the quantities or characteristics they are designed to measure. Accuracy refers to the closeness between an estimated result and the (unknown) true value. It is preferable to calculate sampling errors but if this is not possible a more subjective assessment might be that the variability of the series of observations should not be considered to be so great as to obscure the path or rate of change of the indicator series.

Relevance: As the purpose is to measure short-term change in services GVA, an indicator should be designed to do that; rather than, for instance, being designed to measure the level of the indicator at a point in time. That is, the indicator should measure changes in output (or GVA) rather than some other variable or concept. It is impracticable to collect timely monthly data for intermediate consumption, so generally it will be necessary to assume that the GVA to output ratio is constant in the short-term. Series can be benchmarked to quarterly or annual GVA data to reduce the possibility of long-term bias.

Consistency: The same indicator should be used throughout the entire time series. If there are definitional changes, adjustments should be applied to ensure consistency and to enable comparison over time and between countries, etc.

84. The information box below provides an example of a system of subjective assessment used by Statistics Canada.

Framework for the subjective assessment of the quality of monthly GDP: an example from Statistics Canada

This example provides a brief summary of Statistics Canada's assessment of the quality of monthly GDP.

This particular assessment was carried out in 2004 and was restricted to two dimensions of quality: (i) a subjective assessment of the quality of the indicators used to track the monthly growth rates of value added (GDP) for each industry; (ii) an analysis of the revisions to the growth rates of GDP for each industry.

This example summarises the subjective assessment of quality: an assessment of accuracy. Accuracy refers to the property of an estimate to match the true but unknown value of the characteristic of interest, whereas reliability refers to the stability of the estimate. Clearly, revision analysis is the appropriate tool to study, and quantify, the reliability of the monthly GDP estimates. Their accuracy however cannot be quantified objectively; only a subjective assessment based on professional opinion can be undertaken. Statistics Canada produces a list of criteria by which each analyst can subjectively rate the accuracy of the indicators used for their industries. The list of categories is broadly similar to the quality measures described in Section 4.2 of this Manual. With a common understanding of these criteria, the assessments become consistent across analysts, and can be summarized to assess the accuracy of industry aggregates.

Each analyst rates her/his indicators according to each of the criteria described in the list on an absolute scale of **1 (worst)** to **5 (best**). A score of 5 should be used to indicate that there is absolutely no other indicator, existing or achievable, that would outperform the one currently used with respect to a particular criterion. A score of 1 should be used to indicate that the current indicator is inappropriate **for a particular criterion** and that a replacement indicator could be found. (Note that the overall appropriateness of a set of indicators for a particular industry reflects a compromise between the various criteria. Hence, it is not anticipated having any indicator scoring 1 or 5 on all criteria.). For the accuracy assessment, where coefficients of variation (CV) are available, the following grading system is suggested:

CV	Grade
< 3%	5
3-4.9%	4
5-9.9%	3
10-14.9%	2
15% +	1

Statistics Canada compiles an overall weighting for each industry giving more weight to some quality measures than others. An overall rating for GVA is calculated by aggregating the marks for the individual industries using the latest weighting structure for these industries.

4.3 Criteria for conceptual appropriateness

85. Section 4.2 above describes the parameters of quality that help to identify the strengths and weaknesses behind a set of proxy indicators. This Section sets out criteria for the conceptual appropriateness of proxy indicators. These criteria are based on the criteria set out in the Eurostat *Handbook on price and volume measures in national accounts*. However, the Eurostat price and volume Handbook was developed as a best practice guide for compiling annual indicators. Therefore, while many of the principles are relevant, monthly data are not expected to have the same degree of conceptual appropriateness. For example, when compiling a monthly or quarterly estimate of services it is not practical to collect information on intermediate consumption.

86. When estimating gross value added using turnover / sales information (estimating the outputs), it will usually be necessary to assume that in the short-term the movement in output is a reasonable indicator of movement in gross value added (*i.e.* that the ratio of GVA to output is constant in the short-term). Where it is appropriate to assume a constant net to gross ratio in the short-term the index should, ideally, be benchmarked to quarterly or annual estimates of constant price GVA, for example, as derived from Supply-Use tables, where available.

87. The Eurostat *Handbook on price and volume measures in national accounts* classifies output indicators into three categories: A, B and C; with C category indicators being considered as undesirable. These three categories relate solely to conceptual appropriateness, they do not address the aspects of quality presented in Section 4.2 above. An output indicator should measure change, which is related to some kind of change in gross value added or output. Eurostat now favours gross constant price output indicators, principally deflated turnover, as the best type of proxy for short-term change in constant price value-added. Appropriately deflated turnover would be classified as an "A method". Turnover deflated by a less appropriate deflator (*e.g.* with wider industry coverage) would be classified as a "B method". Generally the Eurostat Handbook classifies volume measures as B methods. However, if there is a detailed breakdown by type of commodity ensuring reasonable homogeneity, and there is very little change in quality, a volume indicator could be classified as an A method. 'Input' indicators are classified as C category indicators by Eurostat, because they do not adequately detect changes in productivity; employment is an example.

88. The Eurostat *Handbook on price and volume measures in national accounts* aspires to an "A method" for each industry category regardless of whether it is practical to achieve it. It presents a theoretical best for each industry. However, the current Manual presents preferred measures that are achievable. Consequently, some of the preferred data sources presented here would be considered to be a "B method" by the Eurostat Handbook. Section 4.4.1 below presents the guidelines that have been used to compile the table of recommended variables discussed in Section 4.4.2 and presented in Annex 2.

4.4 Recommendations for variables and deflators by services activity

4.4.1 Proposed criteria for deciding conceptually appropriate indicators

89. This Section outlines how the principles explained in Section 4.3 above are used to categorise methods of deflation as:

- preferred;
- alternative; and
- other.

Turnover / sales deflated by an appropriate output price index

90. Turnover / sales deflated by an appropriate output price index is considered by the Eurostat Handbook to be an "A method" and will usually be the first choice for a preferred data source. The price index used should be representative of the particular ISIC industrial classification activity being deflated.

91. In practice, many national statistical organisations will, on occasion, need to combine price indexes from different sources in order to develop a representative output price index for use as a deflator. If a combination of price indices is used, then ideally these price indices should be weighted together, at a detailed level, using data related to production values. The most ideal source of such data for weighting purposes would come from national accounts input-output or supply and use tables which identify the destination of industry production (output) to business use (*i.e.* intermediate consumption), household consumption, government consumption (including non-profit institutes serving household) and export. Other sources of this information may come from past structural surveys of the industry or from industry associations[7].

92. It is important to note that the aim of compiling such a hybrid index is to deflate services industry output, and as such must be constructed using data on the same pricing basis (*i.e.* basic prices). For example, if components of a consumer price index adjusted to basic prices are used in conjunction with a services industry producer price index (SPPI) they will need to be weighted together using turnover data for the different components. In addition, potential classification difficulties may arise when using a component of a CPI index (usually classified according to purpose of product) to represent output from a particular industry.

93. It is likely that in most countries SPPIs will be produced as quarterly indicators. For compilation of a monthly ISP it may be appropriate to use these by extrapolating the series and interpolating a monthly path, provided the indices are relatively stable (see Section 5 for further information on interpolating methods that could be applied).

94. Where turnover / sales is deflated by an appropriate output price index, this will be classified as a "preferred" method. The ideal situation is where an SPPI covering the output of the entire industry exists[8]. This will often be satisfied where an industries' output is consumed almost entirely as intermediate consumption, government consumption or export which are included within the scope of most countries SPPI. Examples of such industries are freight transport, market research, business management consultancy, engineering, advertising etc.

95. Where a significant portion of an industries' output is consumed by households and this is not covered within the scope of an existing SPPI for the industry, then construction of a hybrid output index using components of the CPI as described above is also regarded as a preferred method (*e.g.* this may be required in some countries for telecommunication services). Where an industries' output is

[7] Such 'industry associations' exist for most service industries in most countries. Their members are those who own businesses in the relevant industry. These associations often have a reasonable understanding of the likely split of output for the industry between various end users (*e.g.* businesses and households). Advice from these associations is generally sought when establishing a services producer price index (SPPI) for the industry.

[8] The OECD/Eurostat *Methodological Guide for Developing Producer Price Indices for Services* (OECD/Eurostat SPPI guide) recommends that the coverage of the SPPI should include all domestic output from the relevant industries.

consumed almost entirely by the household sector then use of appropriately adjusted components (*i.e.* adjusted to basic prices and combined using production value weights) of the CPI is considered a preferred method (*e.g.* personal services).

96. Deflating output (turnover) by a less appropriate, but satisfactory, price index would be classified as an "alternative indicator." The price index might be less appropriate because its scope and/or coverage does not relate directly to the output being deflated, or because it is not adjusted for known changes in quality. Examples might include the use of a SPPI for another industry where price change is expected to be similar. Under other circumstances an industrial producer price indices (PPI) may be used where a SPPI is not available (*e.g.* to deflate wholesaling). If the deflator is less satisfactory, *e.g.* the total CPI or total PPI, the approach would be classified as "other."

Volume indicator

97. Deflated turnover / sales is presented as the preferred indicator, where practical. Where it is difficult to use deflated turnover, a volume indicator is presented, either as an alternative "preferred indicator" or as the sole "preferred indicator". Volume indicators can be useful where it is difficult to measure price changes due to a lack of available data or the complexity of the data source. For example, in the case of air transport it is difficult to measure price changes so a measure of the volume of air passenger kilometres may be more practical, although it is important to categorise such a measure into business travel, economy travel, etc.

98. Where deflated turnover is considered practical as a preferred indicator, an appropriate and representative volume indicator for well-defined products not subject to rapid quality change is presented as an "alternative indicator". It is important that these volume indicators are applied in sufficient detail that the products are relatively homogenous. If a volume indicator cannot be broken down into relatively homogenous groups, it should be classified as an "other" indicator.

Input indicator

99. Although it is preferable for the ISP to be compiled from output variables, use of a list of inputs to production, *e.g.* employment, can also be recommended as alternative variables under certain circumstances for some services sectors. The consideration of input variables arises due to the fact that output measures for several sectors may not be readily available, especially in the short-term, as many national statistical agencies may not be in the position to undertake new surveys to collect all the necessary data. Where changes in input and output are proportional to each other or input data are supplemented by other estimates (*i.e.* productivity adjustments), use of input variables instead of output figures may produce reliable estimates. However, if the assumption of input and output proportionality is not likely to hold or adjustments for productivity[9] are not made, use of input variables should be avoided where possible.

[9] Generally, a rise in productivity means that a larger volume of services can be produced with a given input. The change in volume may be a consequence of a change in the quantity or quality of the services. Alternatively, a rise in productivity means that output prices fall even though input prices remain unchanged [see OECD/Eurostat SPPI guide (OECD and Eurostat 2005) and the OECD Manual on Productivity (OECD 2001) for further discussion and methods that can be employed to reflect changes in productivity].

100. Therefore, with the exception of non-market collective services, input indicators are generally classified as "other". For the case of non-market collective services, input indicators are classified as "preferred" or "alternative".[10]

4.4.2 Deflation

Why remove prices? The concept of deflation

101. The ISP is defined as a weighted average of the real output of services industries, where the weights are based on their shares in the value added of the services sector. The ISP is intended to measure changes over time in the volume of output of the services sector; it should not reflect any change in price. Users of an ISP are interested in how the volume of output of the services sector has changed over a period of time. Comparison will be made with the percentage change in output (volume) over other periods of time and, possibly, with change in the volume of services sector output in other countries. The rate of change in price will be different at different periods of time and in different countries. Therefore, it is important to remove changes in price to allow a realistic comparison of change in output.

102. Deflation is a process that removes the impact of price changes from an estimate of nominal value or 'current price' output (*e.g.* turnover). This is normally performed by dividing the current price estimate of output by a price index, referred to as the *deflator*. The deflator, if chosen with care, will give a good approximation of the price movements that have affected the current price series and allow for the calculation of an accurate constant price series (*i.e.* a volume index). For many industries, the preferred approach to measuring real output (*i.e.* output at constant prices) for the ISP is deflated turnover, using a representative price index.

Services Industry Producer Price Indexes (SPPIs)

103. The OECD/Eurostat *Methodological Guide for Developing Producer Price Indices for Services* (OECD/Eurostat SPPI guide) recommends that the coverage of the SPPI should include all domestic output from the relevant industries. The coverage of *all* output means that the SPPI should comprise prices in the provision of services to all institutional sectors, financial and non-financial corporations, government units, non-profit institutions serving households (NPISH), households and the rest of the world. However, services provided for different markets are not necessarily the same, and their price development can be different. Sub-division of a SPPI by destination of output can therefore be desirable and would enhance its use, particularly for purposes of deflation in national accounts.

104. It is noteworthy that the scope of the SPPI as defined in the OECD/Eurostat SPPI guide is wider than the provision of goods and services from business to business, and this is not universally adopted by all national statistical agencies that produce SPPI. The OECD/Eurostat SPPI guide explicitly recognises this issue where it states:

> "The present guide has adopted as a principle that the scope of SPPI should cover all types of users, even though the empirical focus is on those SPPI where deliveries to businesses play an important role. Nonetheless, there is an overlap between SPPI and CPIs when it comes to the pricing of services delivered to households.

[10] For further discussion on this issue, see the Eurostat Price and Volume Handbook (OECD 2001).

There is no general rule for how the compilation of SPPI vis-à-vis CPIs is best organised. The situation varies between service products, and data sources may also differ between countries. It may be possible to use CPI information to obtain prices for household end users, and in this case the data collection for the SPPI would be reduced to business-to-business and export if significant. Note, however, that the price concept underlying the CPI is not the same as the concept underlying the SPPI. There may be other cases, where the service output and its prices for different end-users are very similar or cannot be separated in practice (*e.g.*, economy-fare air travel), in which case it may be easier to cover service output prices to all end users in a single estimation.

Statistics by end use, like supply and use tables, are the appropriate tool to identify the relative importance of groups of purchasers (export, intermediate consumption, households) of the output of an industry." (OECD and Eurostat 2005, Section 1.10)

105. The current ISP Manual therefore proposes a pragmatic approach depending on the industry being deflated and the data sources available within a country when defining preferred, alternative and other measures for deflators. Preferred measures can therefore include deflation using a composite index compiled by weighting together an SPPI which measures price change for business to business transactions (notionally including in its scope services provided for export and use in government or NPISH consumption) and a CPI which measures price change of business to household transactions.

106. In practice, most countries establish individual SPPIs at the 4-digit industry level. Price movements for products primary to the industry are surveyed within businesses and aggregated to form these 4-digit industry level indexes. This implies that price changes for products not primary to the industry (*i.e.* secondary production) will not generally be covered, although their value would be recorded in current price (*i.e.* turnover) estimates for an industry. This generally does not present a problem because for most service industries secondary production tends to be small[11].

Quality change: included as volume change rather than price change[12]

107. As it is important for quality and quantity changes to be taken into account, the current price output (turnover) data should preferably be deflated by an appropriate and representative output price index that takes account of quality change.

108. The 1993 SNA, in general, treats differences in quality as differences in volume; different qualities reflect different use values (and in the case of goods and services, different resource costs). Different qualities are, therefore, economically different from each other (European Commission *et al* 1993, para. 12.20).

109. The expression "different qualities" is used to cover sets of goods or services whose characteristics are sufficiently different to make them distinguishable from each other from an economic point of view but which are sufficiently similar to each other to be described by the same generic term, such as potato, computer, or transportation (European Commission *et al*, 1993, para. 16.106).

[11] The OECD/Eurostat SPPI guide does note some exceptions, such as for the management consultancy and computer services industries. This may imply that more care is needed in choosing appropriate deflators for current price data. For example other SPPI which could be expected to adequately represent price change for the secondary products produced within the industry may be required to be given some weight in a composite deflator.

[12] For more information on this topic, see SNA93 16.105 – 16.117.

110. Thus in the compilation of the ISP, it is essential that changes in quality of the services produced flow through as changes to the index. Therefore, any price index used in the production of the ISP must *price to constant quality*. Such pricing is an ongoing challenge for compilers of both SPPI and CPIs but nonetheless an important aspect to which considerable attention is given in most countries in the compilation of these price indices.

Application of deflators

Level of deflation

111. It is recommended that the indicators of current price output are deflated at the ISIC 4-digit level for the ISP as output price indexes at this level provide sufficient detail. As noted above, many countries produce 4-digit industry SPPIs so this recommendation should be in line with the level of data availability in most countries. Again, in the case where a component of the CPI is used, some correspondence needs to be made between the use of the product classification in the CPI and the industry of origin classification required for the deflator.

112. For this to be achieved the CPI and SPPI should be available at this level of detail. If deflators are not available in sufficient detail to deflate at the 4-digit level, the current price series could be deflated at the ISIC 3-digit level instead.

Examples of the application of deflators

113. The table in Annex 1 below describes an assessment by the United Kingdom Office for National Statistics (ONS) of where CPIs are appropriate and where SPPIs are appropriate, by ISIC category, for deflating current price series within an ISP.

114. The table provides a detailed list of recommended variables for compiling an ISP, including sources for deflating current price data. The first column lists the preferred variables. The other two columns provide alternative and other variables that could be used if the preferred source is not available. For deflation within many industry groups a 'more general' PPI is presented as an alternative. A more general indicator might be an SPPI that has wider or different industry coverage than the ISIC industry group of the current price series that is to be deflated. For some industry groups the use of a 'more general' SPPI might involve using an ISIC division level SPPI. The definition and appropriateness of a 'more general' PPI is contextual and its appropriateness must be considered within the context of the industry group being deflated.

Periodicity

115. If the ISP is being compiled as a monthly index, monthly price indices will be needed. If the SPPI (or CPI) is only available quarterly it will be necessary to interpolate a monthly path. In fact, the monthly path can be created from a quarterly series using a variety of methodological procedures (see Section 5 for further discussion).

Guidelines on compiling the CPI and SPPI

116. The OECD / Eurostat *Methodological Guide for Developing Producer Price Indices for services* provides guidance on constructing SPPIs. The Guide sets out three options for SPPIs which can be based on industries, products or both. The Guide recommends sample frames for each of these. The Guide also gives an overview of pricing methods including:

- direct use of prices of repeated services;
- component pricing;
- unit value method;
- model pricing;
- percentage fee method; and
- pricing based on working time (*e.g.* charge-out rates).

117. Each of these pricing methods is clearly defined in the Guide, with an explanation under which circumstances each can be applied. The Guide provides advice on each stage in the process of developing a SPPI, covering issues such as sampling frames, service identification, pilot surveys, treatment of quality change, index formula, weights and aggregation, and quality assessment.

118. The OECD / Eurostat *Methodological Guide for Developing Producer Price Indices for services* (OECD and Eurostat 2005) is available at http://www.oecd.org/document/43/0,2340,en_2649_34355_2727403_1_1_1_1,00.html. Advice on compiling Consumer Price Indices is provided in the *Consumer Price Index Manual: Theory and Practice* (ILO 2004) at http://www.ilo.org/public/english/bureau/stat/download/cpi/order.pdf.

4.4.3 Recommended variables and deflators and their sources

119. In this Section, a list of recommended variables and deflators are presented, along with their sources for all services activities as defined in Section 2, *i.e.* Section G through P of ISIC Rev. 3. Tables in Annex 2 at the end of this Manual show a set of preferred, alternative and other methods proposed for 4-digit ISIC levels of each 2-digit ISIC group. Thus, twenty-seven tables cover all twenty-five services industries defined in ISIC Rev. 3 and two additional groups which are undifferentiated goods-producing activities of private households for own use (NACE code 96) and undifferentiated services-producing activities of private households for own use (NACE code 97). A list of services industries covered in the tables is presented below:

- Code 50: Sale, maintenance and repair of motor vehicles and motorcycles; retail sale of ' automotive fuel;
- Code 51: Wholesale trade and commission trade, except of motor vehicles and motorcycles;
- Code 52: Retail trade, except of motor vehicles and motorcycles; repair of personal and household goods;
- Code 55: Hotels and Restaurants;
- Code 60: Land transport; transport via pipelines;
- Code 61: Water transport;
- Code 62: Air transport;
- Code 63: Supporting and auxiliary activities; activities of travel agencies;
- Code 64: Post and telecommunications;
- Code 65: Financial intermediation, except insurance and pension funding;
- Code 66: Insurance and pension funding, except compulsory social security;

- Code 67: Activities auxiliary to financial intermediation;
- Code 70: Real estate activities;
- Code 71: Renting of machinery and equipment without operator and of personal and household goods;
- Code 72: Computer and related activities;
- Code 73: Research and development;
- Code 74: Other business activities;
- Code 75: Public administration and defence; compulsory social security;
- Code 80: Education;
- Code 85: Health and social work;
- Code 90: Sewage and refuse disposal, sanitation and similar activities;
- Code 91: Activities of membership organisations not elsewhere classified;
- Code 92: Recreational, cultural and sporting activities;
- Code 93: Other service activities;
- Code 95: Activities of private households as employers of domestic staff;
- Code 96: Undifferentiated goods-producing activities of private households for own use; and
- Code 97: Undifferentiated service-producing activities of private households for own use.

120. There are two parts in each presentation at the Division level (two-digit ISIC group): a general comment and a table. The general comments describe the types of services activities included and excluded in the corresponding Division, the desirable method for measuring gross value added, definitions of turnover data, and types of preferred deflators. The table presents explanatory notes and descriptions for each 4-digit ISIC class and preferred, alternative and other methods to measure the economic activities of each ISIC class.

121. It should be emphasised that the selection of the recommended variables and their deflators are made based mainly on current UK practices supplemented by information from Canada and Korea. As the aim of this Manual is to be as practical as possible, any methods that are theoretically optimal but practically less plausible have not been included in the tables. It is, however, worth noting that the contents of the tables are subject to change in the future, if better methods, sources, etc., are developed and employed.

122. This Manual does not explicitly propose a (group of) preferred source(s) of statistical information to be used to compile the ISP, as the statistical environment of OECD countries varies widely. The data can be collected from already existing surveys or from new surveys. At the same time, extensive use of administrative sources is highly recommended to minimise concerns arising from budgetary constraints.

SECTION 5: INDEX COMPILATION

123. This Section deals with practical issues that can be encountered during the actual ISP compilation process. These can be grouped into three categories: types of indices: transformation of input data; and, issues emerging at the stage of consolidation.

124. A range of index methods are currently employed by national statistical agencies for various types of economic time series. Although the Laspeyres index and Paasche index are the most commonly used forms, the Fisher index is also used by several OECD Member countries despite its technical difficulties and resource intensity. To enhance the comparability of economic analysis on the services sector across the OECD area, it is important for national ISPs to be compiled according to comparable indexing method(s). Practical advantages and disadvantages, especially with regard to measuring short-term movements, of various indexing methods will be examined in order to identify a set of preferred types of indices to be used for ISP compilation.

125. It is often observed that not all input variables are ready or fully suitable to be integrated into an ISP or its sub-groups. Differences in measurement, data in raw or other forms and with adjustments, breaks in a series, or missing data are typical examples of unexpected values and heterogeneities often encountered during ISP compilation. In order to cope with these problems, a range of solutions are currently being adopted by national statistical agencies, depending upon their statistical environment and resource availability. As different options may produce different results which could hamper the comparability of ISPs across the OECD area, this Section also suggests a set of viable methods for transformations to input data that can be applied to aid the compilation of a monthly or quarterly ISP.

126. At the same time, compilers are often required to consider other issues at the consolidation stage in order to ensure overall quality of the ISP itself or with other related statistical information. This Section therefore also presents issues concerning weighting, comparability with national accounts and overall quality of short-term ISPs.

5.1 Types of indices

127. As discussed in Section 4 above, variables used as inputs for ISP compilation may be very different in nature, *e.g.* in monetary value, index or unit of quantity. Harmonisation of their heterogeneous aspects is a prerequisite before they can be aggregated into an index. The most widely recognised means of harmonisation involves the transformation of all the input variables into indices. In fact, a volume index is most appropriate as it is free from inflationary effects. Thus, all nominal data will have to be deflated before indexing according to the recommended procedures described in Section 4. Deflated data in monetary values and other data in units of quantity will then have to be indexed before further processing.

128. Theoretical and practical aspects of various indices are reviewed in this Section. Based on their advantages and disadvantages, this Manual recommends the preferred index types for the ISP compilation. Discussions in this Section are based on several national and international sources such as the UK Office for National Statistics *Methodology of the experimental monthly index of services* (Fenton and Pike 2001) the *1993 SNA*, and the Eurostat *Handbook on Price and Volume Measures in National Accounts*.

129. The choice of a particular index type should be guided by the criteria that a monthly or quarterly ISP has to meet. A list of frequently discussed requirements for indices is described in Table 3 below.

Table 3: A list of criteria and their definitions

Criteria	Definition
Symmetry	The index formula assigns equal weight to the two situations being compared; *i.e.* the situation during the current period and the situation during the base period.
Time reversal	The index for a period *t* using period *0* as base is the reciprocal of the index for the period *0* using the period *t* as base.
Factor reversal	Multiplying a price index and a volume index of the same type is equal to the proportionate change in the current values (SNA 1993, para. 16.24).
Additivity	According to the 1993 SNA (para. 16.55), "Additivity is a property pertaining to a set of interdependent index numbers related by definition or by accounting constraints under which an aggregate is defined as the sum of its components; additivity requires this identity to be preserved when the values of both an aggregate and its components in some base period are extrapolated over time using a set of volume index numbers".
Identity	If the volumes in the base and reporting periods are identical, then the index does not show any change.
Monotony	On the assumption of two similarly defined ISPs, during the base period, the input volume indices are equal. If, during the reporting period, the volume index for just one economic sector is higher (lower) for the first ISP than for the second, the first ISP is higher (lower) than the second.
Linear homogeneity in the volumes	When all the volumes in the reporting period are multiplied by a standard factor x, the ISP shows x-times higher value.
Homogeneity of degree zero in prices	The ISP depends only on the price structure, not the absolute level of prices.
"Real" volume comparison over any period	Changes to the index result only from a change in volumes (and not from a change in weights).
Up-to-date weighting structure[13]	The index formula ensures that the weighting structure is up-to-date, not out of date.
Interpretability for users and cost of maintenance	Represent the more practical issues to be taken into consideration.
Timeliness	The speed of dissemination of the data is reasonable, i.e., the lapse of time between the end of a reference period (or a reference date) and dissemination of the data.

[13] Weights should reflect relative prices and shares of the intermediate consumption on the output.

5.1.1 Laspeyres, Paasche and Fisher indices

130. The three main types of indices widely used internationally to aggregate economic quantities for various periods are the Laspeyres, Paasche and Fisher. For the Laspeyres index the weights of some earlier base period are used. For the Paasche index, the weights of the most recent period are used. Finally, the Fisher index is defined as the geometric mean of the Laspeyres and Paasche indices.

131. For a fixed base year *0* and time *t*, a Laspeyres-type index can be expressed mathematically as follows:

$$L_t = \sum_i (w_{i,0} \frac{C_{i,t}}{C_{i,0}}) * 100$$

where $w_{i,0}$: relative share of value added of sector i at time 0

$C_{i,0}$: volume index for sector i at time 0

$C_{i,t}$: volume index for sector i at time t

132. A Paasche-type series can be written as:

$$P_t = \frac{1}{\sum_i (w_{i,t} \frac{C_{i,0}}{C_{i,t}})} * 100$$

where $w_{i,t}$: relative share of value added of sector *i* at time *t*

$C_{i,0}$: volume index for sector *i* at time *0*

$C_{i,t}$: volume index for sector *i* at time *t*

133. A Fisher-type series is obtained for each period by taking a geometric mean of the values for the same period in the Laspeyres-type index and Paasche-type index. Thus, it is expressed mathematically as follows:

$$F_t = [\, L_t \; P_t \,]^{1/2}$$

Comparisons of indices

134. In addition to the index types described above, other index types exist which largely depend on the weighting reference period used. For a detailed discussion on index types and their theoretical properties, the reader is referred to the *International Producer Price Index Manual*, Chapter 15 (IMF, 2004). When changing the base year and index weights, one option is to recompile values for all

periods using the weights from a new base year. In this case, the entire historical series will be revised as the weights for the whole series are expressed in terms of the economic situation in the new base year. This type of index is referred to as a fixed-weight index.

135. Strictly speaking, a fixed weight Laspeyres index would never have its weights updated, as by definition they must relate to the starting point of the time series which therefore becomes less and less relevant the longer the length of the time series. In practice, fixed weight indices are neither Laspeyres nor Paasche because the weighting reference period generally refers to some point within the time series assigned by a pre-determined weight updating strategy. For example, weights might be updated for a fixed weight index every 5 years based on data from censuses or structural surveys generally available with a considerable lag.

136. When changing the base year and index weights, the index time series should not be revised for its entire history – as is the case for fixed weight indices. It is therefore necessary that discrete intervals (*e.g.* 1 year, 5 years) of the component indexes are aggregated by using weights derived from the economic situations for periods near to these intervals. To achieve this, each time the weights and base year for the index are updated, data are only compiled with the new weights for periods close to the reference period for these weights, and the series is then linked to the historical portion. This is called a chain-linked index, as it is compiled for a succession of different segments while keeping the original weights for each past segment fixed.

137. The weighting methodology for the segments will depend on the type of index used, *e.g.* chained Laspeyres, chained Paasche, or chained Fisher[14]. For example in the case of a 5 year chained Laspeyres index with a time series starting in 1990, the portion of the index from 1990 – 1994 would be compiled using weights from 1990; linked to the portion of the index from 1995 – 1999 compiled using weights from 1995; linked to the portion of the index from 2000 onwards compiled using weights from 2000 (assuming that weights relevant to the year 2005 were not yet available).

138. Based on the criteria presented in Table 3 above, the advantages and disadvantages of chain-linked indices for Laspeyres, Paasche and Fisher types are compared in order to identify the most suitable index type for an ISP. Table 4 below outlines the criteria that are met by the Laspeyres, Paasche and Fisher indices. An "X" in Table 4 indicates that an index possesses the corresponding property or represents that the criterion is more relevant for the index / indices than other type(s).

139. Table 4 demonstrates that the properties of the resulting ISP can be very sensitive to the choice of an index type, with each type having different advantages and disadvantages. Paasche types do not seem to possess any comparative advantage over the other types. The Fisher index possesses several theoretical advantages such as symmetry and time reversals. However, it is still a complicated and burdensome technique to be applied for short-term statistics such as ISP, especially from the lower level, as it requires very detailed and timely information. At the same time, Fisher index is known to be non-additive[15].

[14] Other chain-linked indexes can be considered where the weights refer to some mid point of the index segment to which they are applied. For example, if a new base year of 2005 was introduced, an index could be calculated with the new weights back until 2003, and then be linked to the segment from 1998 – 2002 based on weights from 2000 and so on. Such an index is called a 'midyear index', belonging to the class of 'Lowe' indexes (IMF PPI manual, 2004)

[15] A procedure proposed by Statistics Canada can be employed to resolve the problem of non-additivity.

140. The Laspeyres index, on the other hand, can be employed to overcome the main drawbacks of the Fisher index. The Laspeyres index is more interpretable, less costly and more timely. However, Laspeyres indices also have drawbacks. They do not measure actual production growth if the price structure changes rapidly. As such, there is a trade-off between the need for an "up-to-date weighting structure" and a "real comparison of volumes". This conflict can be attenuated by more frequent updating of the weighting structure.

141. Ultimately, however, the choice of index type should be made according to the purpose of an ISP and to practical considerations such as the availability of data. As mentioned earlier in this Manual, the ISP is designed for two-main purposes: for short-term economic analysis, and for quarterly GDP compilation. Thus, users would expect the ISP to measure real changes in production in the services sector. Such changes should reflect changes in volumes over time rather than changes in the price structures. At the same time, users require the timely availability of this information. A chain-linked Laspeyres index (see below) with weights updated at an appropriate frequency fulfils both of these requirements.

Table 4: Criteria met by various types of chain-linked indices

Criteria	Laspeyres	Paasche	Fisher
Symmetry			X
Time reversal			X
Factor reversal			
Additivity			
Identity			
Monotony	X	X	X
Linear homogeneity in the volumes	X	X	X
Homogeneity of degree zero in prices	X	X	X
"Real" comparison of volumes	X		
Up-to-date weighting structure	X	X	X
Interpretability	X		
Cost efficiency	X		
Timeliness	X		

Note: "X" indicates that the index meets the criteria

5.1.2 Recommendations for ISP compilation

142. Based on the comparisons presented in Table 4, this Manual recommends a chained Laspeyres index[16] as a preferred approach for the compilation of an ISP. Chain-linked indices, in practice, show very reliable results for the majority of cases as they take account of modifications to the relative weights of the different categories of services over the whole historical series. In addition, rebasing revisions occur to a much lesser extent than for fixed weight indices which should not be used. In the case of annual chain-linking, the inaccuracies caused by the assumption of a stable relationship between GVA and turnover are reduced, and, furthermore, as every year is automatically a link year, no subjective choice is required.

143. However, it is a costly exercise to apply chain-linking frequently and at lower levels. At the same time, characteristics of the index are closely related to the choice of linking method. Thus, the issues of linking method and frequency and level of chain linking will be discussed in the remainder of this Section.

Linking method

144. As mentioned before, the characteristics of chain-linked indices are known to be dependent upon the linking method used. In their *Quarterly National Accounts Manual*[17] for example, the IMF discusses three linking methods, the:

- over-the-year technique: data are chained using the respective quarter in the previous year;
- one-quarter overlap: data are chained using the last quarter in the respective year; and
- annual overlap: data are chained using annual averages.

145. Although the Laspeyres index chained using the *over-the-year technique* meets the requirement of a real volume comparison for year-on-year rates of change, the rates of change from the previous period calculated using this method always have breaks for statistical reasons caused by frequent changes to the weighting structure. Following their analysis, the IMF stated that the over-the-year technique should be avoided.

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[16] While recognising the theoretical advantages of the Fisher index, Eurostat also recommends a chain-linked Laspeyres index for volumes in their *Handbook on Price and Volume Measures in National Accounts.* The formula for an annual chain-linked Laspeyres index is as follows:

$$L_t^C = \sum_i (w_{i,t-1} \frac{C_{i,t}}{C_{i,t-1}}) * \sum_i (w_{i,t-2} \frac{C_{i,t-1}}{C_{i,t-2}}) * \ldots * \sum_i (w_{i,0} \frac{C_{i,1}}{C_{i,0}}) * 100$$

where $w_{i,t}$: relative share of value added of sector *i* at time *t*

$C_{i,t}$: volume index for sector i at time *t*

[17] Adriaan M Bloem, Robert J. Dippelsman and Nils Ø. Mæhle, *Quarterly National Accounts Manual: Concepts, Data Sources and Compilation*, International Monetary Fund, Washington D.C., 2001; Chapter IX.

146. In contrast, the chained Laspeyres index based on the *one-quarter overlap* measures real volume development from one quarter to the next. These data are therefore particularly well-suited to measuring developments. However, series compiled using this method may differ from those in independent annual accounts. To avoid this, this method is, in practice, usually discussed together with benchmark techniques (to fit the independently derived annual results). However, this results in calculation procedures becoming more complicated and opaque for non-specialist users.

147. With an *annual overlap,* on the other hand, the average quarterly results match the independently derived annual figures. As the weighting structure is changed only once a year concurrently with the first-quarter result, and as the weighting structure thus remains constant over the year, the changes in an ISP calculated using this method between the first and second, second and third, and third and fourth quarters are caused only by changes to the volume indices. Nevertheless, statistical breaks stemming from the change to the weighting structure may remain in the transition between the fourth quarter of one year and the first quarter of the following year.

148. As IMF analyses show, the annual overlap results approach those obtained using the one-quarter overlap. This is also borne out by experiences with national accounts in Germany, the Netherlands and Spain. It is also much easier to aggregate components when using the annual overlap approach over the other two methods. For instance, users of German national accounts data can calculate the time series not included in the standard tables or check the consistency of the official data simply by using the data included in the standard publications and one of the Excel macros developed by the Deutsche Bundesbank (available on request). However, because of the annual change to the weighting structure, year-on-year comparisons of the quarterly results (but not of the annual figures) always include fluctuations that are not caused solely by the volume series. Provided the prices structure does not change significantly, however, such statistical breaks are limited.

149. Thus, as presented in Table 5, this Manual recommends to link chained Laspeyres index based on the annual overlap technique or on one-quarter overlap technique as a preferred method; and on over-the-year technique as an alternative.

Table 5: Types of indexing methods for various stages of ISP compilation

	Preferred	Alternative	Other
Index type	Chain-linked Laspeyres index	Any form of chain-linked index (*e.g.* mid-year, see footnote 18) depending upon the national situation. The type of index used to compile the national ISP should be consistent with those of the national IIP or volume index of national GDP at the corresponding levels.	Any other indices depending upon the national situation. The type of index used to compile the national ISP can be inconsistent with those of national IIP or volume index of national GDP at the corresponding levels.
Linking method	Based on the annual overlap technique or one-quarter overlap technique	Based on over-the-year technique	
Frequency	Annually for services whose structure of weights evolve rapidly and every five years for others and detailed level of aggregation	Every five years or consistent with IIP	Other frequencies depending on resource constraints (*e.g.* 10 years)

Note: Contents in Table 5 are sourced from various publications.

Frequency and level of chain-linking

150. Important issues to consider are how frequently ISP compilers should update the weights and base period, and at which level the chain-linking should be applied. The most common practice for production indices in OECD countries is to re-weight, rebase and chain indices every five years. However, in recent years some countries have moved to annual chain-linking for the compilation of their industrial production indices (*e.g.* the United Kingdom). Annual chain-linking takes better account of changes in relative prices. Nevertheless, five-year chain-linking may also be an acceptable option if the weighting structure is not subject to rapid change.

151. In practice, the choice of the periodicity of chain-linking may depend on the activity in question. This Manual recommends, as a preferred method, to apply annual linking for services industries whose structure of weights evolve rapidly, while, for other activities, 5-years may be appropriate. For detailed aggregation at a lower than 4-digit level, it may be more practical to use five-yearly rebasing.

152. As regard to implementation of the chain-linked method at the disaggregated levels, it is highly preferable to use the chain-linked Laspeyres method at least at the dissemination level, in order to enhance the international comparability of countries' indices. However, countries could employ other types of indices at the elementary and intermediate levels according to limitations in their statistical environment.

5.2 Transformation of input data

153. Practitioners in national statistical agencies are often confronted with extensive heterogeneity with respect to input variables and deflators that could be used for the compilation of an ISP. As these could influence the overall quality of the index, it is important to ensure the suitability of each input variable before actual compilation. The list of variables recommended in Section 4 above and in Annex 2 below refers to various measures in a variety of forms of presentation such as monetary value, units of quantities, and index form. Another difference in data presentation arises from the various adjustments made previously such as working day or trading-day adjustment, and seasonal adjustment. Although such differences can be overcome by applying additional standardisation techniques, the choice of method and stage at which these adjustments are applied are often dependent on the needs and resource availability of each statistical agency. Furthermore, more complicated processes would be required to remove any abnormalities in the data arising from underlying defects, *e.g.* missing values, breaks or outliers.

5.2.1 Managing problems in input data

Missing input variables

154. In practice, compilers are often confronted with a situation where all necessary information is not readily available. Missing data for part of a series can occur at the beginning of a series due to a shorter length of historical data, or in the middle of the series due to exceptional events in the statistical environment. Missing data can also be found at the most recent period due to the less timely nature of data collection in some services industries.

155. Also, because of the specific nature of the services industry, data for some services industries can only be collected at lower frequencies, *i.e.* collected annually or quarterly for a monthly ISP or annually for a quarterly ISP. This means that necessary information for a particular period will have to be estimated from existing information at different frequencies. At the same time, data for some

service industries may not be available at all. This may require the compilers' judgement as to whether these industries should be included in the compilation of the ISP.

156. Table 6 below presents preferred, alternative and other options which can be used to resolve a range of problems with missing data. If the frequencies of the ISP and input variables with missing data are the same, it is preferable to estimate the missing values using information available for other variables in the same ISIC group, as long as they are readily available and their long-term behaviours are similar to the series with missing data. Alternatively, estimates may be made using only information from the series with missing values. When the missing data point occurs at the beginning of the series it is preferable to do this estimation using backcasting techniques. Interpolation can be used if it is located in the middle of the series Forecasting is preferable if missing data are found at the end of the series. Alternatively, in situations where a series with missing data has only a small number of observations, the missing information can be recuperated by imputation using information on other variables in the same ISIC group or by estimation using basic methods such as a simple moving average.

157. When the frequency of an input variable with missing data is lower than that of the ISP, it is preferable to forecast quarterly or annual data for three periods ahead and then to interpolate[18] a monthly or quarterly path from the forecasted data.

158. When there is no data for a particular services activity, the index for the services sector can be compiled with available information in other sectors at the same level of the same ISIC group. This operation assumes that their long-term behaviours are reasonably comparable. Otherwise, no attempt should be made to compile any index for the services industry.

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[18] A monthly path can be created from a quarterly series using various mathematical functions. For example, the UK Office of National Statistics uses a cubic spline. It is recommended that the series is forecast three data points ahead before a monthly path is interpolated using a cubic spline. Various approaches could be used for forecasting the data. A common approach is to use a univariate model such as Auto-Regressive Integrated Moving Average (ARIMA).

ARIMA models are a broad category of models that bring together three concepts in forecasting a time series, the:

- auto-regressive (AR) part of the model assumes that individual values in a time series can be described by linear models based on previous observations;
- moving average (MA) part assumes that the value for any point in a time series depends on the error of the linear auto-regressive model in estimating the previous point. These errors are then taken into account in estimating the next value; and
- integrated (I) part refers to the operations used to model the long-term trend.

The Holt-Winters model is a specific type of ARIMA forecasting. The level, slope and seasonality of a series are forecast separately using 'exponential smoothing'. This means that the moving averages used to take account of errors in forecasting previous points are exponentially weighted, that is, more weight is given to the most recent period than to earlier periods. This is appropriate in forecasting short-term indicators. The Holt-Winters model is not designed for forecasting long runs of missing data points. If it is used to forecast more than three periods, results can sometimes be subject to substantial revision.

Other possible approaches to forecasting involve the use of secondary data sources, model-based forecasting and expert judgement taking account of information from secondary sources.

Table 6: Missing data in input variables

Missing data in input variables	Nature of problems	Preferred	Alternative	Other
Input variables with same frequency as the ISP	Missing data at the beginning of series	Backcast with information on other variables in the same ISIC group; or Backcasting with series information only	Impute using information on other variables in the same ISIC group and with the same statistical behaviour.	Backcast with simple method, *e.g.* simple moving average; or use of implicit imputation
	Missing data in the middle of series	Interpolate with information on other variables in the same ISIC group; or Interpolation with series information only	Impute using information on other variables in the same ISIC group and with the same statistical behaviour.	Interpolate with simple method, *e.g.* simple moving average; or use of implicit imputation.
	Missing data at the end of series	Forecast with information on other variables in the same ISIC group; or Forecasting with series information only	Impute using information on other variables in the same ISIC group and with the same statistical behaviour.	Forecast with simple method, *e.g.* simple moving average; or use of implicit imputation .
Input variables with lower frequency than ISP		Forecast quarterly or annual data for three periods ahead and interpolating a monthly or quarterly path from the forecasted data.	Impute using information on other variables in the same ISIC group and with the same statistical behaviour which are available at higher frequency.	Interpolate using own information only.
No data for a services activity	No information is available for any indicators in the same ISIC group	Do nothing for this sector.		
	Some information is available for other indicators in the same ISIC group	Compile index with available information only, if these indicators are expected to provide a reasonable estimate for changes in output of the activities with no data (*i.e.* implicit imputation).	Do nothing for this sector.	

Note 1: Implicit imputation can be defined as: if no data are available for a particular component which would normally be part of an aggregation process (*e.g.* ISP for a 4 digit level industry required for aggregation to the 3 digit level) then excluding this component from the aggregation process is equivalent to imputing the weighting mean of all other components that are included in the aggregation process. Hence this practice is referred to as implicit imputation – the imputation is implicit because no actual value has been assigned to the missing component for the purposes of aggregation.

Note 2: Contents in Table 6 are sourced from various publications.

Breaks in time series

159. A long and statistically consistent historical time series is one of the most desirable characteristics for an ISP. The availability of a long time series maximises the usefulness of an index

in empirical analysis and as a tool to predict future turning points as well as growth rates of an economy. As a consequence, this property is also required for input variables used in ISP compilation. However, a variety of changes in statistical behaviour are frequently observed in a time series with long historical data. These can be due, for example, to changes in technology, in the political, social and economic environment, and methodologies used for compiling statistics. These changes can affect the comparability of data for the same series over different periods of time, and may often cause unexpected values or 'breaks' in the time series. These breaks could influence the quality of both the input series and the resulting ISP. It is therefore crucial for the reliability of the ISP to treat breaks in input variables properly. This Section presents several recommendations for the detection and treatment of temporary and permanent breaks.

Temporary breaks

160. A temporary break in an economic time series is observed when a value for a given period (or for a few consecutive periods) is significantly different from the overall pattern of the series. This break, however, has no significant impact on the long-term behaviour of a series. There are two types of temporary break. A break can be due to exceptional events, *e.g.* strikes or temporary changes to regulations or market conditions, which is called an outlier. This break is a true value, which should be kept in the series as it reflects actual economic phenomenon and contains true information on the market. It is, however, often removed or smoothed during compilation processes such as seasonal adjustment.

161. The second type of temporary break consists of errors arising from recording or transmission processes. Such breaks in a series should be removed and replaced by correct (or more plausible) values. A careful investigation by statisticians with help of economists and consultation with data suppliers is often necessary to distinguish outliers from possible errors.

Permanent breaks

162. There are several possible explanations for a permanent break. It may happen because of a significant change in methodology such as an increase or decrease in sectoral or geographical coverage, or changes in data collection from survey to administrative sources or vice versa. Permanent breaks may also be the result of changes in market conditions, regulations or changes in consumer behaviour. For example, an introduction of sales via the Internet may reduce turnovers from conventional markets and thus lead to a break if Internet sales are not captured by the relevant survey.

163. Permanent changes in the series are observed in a series in various forms: level shift; change in long-term growth rates, *i.e.* slope changes; both level and slope changes; or change in seasonality.

164. Table 7 below presents recommended processes that can be used to detect and correct series breaks. If a strange data point is observed, it is preferable to examine its property by a relevant statistical test and to then consult with economists and data providers, if further verification is necessary. Alternatively, it can be determined by consultation with economists and data providers followed by graphical checking and simple statistics of the series, in situations when the number of observations is not large enough for a statistical test. If consultation is not possible due to time constraints or non-availability of data providers and economists, the breaks may be determined by graphical checking and simple statistics of the series such as growth rates or averages before and after the suspected break.

165. If errors are found in a series they will have to be corrected. It is far preferable to try and obtain the correct data from the data compiler. Otherwise, the information for this period has to be

considered as missing and this problem is analogous to recovering the missing input variables, discussed in the previous Section. The alternative solution is therefore to compute an estimate by interpolation, possibly using information from other variables in the same ISIC group.

166. For permanent breaks involving a level shift, if a series shows the same trend-cycle behaviour before and after the rupture, information for the whole period should be used in the ISP compilation. Both parts of the series (*i.e.* before and after the break) will have to be linked, in order to remove the effects of the change in the level, by use of a factor. In other words, the level of the data before the break should be harmonised with the level of the data after the break. The main difficulty is that in most cases there is no common period between the two parts of the series and, as a consequence, strong assumptions are necessary.

167. As Table 6 above shows, the preferred method is to compile an average monthly (or quarterly) growth rate over several periods before and after the break and to assume that this average rate corresponds to the movement of the series between the months (or quarters) immediately before and immediately after the break. The periods to be used to compile this average growth rate should be chosen carefully. For a seasonally adjusted series, for example, these could be the 12 months (or 4 quarters) immediately before or after the break. For a series with seasonality, these could be the same month (or quarter) for the same years immediately before and after the break. The alternative is to compute this change using changes in series with clear correlation if available.

168. For permanent breaks with changes in level and slope, *i.e.*, for series whose trend-cycle behaviour is significantly changing along with the level shift, it is more hazardous to consider that consistent information between both parts of the series (*i.e.* before and after the break) can be drawn. For this reason, only the data after the break should be kept. The data before should therefore be estimated. This becomes an issue of estimating missing values in the beginning of a series. The recommendations for this are the same as in Table 6 above.

Table 7: Treatment of breaks

Treating breaks		Preferred	Alternative	Other
Detecting breaks		Relevant statistical tests and consultation with economists and data providers.	Graphical checking and simple statistics of series and consultation with economists and data providers.	Graphical checking and simple statistics of the series.
Fixing breaks	Errors	Try to obtain the correct data from the data provider.	Replace the error by an estimate obtained by interpolation from other variables in the same ISIC group; or from series information only.	Replace the error by an estimate obtained by imputation using information on other variables in the same ISIC group; or by interpolation from a simple method, *e.g.* simple moving average; or implicit imputation.
	Permanent breaks with level shift only	Modify data before the break by multiplying them with a factor based on the average of growth rates before and after the break.	Modify data before the break by multiplying them with a factor computed using changes in series with clear correlation.	
	Permanent breaks with changes in level and slope	Only keep data after the break and estimate the data before by backcasting with information on other variables in the same ISIC group; or backcasting with series information only (after the break).	Only keep data after the break and estimate the data before by imputing using information on other variables in the same ISIC group.	Only keep data after the break and estimate the data before by backcasting with simple method, *e.g.* simple moving average; or use of implicit imputation.

Note: Contents in Table 7 are sourced from various publications.

5.2.2 Adjustment

169. A variety of forms of Index of Services Production are required by different users depending upon their needs for economic analyses. The most frequently requested forms are ISP in raw, in working day adjusted, and in seasonally adjusted forms[19]. ISP in raw form can be compiled by integrating basic information without any further adjustments. The other two forms of ISP, on the other hand, require further adjustments for unequal number of working days or seasonality for different periods. Seasonally adjusted data are implicitly (by the nature of the computer software) adjusted for working days as well.

170. This Section discusses practical issues relating to seasonal and working day adjustments. Discussions are focused on their methods, on the stage in the ISP compilation process and on the frequency of the adjustments. It is assumed in this Section that the seasonal and working day adjustments are performed on deflated series.

Method of adjustment

171. X-12-ARIMA or TRAMO SEATS or combinations of both are the preferred methods of adjustment as they have become standard tools to perform seasonal and working day adjustments in the majority of statistical agencies of the OECD area as well as by analysts. Other nationally developed adjustment methods can also be used as an alternative, as a number of agencies have found that they produce very reliable results and are sometimes more useful for specific statistical environments.

Level of adjustment

172. It is theoretically preferable to have adjusted data (in addition to the corresponding raw data) for all detailed levels of aggregation. This means that data would preferably be adjusted at the lowest level before their aggregation into the adjusted ISP, *i.e.* seasonally and working day adjusted data. However, such a policy could raise a few practical problems due to the number of variables to be seasonally adjusted and whether series at the lowest level are of suitable accuracy to enable reliable seasonal adjustment to be performed over a longer period. A large amount of noise in the data may, indeed, result in large changes in seasonal parameters each time they are re-estimated causing unwanted revisions. This may often be the case at low levels of aggregation and therefore it may be preferable to aggregate to a higher level before performing the seasonal adjustment. This policy also raises the problem of the availability of suitable deflators at the lowest levels. In practice, deflators may not be available at 5 or 6-digit levels. Different approaches are currently used across the OECD area.

173. Statistics Canada, for example, carries out seasonal adjustment for the majority of industries at the lowest level in the industry classification, *i.e.* worksheet level. The United Kingdom ONS, however, compiles seasonally adjusted data from the group level (roughly 4-digit SIC), as the amount of seasonal adjustment to perform at the class level would be huge. The ONS assumes that "The components feeding into a SIC 4-digit classification are sufficiently homogeneous in their seasonality to make seasonally adjusting the group level aggregate the preferred method."

[19] Definitions of the different forms of data are provided in the OECD's *Data and Metadata Reporting and Presentation Handbook* (2006). The Handbook also provides recommendations on the methodological information (metadata) that should be provided to users describing the significance of seasonally adjusted series.

174. Table 8 below recommends seasonal and working day adjustments at the lowest level provided data have sufficient accuracy to enable reliable adjustment to be performed. If this is not plausible due to resource constraints and / or due to a lack of accuracy in the data, statistical agencies may determine the most optimal level, according to their assessment of the best balance between practicality and homogeneity.

Frequency of adjustment

175. Although it is a costly process, technically speaking it is preferable to perform seasonal and working day adjustments every month or quarter. However, such a process can be confusing to users if both recent and historical data are revised every month or quarter. Statistics Canada has adopted the following revision policy for their GDP by industry series. "With the addition of each new observation, concurrent seasonal factors are calculated from all of the available data. Revised seasonal factors are used in the most current period consisting of up to 18 months, while seasonal factors in the time period preceding this segment of the GDP series remain unchanged. Once a year, at the time of the incorporation of the benchmarks from the Input-Output tables, new revised seasonal factors are incorporated in the earlier years as well. This revision policy ensures that while all significant improvements are included, the number of times a given month gets revised is kept to a minimum." (Statistics Canada (2002), *Gross Domestic Product by Industry, Sources and Methods).*

176. On the other hand, the Korean National Statistical Office revises the seasonal factors only once a year, in February, when all monthly data for the previous year becomes available. The principal reason for this approach is to avoid user confusion.

177. Table 8 below therefore recommends that the seasonal factor revision policy should lie between two approaches. Small revisions, *e.g.* use of concurrent seasonal factors method, should be performed every month, especially when options are used in the seasonal adjustment. However, this should only apply to the most recent values of the time series (*e.g.* up to 18 months as is the case at Statistics Canada). Larger revisions, *i.e.* applying the latest seasonal factors to all the historical data, should be done only once a year.

Treatment of series with short historical data

178. When historical data for a time series is short, it is normally preferable not to attempt to compile seasonally adjusted data for the series until the length of historical data is sufficiently long. Four to five years of monthly or quarterly data is generally accepted as the minimum length to perform seasonal adjustment. This could, however, cause problems in the construction of seasonally adjusted ISP data for the whole services industry and its sub-groups if, for example, a few new component series become available due to a new survey. In such a case, it is preferable to estimate seasonally adjusted data for the series with short historical data from their imputed (backcasted) raw data (See previous Section for a detailed discussion).

Table 8: Seasonal and working day adjustments

	Preferred	Alternative	Others
Method	X-12-ARIMA or TRAMO-SEATS	Other national methods	
Level of adjustment	4-digit level or higher, provided suitable accuracy of the data.	Any level for which reliable information for adjustment is available and for which a deflator is available.	Top level
Frequency of adjustment	Concurrent adjustments every month or quarter for recent period; and once a year for all period	Once a year	Ad hoc
Treatment of series with short historical data	Estimate seasonally adjusted data for the newly introduced series in order to produce seasonally adjusted ISP for whole services industry and its sub-groups	Do not perform seasonal adjustment until enough historical data become available.	

Note: Contents in Table 8 are sourced from various publications.

5.3 Consolidation

5.3.1 Weighting

Weights

179. Input variables can be aggregated into the ISP once all the necessary transformations at the individual series level, *e.g.* treatment of missing data points, deflation, indexing, etc., have been completed. Aggregation is carried out at each level from the lowest level of the ISIC. In other words, for a given level of the ISIC (*e.g.* a Group), the ISP for the level is derived from all the ISPs of the lower level (*i.e.* Class). An index for a sector is estimated by taking a weighted average of all the component industries in the sector, where the weights are derived from their relative contributions to total GDP.

180. As shown in Table 11 below, it is preferable to measure the relative importance of industries in GDP using gross value added. Such information is usually available in Input-Output tables. For most countries, however, it requires the use of other comprehensive data sources for lower levels of ISIC groups to obtain weights for those levels. The sources also vary from one industry to another as the services industry is very heterogeneous in nature. It is therefore often necessary to use alternative weighting variables such as turnover data and quantity indicators, or indicators that measure input to an industry such as employment.

Missing variables or indices

181. If for some reason an index is not available for one of the lower level activities, 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.

Missing weights

182. If no weights are available (*e.g.* disaggregated figures for value added do not cover the whole services sector), various methods can be used to consolidate the deflated variables or volume indices[20].

183. The only method which is base-period invariant and which gives individual volume representatives the same degree of representativeness calculating the average change in volumes[21], irrespective of the initial level or that of the rates of changes, is the Jevons index. The Jevons index is the ratio of geometric means of volume representatives (or equivalently the geometric mean of the volume relatives) and mathematically it can be expressed as follows:

$$J_t = \prod_{i-1}^{n} \left[\sqrt[n]{\frac{C_{i,t}}{C_{i,0}}} \right]$$

where $C_{i,0}$: volume for sector i at time 0

$C_{i,t}$ t : volume for sector i at time t

Frequency of weights revision

184. In the case of a Laspeyres index, weights for production indices are normally updated every five years, which is co-ordinated with base year changes. On the other hand, weights for Paasche and Fisher indices by their construction will have to be updated every year when reliable annual data for the year become available. For maintaining a coherent time series, Eurostat, in its *Methodology of Short-term Business Statistics: Interpretation and Guidelines* (Eurostat 2002) advocates the following:

> "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 (linked) in order to maintain a coherent time series. In the standard case of a rebase 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.

[20] Problems such as this are discussed in detail in the price index literature (see *Consumer price index manual: Theory and practice*, ILO/IMF/OECD/UNECE/Eurostat/The World Bank, Geneva, 2004, pp. 355-371 and *Producer price index manual: Theory and practice*, IMF/ILO/OECD/UNECE/Eurostat/The World Bank, Washington D.C., 2004. pp. 508-524). The results developed there can be used in the context of volume indices if the word "price" in the literature is changed to "volumes".

[21] Noting that calculating average change in volumes is the key measurement task of the ISP

Therefore, if for example weights relating to a new base year of 2000 were introduced in 2003, index series based on the new 2000 weights would be revised back to the beginning of 2000, which is also the point where the index would be linked (*i.e.* spliced) to the historical series. "

185. These guidelines from Eurostat equate to the use of a chain linked mid-year index (see Section 5.1.1) re-weighted and linked at five year intervals. This was presented as an alternative method in Table 5. Clearly the updating of weights must accord with the frequency of linking and as outlined in Table 5. This Manual recommends, as the preferred method, chain-linked Laspeyres indexes where weights are updated at either annual or 5-yearly frequency.

186. Another issue related to the frequency of weights revision is whether weights for different levels of ISIC categories should be revised with the same frequency. Due to resource and data constraints, it may be more practical to update weights for higher levels more frequently than those for lower levels. The ONS in their *Methodology of the Experimental Monthly Index of Services* (Fenton and Pike 2001) suggests the following practice:

"The contributions, or 'weights' of indicators at class level (which is normally below the level of 4-digit SIC(92)) are updated every five years. The weights of indicators at group level (normally equates to 4-digit SIC) and above are updated every year."

Table 9: Weights

Methods	Preferred	Alternative	Others
Weighting variables	Gross value added	Turnover or quantity indicators	Indicators measuring inputs to the industry
Missing variables or indices	Proportional distribution of the weight of that activity amongst the other activities in the same group[22]		
Missing weights	Consolidate the volume indices using the Jevons index		
Frequency of update	Once a year for higher levels and every five years for lower levels of ISIC groups	Every five years for all levels of ISIC groups	Ad-hoc

Note: The content of Table 9 is sourced from various publications.

5.3.2 Comparability with GDP

187. As an analogy to the Index of Industrial Production (IIP), the Index of Services Production (ISP) can be considered to be a reasonable estimate of short-term change in Gross Value Added

[22] This is the most realistic option and is recommended as preferred, though it was regarded as the 'other' option in Table 9 above in the context of missing data in input variables with the same frequency as the ISP.

(GVA) for the services industry. This is because of the fact that the ISP is a weighted average of services sectors' output using GVA weights with an assumption of the ratio of Gross Value Added to Output being constant in the short-term. Thus the ISP and the IIP can be aggregated along with estimates of change in GVA for agriculture, forestry and fishing and for construction to arrive at an estimate of change in monthly (or quarterly) GVA for the whole economy or GDP.

188. As mentioned throughout this Manual, a monthly or quarterly ISP should be considered as an important input to the production of quarterly GDP. This is analogous to use of the index of industrial production as an input to the calculation of quarterly GDP which is the case in most OECD countries. The degree to which the ISP is directly used in production of quarterly GDP, or to which input data sources for the ISP are also used in the compilation of quarterly GDP, may differ across countries depending on the frequency and variety of input data sources available and resources available for compilation work. For the production measure of GDP, it is practical to collect annual data for both output (turnover) and intermediate consumption to achieve a direct measure of GVA. It is therefore likely that there will be some incoherence between monthly or quarterly ISP (*i.e.* an estimate of GVA produced as a short-term indicator) and quarterly or annual GVA (*i.e.* an estimate produced by balancing the three measures of GDP).

189. Although some discrepancy can be expected, users would prefer the presentation of a consistent message about the economy, and so it is preferable to 'benchmark' the monthly or quarterly ISP to the quarterly and annual estimates of GVA or GDP at constant prices. Where the estimate of headline GDP is quarterly, the benchmarking process may be used to impose seasonally adjusted quarterly GDP growth rates onto the monthly or quarterly ISP.

190. The benchmarking of the short-term ISP to the quarterly and annual estimates of GDP can be done by using actual statistical information such as reconciling components of the ISP with the corresponding components within a Supply-Use framework. Although this approach could eventually ensure the full consistency between the short-term ISP and the quarterly and annual national accounts at the corresponding levels and sectors, it is not realistic to expect the majority of OECD Member countries to develop their system to meet this requirement. This is because of the fact that this approach requires complete coherence in the statistics used in the short-term ISP and quarterly and annual GDP in terms of data sources and methods.

191. Thus, this Manual recommends utilising econometric benchmarking techniques to achieve comparability between the short-term ISP and quarterly and annual GDP. Specific methodologies for benchmarking techniques with their applications and discussions can be found in other fora such as the Workshop on Frontiers in Benchmarking Techniques and Their Application to Official Statistics (April 2005) at http://epp.eurostat.cec.eu.int/portal/page?_pageid=1853,1,1853_20488614&_dad=portal&_schema=PORTAL

192. As regard to the level at which benchmarking should be applied, it is theoretically preferable for the ISP to have full consistency with quarterly and annual national accounts at all levels. However, it is not realistic in practice to adopt the theoretical preference because of various constraints such as the availability of required information at all levels in the short-run. This Manual therefore recommends, as a preferred method, applying a benchmarking technique at the level at which indices are disseminated to the general public in order to avoid user confusion. Alternatively, the technique should be applied at 1-digit level of ISIC.

193. Although frequent revisions in the data due to benchmarking could cause user confusion, it is still preferable to apply a benchmarking technique as soon as headline national accounts data become

available, *i.e.* every quarter, and further revision of the ISP data subject to annual revision of national accounts data. Alternatively, the ISP should be revised once a year in line with annual national accounts.

5.3.3 Overall quality assessment of ISPs

194. Section 4.2 above discussed issues related to the evaluation of the suitability of specific input variables to be considered in the compilation of monthly or quarterly Index of Services Production. This Section did not attempt to deal with the overall quality of the resulting ISP. Most statistical institutions at national and international levels attempt to systematically evaluate the quality of their own statistical output using various tools and processes. Notable examples at the international level are the IMF quality framework, *i.e.* the General Data Dissemination System (GDDS) and Special Data Dissemination Standards (SDDS)[23].

195. The OECD has also developed tools to assess the quality of statistics stored and maintained by various Directorates within the Organisation. The OECD's quality framework[24] is therefore used in this Manual as a basis for discussing ways to ensure the overall quality for an ISP using input variables discussed in Section 4 above and recommendations for the compilation of an index outlined above in this Section.

196. In general terms quality is defined as "fitness for use" in terms of user needs. This definition is broader than has been customary used in the past when quality was equated with accuracy. It is now generally recognised that there are other important dimensions of quality. Even if data is accurate, they can not be said to be of good quality if they are produced too late to be useful or cannot be easily accessed or appear to conflict with other data. Thus, quality is viewed as a multi-faceted concept.

197. In the OECD's quality framework, the quality of a statistical product is assessed via the following seven dimensions:

- relevance;
- accuracy;
- credibility;
- timeliness;
- accessibility;
- interpretability; and
- coherence.

198. In addition to the seven criteria mentioned above, the OECD also recognises the cost to produce necessary statistics. When it comes to the production of short-term statistics such as a monthly or quarterly ISP, cost-efficiency is an indispensable criterion to assess the quality of statistics. The exact meanings of the seven dimensions are discussed in detail in the remainder of this Section.

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[23] Quality frameworks have also been developed by other institutions such as the European Commission's Eurostat, Statistics Canada, Statistics Finland, Statistics Denmark, etc.

[24] Detailed information on the OECD quality framework is available at www.oecd.org/statistics/qualityframework

Descriptions of quality dimensions

199. The seven dimensions of the OECD's quality framework can be described as follows:

- *Relevance*: As described in the Introduction to this Manual (in Section 1), the ISP is compiled to meet the strong demands of analysts. According to the OECD quality framework, "Relevance depends upon both the coverage of the required topics and the use of appropriate concepts." Relevance is proportional to the number of sub-sectors covered in the index. Relevance is also positively correlated to the number of "preferred" methods adopted in comparison to the number of alternative or other methods.

- *Accuracy:* As the ISP is compiled by a bottom-up approach, the accuracy of the index is strongly dependent on the accuracy of the individual components. The OECD explains that "Accuracy refers to the closeness between the values provided and the (unknown) true values" and that "Accuracy has many attributes, and in practical terms there is no single aggregate or overall measure of it." The framework then advises assessment of accuracy via "the closeness between the initially released value(s) and the subsequent value(s) of estimates" in practice. It, however, also notes that "The absence of revisions does not necessarily mean that the data are accurate". According to the Eurostat's *Methodology of Short-term Business Statistics: Interpretation and Guidelines*, "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".

- *Credibility:* According to the OECD "the credibility of data products refers to the confidence that users place in those products based simply on their image of the data producer, i.e., the brand image."

- *Timeliness*: Monthly ISP should preferably be as timely as the corresponding monthly Index of Industrial Production. But, as the services industries are much more complex than their industry counterpart, it is very difficult to collect all the necessary information in a timely manner. It is however still preferable to produce the monthly ISP within six weeks after the reference period, or within two weeks after the monthly IIP. If the ISP is compiled on a quarterly basis, it should be produced before the quarterly GDP so that it can be used to understand short-term economic fluctuations and as an input to quarterly GDP compilation.

- *Accessibility*: In the OECD quality framework, the accessibility of data products is described as "how readily the data can be located and accessed from within OECD data holdings. Accessibility includes the suitability of the form in which the data are available, the media of dissemination, and the availability of metadata and user support services. It also includes the affordability of the data to users in relation to its value to them and whether the user has reasonable opportunity to know that the data are available and how to access them." In addition, the Eurostat's *Methodology of Short-term Business Statistics: Interpretation and Guidelines* states that there is a "need for a catalogue system to allow users to find what information is available, and where to find it" and that "the SDDS therefore requires advance dissemination of release calendars and simultaneous release to all interested parties". Accessibility is discussed further below in Section 6 covering dissemination.

- *Interpretability:* The interpretability of data is closely related to the users' understanding of the data for their use. Thus the degree of interpretability depends on all aspects of information on the data such as adequacy of the definitions of concepts, target populations, variables and terminology, limitations of the data, etc. Thus the quality of metadata provided

along with the ISP is indeed crucial to improve interpretability. Such metadata should, in particular, inform the user on how close to the target variable (*i.e.* the change in value added) the input variables used in the ISP are. When there is a significant difference, it should be explained to what extent this may cause a bias in the measure of the services production for particular services activities or the index as a whole.

- *Coherence:* The OECD states that "the coherence of data products reflects the degree to which they are logically connected and mutually consistent." The OECD distinguishes four important sub-dimensions for coherence:

  - coherence within a dataset;
  - coherence across datasets;
  - coherence over time; and
  - coherence across countries.

200. The ISP can be *coherent within a dataset* if all individual sub-indices that are components of an overall ISP are compiled based on the methodologies proposed in this Manual.

Coherence across datasets for the ISP cannot be ensured until its coherence with corresponding datasets is properly checked. As the ISP is designed to complement the IIP, coherence between these two indices will have to be examined by ensuring consistency in classifications, concepts and definitions. Comparability between the ISP and GDP is also an important consideration.

Coherence over time and *coherence across countries* are in theory achieved using the methodology recommended in this Manual. However, in practice, as described in the previous discussions in this Section, there are many reasons for these properties not to be respected for all services sub-sectors. When this is the case, it is advisable to clearly note the differences from the recommendations. Coherency across countries and amongst various sub-sectors of services activities may be dependent upon the degree of adoption of recommended methodologies presented in this Manual.

201. The OECD describes cost-efficiency as "A measure of the costs and provider burden relative to the output. Provider burden is a cost that happens to be born by the provider, but is a cost nevertheless." As mentioned earlier, the OECD does not include cost-efficiency as a dimension of the quality framework. However, the OECD views cost-efficiency as a factor that must be taken into account in any analysis of quality as it can affect quality in all dimensions.

202. The challenge is how to assess the quality of an ISP based on the criteria outlined above. It is not a simple task to assemble the seven criteria into an index through which the overall level of quality of an ISP can be evaluated. The main problems arise from the difficulties in quantifying the level of individual dimensions and in aggregating the levels of all dimensions. Any resulting score can be arbitrary as it to a large extent depends on the data compilers choice of quality measurement variables and weights used for their aggregation.

203. No attempt has therefore been made in this Manual to outline a method for deriving a single quantitative quality measure for an ISP. In the absence of such a single measure, it is sufficient that qualitative statements be made with respect to each quality dimension adopted by the statistical agency compiling the ISP. This would enable subsequent determination of priorities on the basis of an understanding of user needs.

204. It is recommended that a quality review of the ISP be undertaken every four or five years, or more frequently if significant new data sources become available

5.4 Procedures carried out at various compilation stages

205. This Section highlights key practical compilation steps described in this Manual, and guides users on how the recommendations, etc., can assist in identifying appropriate solutions if users wish to develop an ISP. It also offers remedies if compilers encounter any problems during ISP compilation. As only a limited number of countries are currently producing monthly ISPs, United Kingdom practices for the compilation of their monthly Index of Services (as explained in *Methodology of the Experimental Monthly Index of Services* (Fenton, T. and Pike, R., 2001)) are used extensively in this Section. Practices applied in other countries will be incorporated when they become available.

5.4.1 Overview of the compilation process

206. As described in this Manual, a number of procedures used at various stages are involved in the compilation of ISP. Sections 4 and 5 of this Manual advise that the lowest level at which basic information should preferably be collected is 4-digit level of the ISIC. Thus, as shown in Table 10 below, there are five stages for the information to be integrated into an ISP for the whole services sector. This Table also shows that detailed procedures are required for each ISIC level.

Table 10: ISP compilation processes to be carried out by ISIC level

ISIC levels	Recommended process
Pre-processing	Preparation of data (*i.e.* deflators; input variables; and weights) suited for an automated compilation program (*e.g.* estimation of missing information and treatment of series breaks at beginning or in the middle of historical series)
4-digit	Deflation; Indexing; Forecast missing data; Interpolation of higher frequency series from the lower ones; Seasonal and/or prior adjustment; Consolidation to 3-digit level
3-digit	Consolidation to 2-digit level by chain-linking
2-digit	Quality adjustment; Benchmark monthly or quarterly ISP to quarterly and annual GDP; Consolidation to 1-digit level by chain-linking
1-digit	Consolidation to overall ISP by chain-linking; Dissemination
Overall ISP for whole services sector	Dissemination

5.4.2 Pre-processing

207. As the compilation of short-term (*i.e.* monthly or quarterly) ISPs will need to be carried out in an automated program, it is important to ensure that all the basic information are transformed to a standard pattern. All input variables (*e.g.* turnover, volume indicators) should therefore be available for all 4-digit levels of services activities defined in ISIC Rev. 3 for the entire compilation period. At the same time, it is desirable to have all deflators (*i.e.* PPIs and CPIs) and weights for the corresponding services activities. If this condition is not initially met, the source data will need to be processed in advance of the actual ISP compilation. As Table 12 above shows, the types of problems that can be encountered are:

- treatment of series breaks at the beginning or in the middle of historical series;
- estimation of missing information at the beginning or in the middle of historical series; and
- no information.

208. These problems should be dealt with during the pre-processing stage. As regard to treatment of breaks, Table 7 in Section 5.2.1 proposes detailed remedies for various cases, which can be summarised as follows:

- If the breaks are errors, obtain the correct data from the data provider, or replace it by an estimate using interpolation or using imputation or implicit imputation.
- If the breaks cause level shift, modify data before the break by multiplying them with a factor based on the average of growth rates before and after the break; or with a factor computed using changes in series with clear correlation.
- If the breaks cause changes in level and slope, keep the data only after the break and estimate the data before by backcasting with information or backcasting with series information only; by imputation using information on other variables in the same ISIC group.

209. When data point(s) is(are) missing at the beginning or in the middle of a series, the missing information should be estimated. Table 6 in Section 5.2.1 recommends the following procedures to be used for the estimation of missing information at the beginning or in the middle of historical series:

- backcast (interpolate) with information on other variables in the same ISIC group or with series information only;
- impute using information from other variables in the same ISIC group and from variables with the same statistical behaviour; or
- backcast (interpolate) with a simple method, *e.g.* simple moving average; or use of implicit imputation.

A Sketch of Interpolation with Cubic Spline

The method used by the ONS to interpolate a smooth path through flows and index series is a cubic spline[25], Although it is quite a complex procedure, a non-technical description of the method can be explained in two stages:

- The first stage is to define the following five parameters:

- to identify the series to be interpolated. The function is run at the periodicity of the output series, so this identifier requires a suffix specifying the periodicity of the input series (annual or quarterly);
- to specify the periodicity of the output series (monthly or quarterly);
- to specify whether the interpolated series should sum (flows) or average (index) to the original series;
- to define the required end date of the interpolated series, which can be beyond the end of the original series due to the forecasting element of the function; and
- to define the type of Holt-Winters (refer below) to be used in the forecast. This can be additive, multiplicative or non-seasonal, to suit the nature of the data.

- The second stage is to apply a cubic spline whose basic concept is as follows:

- it takes the quarterly (or annual) data and tries to run a smooth, continuous curve through all the points; and
- this curve is made up of polynomials of the third order (cubics). The coefficients of each cubic are chosen such that the curve is as smooth as possible while still passing through the quarterly data.

Aside from the selection of five parameters in the first stage, there are other points that should be considered, such as types of data, forecasting, level shifts in series, outliers, seasonality, and revisions (detailed descriptions are given in the Section on Time series method, in Fenton, T. and Pike, R. (2001).

210. Table 6 in Section 5.2.1 also suggests that, for a sector with no data, a proxy can be created if some information is available for other indicators in the same ISIC group. The Manual therefore proposes the following procedures to cope with no (or only some) information being available:

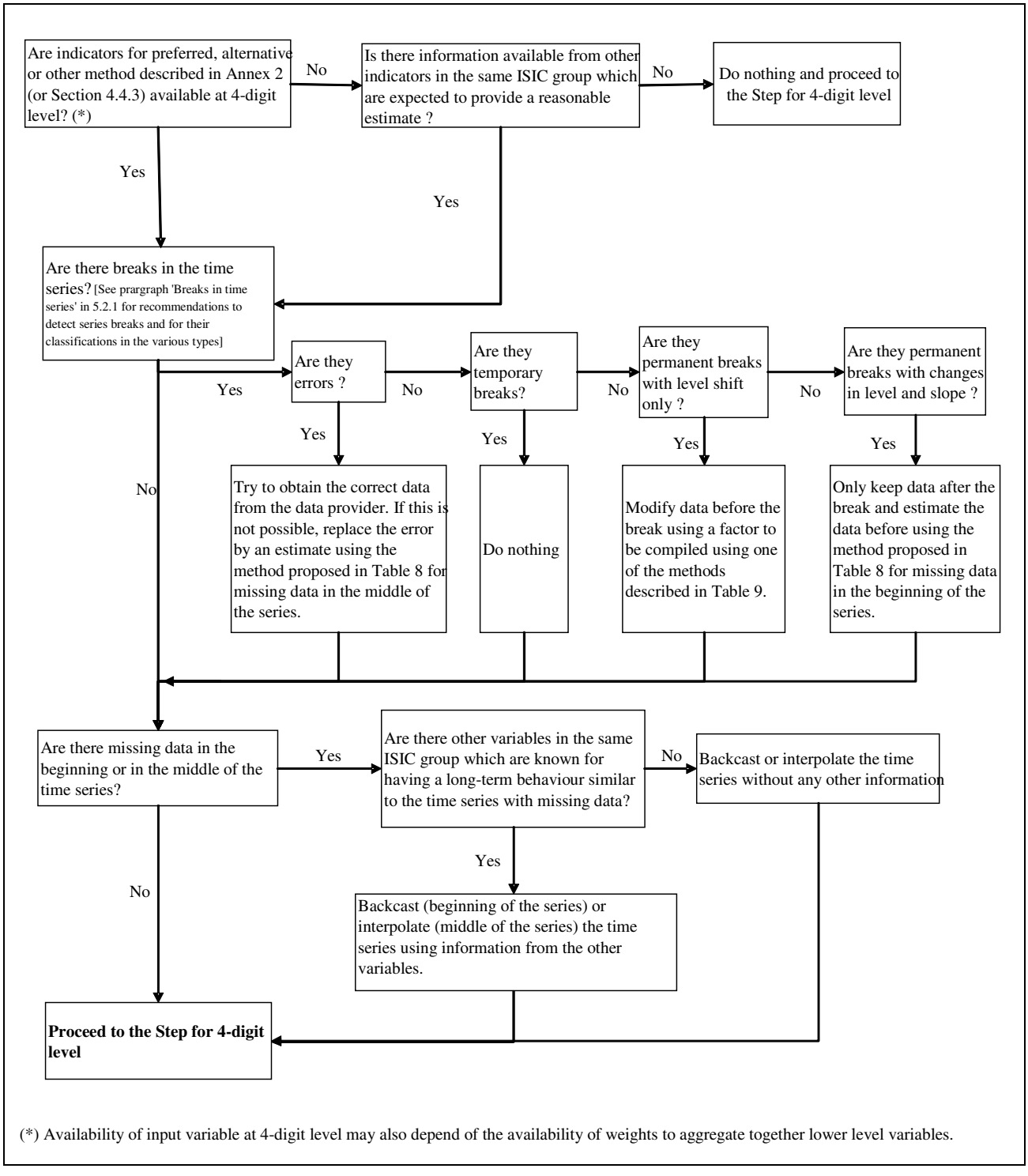
- if some information is available for other indicators in the same ISIC group, then create a proxy with available information only, if these indicators are expected to provide a reasonable estimate for changes in output of the activities with no data; or

- if no information is available for any indicators in the same ISIC group, do nothing. This implies that the ISIC group will be implicitly imputed as the weighted average of other ISIC groups automatically as part of the aggregation procedure to the next level.

[25] A more technical description of a cubic spline used by the ONS can be found in Annex C of *Methodology of the experimental monthly index of services* (Fenton, T. and Pike, R. (2001)).

211. Tasks carried out during pre-processing stage is summarised in a flowchart in Figure 1.

Figure 1: Flowchart for pre-processing



(*) Availability of input variable at 4-digit level may also depend of the availability of weights to aggregate together lower level variables.

5.4.3 4-digit and 3-digit levels

212. Automated compilation processes begin at the ISIC 4-digit level. At this level, all the input data are to be converted into seasonally adjusted deflated indices with a base year = 100, which will then be consolidated into 3-digit ISIC categories. The procedures (as outlined in Table 10) to be carried out at this level in order of execution are:

- forecasting missing data;
- interpolation of higher frequency series from the lower ones;
- deflation;
- indexing;
- seasonal and/or prior adjustment; and
- consolidation to 3-digit level.

213. The first two tasks are concerned with problems in the data. Any missing information for the most recent period should be forecasted. Table 6 in Section 5.2.1 suggests the following procedures for forecasting Missing data (input variables, deflators and weights) for the most recent period:

- forecast with information on other variables in the same ISIC group; or forecasting with series information only;
- impute using information on other variables in the same ISIC group and with the same statistical behaviour; or
- forecast with simple method, *e.g.* simple moving average; or use of implicit imputation.

214. Forecasting is also useful for interpolation of a monthly or quarterly path from quarterly or annual information. Frequencies of deflators are often lower than the overall ISP, *e.g.*, quarterly PPI for monthly ISP. For such cases, the problem should be treated by interpolating a monthly or quarterly path. Table 8 in Section 5.2.1 suggests the following procedures for estimating higher frequency data:

- forecast quarterly or annual data for three periods ahead and interpolating a monthly or quarterly path from the forecasted data; or
- impute using information on other variables in the same ISIC group and with the same statistical behaviour which are available at higher frequency;

A Sketch of Holt-Winters Forecasting Method

To forecast the ONS applies Holt-Winters[26] method, which uses the historical path of a series to predict its future path. The basic concept is as follows:

- In the Holt-Winters methods, prediction of the level, slope, and seasonality of a series are updating exponential smoothing.
- Exponential smoothing is the process by which a predicted value is updated each time new information becomes available at the end of a series. It takes its name from the use of moving averages with exponential weights that ensure that the most recent and relevant data points in the series supply the most information to the predictions.
- These predictions are then combined to give a forecast of the next observation in the series.
- Holt-Winters has an additive and a multiplicative form that determines whether the seasonal component is combined in additive or multiplicative way with the level and slope components.

The ONS system advocates Holt's method if the series is truly non-seasonal.

215. Deflation is undertaken by dividing current price turnover (or proxy) data and deflators by price indices (*i.e.* PPI, CPI, combined index of PPI and CPI, or proxies). Other input series, *e.g.* volume indicators and proxies in constant price, are to be deflated using the same procedure with dummy deflators which have no effect (*i.e.* value of the deflator is set to 1). The deflated series is then converted into an index whose average value for a given reference year equals to 100.

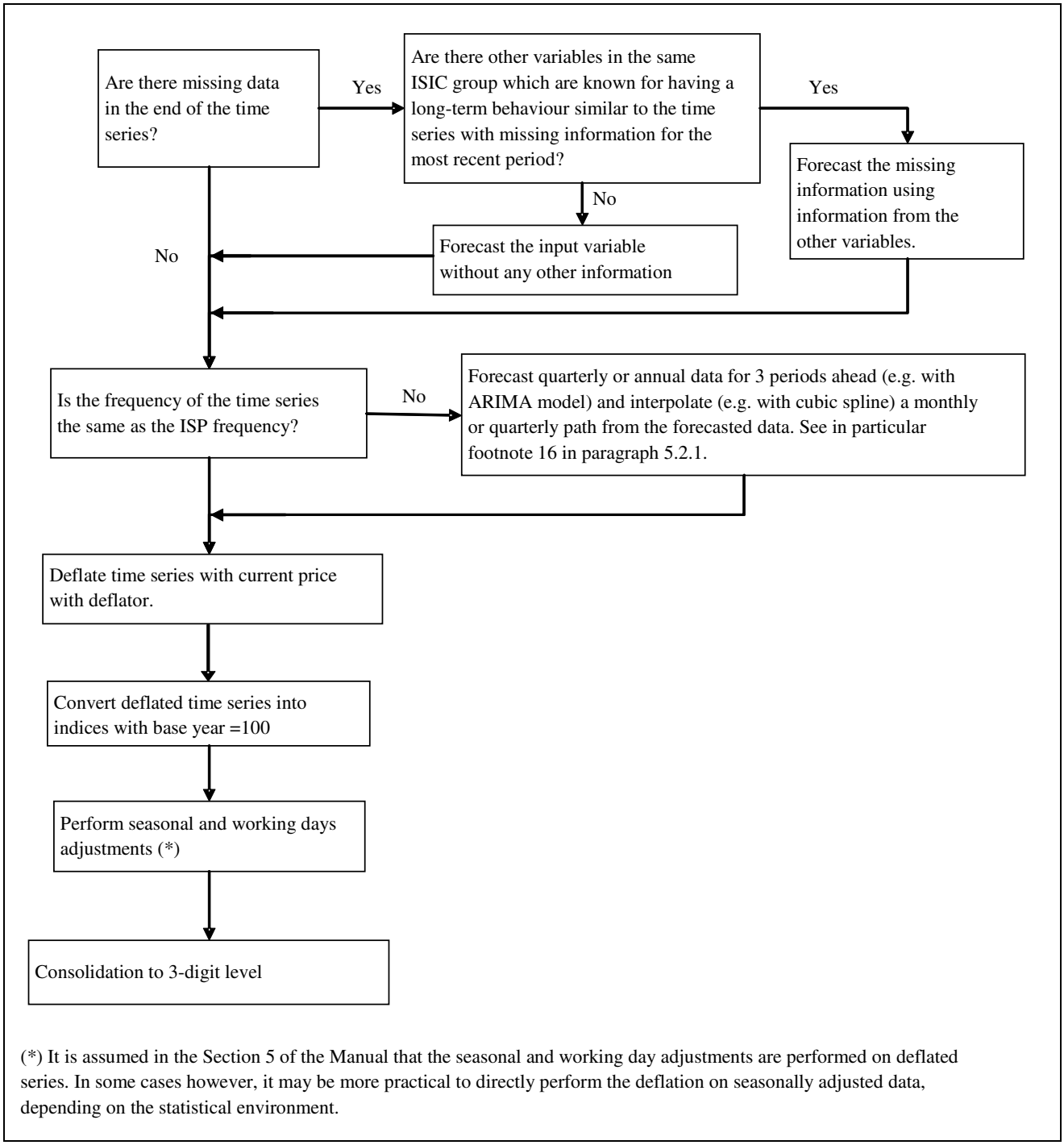
216. The deflated indices are then adjusted for their seasonality. It is recommended that either X-12-ARIMA or TRAMO SEATS or combinations of both are used for this adjustment , as these are the most common methods for the majority of statistical agencies in OECD Member countries as well as by analysts. Other nationally developed adjustment methods could also be used as an alternative. The final task to be carried out at 4-digit level is to consolidate the deflated turnover indices (both raw and seasonally adjusted series) to the 3-digit level with proper weights (*i.e.* while gross value added is preferred, turnover or quantity indicators, and indicators measuring inputs to industry can be used as alternative and other methods, respectively), using the chain-linked method presented in Section 5.1. If no weights are available, as it is recommended in Section 5.3, Jevons formula can be applied.

217. Only task required at 3-digit level is to create chain-linked 2-digit series by aggregating 3-digit series using the chain-linked method described in Section 5.1 of this Manual. The only other possible manipulation at the 3-digit level is seasonal adjustment if it can not be carried out at 4-digit level due to resource constraints or other data deficiencies. As a result of the aggregation process, twenty-seven chain-linked sub-components of ISPs are to be created (see Section 4.4.3 for detailed lists of series) in both raw and seasonally adjusted forms.

218. Tasks carried out at 4-digit level is summarised in a flowchart in Figure 2.

[26] A detailed description of Holt-Winters method can be found Annex B of *Methodology of the experimental monthly index of services* (Fenton, T. and Pike, R. (2001)).

Figure 2: Flowchart for 4-digit level



(*) It is assumed in the Section 5 of the Manual that the seasonal and working day adjustments are performed on deflated series. In some cases however, it may be more practical to directly perform the deflation on seasonally adjusted data, depending on the statistical environment.

5.4.4 2-digit and 1-digit levels

219. Sub-components of the ISP can be published at this level depending upon user needs. Thus, it is important to ensure that the all the sub-ISPs meet the desirable level of quality and move comparably with quarterly and annual GDP at this level in the medium- and long terms. Therefore, as mentioned in Table 10, the following tasks are to be carried out at this level:

- benchmark monthly or quarterly ISP to quarterly and annual GDP;
- quality adjustment; and
- consolidation to 1-digit level and to overall ISP by chain-linking.

220. Ideally, monthly or quarterly ISPs should measure the corresponding sectors in quarterly GDP using the same data. The only possible difference is the periodicity of the output. In reality, however, due to limitations in data, they may differ in many respects. In order to present coherent sets of information about the economy, 2-digit level ISPs should be benchmarked to the corresponding quarterly series in GDP. A number of methodologies have been proposed for benchmarking[27].

221. In order to provide users with an illustration of a benchmarking procedure, the basic version of the proportional Denton method presented in IMF QNA Manual (2001) is summarised as below:

A Sketch of Proportional Denton Benchmarking Method

The basic version of the proportional Denton benchmarking technique keeps the benchmarked series as proportional to the indicator as possible by minimizing (in a least-squares sense) the difference in relative adjustment to neighbouring quarters (months) subject to the constraints provided by the annual (quarterly) benchmarks. Mathematically, it is defined as the sum of the quarters (months) should be equal to the annual (quarterly) data for each benchmark year (quarter).

The proportional Denton technique implicitly constructs from the annual (quarterly) observed benchmark-to-indicator (BI) ratios a time series of quarterly (monthly) benchmarked estimates-to-indicator (quarterly BI or monthly BI) ratios that is as smooth as possible. Thus, the proportional Denton technique allows users to avoid distorted quarterly (monthly) pattern caused by introducing a step in the series by employing a basic distribution technique. In the case of flow series, the proportional Denton technique produces:

- the back series averages to the annual (quarterly) BI ratios for each year (quarter); and
- the forward series are kept constant and equal to the ratio for the last quarter (month) of the last benchmark year (quarter).

[27] Univariate methods without indicators can be found in Boot-Feibes-Lisman (1967) and Stam-Wei (1986)); univariate methods with indicators in Denton (1971), Chow-Lin (1971), Litterman (1983), and Santos-Cardoso (2001)); and multivariate methods with indicators and transversal constraints in Di Fonzo (1990, 2002).

A numerical example to illustrate the proportional Denton method for a quarterly series is borrowed from Example 6.1 on p. 85 of IMF QNA Manual (2001):

	Indicator				Derived quarterly estimates			
					Distributed data			Period-to-period
	Quarterly data (1)	Period-to-period rate of change	Annual data (2)	Annual BI ratio (3)=(2)/(1)	(1)	(3)	(4)=(1)x(3)	rate of change
Q1 1998	98.2				98.2	9.950	977.1	
Q2 1998	100.8	2.6%			100.8	9.950	1,003.0	3.0%
Q3 1998	102.2	1.4%			102.2	9.950	1,016.9	2.0%
Q4 1998	100.8	-1.4%			100.8	9.950	1,003.0	-0.5%
Sum	**402.0**		**4000.0**	**9.950**			**4,000.0**	
Q1 1999	99.0	-1.8%			99.0	10.280	1,017.7	-0.6%
Q2 1999	101.6	2.6%			101.6	10.280	1,044.5	3.5%
Q3 1999	102.7	1.1%			102.7	10.280	1,055.8	1.7%
Q4 1999	101.5	-1.2%			101.5	10.280	1,043.4	-0.9%
Sum	**404.8**	**0.7%**	**4161.4**	**10.280**			**4,161.4**	**4.0%**
Q1 2000	100.5	-1.0%			100.5	10.280	1,033.2	-1.0%
Q2 2000	103.0	2.5%			103.0	10.280	1,058.9	2.5%
Q3 2000	103.5	0.5%			103.5	10.280	1,064.0	0.5%
Q4 2000	101.5	-1.9%			101.5	10.280	1,043.4	-1.9%
Sum	**408.5**	**0.9%**	**?**	**?**			**4,199.4**	**1.6%**

222. The benchmarking method should:

- create a series that is consistent with the annual or quarterly benchmarks;
- as far as possible, preserve the growth rates of the indicator series;
- be able to deal with situations where the indicator series extends into a period for which there is no benchmark yet available; and
- be able to deal with benchmarking with any combination of frequencies, *e.g.* monthly data to quarterly benchmarks, quarterly and monthly to annual, quarterly to fiscal year annuals, etc.

223. Benchmarking is sometimes seen as a form of interpolation – the benchmark series is interpolated using an indicator series to provide information about short-term movements. Benchmarking and interpolation in these circumstances are identical. A complexity with benchmarking, however, occurs when estimating unobserved benchmarking series (UBS) beyond the period for which a related indicator (RI) is available. In this case forecasting and benchmarking

methods need to be combined. Forecasting the RI then benchmarking the extended series onto the benchmarks is a sensible solution.

224. In fact, because of the relative timeliness of annual and quarterly data, during the current year, the quarterly values will generally be available before the annual benchmark annual values are known. Therefore, the last few data points in the partial year at the end of the series UBS are estimated in the absence of an annual benchmark – an important aspect of any method of benchmarking is how it deals with this problem.

225. Section 5.3.3 explains the advantages of and dimensions used for quality adjustment. The Section recommends that a quality review of the ISP be undertaken every four or five years, or more frequently if significant new data sources become available. This Section, however, makes no attempt to recommend a single measure and leaves each statistical agency compiling the ISP to implement their own quality dimensions / quality procedures.

226. The final task to be carried out at the ISIC 2-digit level is to consolidate ISPs into 1-digit level by chain-linking[28] or other useful groups (*e.g.* Distribution services or ICT services) according to users' needs, so that the overall ISP can be compiled at the final stage.

5.4.5 Evaluation of the usefulness of the Manual [29]

227. The practicability and usefulness of this Manual was assessed by applying its guidelines to the actual compilation of an ISP. The information, communication and technology (ICT) industry for France was chosen for the evaluation, as the ICT industry is known to be more dynamic and as a consequence attracts the interest of market players and policy makers with regard to the availability of measures for short-term movements in output. At the same time, ICT involves various types of services activities in several fields such as wholesale, post and telecommunications, and renting.

228. The evaluation study outlined various compilation strategies chosen to cope with heterogeneity and missing information of the input variables for each sector at 4-digit levels of ISIC. For most sectors, an alternative method was chosen as price indices do not cover all service activities for the sectors except for Sector 72 where input variables and their deflators match with the preferred method. It was found that the recommendations listed in this Manual were very useful and dealt with most of main issues encountered during the compilation of a short-term ISP. The flowcharts presented in this Section were also found to be very useful and provided concise remedies for various problems which occurred at various compilation stages [see Arnaud, B. & Hong, E-P. (2006) for more details].

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[28] The formula for an annual chain-linked Laspeyres index is as follows:

$$L_t^{\,C} = \sum_i (w_{i,t-1} \frac{C_{i,t}}{C_{i,t-1}}) * \sum_i (w_{i,t-2} \frac{C_{i,t-1}}{C_{i,t-2}}) * \ldots * \sum_i (w_{i,0} \frac{C_{i,1}}{C_{i,0}}) * 100$$

where $w_{i,t}$: relative share of value added of sector *i* at time *t*

$C_{i,t}$: volume index for sector i at time *t*

[29] The content of this Section were extracted from Arnaud, B. & Hong, E-P. (2006), "An Experimental Index of Services Production for the French ICT Industry".

SECTION 6: PRESENTATION AND DISSEMINATION

229. The issues briefly discussed in this Section for the transmission and dissemination of ISPs compiled by national statistical agencies cover two broad areas: the form of presentation of the ISP, and their dissemination to users.

6.1 Presentation of ISPs

230. The main issues touching on the presentation and reporting of ISPs relate to their type and form of presentation. The information provided below is drawn largely from guidelines and recommendations outlined in the *Data and Metadata Reporting and Presentation Handbook* (OECD 2006) published by the OECD in 2006. Particular attention is drawn in various parts of this Handbook (especially in Section 5) to the need to ensure that statistics disseminated to users via various media are accompanied by appropriate methodological information (or metadata) describing key concepts and terminology and practices used in the collection of basic data, etc.

6.1.1 Presentation as an index

231. As outlined in Section 5.2.2 above, the heterogeneous nature of the input variables used in the compilation of the indicator necessitates the presentation of the ISP as an index. Methodologies for the compilation of the indicator in index form are presented in Section 5, and the focus of this Section are recommendations for the presentation of appropriate information about the index to enable users to assess its relevance to their particular requirement(s).

232. The Statistics Canada Policy on Informing Users of Data Quality and Methodology (Statistics Canada 2000, p. 11) states that the provision of an adequate description of characteristics and methodologies specific to indices is as important to users as quality assessments of the data. Canadian recommendation as to the range of information (or metadata) that should be provided are also relevant to ISPs. Such information comprises:

- precise definitions of the underlying economic concepts the indices are intended to measure. Specific mention should be given to any limitations in the use or application of the index; and

- descriptions of the methodologies used in the compilation of the index, with particular reference to the:

  - index calculation methods entailing the choice of index formula (*e.g.* Laspeyres, Paasche, Fisher) and the strategy for constructing the index series (*i.e.* as either fixed base or chain indices);
  - weighting system used, weight revision practices and frequency of weight revision;
  - computation at various aggregation levels;
  - selection of base year;

- frequency of re-basing;
- procedures for linking indices;
- treatment of changes in the composition of commodities in the market as well as changes in quality.

233. The methodologies applied should be compared with underlying index concepts and the impact of any departures described.

234. Finally, as much of the above information is of specific interest to specialised users, consideration should be given to having differing levels of detail of information targeted to different kinds of users. The OECD data and metadata presentation Handbook emphasises the need to structure metadata appropriately for users with differing degrees of expertise and need. In this context the distinction is often made between the general public who require only a layperson's explanation of key aspects relating to index compilation and informed / analytical users who require more detailed technical information.

6.1.2 Form of presentation

235. The question of the most appropriate form of ISP presentation is however less clear-cut, with a range of possible options. Section 5.2.3 above emphasises that a variety of forms of ISP are required by various users depending on their need for economic analyses, the most requested forms being raw, working day adjusted and seasonally adjusted series. The same Section then outlines some of the practical issues relating to the actual compilation of working day adjustment and seasonal adjustment estimates.

236. The *OECD Handbook on data and metadata presentation* (OECD 2006, Section 4.2) outlines a set of terminology covering concepts related to time series analysis, working day adjustment and seasonal adjustment to which readers of the ISP Manual are referred.

237. It should be emphasised that working day and seasonally adjusted estimates represent an analytical massaging of the raw or original time series and are intended to complement the original data and can never replace them. The original series shows the actual changes that have taken place (subject to the impact of sampling and non-sampling errors) and the other forms of presentation represent an analytical elaboration of the data to help show underlying movements.

238. There is continuing debate among statisticians on which is the most appropriate form for the presentation of a time series to users – raw, seasonally adjusted or trend-cycle. The outcome of the discussion is that there is generally no absolute ideal, and the final choice depends on the media for the dissemination of data and the main focus or intent of the series. Dissemination of detailed data via an on-line database could imply the availability of original series which affords maximum flexibility to users, whereas dissemination of more aggregated and headline series in a press release would involve the presentation of seasonally adjusted, perhaps in addition to original series.

239. The recommendations provided in the OECD Handbook on data presentation relevant to the presentation of working day adjusted or seasonally adjusted ISPs (OECD 2006, Section 4.6) are summarised below.

- When seasonality is present and can be identified, sub-annual indicators should be made available in seasonally adjusted form. The level of detail of indicators to be adjusted should be chosen taking into account user demand and cost-effectiveness criteria. The adjustment

should be applied appropriately using the method chosen as a standard by the agency. The method used should be explicitly mentioned in metadata accompanying the series.

- When applicable, the focus of press releases (or similar releases to the general public) concerning the main sub-annual indicators should be on their appropriately seasonally adjusted version. Users should also be given access to the original (or raw) series, either in the publication (if space permits) or by reference to it.

  Where there is a user demand, the agency may also disseminate intermediate components of the seasonal adjustment process (*e.g.* series adjusted for calendar effects) and / or trend-cycle estimates but it should be clearly indicated that the focus is on the seasonally adjusted estimate when short-term variation is of interest.

- The general public has an interest in understanding what seasonal adjustment is all about. However, given the sophisticated nature of seasonal adjustment methods, it is not reasonable to expect such users to possess the mathematical and statistical background to understand a technical description of any particular adjustment method. Accordingly, statistical agencies should provide metadata on seasonal adjustment in the form of a layperson's explanation of the seasonal adjustment process and how seasonally adjusted series should be interpreted.

- For the benefit of informed users requiring information about the validity of the seasonal adjustment method applied, statistical agencies should provide a minimum standard of information that would facilitate an assessment of the reliability of each seasonally adjusted series.

- For analytical users, the availability of metadata is of paramount importance. The main elements of this metadata could include the following: a short standardized description of the method used, all the main parameters of the adjustment (*e.g.* additive versus multiplicative decomposition model), outlier date, type and reason specification, and some of the derived information (*e.g.* the trading-day weights). The principle to be followed is that the metadata should be sufficient to enable an analytic user to seasonally adjust in a consistent way other series from the same statistical program which may not have been adjusted, or to compare the results obtained from using different options or methods for seasonally adjusting the same series.

6.2 Dissemination to users

240. The dissemination of ISPs will be undertaken by statistical agencies in accordance with existing dissemination strategies and practices involving the release of statistics in a variety of media. These range from the release of key aggregates in press releases and summary tables on websites, the use of paper publications, CD-ROMs and finally, providing user access to more detailed data through on-line databases.

241. As mentioned above in the introduction in Section 1, the main aim of this Manual is to provide economic analysts with information on short-term movements in the service sector that would complement existing indices of industrial production (IIP). The introduction also mentions that such services indicators, where they exist at the national level, tend to receive less attention by users than other key indicators, often being regarded more as supplementary indicators. Possible reasons for this are outlined in Section 1.2.

242. In order to overcome the inertia of existing user practices, national agencies therefore need to devise strategies for placing any new output indicators for services both in the context of existing key short-term indicators (such as IIPs, price indices, employment and unemployment indicators, external trade, etc.) and in terms of the importance of the services sector and how short-term movements in services may differ from those for other sectors such as manufacturing and agriculture.

243. Ideally, the "promotion" of the ISP should be undertaken within a broader strategy for the development of a range of short-term indicators for services. For example, each of the short-term indicators listed above have a services "component" that should be developed and where possible sector disaggregations provided that highlight differences in short-term evolution.

244. The obvious targets for this information and strategies are government and non-government analysts themselves, however, there is also a need to develop a targeted approach to the media.

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ANNEXES

A LIST OF PROPOSED DEFLATORS (USING UK PRACTICE AS AN EXAMPLE)

	Code	CPI	PPI
50	5010	New and used cars; other new vehicles	New cars; new and used lorries and trailers
	5020	Car maintenance and repairs	Car maintenance and repairs; lorry and truck maintenance and repairs
	5030	Motor vehicle parts and accessories	Motor vehicle parts and accessories
	5040	Motor cycles; motorcycle maintenance and repairs	Motor cycles; motorcycle maintenance and repairs
	5050	Petrol; diesel; lubricants and cooling products	None
51	511	None	None
	512	None	Agricultural raw materials; food and beverages; tobacco product excluding duty
	513	None	Textile, clothing and footwear; household furniture and appliances; other household goods
	514	None	Coal and petroleum products; metals and metal ores; wastes and scrap
	515	None	Computers and software; electronic and telecommunication equipment; office machinery and equipment
	519	None	Various miscellaneous goods
52	521	Food and beverages; cigarettes and tobacco; pharmaceutical and medical goods, cosmetic and toilet articles; textiles, clothing, footwear and leather goods; household appliances; hardware, paints and glass	None
	522	Fruit and vegetables; meat and meat products; fish seafood products; bread and cakes; cigarettes and tobacco	None
	523	Pharmaceutical and medical goods; textiles, clothing, footwear and leather goods; household appliances; hardware, paints and glass	None
	524	Antiques; second-handed books; other second-handed goods	None
	525	Food and beverages; pharmaceutical and medical goods, cosmetic and toilet articles; textiles, clothing, footwear and leather goods; household appliances; articles and	None
	526	equipment Repair of household appliances; repair of leather goods; repair of clocks and watches	None
55	5510	Hotels; domestic holidays; camping sites; restaurant meals; beer on sales; wine and spirits on sales	Conference rooms
	5520	Restaurant meals; beer on sales; wine and spirits on sales; self-service meals; burgers to eat-in; take-aways and snacks; night clubs admission; canteens and catering	Catering for functions
60	6010	Rail fares	Rail freight changes

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	Code	CPI	PPI
	6021	Underground railways; other metro fares; bus and coach fares	None
	6022	Taxi and minicab fares	Non-local bus and coach journeys all hiring
	6023	None	Road haulage
61	6110	Sea travel	Sea freight (import; export)
	6120	River and canal excursions; inland ferries and water taxis	Inland waterways freight (internal and seagoing traffic)
62	6210	Internal air travel; trans-continental air travel; inter-continental air travel	Air freight (import; export)
	6220	Carter air fares ; other non-scheduled air fares	Charter air fares; other non-scheduled air fares
63	6301	None	Cargo handling
	6302	None	Storage and warehousing
	6303	None	Miscellaneous transport activities
	6304	Holidays	Travel agents and tour operators
	6309	None	Freight forwarding; freight logistic
64	6411	Letters and parcels	Letters and parcels
	6412	None	Domestic letters and parcels; trans-continental letters and parcels; inter-continental letter and parcels
	6420	Telephone services	Telephone services; transmission of radio and television programme
65	6519	Retail back fees; savings bank fees; investment fund management fees, overall CPI, general GDP deflator	Retail back fees; merchant bank fees; investment fund management fees; security transaction fees
	6592	Retail back fees; savings bank fees; investment fund management fees, overall CPI, general GDP deflator	Retail back fees; merchant bank fees; investment fund management fees; security transaction fees
66	6601	Life insurance premiums, life insurance set up fees	None
	6602	Employees' contributions	Employees' contributions
	6603	Car insurance premiums; house insurance premiums; health insurance premiums	Building insurance premiums; pecuniary loss and liability premiums
67	6711	Financial services	Financial service
	6712	Financial services	Financial service
	6719	Financial advice fees; mortgage advice fees; bureau de change commission fees	None
	6720	Insurance premium	Insurance premium
70	7010	Residential rent	Residential rent; non-residential rent
	7020	Residential rent; management fees	Non-residential rent; management fees
71	711	Car and van rental	Car and van rental; truck and trailer rental; boat rental (passenger; freight); air transport rental (passenger; freight)
	712	None	Agricultural machinery rental; construction material rental; office machinery rental
	713	Furniture and appliance rental; do-it-yourself equipment rental; records, video etc. rental	Furniture and appliance rental; flowers and plants rental
72	721	None	Consultancy (hardware; software)
	722	Software packages	Software (publishing; consultancy; production; maintenance)
	723	None	Data processing; operation of data processing facilities
	724	Internet services	Database service; online publishing
	725	None	Maintenance of (computing equipment; photocopiers; other office machinery)
	729	None	Computer disaster recovery; software installation services

	Code	CPI	PPI
73	7310	None	Research charges out rates
	7320	None	Research charges out rates
74	741	Legal services; financial services	Services (legal; financial); market research; consultancy (business; management); management holding companies
	742	Architectural services	Services (architectural; engineering); other technical consultancy; technical testing
	743	None	Advertising services; advertising space
	749	Film processing	Recruitment agencies; security services; contract cleaning; film processing; contract packaging; stenographic services
75		None	None
80	8010	Education fees (pre-primary; primary)	None
	8021	Secondary education fees (day schools; boarding schools)	None
	8022	Secondary education fees (day schools; boarding schools)	None
	8030	Degree fees; non-degree fees	None
	8090	Day and evening class fees; driving school fees; fees for vocational courses	Training course fees
85	8511	Health services	Health services
	8512	Health services; dental charges	Health services
	8519	Physiotherapy; eyesight test fees; chiropody fees; chiropractic fees	Health services
	8520	Veterinary fees	Veterinary fees
	8531	Residential care	Residential care
	8532	Non-residential care	Non-residential care
90	9000	Waste disposal	Waste disposal; contaminated waste; decontamination
91	9111	None	Legal fees; publishing of journals and periodicals
	9112	Examination fees	Legal fees; publishing of journals and periodicals
	9120	None	Legal fees; publishing of journals and periodicals
	9191	None	Building insurance; contents insurance
	9192	Alcohol	Hire of conference facilities; publishing of journals and periodicals
	9199	Alcohol; legal fees	Publishing of journals and periodicals
92	921	Tickets (cinema; theatre tickets; concert)	Advertising (cinema; television)
	922	None	News agencies
	923	Entrance fees to (museums; historical sites; botanical gardens; zoological gardens)	None
	924	Health clubs; football matches; bowling alleys; golf club membership	None
93	9301	Services (laundry; dry cleaning); carpet and rug shampooing	Services (laundry; dry cleaning); carpet and rug shampooing
	9302	Cutting (men; women); permanent; colouring; beauty treatments	None
	9303	Funeral services; grave and gravestones; crematorium fees	Maintenance of grave and gravestones
	9309	Turkish bath; escort services; coin-operated personal service machines; pet grooming and boarding	None
95	9500	Domestic service	None
96	9600	Domestic service	None
97	9700	Domestic service	None

ANNEX 2

RECOMMENDED VARIABLES AND DEFLATORS AND THEIR SOURCES

Division 50: Sale, maintenance and repair of motor vehicles and motorcycles

This division covers the majority of activities related to motor vehicles and motorcycles, including lorries and trucks. It does not include manufacture and renting of motor vehicles or motorcycles.

This division is divided into five classes: ***5010 - Sale of motor vehicles, 5020 - Maintenance and repair of motor vehicles, 5030 - Sale of motor vehicle parts and accessories, 5040 - Sale, maintenance and repair of motorcycles and related parts and accessories*** and ***5050 - Retail sale of automotive fuel.*** For measuring gross value added as deflated turnover it may be desirable to use a lower level of industrial activity such as sub-dividing sale of motor vehicles into the sale of new motor vehicle and the sale of used motor vehicles. This will depend on how important the industry is to the country's economy and how accurately the output can be measured (e.g. turnover and prices).

ISIC class	Description	Explanatory notes	Preferred	
5010	***Sale of motor vehicles***	Includes the wholesale and retail sale of all types of new and used motor vehicles except motorcycles	**Gross turnover deflated by appropriate quality adjusted price indices**	
			Turnover from survey of motor vehicle wholesalers and retailers or administrative data taken from tax returns which could be split by type of vehicle. Examples are: - New cars - Other new motor vehicles - Used cars - Other used motor vehicles	Weighted appropriate price indices that reflect the mixed market. Examples are : - CPI: New cars - CPI: Other new vehicles - CPI: Used cars - PPI: New cars - PPI: New lorries and trailers - PPI: Used lorries and trailers
5020	***Maintenance and repair of motor vehicles***	Includes towing and roadside assistance Excludes the retreading and rebuilding of tyres and the maintenance and repair of caravans	**Gross turnover deflated by appropriate quality adjusted price indices**	
			Turnover from survey of motor vehicle maintenance and repair companies or administrative data from tax returns which could be split by type of maintenance activity. Examples are: - Maintenance and repair of motor vehicles - Tyre and exhaust repairs - Towing and roadside assistance	Weighted appropriate price indices that reflect the mixed market. Examples are : - CPI: Car maintenance and repairs - PPI: Car maintenance and repairs - PPI: Lorry and truck maintenance and repairs
5030	***Sale of motor vehicle parts and accessories***	Includes the wholesale and retail sale of all kinds of parts, components, supplies, tools and accessories for motor vehicles (when not combined with sale of motor vehicles)	**Gross turnover deflated by appropriate quality adjusted price indices**	
			Turnover from survey of wholesalers or retailers of motor vehicle parts and accessories or administrative data from tax returns which could be split by type of outlet. Examples are: - Wholesale - Retail	Weighted appropriate price indices that reflect the mixed market. Examples are : - CPI: Motor vehicle parts and accessories - PPI: Motor vehicle parts and accessories
5040	***Sale, maintenance and repair of motorcycles and related parts and accessories***	Excludes the sale, maintenance and repair of bicycles and related parts and accessories	**Gross turnover deflated by appropriate quality adjusted price indices**	
			Turnover from survey of wholesalers or retailers of motorcycles, related parts and accessories and of motorcycle maintenance and repair companies or administrative data from tax returns which could be split by type of motorcycle activity. Examples are: - Wholesale and retail sale of motorcycles - Wholesale and retail sale of motorcycle parts and accessories - Maintenance and repair of motorcycles	Weighted appropriate price indices that reflect the mixed market. Examples are : - CPI: Motorcycles - CPI: Motorcycle maintenance and repairs - PPI: Motorcycles - PPI: Motorcycle maintenance and repairs
5050	***Retail sale of automotive fuel***	Includes the retail sale of similar fuels used in boats and the retail sale of lubricating products and cooling products for motor vehicles Excludes the wholesale of fuels and the retail sale of liquefied petroleum gas for cooking or heating	**Gross turnover deflated by appropriate quality adjusted price indices**	
			Turnover from survey of retailers of automotive fuel or administrative data from tax returns which could be split by type of fuel product. Examples are: - Petrol - Diesel - Lubricants and cooling products	Weighted appropriate price indices. Examples are : - CPI: Petrol - CPI: Diesel - CPI: Lubricants and cooling products

CPI is Consumer price index.
PPI is Services producer price index.

retail sale of automotive fuel

Turnover data are defined as receipts from sales excluding VAT and other taxes on products plus any subsidies on products. As the services are provided to both consumers and businesses, the preferred deflators to use are a mix of consumer price indices and service producer price indices.

Note: Within the wholesale and retail industries, output is the trade margin. Theoretically, this can be measured by taking the difference between deflated sales and deflated purchases. However, if it is assumed that the volume of margins follows the volume of sales (or equivalently, that the margin-to-sales ratios are constant at constant prices), then gross turnover deflated by appropriate quality adjusted price indices is a more achievable method.

Alternative	Other	ISIC class
Gross turnover deflated by partially representative price indices Turnover from survey of motor vehicle wholesalers and retailers or administrative data taken from tax returns Deflated by partially representative CPIs and PPIs or a general price index Or **Volume indicators** Examples are: - Number of new cars sold - Number of used cars sold - Number of other new motor vehicles sold - Number of other used motor vehicles sold	**Volume indicators** Examples are: - Employment	***5010***
Gross turnover deflated by partially representative price indices Turnover from survey of motor vehicle maintenance and repair companies or administrative data from tax returns Deflated by partially representative CPIs and PPIs or a general price index	**Volume indicators** Examples are: - Employment	***5020***
Gross turnover deflated by partially representative price indices Turnover from survey of wholesalers or retailers of motor vehicle parts and accessories or administrative data from tax returns Deflated by partially representative CPIs or a general price index	**Volume indicators** Examples are: - Employment	***5030***
Gross turnover deflated by partially representative price indices Turnover from survey of wholesalers or retailers of motorcycles, related parts and accessories and of motorcycle maintenance and repair companies or administrative data from tax returns Deflated by partially representative CPIs or a general price index Or **Volume indicators** Examples are: - Number of new motorcycles sold - Number of used motor cycles sold	**Volume indicators** Examples are: - Employment	***5040***
Gross turnover deflated by partially representative price indices Turnover from survey of retailers of automotive fuel or administrative data from tax returns Deflated by partially representative CPIs or a general price index Or **Volume indicators** Examples are: - Number of litres of petrol sold - Number of litres of diesel sold - Number of litres of lubricants sold - Number of litres of cooling products sold	**Volume indicators** Examples are: - Employment - Number of litres of fuel leaving oil refineries	***5050***

Division 51: Wholesale trade and commission trade, except of motor vehicles

This division covers the resale (sale without transformation) of new and used goods to retailers, to industrial, commercial, institutional or professional users, or to other wholesalers. It does not include the wholesale of motor vehicles or motor cycles.

This division is divided into six groups (13 classes): ***511 - Wholesale on a fee or contract basis, 512 - Wholesale of agricultural raw materials, live animals, food, beverages and tobacco, 513 - Wholesale of household goods, 514 - Wholesale of non-agricultural intermediate products, waste and scrap, 515 - Wholesale of machinery, equipment*** **and** ***supplies*** and ***519 - Other wholesale.*** For measuring gross value added as deflated turnover it may be desirable to sub-divide the groups into the underlying classes. This will depend on how important the industry is to the country's economy and how accurately the output can be measured (e.g. turnover and prices).

ISIC group	Description	Explanatory notes	Preferred	
511	***Wholesale on a fee or contract basis***	Includes 5110 - wholesale on a fee or contract basis and activities of wholesale auction houses Excludes wholesale trade in own name, retail sale by agents, activities of insurance and real estate agents	**Gross turnover deflated by appropriate quality adjusted price indices** Turnover from survey of commission agents, commodity brokers and wholesale auction houses or administrative data from tax returns	Weighted appropriate price indices Examples are : - PPIs for all products sold
512	***Wholesale of agricultural raw materials, live animals, food, beverages and tobacco***	Includes wholesale of: 5121 - agricultural raw materials and live animals 5122 - wholesale of food, beverages and tobacco Excludes wholesale of textile fibres and the blending of wine or distilled spirits	**Gross turnover deflated by appropriate quality adjusted price indices** Turnover from survey of wholesalers of agricultural raw materials, live animals, food, beverages and tobacco, or administrative data from tax returns which could be split by type of agricultural raw product. Examples are: - Agricultural raw materials - Food, beverages and tobacco	Weighted appropriate price indices Examples are : - PPI: Agricultural raw materials - PPI: Food and beverages - PPI: Tobacco products excluding duty
513	***Wholesale of household goods***	Includes wholesale of: 5131- textiles, clothing and footwear 5139 - other household goods Excludes wholesale of textile fibres and office furniture	**Gross turnover deflated by appropriate quality adjusted price indices** Turnover from survey of wholesalers of household goods or administrative data from tax returns which could be split by type of household goods. Examples are: - Textiles, clothing and footwear - Other household goods	Weighted appropriate price indices Examples are : - PPI: Textiles, clothing and footwear - PPI: Household furniture and appliances - PPI: Pharmaceuticals and cosmetics - PPI: Other household goods
514	***Wholesale of non-agricultural intermediate products waste and scrap***	Includes wholesale of: 5141 - solid, liquid and gaseous fuels and related products 5142 - metals and metal ores 5143 - construction materials, hardware, plumbing and heating equipment and supplies 5149 - other intermediate products, waste and scrap Excludes the real transformation of waste, scrap and other articles into secondary raw materials and the treatment of waste for disposal	**Gross turnover deflated by appropriate quality adjusted price indices** Turnover from survey of wholesalers of non-agricultural intermediate products, waste and scrap, or administrative data from tax returns which could be split by non-agricultural intermediate product. Examples are: - Solid, liquid and gaseous fuels - Metals and metal ores - Construction materials - Intermediate products, waste and scrap	Weighted appropriate price indices Examples are : - PPI: Coal and petroleum products (excluding duty) - PPI: Metals and metal ores - PPI: Construction materials - PPI: Waste and scrap
515	***Wholesale of machinery, equipment and supplies***	Includes wholesale of: 5151 - computers, computer peripheral equipment, software 5152 - electronic and telecommunications parts and equipment 5159 - other machinery, equipment and supplies Excludes the wholesale of motor vehicles, trailers, caravans, motor vehicle parts, motorcycles and bicycles	**Gross turnover deflated by appropriate quality adjusted price indices** Turnover from survey of wholesalers of machinery, equipment and supplies, or administrative data from tax returns which could be split by machinery and equipment type. Examples are: - Computers and software - Electronic and telecommunications equipment - Office machinery and equipment	Weighted appropriate price indices Examples are : - PPI: Computers and software - PPI: Electronic and telecommunications equipment - PPI: Office machinery and equipment
519	***Other wholesale***	Includes wholesale of: 5190 - other	**Gross turnover deflated by appropriate quality adjusted price indices** Turnover from survey of wholesalers of other types of goods, or administrative data from tax returns	Weighted appropriate price indices Examples are : - PPIs of various miscellaneous goods

PPI is Services producer price index.

and motorcycles

Turnover data are defined as receipts from sales excluding VAT and other taxes on products plus any subsidies on products. **Preferred deflators** to use are mostly service producer price indices. If available wholesale price indices can be substituted, or if imports are a significant source of goods for the wholesaler, then import price indices are an acceptable alternative.

Note: Within the wholesale and retail industries, output is the trade margin. Theoretically, this can be measured by taking the difference between deflated sales and deflated purchases. However, if it is assumed that the volume of margins follows the volume of sales (or equivalently, that the margin-to-sales ratios are constant at constant prices), then gross turnover deflated by appropriate quality adjusted price indices is a more achievable method.

Alternative	Other	ISIC class
Gross turnover deflated by partially representative price indices Turnover from survey of commission agents, commodity brokers and wholesale auction houses | Deflated by partially representative PPIs or a general price index Or **Production output index** Lagged index of production for the manufacture of all goods	**Volume indicators** Examples are : - Employment	*511*
Gross turnover deflated by partially representative price indices Turnover from survey of wholesalers of agricultural raw materials, live animals, food, beverages and tobacco, or administrative data from tax returns | Deflated by partially representative PPIs or a general price index Or **Production output index** Lagged index of production for: - agriculture - the manufacture of food, beverages and tobacco	**Volume indicators** Examples are : - Employment - Tonnes of agricultural raw materials	*512*
Gross turnover deflated by partially representative price indices Turnover from survey of wholesalers of household goods or administrative data from tax returns | Deflated by partially representative PPIs or a general price index Or **Production output index** Lagged index of production for the manufacture of: - textiles, clothing, and footwear - other household goods, such as furniture, lighting equipment, cutlery and glassware	**Volume indicators** Examples are: - Employment	*513*
Gross turnover deflated by partially representative price indices Turnover from survey of wholesalers of non-agricultural intermediate products, waste and scrap, or administrative data from tax returns | Deflated by partially representative PPIs or a general price index Or **Production output index** Lagged index of production for the manufacture of: - solid, liquid and gaseous fuels - metals and metal ores - construction materials, hardware, plumbing and heating equipment supplies - intermediate products, such as industrial chemicals, waste and scrap	**Volume indicators** Examples are: - Employment - Tonnes of intermediate products	*514*
Gross turnover deflated by partially representative price indices Turnover from survey of wholesalers of machinery, equipment and supplies, or administrative data from tax returns | Deflated by partially representative PPIs or a general price index Or **Production output index** Lagged index of production for the manufacture of: - computers and computer peripherals - electronic and telecommunications equipment - office machinery and other machinery, equipment and supplies	**Volume indicators** Examples are: - Employment	*515*
Gross turnover deflated by appropriate quality adjusted price indices Turnover from survey of wholesalers of other types of goods, or administrative data from tax returns | Deflated by partially representative PPIs or a general price index Or **Production output index** Lagged index of production for the manufacture of: - miscellaneous goods	**Volume indicators** Examples are: - Employment	*519*

Division 52: Retail trade, except of motor vehicles and motorcycles; repair of

This division covers the resale (sale without transformation), repair and installation of new and used goods mainly to the general public for personal or household consumption or utilisation. It does not include the sale of motor vehicles, motorcycles and automotive fuel, nor the sale of food and drinks for consumption on the premises.

This division is divided into six groups (13 classes): ***521 - Non-specialised retail trade in stores; 522 - Retail sale of food, beverages and tobacco in specialised stores; 523 - Other retail trade of new goods in specialised stores; 524 - Retail sale of second-hand goods in stores; 525 - Retail trade not in stores*** and ***526 - Repair of personal and household goods .*** For measuring gross value added as deflated turnover it may be desirable to sub-divide the groups into the underlying classes. This will depend on how important the industry is to the country's economy and how accurately the output can be measured (e.g. turnover and prices). An estimate for **smuggling of alcohol and tobacco** can also be included in this code.

ISIC group	Description	Explanatory notes	Preferred	
521	***Non-specialised retail trade in stores***	Includes 5211 - retail sale in non-specialised stores with food, beverages or tobacco predominating 5212 - other retail sale in non-specialised stores, including activities of department stores	**Gross turnover deflated by appropriate quality adjusted price indices** Turnover from survey of non-specialised retail stores or administrative data from tax returns which could be split by type of retail outlet. Examples are: - Non-specialised stores with predominant food, beverages and tobacco sales - Other non-specialised stores such as department stores	Weighted appropriate price indices Examples are : - CPI: Food and beverages - CPI: Cigarettes and tobacco - CPI: Pharmaceutical and medical goods, cosmetic and toilet articles - CPI: Textiles, clothing, footwear and leather goods - CPI: Household appliances - CPI: Hardware, paints and glass
522	***Retail sale of food, beverages and tobacco in specialised stores***	5220 - stores specialising in the sale of merchandise lines, such as fruit and vegetables, meat and meat products, fish and other seafood products, bakery products or tobacco products	**Gross turnover deflated by appropriate quality adjusted price indices** Turnover from survey of stores specialising in the retail sale of food, beverages and tobacco, or administrative data from tax returns which could be split by type of specialised outlet. Examples are: - Greengrocers, bakers, tobacconists, butchers, fishmongers	Weighted appropriate price indices Examples are : - CPI: Fruit and vegetables - CPI: Meat and meat products - CPI: Fish and seafood products - CPI: Bread and cakes - CPI: Cigarettes and tobacco
523	***Other retail trade of new goods in specialised stores***	Includes retail sale of 5231 - pharmaceutical and medical goods, cosmetic and toilet articles 5232 - textiles, clothing, footwear and leather goods 5233 - household appliances, articles and equipment 5234 - hardware, paints, glass 5239 - other goods Excludes the retail sale of second-hand or antique books	**Gross turnover deflated by appropriate quality adjusted price indices** Turnover from survey of stores specialising in the retail sale of other new goods, or administrative data from tax returns which could be split by type of specialised outlet. Examples are: - Pharmacies - Clothing and textiles shops - Footwear and leather goods shops - Household appliances shops - Hardware shops	Weighted appropriate price indices Examples are : - CPI: Pharmaceutical and medical goods - CPI: Textiles and clothing - CPI: Footwear and leather goods - CPI: Household appliances - CPI: Hardware, paints and glass
524	***Retail sale of second-hand goods in stores***	5240 - second-hand books, antiques and other second-hand goods; activities of retail auction houses Excludes second-hand motor vehicles, pawn shops, internet auctions and other non-store retail auctions	**Gross turnover deflated by appropriate quality adjusted price indices** Turnover from survey of stores specialising in the retail sale of second-hand goods, or administrative data from tax returns which could be split by type of outlet. Examples are: - Antiques and second-hand book shops - Other second-hand goods shops	Weighted appropriate price indices Examples are : - CPI: Antiques - CPI: Second-hand books - CPI: Other second-hand goods
525	***Retail trade not in stores***	Includes 5251 - retail sales via mail order houses and direct sales via television, radio, telephone and internet 5252 - retail sales via stalls and markets 5259 - other non-store retail sales such as door-to-door and vending machines	**Gross turnover deflated by appropriate quality adjusted price indices** Turnover from survey of non-store retail outlets, or administrative data from tax returns which could be split by type of retail trade not in store. Examples are: - Mail order houses - Internet, television, other direct sales - Stalls and markets - Vending machines	Weighted appropriate price indices Examples are : - CPI: Food and beverages - CPI: Pharmaceutical and medical goods, cosmetic and toilet articles - CPI: Textiles, clothing, footwear and leather goods - CPI: Household appliances, articles and equipment
526	***Repair of personal and household goods.***	5260 - repair of household appliances, consumer electronics, shoes, clothing, watches etc., piano-tuning and while-you-wait services	**Gross turnover deflated by appropriate quality adjusted price indices** Turnover from survey of repairers of personal and household goods, or administrative data from tax returns which could be split by type of repair of personal and household goods. Examples are: - household and consumer appliances - shoes, clothing and watches	Weighted appropriate price indices Examples are : - CPI: Repair of household appliances - CPI: Repair of leather goods - CPI: Repair of clocks and watches

CPI is Consumer price index.

personal and household goods

Turnover data are defined as receipts from sales excluding VAT and other taxes on products plus any subsidies on products. If retail forms only part of the business, then ideally only the retail element of the business's turnover should be used. **Preferred deflators** to use are consumer price indices.

Note: Within the wholesale and retail industries, output is the trade margin. Theoretically, this can be measured by taking the difference between deflated sales and deflated purchases. However, if it is assumed that the volume of margins follows the volume of sales (or equivalently, that the margin-to-sales ratios are constant at constant prices), then gross turnover deflated by appropriate quality adjusted price indices is a more achievable method.

Alternative		Other	ISIC class
Gross turnover deflated by partially representative price indices		**Volume indicators**	***521***
Turnover from survey of non-specialised retail stores or administrative data from tax returns	Deflated by partially representative CPIs or a general price index	Examples are: - Employment	
Gross turnover deflated by partially representative price indices		**Volume indicators**	***522***
Turnover from survey of stores specialising in the retail sale of food, beverages and tobacco, or administrative data from tax returns	Deflated by partially representative CPIs or a general price index	Examples are: - Employment	
Gross turnover deflated by partially representative price indices		**Volume indicators**	***523***
Turnover from survey of stores specialising in the retail sale of other new goods, or administrative data from tax returns	Deflated by partially representative CPIs or a general price index	Examples are: - Employment	
Gross turnover deflated by partially representative price indices		**Volume indicators**	***524***
Turnover from survey of stores specialising in the retail sale of second-hand goods, or administrative data from tax returns	Deflated by partially representative CPIs or a general price index	Examples are: - Employment	
Gross turnover deflated by partially representative price indices		**Volume indicators**	***525***
Turnover from survey of non-store retail outlets, or administrative data from tax returns	Deflated by partially representative CPIs or a general price index	Examples are: - Employment	
Gross turnover deflated by partially representative price indices		**Volume indicators**	***526***
Turnover from survey of repairers of personal and household goods, or administrative data from tax returns	Deflated by partially representative CPIs or a general price index	Examples are: - Employment	

Division 55: Hotels and Restaurants

This division covers the provision of hotel and other short-stay accommodation and the provision of food, drink and club entertainment. The division is divided into two classes: ***5510 - Hotels; camping sites and other provision of short-stay accommodation*** and ***5520 - Restaurants, bars and canteens*** . For measuring gross value added as deflated turnover it may be desirable to use a lower level of industrial activity. This will depend on how important the industry is to the country's economy and how accurate the output can be measured (e.g. turnover and prices). The choice for this depends on the relative changes in the output of the different types of establishment over time and respective movements in their prices. The table below shows how the groups might be further subdivided.

ISIC class	Description	Explanatory notes	Preferred
5510	***Hotels; camping sites and other provision of short-stay accommodation***	This may be subdivided Examples are:	
		Hotels, motels and inns Includes licensed and unlicensed restaurant facilities and conference facilities	**Gross turnover deflated by appropriate quality adjusted price indices** Turnover from survey of hotels, motels and inns or administrative data from tax returns Weighted appropriate price indices Examples are : - CPI: Hotels - CPI: Domestic holidays (non self-catering) - CPI: Camping sites - CPI: Restaurant meals - CPI: Beer 'on' sales - CPI: Wines and spirits 'on' sales - PPI: Accommodation - PPI: Conference rooms Or **Volume indicators** Examples are: - Number of bed nights: Luxury hotels; City hotels; Rural hotels and inns; Motels
		Holiday resorts, chalets, flats and cottages; guest houses, farm houses and youth hostels; camping sites	**Gross turnover deflated by appropriate quality adjusted price indices** Turnover from survey of holiday resorts, and providers of other short-stay accommodation including camping sites or administrative data from tax returns Weighted appropriate price indices Examples are : - CPI: Domestic holidays (self-catering) - CPI: Domestic holidays (non self-catering) - CPI: Camping sites Or **Volume indicators** Examples are: - Number of bed nights: Holiday centres; Guest houses and farm houses; Youth hostels - Number of pitch nights: Caravans; Tents
5520	***Restaurants, bars and canteens***	This may be subdivided Examples are:	
		Restaurants, including licensed and unlicensed premises, self-service restaurants; burger bars and fast-food outlets and ice cream parlours	**Gross turnover deflated by appropriate quality adjusted price indices** Turnover from survey of restaurants and other suppliers of meals or administrative data from tax returns which could be split by type of restaurant Examples are: - Licensed / unlicensed restaurants - Chinese, French, Italian, Japanese etc. - Take-away food shops Weighted appropriate price indices Examples are : - CPI: Restaurant meals - CPI: Beer 'on' sales - CPI: Wines and spirits 'on' sales - CPI: Self-service meals - CPI: Burgers to eat-in - CPI: Take-aways and snacks
		Licensed clubs, including night clubs and social clubs	**Gross turnover deflated by appropriate quality adjusted price indices** Turnover from survey of licensed clubs or administrative data from tax returns Weighted appropriate price indices Examples are : - CPI: Night-club admissions - CPI: Beer 'on' sales - CPI: Wines and spirits 'on' sales
		Public houses and bars including independent, tenanted and managed public houses and bars but excluding sales through vending machines	**Gross turnover deflated by appropriate quality adjusted price indices** Turnover from survey of public houses and bars or administrative data from tax returns Weighted appropriate price indices Examples are : - CPI: Beer 'on' sales - CPI: Wines and spirits 'on' sales - CPI: Restaurant meals - CPI: Pub meals - CPI: Cigarettes and tobacco
		Canteens and catering including the supply of prepared meals to airlines and other organisations	**Gross turnover deflated by appropriate quality adjusted price indices** Turnover from survey of canteens and catering or administrative data from tax returns Weighted appropriate price indices e.g.: - CPI: Canteens and catering - PPI: Catering for functions

CPI is Consumer price index.
PPI is Services producer price index

Turnover data are defined as receipts from sales excluding VAT and other taxes on products plus any subsidies on products. **Preferred deflators** to use are mostly consumer price indices with some service producer price indices. ***Smuggling of alcohol and tobacco*** , if significant, should be included in the Hotels and restaurants value added index. Such estimates can be made with the advice of a country's agency which deals with detecting these forms of smuggling.

Alternative	Other	ISIC class
		5510
Gross turnover deflated by partially representative price indices Turnover from survey of hotels, motels and inns or administrative data from tax returns | Deflated by partially representative CPIs and PPIs or a general price index Or **Volume indicators** Examples are: - Number of beds	**Volume indicators** Examples are: - Employment	
Gross turnover deflated by partially representative price indices Turnover from survey of holiday resorts, and providers of other short-stay accommodation including camping sites or administrative data from tax returns | Deflated by partially representative CPIs or a general price index Or **Volume indicators** Examples are: - Number of beds - Number of pitches	**Volume indicators** Examples are: - Employment	
		5520
Gross turnover deflated by partially representative price indices Turnover from survey of restaurants and other suppliers of meals or administrative data from tax returns | Deflated by partially representative CPIs or a general price index Or **Volume indicators** Examples are: - Number of meals sold - Number of customers	**Volume indicators** Examples are: - Employment	
Gross turnover deflated by partially representative price indices Turnover from survey of licensed clubs or administrative data from tax returns or excise duty revenue | Deflated by partially representative CPIs or a general price index Or **Volume indicators** Examples are: - Number of admissions - Number of drinks sold	**Volume indicators** Examples are: - Employment	
Gross turnover deflated by partially representative price indices Turnover from survey of public houses and bars or administrative data from tax returns or excise duty revenue | Deflated by partially representative CPIs or a general price index Or **Volume indicators** Examples are: - Number of drinks sold - Number of meals sold	**Volume indicators** Examples are: - Employment	
Gross turnover deflated by partially representative price indices Turnover from survey of canteens and catering or administrative data from tax returns | Deflated by partially representative PPIs and CPIs or a general price index Or **Volume indicators** Examples are: - Number of meals sold - Number of customers	**Volume indicators** Examples are: - Employment	

Division 60: Land transport; transport via pipelines

This division covers the transportation of goods and people across land, by rail, lorry, bus or taxi and the transport of gases, liquids etc via pipelines. It does not include self-drive car hire or the distribution of natural and manufactured gas, water and steam from the distributor to the final user.

The division is divided into five classes: ***6010 - Transport via railways; 6021 - Other scheduled passenger land transport; 6022 - Other non-scheduled passenger land transport; 6023 - Freight transport by road and 6030 - Transport via pipelines.*** For measuring gross value added as deflated turnover it may be desirable to sub-divide rail transport between passengers and freight and sub-divide other non-scheduled passenger transport between taxis and other transport. This will depend on how important the industry is to the country's economy and how accurately the output can be measured (e.g. turnover and prices).

ISIC class	Description	Explanatory notes	Preferred
6010	***Transport via railways***	Excludes passenger and freight terminal activities, cargo handling storage and other auxiliary activities, urban and suburban transportation by underground, metro and similar systems, maintenance and minor repairs of rolling stock.	**Gross turnover deflated by appropriate quality adjusted price indices** Turnover from survey of rail transport providers or administrative data from tax returns which could be split by goods and people being transported. Examples are: - Passengers - Freight Weighted appropriate price indices Examples are : - CPI: Rail fares - PPI: Rail freight charges Or **Volume indicators** Examples are: - Passenger-kilometres travelled: First class ticket holders; Second class ticket holders; Third class ticket holders - Tonnes-kilometres transported: Within 24 Hours; Two to three days; Four to seven days; Over a week
6021	***Other scheduled passenger land transport***	Includes interurban coach services using scheduled routes, picking up and setting down passengers at normally fixed stops. Includes urban and suburban railway transportation by underground, metro and similar systems, funicular railways, aerial cableways, tramways and streetcars.	**Gross turnover deflated by appropriate quality adjusted price indices** Turnover from survey of other scheduled passenger land transport or administrative data from tax returns Weighted appropriate price indices Examples are : - CPI: Underground railways - CPI: Other metro fares - CPI: Bus and coach fares Or **Volume indicators** Examples are: - Passenger-kilometres travelled: First class ticket holders; Second class ticket holders; Third class ticket holders
6022	***Other non-scheduled passenger land transport***	Includes renting of private cars with driver and renting of non-scheduled buses, coaches, etc.	**Gross turnover deflated by appropriate quality adjusted price indices** Turnover from survey of other non-scheduled passenger land transport or administrative data from tax returns which could be broken down by type of non-scheduled transportation. Examples are: - Taxi operation - Other Weighted appropriate price indices Examples are : - CPI: Taxi and minicab fares - PPI: Non-local bus or coach journeys all hirings
6023	***Freight transport by road***	Comprises all forms of haulage, including logging haulage, renting of trucks with driver. Excludes freight terminals.	**Gross turnover deflated by appropriate quality adjusted price indices** Turnover from survey of freight transporters or administrative data from tax returns Weighted appropriate price indices Examples are : - PPI: Road haulage Or **Volume indicators** Examples are: - Tonnes-kilometres transported: Premium service; Standard service
6030	***Transport via pipelines***	Includes transport of gases, liquids, slurry and other commodities other than the distribution of natural or manufactured gas, water or steam. Includes pumping stations.	**Gross turnover deflated by appropriate quality adjusted price indices** Turnover from survey of appropriate units of the oil industry or administrative data from tax returns. Weighted appropriate price indices Examples are : - PPI: Crude petroleum oils - PPI: Road haulage Or **Volume indicators** Examples are: - Cubic metres-kilometres transported

CPI is Consumer price index.
PPI is Services producer price index.

Turnover data are defined as receipts from fares, freight and pipeline transport excluding VAT and other taxes on products plus any subsidies on products. Deflators for rail transport can be difficult to measure because of possible special price offers and the difficulty of adjusting for quality changes (e.g. speed, comfort, reliability, timeliness). An alternative preferred measure is to use volume indicators such as passenger-kilometres travelled and tonnes of freight-kilometres transported.

Alternative	Other	ISIC class
Gross turnover deflated by partially representative price indices Turnover from survey of rail transport providers or administrative data from from tax returns Deflated by partially representative CPIs and PPIs or a general price index Or **Volume indicators** Examples are: - Number of passengers: Season ticket holders; Full price ticket holders; Reduced price ticket holders - Number of tonnes of freight: Coal and coke; Metals; Construction; Oil and petroleum; International; Domestic inter-modal; Other commodities	**Volume indicators** Examples are: - Employment	*6010*
Gross turnover deflated by partially representative price indices Turnover from survey of other scheduled passenger land transport or administrative data from tax returns Deflated by partially representative CPIs or a general price index Or **Volume indicators** Examples are: - Number of passengers: Season ticket holders; Full price ticket holders; Reduced price ticket holders	**Volume indicators** Examples are: - Employment	*6021*
Gross turnover deflated by partially representative price indices Turnover from survey of taxi operators or administrative data from tax returns Deflated by partially representative CPIs or a general price index Or **Volume indicators** Examples are: - Number of trips	**Volume indicators** Examples are: - Number of vehicles licensed - Number of drivers licensed - Employment	*6022*
Gross turnover deflated by partially representative price indices Turnover from survey of freight transporters or administrative data from tax returns Deflated by partially representative CPIs or a general price index Or **Volume indicators** Examples are: - Number of kilometres travelled - Number of tonnes carried	**Volume indicators** Examples are: - Number of vehicles licensed - Number of drivers licensed - Employment	*6023*
Gross turnover deflated by partially representative price indices Turnover from survey of appropriate units of the oil industry or administrative data from tax returns Deflated by partially representative PPIs or a general price index Or **Volume indicators** Examples are: - Cubic metres transported	**Volume indicators** Examples are: - Employment	*6030*

Division 61: Water transport

This division covers the transport of passengers and freight over water, whether scheduled or not. It does not include restaurant and bar activities on board ships, except when delivered as an integral part of transportation.

This division is divided into two classes: ***6110 - Sea and coastal water transport*** and ***6120 - Inland water transport.*** For measuring gross value added as deflated turnover it may be desirable to sub-divide each of these classes into passenger and freight transport. This will depend on how important the industry is to the country's economy and how accurately the output can be measured (e.g. turnover and prices).

ISIC class	Description	Explanatory notes	Preferred
6110	***Sea and coastal water transport***	Includes transport of passengers and freight over seas and coastal water, whether scheduled or not. It also includes transport via great lakes requiring similar types of vessels. Excludes restaurant and bar activities on board ships, except when integral part of transportation; cargo handling, storage of freight, harbour and other auxiliary activities; operation of gambling cruises.	**Gross turnover deflated by appropriate quality adjusted price indices** Turnover from survey of sea and coastal water transport providers or administrative data from tax returns, which could be split by passengers and goods being transported. Examples are: - Excursions, cruises, sightseeing boats, - Ferries and water taxis - Rental of ships and boats with crew for freight - Transport, towing of barges and oil rigs Weighted appropriate price indices Examples are : - CPI: Sea travel - PPI: Sea freight (imports) - PPI: Sea freight (exports) Or **Volume indicators** Examples are: - Passenger-kilometres: Cruises; Day excursions and sightseeing; Ferries and water taxis - Tonnes-kilometres transported: Oil and petroleum; Other goods - containerised; Other goods - non-containerised
6120	***Inland water transport***	Includes the transport of passengers or freight via, rivers, lakes, canals and other inland waterways, including inside harbours and ports.	**Gross turnover deflated by appropriate quality adjusted price indices** Turnover from survey of inland waterway transport providers or administrative data from tax returns, which could be split by passengers and goods being transported. Examples are: - Excursions, sightseeing boats - Ferries and water taxis - Freight by barges - Freight by seagoing vessels Weighted appropriate price indices Examples are : - CPI: River and canal excursions - CPI: Inland ferries and water taxis - PPI: Inland waterways freight (internal traffic) - PPI: Inland waterways freight (seagoing traffic) Or **Volume indicators** Examples are: - Passenger-kilometres: River and canal excursions; Inland ferries and water taxis - Tonnes-kilometres transported: Bulk liquids; Bulk dry goods; Other goods

CPI is Consumer price index.
PPI is Services producer price index.

Turnover data are defined as receipts from sales excluding VAT and other taxes on products plus any subsidies on products. **Preferred deflators** to use are a mix of consumer price indices and producer price indices.

Alternative		Other	ISIC class
Gross turnover deflated by partially representative price indices Turnover from survey of sea and coastal water transport providers or administrative data from tax returns	Deflated by partially representative CPIs and PPIs or a general price index	**Volume indicators** Examples are: - Employment	*6110*
Or **Volume indicators** Examples are: - Number of passengers carried: - Tonnes transported: - Number of vehicles transported: - Number of containers transported:	Cruises Day excursions and sightseeing Ferries and water taxis Oil and petroleum Other goods - containerised Other goods - non-containerised Cars Other vehicles Refrigerated Non-refrigerated		
Gross turnover deflated by partially representative price indices Turnover from survey of inland waterway transport providers or administrative data from tax returns	Deflated by partially representative CPIs and PPIs or a general price index	**Volume indicators** Examples are: - Employment	*6120*
Or **Volume indicators** Examples are: - Number of passengers carried: - Tonnes transported: - Number of vehicles transported: - Number of containers transported:	River and canal excursions Inland ferries and water taxis Bulk liquids Bulk dry goods Other goods Cars Other vehicles Refrigerated Non-refrigerated		

Division 62 : Air transport

This code covers the transport of passengers and freight by air or via space or over water, whether scheduled or not. It does not include crop spraying, aerial advertising or aerial photography.

This division is divided into two classes: ***6210 - Scheduled air transport*** and ***6220 - Non-scheduled air transport.*** For measuring gross value added as deflated turnover it may be desirable to sub-divide each of these classes into passenger and freight transport. This will depend on how important the industry is to the country's economy and how accurately the output can be measured (e.g. turnover and prices).

ISIC class	Description	Explanatory notes	Preferred	
6210	***Scheduled air transport***	Includes transport of passengers and freight by air over regular routes and on regular schedules Excludes regular charter flights	**Gross turnover deflated by appropriate quality adjusted price indices**	
			Turnover from survey of scheduled air transport providers or administrative data from tax returns, which could be split by passengers and goods being transported. Examples are: - Internal passenger flights - Trans-continental passenger flights - Inter-continental passenger flights - Transport of freight via internal flights - Transport of freight via trans-continental flights - Transport of freight via inter-continental flights	Weighted appropriate price indices Examples are : - CPI: Internal air travel - CPI: Trans-continental air travel - CPI: Inter-continental air travel - PPI: Air freight (imports) - PPI: Air freight (exports)
			Or **Volume indicators**	
			Examples are: - Passenger-kilometres: - Tonnes-kilometres transported:	 Executive, first class Business class Economy, tourist class First, premier services Value services Charter services
6220	***Non-scheduled air transport***	Includes non-scheduled transport of passengers or freight by air, scenic and sightseeing flights, regular charter flights, renting of air-transport equipment with operator, launching of satellites and space vehicles, space transport of physical goods and passengers	**Gross turnover deflated by appropriate quality adjusted price indices**	
			Turnover from survey of non-scheduled air transport providers or administrative data from tax returns, which could be split by passengers and goods being transported. Examples are: - Passenger charter flights - Other non-scheduled passenger flights - Freight charter flights - Other non-scheduled freight flights	Weighted appropriate price indices Examples are : - CPI: Charter air fares - CPI: Other non-scheduled air fares - PPI: Charter air fares - PPI: Other non-scheduled air fares
			Or **Volume indicators**	
			Examples are: - Passenger-kilometres: - Tonnes-kilometres transported:	 Charter flights Other non-scheduled flights Charter flights Other non-scheduled flights

CPI is Consumer price index.
PPI is Services producer price index.

Turnover data are defined as receipts from sales excluding VAT and other taxes on products plus any subsidies on products. **Preferred deflators** to use are a mix of consumer price indices and producer price indices.

Alternative		Other	ISIC class
Gross turnover deflated by partially representative price indices		**Volume indicators**	***6210***
Turnover from survey of scheduled air transport providers or administrative data from tax returns or airport tax revenue	Deflated by partially representative CPIs and PPIs or a general price index	Examples are: - Employment	
Or **Volume indicators**			
Examples are: - Number of passengers carried: - Number of tonnes transported: - Number of aircraft movements:	 Executive, first class Business class Economy, tourist class First, premier services Value services Charter services Arrivals Departures		
Gross turnover deflated by partially representative price indices		**Volume indicators**	***6220***
Turnover from survey of non-scheduled air transport providers or administrative data from tax returns	Deflated by partially representative CPIs and PPIs or a general price index	Examples are: - Employment	
Or **Volume indicators**			
Examples are: - Number of passengers carried: - Number of tonnes transported: - Number of aircraft movements:	 Charter flights Other non-scheduled flights Charter flights Other non-scheduled flights Arrivals Departures		

Division 63 : Supporting and auxiliary activities; activities of travel agencies

This division covers activities related to the handling of freight immediately before or after transport or between transport segments; the operation and maintenance of all transport facilities; activities assisting passengers such as those of travel agencies. It does not include the operation of flying schools or docking facilities related to pleasure boats or activities related to the arrangement of freight insurance.

This division is divided into five classes: ***6301 - Cargo handling, 6302 - Storage and warehousing, 6303 Other supporting transport activities, 6304 - Activities of travel agencies and tour operators; tourist assistance activities not elsewhere classified*** and ***6309 - Activities of other transport agencies.*** For measuring gross value added as deflated turnover it may be desirable to sub-divide some of these classes. This will depend on how important the industry is to the country's economy and how accurately the output can be measured (e.g. turnover and prices).

ISIC class	Description	Explanatory notes	Preferred	
6301	***Cargo handling***	Includes loading and unloading of goods or passengers' luggage irrespective of the mode of transport used for transportation; stevedoring	**Gross turnover deflated by appropriate quality adjusted price indices** Turnover from survey of cargo handlers or administrative data from tax returns which could be split by type of transportation. Examples are: - Sea, river, canal ports - Airports - Road, rail depots	Weighted appropriate price indices Examples are : - PPI: Cargo handling
6302	***Storage and warehousing***	Includes the operation of storage and warehouse facilities for all kind of goods; storage of goods in foreign trade zones	**Gross turnover deflated by appropriate quality adjusted price indices** Turnover from survey of storage and warehouse providers or administrative data from tax returns which could be split by type of storage operation. Examples are: - Grain silos - General merchandise warehouses - Refrigerated warehouses - Storage tanks - Storage of goods in foreign trade zones	Weighted appropriate price indices Examples are : - PPI: Storage and warehousing
6303	***Other supporting transport activities***	Includes activities related to land, water or air transport of passengers, animals or freight; fire fighting and fire-prevention services at airports; maintenance and minor repair of rolling stock Excludes the operation of flying schools and of docking facilities related to pleasure boats (marinas)	**Gross turnover deflated by appropriate quality adjusted price indices** Turnover from survey of providers of other supporting transport activities or administrative data from tax returns which could be split by type of other transport activity. Examples are: - Land transport, e.g. bus and railway stations - Water transport, e.g. harbours, piers and locks - Air transport, eg airports, air-traffic-control, ground	Weighted appropriate price indices Examples are : - PPI: Miscellaneous transport activities
6304	***Activities of travel agents and tour operators; tourist assistance activities not elsewhere classified***	Includes activities of travel agencies, of local tourist information offices and accommodation offices and of tourist guides	**Gross turnover deflated by appropriate quality adjusted price indices** Turnover from survey of travel agents, tour operators and providers of tourist assistance or administrative data from tax returns which could be split by type of travel operation. Examples are: - Travel agents - Tour operators - Local tourist information and accommodation offices - Tourist guides	Weighted appropriate price indices Examples are : - CPI: Holidays - PPI: Travel agents and tour operators
6309	***Activities of other transport agencies***	Includes forwarding of freight, goods-handling operations such as crating goods for transit, activities of customs agents. Excludes courier activities and activities related to the arrangement of freight insurance.	**Gross turnover deflated by appropriate quality adjusted price indices** Turnover from survey of providers of other transport agencies or administrative data from tax returns, which could be split by type of other transport activity. Examples are: - Freight forwarding - Goods handling operations - Customs agents	Weighted appropriate price indices Examples are : - PPI: Freight forwarding - PPI: Freight logistics

CPI is Consumer price index.
PPI is Services producer price index.

Turnover data are defined as receipts from sales excluding VAT and other taxes on products plus any subsidies on products. **Preferred deflators** to use are mainly producer price indices with some consumer price indices.

Alternative	Other	ISIC class
Gross turnover deflated by partially representative price indices Turnover from survey of cargo handlers or administrative data from tax returns | Deflated by partially representative PPIs or a general price index Or **Volume indicators** Examples are: - Tonnes of goods handled	**Volume indicators** Examples are: - Employment	*6301*
Gross turnover deflated by partially representative price indices Turnover from survey of storage and warehouse providers or administrative data from tax returns | Deflated by partially representative PPIs or a general price index Or **Volume indicators** Examples are: - Tonnes of goods handled	**Volume indicators** Examples are: - Employment	*6302*
Gross turnover deflated by partially representative price indices Turnover from survey of providers of other supporting transport activities or administrative data from tax returns | Deflated by partially representative PPIs or a general price index	**Volume indicators** Examples are: - Employment	*6303*
Gross turnover deflated by partially representative price indices Turnover from survey of travel agents, tour operators and providers of tourist assistance or administrative data from tax returns | Deflated by partially representative PPIs and CPIs or a general price index Or **Volume indicators** Examples are: Number of bookings: Domestic Trans-continental Inter-continental	**Volume indicators** Examples are: - Employment	*6304*
Gross turnover deflated by partially representative price indices Turnover from survey of providers of other transport agencies or administrative data from tax returns | Deflated by partially representative PPIs or a general price index Or **Volume indicators** Examples are: - Tonnes of goods carried	**Volume indicators** Examples are: - Employment	*6309*

Division 64 : Post and telecommunications

This division covers National post activities, courier activities and telecommunications. It does not include financial activities carried out in combination with postal activities, the dissemination of information through web sites or the production of radio and television programmes.

This division is divided into three classes: ***6411 - National post activities; 6412 - Courier activities other than national post activities*** and ***6420 - Telecommunications.*** For measuring gross value added as deflated turnover it may be desirable to sub-divide the classes. This will depend on how important the industry is to the country's economy and how accurately the output can be measured (e.g. turnover and prices).

ISIC class	Description	Explanatory notes	Preferred
6411	***National post activities***	Includes the pick up, transport and delivery of domestic and international mail and and parcels, mailbox rental, poste restante and sale of postage stamps Excludes postal giro and postal savings activities and other financial activities carried out in combination with postal activities	**Gross turnover deflated by appropriate quality adjusted price indices** Turnover from survey of national post provider(s) or administrative data from tax returns, which could be split by type of national post activity. Examples are: - Business letters and parcels - Consumer letters and parcels - Mailbox rental and poste restante - Sale of postage stamps Weighted appropriate price indices Examples are : - CPI: Letters and parcels - CPI: Other mail services - PPI: Letters and parcels Or **Volume indicators** Examples are: - Number of domestic letters: Premium service; Standard service - Number of international letters: Premium service; Standard service - Number of domestic parcels: Packages and small parcels; Large parcels - Number of international parcels: Packages and small parcels; Large parcels - Number of pick up points: Mailboxes; Poste restante
6412	***Courier activities other than national post activities***	Includes the pick up, transport and delivery of letters and mail-type parcels and packages by firms other than national post; home delivery services	**Gross turnover deflated by appropriate quality adjusted price indices** Turnover from survey of couriers or administrative data from tax returns, which could be split by type of other post activity Examples are: - Domestic - International - One-off contracts Weighted appropriate price indices Examples are : - PPI: Domestic letters and parcels - PPI: Trans continental letters and parcels - PPI: Inter continental letters and parcels Or **Volume indicators** Examples are: - Number of domestic letters: Premium service; Standard service - Number of international letters: Premium service; Standard service - Number of domestic packages/small parcels: Premium service; Standard service - Number of domestic large parcels: Premium service; Standard service - Number of international packages/small parcels: Premium service; Standard service - Number of international large parcels: Premium service; Standard service
6420	***Telecommunications***	Includes the transmission of sound, images, data or other information via cables, broadcasting, relay or satellite, the maintenance of the network, internet access provision and public pay-telephone services Excludes the dissemination of information through web sites and the production of radio and television programmes	**Gross turnover deflated by appropriate quality adjusted price indices** Turnover from survey of telecommunications providers or administrative data from tax returns, which could be split by type of telecommunications activity Examples are: - Fixed telephone services - Mobile telephone services - Transmission of radio and television programmes - Provision of internet access Weighted appropriate price indices Examples are : - CPI: Telephone services - PPI: Telephone services - PPI: Transmission of radio and television programmes

CPI is Consumer price index.
PPI is Services producer price index.

Turnover data are defined as receipts from sales excluding VAT and other taxes on products plus any subsidies on products. **Preferred deflators** to use are mostly producer price indices with some consumer price indices.

Alternative	Other	ISIC class
Gross turnover deflated by partially representative price indices Turnover from survey of national post provider(s) or administrative data from tax returns | Deflated by partially representative CPIs and PPIs or a general price index Or **Volume indicators** Examples are: - Number of letters: Domestic, International - Number of parcels: Domestic, International	**Volume indicators** Examples are: - Number of items carried (without distinction of type of mail) - Employment	*6411*
Gross turnover deflated by partially representative price indices Turnover from survey of couriers or administrative data from tax returns, | Deflated by partially representative CPIs or a general price index Or **Volume indicators** Examples are: - Number of letters: Domestic, International - Number of parcels: Domestic, International	**Volume indicators** Examples are: - Number of items carried (without distinction of type of mail) - Employment	*6412*
Gross turnover deflated by partially representative price indices Turnover from survey of telecommunications providers or administrative data from tax returns | Deflated by partially representative CPIs or a general price index Or **Volume indicators** Examples are: Number of calls made: Fixed line national, Fixed line international, Mobile voice, Mobile text	**Volume indicators** Examples are: - Employment	*6420*

Division 65 : Financial intermediation, except insurance and

This division covers the activity of obtaining and redistributing funds other than for the purpose of insurance or pension funding or compulsory social security

This division is divided into five classes: ***6511 - Central banking; 6519 - Other monetary intermediation; 6591 - Financial leasing; 6592 - Other credit granting*** and ***6599 - Other financial intermediation not elsewhere classified.***

ISIC class	Description	Explanatory notes	Preferred
6511	***Central banking***	Includes holding the country's exchange reserves; acting as banker to the government	**Volume indicators** Examples are: - Central bank employees adjusted for productivty
6519	***Other monetary intermediation***	Includes monetary intermediation of monetary institutions other than central banks, such as banks, saving banks, discount houses, credit unions; plus postal giro and postal savings bank activities.	**Non-FISIM** **Fee income deflated by appropriate quality adjusted price indices** Administrative or survey data which could be split by fees and commissions from different sources. Examples are: - Investment banking, brokerage, underwriting, fiduciary activities etc. - Business loans, advances, current account charges etc. - Consumer loans, advances, current account charges etc. Weighted appropriate price indices Examples are: - CPI: Retail bank fees - CPI: Savings bank fees - CPI: Investment fund management fees - PPI: Retail bank fees - PPI: Merchant bank fees - PPI: Credit/debit card fees - PPI: Investment fund management fees - PPI: Security transaction fees Or **Volume indicators** Examples are: - Number of transactions: Bank credits and debits; Credit and debit cards Where fees are charged: - Number of loans: Own country businesses - own/foreign currency; Foreign country businesses - own/foreign currency; Consumers - property/non-property - Number of deposits: Own country businesses - own/foreign currency; Foreign country businesses - own/foreign currency **FISIM** **Income generated from interest margins deflated by a general price index** Administrative or survey data which could be split by income generated from different sources. Examples are: - Stock of loans and deposits split by sector, type or purpose and weighted together by base period interest margins Weighted appropriate price indices Examples are: - General GDP deflator - Overall CPI Or **Volume indicators** Examples are: Number of bank accounts split by: - Number of loans: Own country businesses; Foreign country businesses; Consumers - Number of deposits: Own country businesses; Foreign country businesses; Consumers
6591	***Financial leasing***	Includes leasing where the term covers the expected life of the asset and the lessee acquires all benefits of its use and the risks associated with its ownership. Excludes operational leasing.	**Volume indicators** As for 6519 FISM above
6592	***Other credit granting***	Includes financial intermediation primarily concerned with making loans by institutions not involved in monetary intermediation, such as granting of consumer credit, provision of long-term finance to industry, money lending outside the banking system, credit granting for house purchase by specialised non-depository institutions.	**Non-FISIM** **Fee income deflated by appropriate quality adjusted price indices** As for 6519 above **FISIM** **Income generated from interest margins deflated by a general price index** As for 6519 above Or **Volume indicators** As for 6519 above
6599	***Other financial intermediation not elsewhere classified***	Includes other financial intermediation primarily concerned with distributing funds other than by making loans such as investment in securities, swaps and options; activities of financial holding companies	**Volume indicators** Examples are: - Total number of funds managed: Unit trusts; Investment trusts; Securities

CPI is Consumer price index.
PPI is Services producer price index.

pension funding

The output of financial intermediation services consists of two main components: financial intermediation services directly charged by financial intermediaries to their clients and financial intermediation services indirectly measured (FISIM).

FISIM output is generated from the management by financial intermediaries of loans and deposits whose rates they control, i.e. they generate income from the difference between their lending and borrowing interest rates. Output from financial intermediation outside FISIM can be measured as the sum of fees and commissions charged to clients.

Alternative	Other	ISIC class
Volume indicators Examples are: - Central bank employees		*6511*
Non-FISIM **Fee income deflated by partially represented price indices** Administrative data from tax returns | Deflated by partially representative PPIs and CPIs or a general price index Or **Volume indicators** Examples are: - Number of bank clearings - Number of credit card transactions - Number of debit card transactions - Number of investment funds managed - Number of securities transactions - Number of loans - Number of deposits	**Non-FISIM** **Volume indicators** Examples are: - Employment	*6519*
FISIM **Volume indicators** Examples are: - Number of loan accounts: - Number of deposit accounts: - Number of current accounts:	**FISIM** **Volume indicators** Examples are: - Employment	
Volume indicators Examples are: - Number of capital repayments - Number of outstanding credits	**Volume indicators** Examples are: - Employment	*6591*
Volume indicators Examples are: - Number of loans - Number of clients - Total assets - Total investments	**Volume indicators** Examples are: - Employment	*6592*
Volume indicators Examples are: - Number of funds managed - Number of clients - Total assets - Total investments	**Volume indicators** Examples are: - Employment	*6599*

Division 66 : Insurance and pension funding, except

This division covers units engaged in setting up and managing insurance funds for all kinds of insurance types (life and non-life) and units engaged in the provision of retirement incomes. It does not include compulsory social security or activities auxiliary to insurance and pension funding.

This division is divided into three classes: ***6601 - Life insurance; 6602 - Pension funding*** and ***6603 - Non-life insurance.***

ISIC class	Description	Explanatory notes	Preferred
6601	***Life insurance***	Includes life insurance and life reinsurance with or without a substantial savings element	**Provisions deflated by the GDP deflator** Administrative data from balance sheet Examples are: - Provisions less claims - Long-term funds Deflated by a general GDP deflator Or **Volume indicators** Examples are: - Acquisition and administration of life insurance policies: Single premium, Term life, Universal life, Whole life
6602	***Pension funding***	Includes the provision of retirement incomes Excludes compulsory social security schemes	**Provisions deflated by the GDP deflator** Administrative data from balance sheet Examples are: - Provisions less claims - Long-term funds Deflated by a general GDP deflator Or **Volume indicators** Examples are: - Acquisition and administration of pensions: Personal pensions, Group pensions
6603	***Non-life insurance***	Includes insurance and reinsurance of non-life insurance business such as accident, fire, health, property, motor, marine, aviation, and transport insurance, pecuniary loss and liability insurance	**Provisions deflated by the GDP deflator** Administrative data from balance sheet Examples are: - Provisions less claims - General business technical reserves Deflated by a general GDP deflator Or **Volume indicators** Examples are: - Number of non-life insurance policies sold: Motor vehicles, Buildings, Accident and fire, Health, Pecuniary loss and liability

GDP is Gross Domestic Product

compulsory social security

Output of insurance services at current prices is measured as the sum of actual premiums earned and premium supplements less the claims due and the change in the actuarial reserves and reserves for with-profits. Output of pension funding services at current prices is measured as the sum of actual pensions contributions and supplementary contributions less the benefits due and the change in actuarial reserves. These are known as service charges. However, it is not practical to deflate services charges.

Alternatively, output can be considered as the pooling or transfer of risks. Insurance and pension companies make provision in their balance sheets against future expected claims that reflect this risk. Changes in these provisions result not only from changes in risk, but also because of general changes in process and the occurrence of unexpected claims.

Alternative	Other	ISIC class
Volume indicators Examples are: - Number of life insurance policies sold: Single premium Term life Universal life Whole life	**Volume indicators** Examples are: - Life insurance policies sold (no breakdown) - Employment	*6601*
Volume indicators Examples are: - Number of pensions sold: Personal pensions Group pensions	**Volume indicators** Examples are: - Pensions sold - Employment	*6602*
Volume indicators Examples are: - Number of non-life insurance policies sold (no breakdown by type) - Number of clients	**Volume indicators** Examples are: - Employment	*6603*

Division 67 : Activities auxiliary to financial intermediation

This division covers the provision of services involved in or closely related to financial intermediation, but not themselves involving financial intermediation.

This division is divided into four classes: ***6711 - Administration of financial markets; 6712 - Security dealing activities; 6719 - Activities auxiliary to financial intermediation not elsewhere classified and 6720 - Activities auxiliary to insurance and pension funding.***

ISIC class	Description	Explanatory notes	Preferred
6711	***Administration of financial markets***	Includes the operation and supervision of financial markets other than by public authorities, such as stock exchanges and commodity exchanges	**Gross turnover deflated by appropriate quality adjusted price indices** Turnover from survey of stock exchanges and commodity exchanges or administrative data from tax returns which could be split by type of market. Examples are: - Stock exchanges - Commodity exchanges Weighted appropriate price indices Examples are : - CPI: Financial services - PPI: Financial services Or **Volume indicators** Examples are: - Number of stockbroking transactions: Government securities with up to seven years to maturity; Government securities with over seven years to maturity, or undated; Ordinary and fixed interest shares - Number of commodity transactions: Oil and petroleum; Metals; Foodstuffs - Number of foreign exchange transactions: US dollars; Other
6712	***Security dealing activities***	Includes dealing in financial markets on behalf of others (e.g. stockbrokers) and related activities Excludes dealing in markets on own account	**Gross turnover deflated by appropriate quality adjusted price indices** Turnover from survey of brokers or administrative data from tax returns Weighted appropriate price indices Examples are: - CPI: Financial services - PPI: Financial services Or **Volume indicators** Examples are: - Number of transactions: Ordinary and fixed interest shares; Gilts (Government stocks); Investment and unit trusts; Derivatives; Mutual funds; Foreign exchange
6719	***Activities auxiliary to financial intermediation not elsewhere classified***	Includes the activities of financial advisers, mortgage advisers and bureaux de change etc.	**Gross turnover deflated by appropriate quality adjusted price indices** Turnover from survey of financial advisers, mortgage advisers etc., or administrative data from tax returns which could be split by type of financial service. Examples are: - Financial advisers - Mortgage advisers - Bureaux de change Weighted appropriate price indices Examples are: - CPI: Financial advice fees - CPI: Mortgage advice fees - CPI: Bureau de change commission fees Or **Volume indicators** Examples are: - Number of transactions: Investments based on equities; Savings accounts; Mortgages; Foreign currency exchanges
6720	***Activities auxiliary to insurance and pension funding***	Includes activities involved in or closely related to insurance and pension funding other than financial intermediation, such as insurance agents, loss adjusters, damage evaluators, actuaries and salvage administration Excludes marine salvage activities	**Gross turnover deflated by appropriate quality adjusted price indices** Turnover from survey of insurance agents, loss adjusters, actuaries etc., or administrative data from tax returns Weighted appropriate price indices Examples are: - CPI: Insurance premiums - PPI: Insurance premiums Or **Volume indicators** Examples are: - Number of insurance policies: Life insurance; Health insurance; Buildings insurance; Motor vehicle insurance

CPI is Consumer price index.
PPI is Services producer price index.

Turnover data are defined as receipts from sales excluding VAT and other taxes on products plus any subsidies on products. **Preferred deflators** to use are mostly consumer price indices with some services producer price indices.

Alternative	Other	ISIC class
Gross turnover deflated by partially representative price indices Turnover from survey of stock exchanges and commodity exchanges or administrative data from tax returns | Deflated by partially representative PPIs and CPIs or a general price index Or **Volume indicators** Examples are: - Number of stockbroking transactions - Number of commodity transactions - Number of foreign exchange transactions	**Volume indicators** Examples are: - Employment	*6711*
Gross turnover deflated by partially representative price indices Turnover from survey of brokers or administrative data from tax returns | Deflated by partially representative PPIs and CPIs or a general price index Or **Volume indicators** Examples are: - Number of transactions	**Volume indicators** Examples are: - Employment	*6712*
Gross turnover deflated by partially representative price indices Turnover from survey of financial advisers, mortgage advisers etc., or administrative data from tax returns | Deflated by partially representative CPIs or a general price index Or **Volume indicators** Examples are: - Number of transactions - Number of clients	**Volume indicators** Examples are: - Employment	*6719*
Gross turnover deflated by partially representative price indices Turnover from survey of insurance agents, loss adjusters, actuaries etc., or administrative data from tax returns | Deflated by partially representative PPIs and CPIs or a general price index Or **Volume indicators** Examples are: - Number of policies - Number of clients	**Volume indicators** Examples are: - Employment	*6720*

Division 70 : Real estate activities

This division covers real estate activities. It does not include development on own account involving construction.

This division is divided into two classes: ***7010 - Real estate activities with own or leased property*** *and* ***7020 - Real estate activities on a fee or contract basis.*** For measuring gross value added as deflated turnover it may be desirable to sub-divide these classes. This will depend on how important the industry is to the country's economy and how accurate the output can be measured (e.g. turnover and prices).

ISIC class	Description	Explanatory notes	Preferred
7010	***Real estate activities with own or leased property***	Includes buying, selling, renting and operation of self-owned or leased real estate; development and sale of land; operation of residential mobile home sites. Excludes development on own account involving construction; operation of hotels, camps and other non-residential or short-stay lodging places	**Gross turnover deflated by appropriate quality adjusted price indices** Turnover from survey of real estate agencies or administrative data taken from tax returns which could be split by type of activity. Examples are: - Apartment buildings and dwellings - Non-residential buildings - Land Weighted appropriate price indices Examples are: - CPI: Residential rent - PPI: Residential rent - PPI: Non-residential rent Or **Volume indicators** Examples are: - Number of new dwellings sold: One/two-bedrooms; Three/four bedrooms; Five or more bedrooms - Number of existing dwellings sold: One/two-bedrooms; Three/four bedrooms; Five or more bedrooms - Square metres of new non-residential buildings sold: Office accommodation; Light industrial; Heavy industrial - Square metres of existng non-residential buildings sold: Office accommodation; Light industrial; Heavy industrial - Square metres of land sold: For residential development; For non-residential development - Number of residential rentals: One/two-bedrooms; Three/four bedrooms; Five or more bedrooms - Number of non-residential leases: Office accommodation; Light industrial; Heavy industrial - Imputed rent for owner occupied housing stock: One/two-bedrooms; Three/four bedrooms; Five or more bedrooms; Up to 150 square metres; 150 - 300 square metres; More then 300 square metres; House type / style; House location / region
7020	***Real estate activities on a fee or contract basis***	Includes intermediation in buying, selling and renting of real estate on a fee or contract basis; managing of real estate on a fee or contract basis; real estate escrow agents	**Gross turnover deflated by appropriate quality adjusted price indices** Turnover from survey of real estate agencies or administrative data taken from tax returns which could be split by type of activity. Examples are: - Apartment buildings and dwellings - Non-residential buildings - Land Weighted appropriate price indices Examples are: - CPI: Residential rent - CPI: Management fees - PPI: Management fees - PPI: Non-residential rent Or **Volume indicators** Examples are: - Number of dwellings sold or managed: One/two-bedrooms; Three/four bedrooms; Five or more bedrooms - Square metres of non-residential buildings sold or managed: Office accommodation; Light industrial; Heavy industrial - Square metres of land sold: For residential development; For non-residential development

CPI is Consumer price index.
PPI is Services producer price index.

Turnover data are defined as receipts from sales excluding VAT and other taxes on products plus any subsidies on products. **Preferred deflators** to use are mostly producer price indices with some consumer price indices.

Alternative	Other	ISIC class
Gross turnover deflated by partially representative price indices Turnover from survey of real estate agencies or administrative data taken from tax returns | Deflated by partially representative PPIs or a general price index Or **Volume indicators** Examples are: - Number of property transactions: Dwellings; Non-residential buildings; Land - Number of dwellings rented: Private sector; Public sector; Housing associations - Number of non-residential buildings rented: Private sector; Public sector - Number of owner occupied dwellings	**Volume indicators** Examples are: - Number of property transactions - Employment	*7010*
Gross turnover deflated by partially representative price indices Turnover from survey of real estate agencies or administrative data taken from tax returns | Deflated by partially representative PPIs and CPIs or a general price index Or **Volume indicators** Examples are: - Number of fees negotiated - Number of contracts managed - Number of property transactions	**Volume indicators** Examples are: - Number of property transactions - Employment	*7020*

Division 71: Renting of machinery and equipment without operator

This division covers renting and operational leasing, either short- or long-term and either with or without maintenance. It does not include financial leasing.

This division is divided into three groups (eight classes): ***711 - Renting of transport equipment; 712 - Renting of other machinery and equipment*** and ***713 - Renting of personal and household goods not elsewhere classified.*** For measuring gross value added as deflated turnover it may be desirable to sub-divide these groups. This will depend on how important the industry is to the country's economy and how accurate the output can be measured (e.g. turnover and prices).

ISIC group	Description	Explanatory notes	Preferred	
711	***Renting of transport equipment***	Includes the renting and operational leasing, without operator, of 7111 - Land transport equipment, pallets and containers 7112 - Water transport equipment 7113 - Air transport equipment with driver. Excludes financial leasing and pleasure boats	**Gross turnover deflated by appropriate quality adjusted price indices**	
			Turnover from survey of companies that rent out land, water or air transport equipment or administrative data taken from tax returns which could be split by type of transport equipment. Examples are: - Automobiles and small vans - Other passenger land transport, eg motorcycles, caravans and campers - Freight land transport, eg trucks, haulage tractors, trailers and semi-trailers - Passenger water transport equipment - Freight water transport equipment - Passenger air transport equipment - Freight air transport equipment	Weighted appropriate price indices Examples are: - CPI: Car and van rental - PPI: Car and van rental - PPI: Truck and trailer rental - PPI: Passenger boat rental - PPI: Freight boat rental - PPI: Passenger air transport rental - PPI: Freight air transport rental
712	***Renting of other machinery and equipment***	Includes the renting and operational leasing, without operator, of 7121 - Agricultural and forestry machinery and equipment 7122 - Construction and civil engineering machinery and equipment 7123 - Office machinery and equipment including computers 7129 - Other machinery and equipment not elsewhere classified	**Gross turnover deflated by appropriate quality adjusted price indices**	
			Turnover from survey of companies that rent out agricultural, construction, office and other machinery and equipment or administrative data taken from tax returns which could be split by type of other machinery and/or equipment. Examples are: - Tractors, trailers and semi-trailers - Other agricultural machinery - Scaffolds and work platforms, without erection and dismantling - Other construction and civil engineering machinery and equipment - Computers and computer peripherals - Other office machinery and equipment	Weighted appropriate price indices Examples are: - PPI: Agricultural machinery rental - PPI: construction equipment rental - PPI: Office machinery rental
713	***Renting of personal and household goods not elsewhere classified***	Includes the renting of all kinds of household or personal goods to house-holds or industries. Excludes the renting of cars, vans, motorcycles etc without operator and of leisure and pleasure equipment as an integral part of recreational facilities.	**Gross turnover deflated by appropriate quality adjusted price indices**	
			Turnover from survey of companies that rent out household or personal goods to households or industries or administrative data taken from tax returns which could be split by type of product. Examples are: - Furniture and other household appliances - Do-it-yourself equipment and tools - Records, compact discs, videos etc. - Flowers and plants	Weighted appropriate price indices Examples are: - CPI: Furniture and appliance rental - CPI: Do-it-yourself equipment rental - CPI: Records, videos etc. rental - PPI: Furniture and appliance rental - PPI: Flowers and plants rental

CPI is Consumer price index.
PPI is Services producer price index.

and of personal and household goods

Turnover data are defined as receipts from sales excluding VAT and other taxes on products plus any subsidies on products.
Preferred deflators to use are mostly producer price indices with some consumer price indices.

Alternative	Other	ISIC group
Gross turnover deflated by partially representative price indices Turnover from survey of companies that rent out land, water or air transport equipment or administrative data taken from tax returns. Deflated by partially representative PPIs and CPIs or a general price index Examples are: - CPI: New cars - CPI: Used cars - PPI: New cars - PPI: New trucks and trailers - PPI: Used trucks and trailers Or **Volume indicators** Examples are: - Number of items leased or rented out: Land transport equipment; Water transport equipment; Air transport equipment - Number of leases or rental agreements: Land transport equipment; Water transport equipment; Air transport equipment	**Volume indicators** Examples are: - Employment	*711*
Gross turnover deflated by partially representative price indices Turnover from survey of companies that rent out agricultural, construction, office and other machinery and equipment or administrative data taken from tax returns Deflated by partially representative PPIs or a general price index Examples are: - PPI: New tractors - PPI: Used tractors - PPI: Construction machinery - PPI: Photocopiers Or **Volume indicators** Examples are: - Number of items leased or rented out: Agricultural and forestry equipment; Construction and civil engineering equipment; Office machinery and equipment - Number of leases or rental agreements: Agricultural and forestry equipment; Construction and civil engineering equipment; Office machinery and equipment - Number of lease days: Agricultural and forestry equipment; Construction and civil engineering equipment; Office machinery and equipment	**Volume indicators** Examples are: - Employment	*712*
Gross turnover deflated by partially representative price indices Turnover from survey of companies that rent out household or personal goods to households or industries or administrative data taken from tax returns Deflated by partially representative PPIs and CPIs or a general price index Examples are: - CPI: Furniture - CPI: Do-it-yourself tools - CPI: Records, compact discs, videos Or **Volume indicators** Examples are: - Number of items rented out - Number of customers	**Volume indicators** Examples are: - Employment - Number of items available for lease	*713*

Division 72: Computer and related activities

This division covers activities related to the design, set-up, operation and maintenance of computer systems and networks, as well as custom software development and software publishing. It also includes data processing activities of various kinds and the storage, online distribution of electronic content and the maintenance and repair of other office, accounting and computing machinery.

This division is divided into six groups (seven classes): ***721 - Hardware consultancy; 722 - Software publishing; 723 - Data processing; 724 - Database activities and online distribution of electronic content; 725 - Maintenance and repair of office, accounting and computing machinery*** and ***729 - Other computer-related activities.*** For measuring gross value added as deflated turnover it may be desirable to sub-divide these groups. This will depend on how important the industry is to the country's economy and how accurate the output can be measured (e.g. turnover and prices).

ISIC group	Description	Explanatory notes	Preferred	
721	***Hardware consultancy***	Includes consultancy on type and configuration of hardware, with or without associated software applications. Excludes hardware consultancy carried out by computer producing or selling units.	**Gross turnover deflated by appropriate quality adjusted price indices** Turnover from survey of hardware consultants or administrative data taken from tax returns which could be split by type of hardware consultancy activity. Examples are: - Hardware only consultancy - Hardware and software consultancy	Weighted appropriate price indices Examples are: - PPI: Hardware consultancy - PPI: Software consultancy
722	***Software publishing, consultancy and supply***	Includes 7221 - Software publishing i.e. production, supply and documentation of ready-made software 7229 - Other software consultancy and supply i.e. analysis, design and programming of custom software, software maintenance and web page design. Excludes reproduction of software and retail sale of non-cutomised software	**Gross turnover deflated by appropriate quality adjusted price indices** Turnover from survey of software publishers and software consultants or administrative data taken from tax returns which could be split by type of software consultancy activity. Examples are: - Software publishing - Software consultancy - Production of made-to-order software - Software maintenance	Weighted appropriate price indices Examples are: - CPI: Software packages - PPI: Software publishing - PPI: Software consultancy - PPI: Software production - PPI: Software maintenance
723	***Data processing***	Includes processing of data employing either the customer's or a propriety program; management of data-processing facilities belonging to others; web-hosting and timeshare computer services	**Gross turnover deflated by appropriate quality adjusted price indices** Turnover from survey of data processing companies or administrative data from tax returns which could be split by type of data processing activity. Examples are: - Data processing - Operation of others' data processing facilities - Time share computer services	Weighted appropriate price indices Examples are: - PPI: Data processing - PPI: Operation of data processing facilities
724	***Database activities and online distribution of electronic content***	Includes assembly of compilations of data from one or more sources; web search portals, internet search, game and entertainment sites. Excludes online-publishing combined with traditional publishing, retail sale activities conducted over the internet and operation of internet gambling sites.	**Gross turnover deflated by appropriate quality adjusted price indices** Turnover from survey of companies providing database and online services or administrative data from tax returns which could be split by type of database and online service. Examples are: - Database compilation - Online publishing - Internet sites	Weighted appropriate price indices Examples are: - CPI: Internet services - PPI: Database services - PPI: Online publishing
725	***Maintenance and repair of office, accounting and computer machinery***	Includes maintenance and repair of computers, computer peripheral equipment, typewriters, photocopiers, calculating machines and cash registers	**Gross turnover deflated by appropriate quality adjusted price indices** Turnover from survey of companies providing office machinery maintenance and repair services or administrative data from tax returns which could be split by type of office / computer machinery service. Examples are: - Computers and computer peripheral equipment - Photocopiers and thermocopy machines - Other office machinery	Weighted appropriate price indices Examples are: - PPI: Maintenance of computing equipment - PPI: Maintenance of photocopiers - PPI: Maintenance of other office machinery
729	***Other computer-related activities***	Includes computer disaster recovery and software installation services	**Gross turnover deflated by appropriate quality adjusted price indices** Turnover from survey of companies providing other computer related services or administrative data from tax returns which could be split by type of computer related service. Examples are: - Computer disaster recovery - Software installation services	Weighted appropriate price indices Examples are: - PPI: Computer disaster recovery - PPI: Software installation services

CPI is Consumer price index.
PPI is Services producer price index.

Turnover data are defined as receipts from sales excluding VAT and other taxes on products plus any subsidies on products. Where long-term projects are involved, turnover should be adjusted for number of hours worked but not billed for. However, this may lead to an inappropriately volatile series. **Preferred deflators** to use are mostly services producer price indices with some consumer price indices.

Alternative	Other	ISIC group
Gross turnover deflated by partially representative price indices Turnover from survey of hardware consultants or administrative data taken from tax returns | Deflated by partially representative PPIs or a general price index Or **Volume indicators** Examples are: - Number of hardware consultancy contracts - Number of billable hours	**Volume indicators** Examples are: - Employment	*721*
Gross turnover deflated by partially representative price indices Turnover from survey of software publishers and software consultants or administrative data taken from tax returns | Deflated by partially representative PPIs or a general price index Or **Volume indicators** Examples are: - Number of software licences sold - Number of programming hours - Number of billable hours	**Volume indicators** Examples are: - Employment	*722*
Gross turnover deflated by partially representative price indices Turnover from survey of data processing companies or administrative data from tax returns | Deflated by partially representative PPIs or a general price index Or **Volume indicators** Examples are: - Number of transactions processed - Number of forms processed - Number of keystrokes	**Volume indicators** Examples are: - Employment	*723*
Gross turnover deflated by partially representative price indices Turnover from survey of companies providing database and online services or administrative data from tax returns | Deflated by partially representative PPIs and CPIs or a general price index Or **Volume indicators** Examples are: - Number of databases commissioned - Number of accesses to search engines - Number of programming hours	**Volume indicators** Examples are: - Employment	*724*
Gross turnover deflated by partially representative price indices Turnover from survey of companies providing office machinery maintenance and repair services or administrative data from tax returns | Deflated by partially representative PPIs or a general price index Or **Volume indicators** Examples are: - Number of maintenance contracts - Number of items repaired	**Volume indicators** Examples are: - Employment	*725*
Gross turnover deflated by appropriate quality adjusted price indices Turnover from survey of companies providing other computer related services or administrative data from tax returns | Deflated by partially representative PPIs or a general price index Or **Volume indicators** Examples are: - Number of disaster recovery contracts	**Volume indicators** Examples are: - Employment	*729*

Division 73: Research and development

This division covers the three types of research and development (R&D): **Basic research**, i.e. experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundations of phenomena; **Applied research**, i.e. original investigation undertaken in order to acquire new knowledge directed primarily towards a specific practical aim or objective; and **Experimental development**, i.e. systematic work drawing on existing knowledge gained from research and/or practical experience. It does not include the administration of R&D nor the raising and management of funds for R&D.

This division is divided into two classes: ***7310 - Research and experimental development on natural sciences and engineering and 7320 - Research and experimental development on social sciences and humanities.*** For measuring gross value added as deflated turnover it may be desirable to sub-divide these classes. This will depend on how important the industry is to the country's economy and how accurate the output can be measured (e.g. turnover and prices).

ISIC class	Description	Explanatory notes	Preferred
7310	***Research and experimental development on natural sciences and engineering***	Includes research in mathematics, physics, astronomy, chemistry, life sciences, medical sciences, earth sciences, agriculture, engineering and technology.	**Market services** **Gross turnover deflated by appropriate quality adjusted price indices** Turnover from survey of R&D companies or administrative data from tax returns which could be split by type of natural science and engineering research. Examples are: - Basic research - Applied research - Experimental development Weighted appropriate price indices Examples are: - PPI: Research charge out rates **Non-market services** **Volume indicators** - Number of employees
7320	***Research and experimental development on social sciences and humanities***	Includes research in economics, psychology, sociology, archaeology, legal sciences, linguistics, languages and arts. Excludes market research.	**Market services** **Gross turnover deflated by appropriate quality adjusted price indices** Turnover from survey of R&D companies or administrative data from tax returns which could be split by type of social sciences and humanities research. Examples are: - Basic research - Applied research - Experimental development Weighted appropriate price indices Examples are: - PPI: Research charge out rates **Non-market services** **Volume indicators** - Number of employees

PPI is Services producer price index.

Turnover data are defined as receipts from sales excluding VAT and other taxes on products plus any subsidies on products. **Preferred deflators** to use are mostly services product price indices with some earnings price indices.

Note: R&D can be split into non-market and market components. Non-market production principally takes place within educational establishments and hospitals, often funded by government. The market part of the output is often carried out by enterprises or private research institutes. They work mostly on the basis of contracts and are often active in the more practical orientated type of research. R&D is by nature a unique activity that only takes place once and so price comparisons over time are impossible.

Alternative	Other	ISIC class
Market services **Gross turnover deflated by partially representative price indices** Turnover from survey of R&D companies or administrative data from tax returns | Deflated by partially representative PPIs or an average earnings index Or **Volume indicators** Examples are: - Number of publications by researchers - Number of research degrees completed - Number of patents granted	**Volume indicators** Examples are: - Employment	*7310*
Market services **Gross turnover deflated by partially representative price indices** Turnover from survey of R&D companies or administrative data from tax returns | Deflated by partially representative PPIs or an average earnings index Or **Volume indicators** Examples are: - Number of publication by researchers - Number of research degrees completed - Number of patents granted	**Volume indicators** Examples are: - Employment	*7320*

Division 74: Other business activities

This division includes all business activities except computer- and research-related activities. Outsourcing is a major factor in changing the way these activities are accounted for. The majority of the activities are carried out for commercial clients.

This division is divided into four groups (13 classes): ***741 - Legal, accounting, bookkeeping and auditing activities; tax consultancy; market research and public opinion polling; business and management consultancy; 742 - Architectural, engineering and other technical activities; 743 Advertising*** and ***749 Business activities not elsewhere classified.*** For measuring gross value added as deflated turnover it may be desirable to sub-divide these groups. This will depend on how important the industry is to the country's economy and how accurate the output can be measured (eg turnover and prices).

ISIC group	Description	Explanatory notes	Preferred	
741	***Legal, accounting, bookkeeping and auditing activities, tax consultancy, market research and public opinion polling, business and management consultancy***	Excludes law court activities, design of computer software for accounting systems, data processing and tabulation activities.	**Gross turnover deflated by appropriate quality adjusted price indices**	
			Turnover from survey of companies supplying these types of services or administrative data taken from tax returns which could be split by type of legal / busines service supplied. Examples are: - Legal services - Financial services - Market research and public opinion polling - Business and management consultancy - Management holding companies	Weighted appropriate price indices Examples are: - CPI: Legal services - CPI: Financial services - PPI: Legal services - PPI: Financial services - PPI: Market research - PPI: Business consultancy - PPI: Management consultancy - PPI: Management holding companies
742	***Architectural, engineering and other technical activities***	Excludes test drilling and test hole boring in connection with the extraction of minerals, activities of computer consultants, research and development activities	**Gross turnover deflated by appropriate quality adjusted price indices**	
			Turnover from survey of companies supplying these types of services or administrative data taken from tax returns which could be split by type of technical / engineering service supplied. Examples are: - Architectural services - Engineering services - Other technical consultancy - Technical testing and analysis	Weighted appropriate price indices Examples are: - CPI: Architectural services - PPI: Architectural service - PPI : Engineering services - PPI : Other technical consultancy - PPI: Technical testing
743	***Advertising***	Excludes the printing of advertising material and the production of commercial messages for radio, television and film.	**Gross turnover deflated by appropriate quality adjusted price indices**	
			Turnover from survey of advertising agencies or administrative data taken from tax returns which could be split by type of advertising activity. Examples are: - Planning and creation of advertisements - Placement of advertisements - Provision of advertising space, e.g. billboards	Weighted appropriate price indices Examples are: - PPI: Advertising services - PPI : Advertising space
749	***Business activities not elsewhere classified***	Includes labour recruitment, security activities, industrial cleaning, photographic activities, and packaging activities. Excludes activities of theatrical, film, or TV casting agencies; installation of alarm systems, investigation in connection with insurance; agricultural pest control, steam-cleaning and similar activities for building exteriors, packaging activities incidental to transport, auctions.	**Gross turnover deflated by appropriate quality adjusted price indices**	
			Turnover from survey of companies supplying these types of services or administrative data taken from tax returns which could be split by type of other business service supplied. Examples are: - Labour recruitment and provision of personnel - Investigation and security services - Building- and industrial-cleaning - Photographic services - Packaging activities - Stenographic and mailing services - Speciality design services	Weighted appropriate price indices Examples are: - CPI: Film processing - PPI: Film processing - PPI: Recruitment agencies - PPI: Security services - PPI: Contract cleaning - PPI: Contract packaging - PPI: Stenographic services

CPI is Consumer price index.
PPI is Services producer price index.

Turnover data are defined as receipts from sales excluding VAT and other taxes on products plus any subsidies on products. Where long-term projects are involved, turnover should be adjusted for number of hours worked but not billed for. However, this may lead to an inappropriately volatile series. **Preferred deflators** to use are mostly services producer price indices with some consumer price indices.

Alternative	Other	ISIC group
Gross turnover deflated by partially representative price indices Turnover from survey of companies supplying these types of services or administrative data taken from tax returns. | Deflated by partially representative PPIs and CPIs or a general price index Or **Volume indicators** Examples are: - Number of contracts drawn up - Number of tax returns filed - Number of campaigns run - Number of billable hours	**Volume indicators** Examples are: - Employment	*741*
Gross turnover deflated by partially representative price indices Turnover from survey of companies supplying these types of services or administrative data taken from tax returns | Deflated by partially representative PPIs and CPIs or a general price index Or **Volume indicators** Examples are: - Number of designs commissioned - Number of surveys commissioned - Number of tests carried out - Number of billable hours	**Volume indicators** Examples are: - Employment	*742*
Gross turnover deflated by partially representative price indices Turnover from survey of advertising agencies or administrative data taken from tax returns | Deflated by partially representative PPIs or a general price index Or **Volume indicators** Examples are: - Number of campaigns carried out - Square metres of billboards rented - Seconds of television time bought - Number of units of media space - Number of newspaper/magazine subscribtions - Number of newspaper/magazine single sales - Number of billable hours	**Volume indicators** Examples are: - Employment	*743*
Gross turnover deflated by partially representative price indices Turnover from survey of companies supplying these types of services or administrative data taken from tax returns | Deflated by partially representative PPIs and CPIs or a general price index Or **Volume indicators** Examples are: - Number of employees placed - Number of man-hours of surveillance - Number of man-hours of cleaning - Number of films processed - Number of litres packaged - Number of words typed or translated - Number of envelopes mailed	**Volume indicators** Examples are: - Employment	*749*

Division 75: Public administration and defence; compulsory social security

This division covers activities usually carried out by the public administration. However, the legal or institutional status is not, in itself, the determining factor. This code includes units that are part of local or central public bodies that enable the administration of the community to function properly. It does not include education, health, social work, sewage and refuse disposal which are classified elsewhere.

This division is divided into three groups (eight classes): ***751 - Administration of the State and the economic and social policy of the community; 752 - Provision of services to the community as a whole*** and ***753 Compulsory social security activities.*** These are mainly non-market services that can be divided into collective services (751 and 752) and individual services (753). For measuring output it may be desirable to sub-divide the groups.

ISIC group	Description	Explanatory notes	Preferred
751	***Administration of the State and the economic and social policy of the community***	Includes 7511 - General (overall) public service activities 7512 - Regulation of the activities of agencies that provide health care, education, cultural services and other social services, excluding social security 7513 - Regulation of and contribution to more efficient operation of business 7514 - Supporting service activities for the government as a whole Excludes education activities, human-health related activities, sewage and refuse disposal, activities of libraries, museums etc. sporting or recreational activities, research and experimental development activities	**Expenditure deflated by appropriate quality price indices** Expenditure from administrative data taken from tax returns which could be split by type of public service. Examples are: - Health - Education - Social services - Transport Weighted appropriate price indices Examples are: - PPI: Wages - Health department staff - PPI: Wages - Education department staff - PPI: Wages - Social services department staff - PPI: Wages - Transport department staff Or **Detailed volume indicators adjusted for labour quality** Examples are: - National government employees: Executive and legislative administration; Fiscal affairs administration; Economic and social planning; Administration of health programmes; Administration of educational programmes; Administration of social services programmes; Administration of agricultural economy; Administration of industrial economy; Administration of wholesale and retail economy; Administration of general services - Regional government employees: Executive and legislative administration; Fiscal affairs administration; Economic and social planning; Administration of regional agencies; Administration of general services - Local government employees: Executive and legislative administration; Fiscal affairs administration; Economic and social planning; Administration of local agencies; Administration of general services
752	***Provision of services to the community as a whole***	Includes 7521 - Foreign affairs 7522 - Defence activities 7523 - Public order and safety activities Excludes research and experimental development activities, educational activities of military schools, colleges and academies, activities of military hospitals, various specialist fire fighting and fire prevention, advice in civil and criminal cases, activities of prison schools and hospitals	**Expenditure deflated by appropriate quality price indices** Expenditure from administrative data taken from tax returns which could be split by type of public service Examples are: - Foreign affairs - Defence - Public order and safety Weighted appropriate price indices Examples are: - PPI: Wages - Foregn office staff - PPI: Wages - Defence office staff - PPI: Wages - Public order office staff Or **Detailed volume indicators adjusted for labour quality** Examples are: - National government employees: Administration of diplomatic and consular missions; Administration of foreign aid and assistance; Administration of military defence affairs; Administration of police forces; Administration of the judicial system - Regional government employees: Administration of civil defence forces; Administration of police forces; Administration of firefighting and fire prevention - Local government employees: Administration of civil defence forces; Administration of police forces; Administration of firefighting and fire prevention - Number of crimes: Property crimes; Violent crimes - Number of arrests: Property crimes; Violent crimes
753	***Compulsory social security activities***	Includes the funding and administration of government-provided social security programmes such as sickness, and unemployment insurance, retirement pensions and those covering losses of income due to maternity, temporary disablement and widowhood. Excludes non-compulsory social security and the provision of welfare services and social work	**Expenditure deflated by appropriate quality price indices** Expenditure from administrative data taken from tax returns which could be split by type of public service Examples are: - Sickness and disability allowances - Unemployment allowances - Retirement pensions - Maternity allowances - Widowhood allowances Weighted appropriate price indices Examples are: - PPI: Wages - Social security departmentf staff Or **Detailed volume indicators adjusted for labour quality** Examples are: - Government employees: Administration of sickness / disability allowances; Administration of unemployment allowances; Administration of retirement pensions; Administration of maternity / widowhood allowances - Number of claims or claimants: Sickness and disability allowances; Unemployment allowances; Retirement pensions; Maternity allowances; Widowhod allowances Number of appeals handled: Sickness and disability allowances; Unemployment allowances; Retirement pensions; Maternity allowances; Widowhod allowances

PPI is Services producer price index.

Historically, input methods have been used to measure the output of non-market services. However, increasingly, governments are collecting performance and output data for public services, typically starting with services to individuals such as health and education, as they need this information for good management and to assure tax payers that resources are being efficiently and effectively deployed. Also, some data sources on outputs have been available for many years because they are required for administrative reasons, e.g. pupil and patient numbers, numbers of social security and tax cases handled. Due to the difficulty in defining the output of collective services, input methods are acceptable. However, for individual services input methods should be replaced by a more direct form of output measurement where possible.

Alternative	Other	ISIC group
Expenditure deflated by partially representative price indices Expenditure from administrative data taken from tax returns | Deflated by partially representative PPIs or a general wage index Or **Detailed volume indicators** Examples are: - National, regional and local government employees: Executive and legislative administration Fiscal affairs administration Economic and social planning Administration of health programmes Administration of educational programmes Administration of social services programmes Administration of agricultural economy Administration of industrial economy Administration of wholesale and retail economy Administration of general services Administration of regional agencies Administration of local agencies	**Volume indicators** Examples are: - National government employees - Regional government employees - Local government employees	*751*
Expenditure deflated by partially representative price indices Expenditure from administrative data taken from tax returns | Deflated by partially representative PPIs or a general wage index Or **Detailed volume indicators** Examples are: - National, regional and local government employees: Administration of diplomatic and consular missions Administration of foreign aid and assistance Administration of military defence affairs Administration of civil defence forces Administration of police forces Administration of firefighting and fire prevention Administration of the judicial system	**Volume indicators** Examples are: - National government employees - Regional government employees - Local government employees	*752*
Expenditure deflated by partially representative price indices Expenditure from administrative data taken from tax returns | Deflated by partially representative PPIs or a general wage index Or **Detailed volume indicators** Examples are: - Number of claims - Number of claimants - Number of appeals handled	**Volume indicators** Examples are: - National government employees - Regional government employees - Local government employees	*753*

Division 80: Education

This division covers public as well as private education at any level or for any profession, oral or written as well as by radio and television or other means of communication. It includes education by the different institutions in the regular school system at its different levels (including special education for physically or mentally handicapped pupils) as well as adult education, literacy programmes etc.. Also included are military schools and academies, prison schools etc.. It does not include education primarily concerned with recreational activities such as bridge or golf.

This division is divided into five classes: ***8010 - Primary education; 8021 - General secondary education; 8022 - Technical and vocational secondary education; 8030 - Higher education*** and ***8090 - Other education.***

ISIC class	Description	Explanatory notes	Preferred
8010	***Primary education***	Includes pre-primary education and primary education (education at the first level), special education for handicapped students at this level, and the provision of literacy programmes for handicapped adults. Excludes child day-care activities	**Gross turnover deflated by appropriate quality adjusted price indices** Turnover from survey of organisations providing primary education or administrative data from tax returns which could be split by type of primary education. Examples are: - Primary education - Pre-primary education - Literacy programmes for handicapped adults Weighted appropriate price indices Examples are: - CPI: Pre-primary education fees - CPI: Primary education fees Or **Volume indicators** Examples are: - Pupil-hours: Primary education Pre-primary education Literacy programmes for handicapped adults
8021	***General secondary education***	Includes general school education in the first stage of secondary level corresponding more or less to the period of compulsory school attendance, general school education in the second stage of secondary level giving, in principle, access to higher education, and special education for handicapped students at this level	**Gross turnover deflated by appropriate quality adjusted price indices** Turnover from survey of organisations providing general secondary education or administrative data from tax returns which could be split by type of general secondary education. Examples are: - General secondary education up to school leaving age - General secondary education past school leaving age - General secondary education for handicapped pupils Weighted appropriate price indices Examples are: - CPI: Secondary education fees - day schools - CPI: Secondary education fees - boarding schools Or **Volume indicators** Examples are: - Pupil-hours: Up to school leaving age Past school leaving age Handicapped pupils
8022	***Technical and vocational secondary education***	Includes technical and vocational education below the level of higher education and special education for handicapped students at this level	**Gross turnover deflated by appropriate quality adjusted price indices** Turnover from survey of organisations providing technical and vocational secondary education or administrative data from tax returns which could be split by type of technical / vocational education Examples are: - Technical education - Vocational education - Technical and vocational education for handicapped pupils Weighted appropriate price indices Examples are: - CPI: Secondary education fees - day schools - CPI: Secondary education fees - boarding schools Or **Volume indicators** Examples are: - Pupil-hours: Technical education Vocational education Technical and vocational education for handicapped pupils
8030	***Higher education***	Includes first, second and third stages of higher education, i.e. post-secondary education either leading to a university degree (or equivalent) or not; and special education for handicapped students at this level	**Gross turnover deflated by appropriate quality adjusted price indices** Turnover from survey of organisations providing higher education or administrative data from tax returns which could be split by type of higher education Examples are: - Leading to a university degree or equivalent - Not leading to a university degree or equivalent Weighted appropriate price indices Examples are: - CPI: Degree fees - CPI: Non-degree fees Or **Volume indicators** Examples are: - Student-hours: University degree courses - medical and science University degree courses - arts Courses not leading to a degree
8090	***Other education***	Includes adult education such as day and evening classes, driving and flying schools, art and cooking schools, general and vocational subjects and other education that is not definable by level. Excludes activities of dance schools and instruction in sport and games.	**Gross turnover deflated by appropriate quality adjusted price indices** Turnover from survey of organisations providing adult education or administrative data from tax returns which could be split by type of other education service Examples are: - Day and evening classes - Driving schools - Business related courses - Art schools - Cookery schools Examples are: - CPI: Day and evening class fees - CPI: Driving school fees - CPI: Fees for vocational courses - PPI: Training course fees Or **Volume indicators** Examples are: - Student-hours: Day and evening classes Driving lessons Business training courses Art courses Cookery courses

CPI is Consumer price index.
PPI is Services producer price index.

Turnover data are defined as receipts from sales excluding VAT and other taxes on products plus any subsidies on products. **Preferred deflators** to use are mostly consumer price indices with some services producer price indices. Pupil hours or pupil numbers can be used for both the market and non-market sectors.

Alternative	Other	ISIC class
Gross turnover deflated by partially representative price indices Turnover from survey of organisations providing primary education or administrative data from tax returns | Deflated by partially representative CPIs or a general price index Or **Volume indicators** Examples are: - Number of pupils: Primary education; Pre-primary education; Literacy programmes for handicapped adults	**Volume indicators** Examples are: - Employment	*8010*
Gross turnover deflated by partially representative price indices Turnover from survey of organisations providing general secondary education or administrative data from tax returns | Deflated by partially representative CPIs or a general price index Or **Volume indicators** Examples are: - Number of pupils: Up to school leaving age; Past school leaving age; Handicapped pupils	**Volume indicators** Examples are: - Employment	*8021*
Gross turnover deflated by partially representative price indices Turnover from survey of organisations providing technical and vocational secondary education or administrative data from tax returns | Deflated by partially representative CPIs or a general price index Or **Volume indicators** Examples are: - Number of pupils: Technical education; Vocational education; Handicapped pupils; Technical and vocational education for handicapped pupils	**Volume indicators** Examples are: - Employment	*8022*
Gross turnover deflated by partially representative price indices Turnover from survey of organisations providing higher education or administrative data from tax returns | Deflated by partially representative CPIs or a general price index Or **Volume indicators** Examples are: - Number of students: University degree courses - medical and science; University degree courses - arts; Courses not leading to a degree	**Volume indicators** Examples are: - Employment	*8030*
Gross turnover deflated by partially representative price indices Turnover from survey of organisations providing adult education or administrative data from tax returns | Or **Volume indicators** Examples are: - Number of students: Day and evening classes; Driving lessons; Business training courses; Art courses; Cookery courses	**Volume indicators** Examples are: - Employment	*8090*

Division 85: Health and social work

This division covers the provision of health care by diagnosis and treatment, the provision of residential care for medical and social reasons, the provision of social assistance such as counselling, welfare, child protection etc., and the provision of veterinary services.

This division is divided into six classes: ***8511 - Hospital activities; 8512 - Medical and dental practice activities; 8519 - Other human health activities; 8520 - Veterinary activities; 8531 - Social work activities with accommodation*** and ***8532 - Social work activities without accommodation.***

ISIC class	Description	Explanatory notes	Preferred
8511	***Hospital activities***	Includes short- or long-term hospital activities, medical and surgical, of general and specialised hospitals, medical nursing homes, asylums and rehabilitation centres etc. The activities are chiefly directed to inpatients and carried out under the direct supervision of medical doctors. Excludes health activities for military personnel in the field.	**Gross turnover deflated by appropriate quality adjusted price indices** Turnover from survey of hospitals or administrative data from tax returns which could be split by type of hospital. Examples are: - General hospitals - Psychiatric hospitals - Rehabilitation centres Weighted appropriate price indices Examples are: - CPI: Health services - PPI: Health services Or **Volume indicators** Examples are: - Number of patients discharged: Diagnostic related groups; Heart / circulatory / respiratory diseases; Cancers; Accidental injuries - Number of occupant-days: Psychiatric illnesses; Rehabilitation
8512	***Medical and dental practice activities***	Includes medical consultation and treatment, dental practice activities and orthodontics. The activities can be carried out in private practice, group practices, hospital outpatient clinics, clinics attached to firms, schools etc. and in patients' homes. Excludes the production of artificial teeth, denture and prosthetic appliances by dental laboratories.	**Gross turnover deflated by appropriate quality adjusted price indices** Turnover from survey of medical providers or administrative data from tax returns which could be split by type of medical and dental service provider. Examples are: - General practitioners (GPs) - Specialists - Clinics attached to businesses - Dental practitioners Weighted appropriate price indices Examples are: - CPI: Health services - CPI: Dental charges - PPI: Health services Or **Volume indicators** Examples are: - Number of GP consultations: Heart and circulatory diseases; Respiratory diseases; Childhood diseases - Number of first visits to specialists: Heart and circulatory diseases; Respiratory diseases; Cancers - Number of courses of treatment: Dental care
8519	***Other human health activities***	Includes activities for human health not performed by hospitals, medical doctors or dentists; activities of nurses, midwives, physiotherapists etc. Activities may be carried out in health clinics, own consulting rooms, patients' homes etc. Excludes the production of artificial teeth, denture and prosthetic appliances by dental laboratories and testing activities in the field of food hygiene.	**Gross turnover deflated by appropriate quality adjusted price indices** Turnover from survey of providers of other medical care or administrative data from tax returns which could be split by type of other human health care. Examples are: - Physiotherapy - Optometry - Chiropody - Chiropractic Weighted appropriate price indices Examples are: - CPI: Physiotherapy - CPI: Eyesight test fees - CPI: Chiropody fees - CPI: Chiropractic fees - PPI: Health services Or **Volume indicators** Examples are: - Number of courses of treatment: Physiotherapy; Chiropody; Chiropractic
8520	***Veterinary activities***	Includes animal health care and control activities for farm animals and for pet animals. Excludes farm animal boarding and pet animal boarding activities without health care	**Gross turnover deflated by appropriate quality adjusted price indices** Turnover from survey of veterinarians or administrative data from tax returns which could be split by type of vetinary care. Examples are: - Farm animals - Pet animals Weighted appropriate price indices Examples are: - CPI: Veterinary fees - PPI: Veterinary fees Or **Volume indicators** Examples are: - Number of courses of treatment: Farm animals; Pet animals - Number of appointments/consultations: Farm animals; Pet animals
8531	***Social work activities with accommodation***	Includes activities provided on a round-the-clock basis directed to provide social assistance but where medical treatment or education are not important elements. Excludes funding and administration of compulsory social security programmes	**Gross turnover deflated by appropriate quality adjusted price indices** Turnover from survey of providers of residential care or administrative data from tax returns which could be split by type of social home. Examples are: - Children's homes - Homes for the aged - Homes for handicapped people Weighted appropriate price indices Examples are: - CPI: Residential care - PPI: Residential care Or **Volume indicators** Examples are: - Number of occupant-days: Children's homes; Homes for the aged; Homes for handicapped people
8532	***Social work activities without accommodation***	Includes social, counselling, welfare and similar activities which are delivered to families and individuals in their homes or elsewhere and carried out by government offices or by other organisations. Excludes funding and administration of compulsory social security programmes	**Gross turnover deflated by appropriate quality adjusted price indices** Turnover from survey of providers of non-residential care or administrative data from tax returns which could be split by type of social care. Examples are: - Child day care - Day care for handicapped adults - Counselling services Weighted appropriate price indices Examples are: - CPI: Non-residential care - PPI: Non-residential care Or **Volume indicators** Examples are: - Number of persons receiving care: Children; Adults; Handicapped adults

CPI is Consumer price index.
PPI is Services producer price index.

Turnover data are defined as receipts from sales excluding VAT and other taxes on products plus any subsidies on products. **Preferred deflators** to use are a mix of services producer price indices and consumer price indices.

Alternative	Other	ISIC class
Gross turnover deflated by partially representative price indices Turnover from survey of hospitals or administrative data from tax returns | Deflated by partially representative CPIs and PPIs or a general price index Or **Volume indicators** Examples are: - Number of patients discharged - Number of beds - Number of admissions - Number ofsurgical operations - Number of births	**Volume indicators** Examples are: - Employment	***8511***
Gross turnover deflated by partially representative price indices Turnover from survey of medical providers or administrative data from tax returns | Deflated by partially representative CPIs and PPIs or a general price index Or **Volume indicators** Examples are: - Number of consultations - Number of registered patients	**Volume indicators** Examples are: - Employment	***8512***
Gross turnover deflated by partially representative price indices Turnover from survey of providers of other medical care or administrative data from tax returns | Deflated by partially representative CPIs and PPIs or a general price index Or **Volume indicators** Examples are: - Number of patients	**Volume indicators** Examples are: - Employment	***8519***
Gross turnover deflated by partially representative price indices Turnover from survey of veterinarians or administrative data from tax returns | Deflated by partially representative CPIs and PPIs or a general price index Or **Volume indicators** Examples are: - Number of animals treated	**Volume indicators** Examples are: - Employment	***8520***
Gross turnover deflated by partially representative price indices Turnover from survey of providers of residential care or administrative data from tax returns | Deflated by partially representative CPIs and PPIs or a general price index Or **Volume indicators** Examples are: - Number of people in residential care - Number of beds	**Volume indicators** Examples are: - Employment	***8531***
Gross turnover deflated by partially representative price indices Turnover from survey of providers of non-residential care or administrative data from tax returns | Deflated by partially representative CPIs and PPIs or a general price index Or **Volume indicators** Examples are: - Number of day care places for children - Number of day care places for homeless persons - Number of day care places for handicapped people	**Volume indicators** Examples are: - Employment	***8532***

Division 90: Sewage and refuse disposal, sanitation and similar activities

This division covers the collection and treatment of household and industrial waste, not for a further use in an industrial manufacturing process, but with the aim of disposal and resulting in a product with little or no value. It does not include the processing of waste and scrap and other articles into secondary raw material fit for direct use in an industrial manufacturing process nor the wholesale in waste and scrap, i.e. collecting, sorting, packing etc. but without a real transformation process.

There is only one class in this division. For measuring gross value added as deflated turnover it may be desirable to sub-divide this class. This will depend on how important the industry is to the country's economy and how accurate the output can be measured (eg turnover and prices).

ISIC class	Description	Explanatory notes	Preferred
9000	***Sewage and refuse disposal, sanitation and similar activities***	Excludes cleaning of ditches and pest control for the benefit of agriculture, treatment of residual food substances for manufacture of food products, treatment of slaughter waste to produce animal feed, reprocessing of nuclear fuels and of radioactive nuclear waste, composting waste etc.	**Gross turnover deflated by appropriate quality adjusted price indices** Turnover from survey of waste disposal companies or administrative data taken from tax returns which could be split by type of activity Examples are: - Collection and disposal of waste water and sewage from households and industry - Collection and disposal of waste water and sewage - Collection and disposal of waste by means of refuse bins, wheeled bins, litter bins in public places etc. - Treatment and disposal of contaminated waste - Decontamination and cleaning up of polluted soil, surface water, seas and oceans Weighted appropriate price indices Examples are: - CPI: Waste disposal - PPI: Waste disposal - PPI: Contaminated waste - PPI: Decontamination Or **Volume measures** Examples are: Tonnes of rubbish collected: Households, Industries Tonnes of rubbish disposed: Incinerated, Land fill Litres of waste water and sewage processed: Surface water, Sewage Tonnes of contaminated waste treated: Agricultural, Industrial, Radioactive

CPI is Consumer price index.
PPI is Services producer price index.

Turnover data are defined as receipts from sales excluding VAT and other taxes on products plus any subsidies on products.
Preferred deflators to use are mostly services producer price indices with some consumer price indices.

Alternative	Other	ISIC class
Gross turnover deflated by partially representative price indices Turnover from survey of waste disposal companies or administrative data taken from tax returns | Deflated by partially representative PPIs and CPIs or a general price index Or **Volume measures** Examples are: - Tonnes of rubbish collected - Litres of sewage treated - Litres of decontamination agents used	**Volume indicators** Examples are: - Employment	***9000***

Division 91: Activities of membership organisations not elsewhere classified

This division covers activities of organisations representing interests of special groups or promoting ideas to the general public. These organisations, many of which are Non Profit Institutions (NPIs), usually have a constituency of members but their activities may involve and benefit non-members as well.

This division is divided into six classes: ***9111 - Activities of business and employers organisations; 9112 - Activities of professional organisations; 9120 - Activities of trade unions; 9191 - Activities of religious organisations; 9192 - Activities of political organisations*** and ***9199 - Activities of other membership organisations not elsewhere classified.*** For measuring gross value added as deflated turnover it may be desirable to sub-divide these classes. This will depend on how important the industry is to the country's economy and how accurate the output can be measured (e.g. turnover and prices).

ISIC class	Description	Explanatory notes	Preferred
9111	***Activities of business and employers organisations***	Includes activities of organisations, such as guilds and chambers of commerce, whose members' interests centre on the development and prosperity of enterprises in a particular line of business or trade.	**Income deflated by appropriate quality adjusted price indices** Income from survey of such organisations or administrative data taken from tax returns which could be split by type of services provided. Examples are: - Legal advice - Dissemination of information Weighted appropriate price indices Examples are: - PPI: Legal fees - PPI: Publishing of journals and periodicals Or **Volume indicators** Examples are: - Number of members: Full members; Part members; Non-voting members
9112	***Activities of professional organisations***	Includes activities of organisations whose members' interests centre chiefly on a particular scholarly discipline or professional practice or technical field. Excludes education provided by these organisations.	**Income deflated by appropriate quality adjusted price indices** Income from survey of such organisations or administrative data taken from tax returns which could be split by type of services provided. Examples are: - Legal advice - Dissemination of information - Examination or accreditation services Weighted appropriate price indices Examples are: - CPI: Examination fees - PPI: Legal fees - PPI: Publishing of journals and periodicals Or **Volume indicators** Examples are: - Number of members: Full members; Part members; Non-voting members; Student members
9120	***Activities of trade unions***	Includes activities of associations whose members are employees interested chiefly in the representation of their views concerning salary and work situation and in concerted action through organisation Excludes education provided by these organisations.	**Income deflated by appropriate quality adjusted price indices** Income from survey of trade unions or administrative data taken from tax returns which could be split by type of services provided Examples are: - Legal advice - Dissemination of information Weighted appropriate price indices Examples are: - PPI: Legal fees - PPI: Publishing of journals and periodicals Or **Volume indicators** Examples are: - Number of members: Full members; Part members
9191	***Activities of religious organisations***	Includes activities of religious organisations or individuals providing services directly to worshippers in churches, mosques, temples, synagogues or other places Excludes education, health and social work activities provided by these organisations.	**Income deflated by appropriate quality adjusted price indices** Income from survey of such organisations or administrative data taken from tax returns which could be split by type of services provided Examples are: - Services in churches, mosques, temples etc. - Monasteries, convents etc. - Retreats Weighted appropriate price indices Examples are: - PPI: Buildings insurance - PPI: Contents insurance Or **Volume indicators** Examples are: - Number people attending services: - Number of services held:
9192	***Activities of political organisations***	Includes activities of political organisations and auxiliary organisations such as young people's auxiliaries associated with a political party	**Income deflated by appropriate quality adjusted price indices** Income from survey of such organisations or administrative data taken from tax returns which could be split by type of services provided Examples are: - Conferences - Dissemination of information - Social facilities Weighted appropriate price indices Examples are: - CPI: Alcohol. - PPI: Hire of conference facilities - PPI: Publishing of journals and periodicals Or **Volume indicators** Examples are: - Number of members: Full members; Social or non-voting members
9199	***Activities of other membership organisations not elsewhere classified***	Includes activities of organisations (not directly affiliated to a political party) furthering a public cause or issue by means of public education, political influence, fund-raising etc., special interest groups and associations such as touring clubs, rotary clubs, youth clubs, film and photo clubs.	**Income deflated by appropriate quality adjusted price indices** Income from survey of such organisations or administrative data taken from tax returns which could be split by type of services provided Examples are: - Dissemination of information - Social facilities - Legal advice Weighted appropriate price indices Examples are: - CPI: Alcohol. - CPI: Legal fees - PPI: Publishing of journals and periodicals Or **Volume indicators** Examples are: - Number of members: Full members; Social or non-voting members

CPI is Consumer price index.
PPI is Services producer price index.

Income data are appropriate for these non-market services provided by Non-Profit Institutions (NPIs) such as professional bodies, trade unions and religious organisations.The common feature is that payment of a membership fee covers a range of services, which may or may not be used by the individual member in a particualr time period.

Due to the large number of small units providing some of these services and the exemptions often granted to them by Government (e.g. for taxation purposes), there can be a shortage of suitable data. However, organisations can be expected to maintain reasonably comprehensive and up-to-date membership registers. There is also sometimes a mandatory provision of information to the Government administration responsible for monitoring NPIs (including also a set of accounts where monetary flows are significant).

Alternative	Other	ISIC class
Income deflated by partially representative price indices Income from survey of such organisations or administrative data taken from tax returns | Deflated by partially representative CPIs and PPIs or a general price index Or **Volume indicators** Examples are: - Number of members	**Volume indicators** Examples are: - Employment	*9111*
Income deflated by partially representative price indices Income from survey of such organisations or administrative data taken from tax returns | Deflated by partially representative CPIs and PPIs or a general price index Or **Volume indicators** Examples are: - Number of members	**Volume indicators** Examples are: - Employment	*9112*
Income deflated by partially representative price indices Income from survey of trade unions or administrative data taken from tax returns | Deflated by partially representative CPIs and PPIs or a general price index Or **Volume indicators** Examples are: - Number of members	**Volume indicators** Examples are: - Employment	*9120*
Income deflated by partially representative price indices Income from survey of such organisations or administrative data taken from tax returns | Deflated by partially representative CPIs and PPIs or a general price index Or **Volume indicators** Examples are: - Number of members	**Volume indicators** Examples are: - Employment	*9191*
Income deflated by partially representative price indices Income from survey of such organisations or administrative data taken from tax returns | Deflated by partially representative CPIs and PPIs or a general price index Or **Volume indicators** Examples are: - Number of members	**Volume indicators** Examples are: - Employment	*9192*
Income deflated by partially representative price indices Income from survey of such organisations or administrative data taken from tax returns | Deflated by partially representative CPIs and PPIs or a general price index Or **Volume indicators** Examples are: - Number of members	**Volume indicators** Examples are: - Employment	*9199*

Division 92: Recreational, cultural and sporting activities

This division covers the operation of facilities and provision of services to meet the cultural, entertainment, recreational and sports interest in their customers.

This division is divided into four groups (12 classes): ***921 Motion picture, radio, television and other entertainment activities; 922 - News agency activities; 923 - Library, archives, museums and other cultural activities and 924 - Sporting and other recreational activities.*** For measuring gross value added as deflated turnover it may be desirable to sub-divide these groups. This will depend on how important the industry is to the country's economy and how accurate the output can be measured (e.g. turnover and prices).

ISIC group	Description	Explanatory notes	Preferred
921	***Motion picture, radio, television and other entertainment activities***	Includes 9211 - Motion picture and video production and distribution 9212 - Motion picture projection 9213 - Radio and television activities 9214 - Dramatic arts, music and other arts activities. Excludes reproduction from master copies; wholesale, retail and renting of video tapes; film processing other than for the motion picture business; activities of theatrical agents; radio and television transmission via cable, relay or satellite; restoration of furniture and musical instruments.	**Gross turnover deflated by appropriate quality adjusted price indices** Turnover from survey of producers of films, radio and television programmes, and live presentations in theatres and concert halls, or administrative data taken from tax returns which could be split by type of entertainment. Examples are: - Production, distribution of motion pictures - Activities of sound recording studios - Production of radio and television programmes - Broadcasting of radio and television programmes - Production of live theatrical presentations - Production of concerts, opera and dance - Operation of ticket agencies Weighted appropriate price indices Examples are: - CPI: Cinema tickets - CPI: Theatre tickets - CPI: Concert tickets - PPI: Cinema advertising - PPI: Television advertising Or **Volume indicators** Examples are: - Cinema tickets: Adult tickets, Family tickets, Concession tickets - Theatre tickets: Best seats, Other seats, Matinee performances - Concert tickets: One-off tickets, Season tickets
922	***News agency activities***	Includes news syndicate and news agency activities and the activities of independent journalists	**Gross turnover deflated by appropriate quality adjusted price indices** Turnover from survey of news syndicates and news agencies or administrative data taken from tax returns Weighted appropriate price indices Examples are: - PPI: News agencies
923	***Library, archives, museums and other cultural activities*** Some of these services are provided as non-market services, i.e. by the government, others are provided as market services	Includes 9231 - Library and archives activities 9232 - Museums activities and preservation of historic sites and buildings 9233 - Botanical and zoological gardens and nature reserves activities Excludes renting of video tapes; database activities.	**Non-market services, eg libraries** **Volume indicators** Examples are: - Number of items lent: Adult fiction books, Adult non-fiction books, Child books, Videos, records, audio tapes and compact discs - Number of visitors: Lending library, Reference library, Children's library **Market services, eg zoological gardens** **Gross turnover deflated by appropriate quality adjusted price indices** Turnover from survey of providers of cultural activities or administrative data taken from tax returns which could be split by type of activity Examples are: - Museums - Historical sites and buildings - Botanical and zoological gardens Weighted appropriate price indices Examples are: - CPI: Entrance fees to museums - CPI: Entrance fees to historical sites - CPI: Entrance fees to botanical gardens - CPI: Entrance fees to zoological gardens Or **Volume indicators adjusted for quality** Examples are: - Number of tickets sold: Adult tickets, Family tickets, Season tickets, Concessionary tickets
924	***Sporting and other recreational activities***	Includes 9241 - Sporting activities 9249 - Other recreational activities Excludes renting of sports equipment separate from the sports facility; activities of personal theatrical or artistic agents	**Non-market services, eg municipal swimming pools** **Volume indicators adjusted for quality** Examples are: - Number of tickets sold: Adult tickets - single facility, Adult tickets - multi facility, Season tickets, Child/family/concessionary tickets **Market services, eg golf courses** **Gross turnover deflated by appropriate quality adjusted price indices** Turnover from survey of providers of sporting facilities or administrative data from tax returns which could be split by type of facility Examples are: - Health clubs - Bowling alleys - Golf courses Weighted appropriate price indices Examples are: - CPI: Health clubs - CPI: Football matches - CPI: Bowling alleys - CPI: Golf club membership Or **Volume indicators adjusted for quality** Examples are: - Number of tickets sold: Adult tickets - single facility, Adult tickets - multi facility, Family tickets, Season tickets

CPI is Consumer price index.
PPI is Services producer price index.

Turnover data are defined as receipts from sales excluding VAT and other taxes on products plus any subsidies on products.
Preferred deflators to use are mostly consumer price indices with some services producer price indices.

Alternative	Other	ISIC group
Gross turnover deflated by partially representative price indices Turnover from survey of producers of films, radio and television programmes, and live presentations in theatres and concert halls, or administrative data taken from tax returns | Deflated by partially representative CPIs and PPIs or a general price index Or **Volume indicators** Examples are: - Number of tickets sold: Cinemas, Theatres, Concerts	**Volume indicators** Examples are: - Employment	*921*
Gross turnover deflated by partially representative price indices Turnover from survey of news syndicates and news agencies or administrative data taken from tax returns | Deflated by partially representative PPIs or a general price index Or **Volume indicators** Examples are: - Number of words published - Number of photographs published	**Volume indicators** Examples are: - Employment	*922*
Non-market services, eg libraries **Volume indicators** Examples are: - Number of items lent - Number of visitors	**Volume indicators** Examples are: - Employment	*923*
Market services, eg zoological gardens **Gross turnover deflated by partially representative price indices** Turnover from survey of providers of cultural activities or administrative data taken from tax returns | Deflated by partially representative CPIs or a general price index Or **Volume indicators** Examples are: - Number of tickets sold: Museums, Historical sites and buildings, Botanical and zoological gardens	**Volume indicators** Examples are: - Employment	
Non-market services, eg municipal swimming pools **Volume indicators** Examples are: - Number of tickets sold: Participants, Spectators	**Volume indicators** Examples are: - Employment	*924*
Market services, eg golf courses **Gross turnover deflated by partially representative price indices** Turnover from survey of providers of sporting facilities or administrative data from tax returns | Deflated by partially representative CPIs or a general price index Or **Volume indicators** Examples are: - Number of tickets sold: Participants, Spectators	**Volume indicators** Examples are: - Employment	

Division 93: Other service activities

This division covers all service activities not elsewhere classified

This division is divided into four classes: ***9301 - Washing and (dry-)cleaning of textile and fur products; 9302 - Hairdressing and other beauty treatment; 9303 - Funeral and related activities*** and ***9309 - Other service activities not elsewhere classified.*** For measuring gross value added as deflated turnover it may be desirable to sub-divide some of the classes. This will depend on how important the industry is to the country's economy and how accurately the output can be measured (e.g. turnover and prices).

ISIC class	Description	Explanatory notes	Preferred
9301	***Washing and (dry-)cleaning of textile and fur products***	Includes laundering and dry-cleaning of all kinds of clothing and textiles by hand or machine and for both the general public and commercial clients. Excludes repair and alteration as an independent activity and renting of clothing other than work uniforms.	**Gross turnover deflated by appropriate quality adjusted price indices** Turnover from survey of providers of laundry and cleaning services or administrative data taken from tax returns which could be split by type of client. Examples are: - Households - Businesses Weighted appropriate price indices Examples are: - CPI: Laundry services - CPI: Dry cleaning services - CPI: Carpet and rug shampooing - PPI: Laundry services - PPI: Dry cleaning services - PPI: Carpet and rug shampooing Or **Volume indicators** Examples are: - Number of kilograms cleaned: Laundry; Dry cleaning -Number of 'standard loads': Laundry; Dry cleaning
9302	***Hairdressing and other beauty treatment***	Includes hair washing, cutting, setting, dyeing etc. for men and women, shaving and beard trimming and facial massage, manicure, pedicure, and make-up etc. Excludes manufacture of wigs	**Gross turnover deflated by appropriate quality adjusted price indices** Turnover from survey of hairdressers and providers of other beauty treatment services or administrative data taken from tax returns which could be split by type of activity. Examples are: - Hair dressing - Beauty treatments Weighted appropriate price indices Examples are: - CPI: Cutting/trimming for men - CPI: Cutting/trimming for women - CPI: Permanent waving/straightening - CPI: Colouring/Highlights - CPI: Beauty treatments Or **Volume indicators** Examples are: - Number of appointments: Hairdressing - men; Hairdressing - women; Beauty treatments
9303	***Funeral and related activities***	Includes burial and incineration of human or animal corpses; rental or sale of graves; maintenance of graves and mausoleums Excludes religious funeral service activities	**Gross turnover deflated by appropriate quality adjusted price indices** Turnover from survey of providers of burial and cremation services or administrative data taken from tax returns which could be split by type of activity. Examples are: - Preparation of the dead for burial and cremation - Provision of burial and cremation services - Maintenance of graves and mausoleums Weighted appropriate price indices Examples are: - CPI: Funeral services - CPI: Graves and gravestones - CPI: Crematorium fees - PPI: Maintenance of graves and mausoleums Or **Volume indicators** Examples are: - Number of deaths: Burial; Cremation - Number of coffins: Top range; Middle range; Budget range
9309	***Other service activities not elsewhere classified***	Includes activities of saunas and massage salons etc.; astrological and spiritualists' activities; social activities such as escort services and marriage bureaux; pet care services; shoes-shiners and porters etc.; coin-operated personal service machines Excludes public pay-telephone services; veterinary activities and activities of health clubs	**Gross turnover deflated by appropriate quality adjusted price indices** Turnover from survey of providers of other personal services or administrative data taken from tax returns which could be split by type of service Examples are: - Turkish baths, saunas and massage salons - Escort and dating services, marriage bureaux - Coin-operated photo booths, weighing machines etc - Pet cares services Weighted appropriate price indices Examples are: - CPI: Turkish baths etc. haulage - CPI: Escort services etc. - CPI: Coin-operated personal service machines - CPI: Pet grooming and boarding etc. Or **Volume indicators** Examples are: - Number of visits: Saunas; Massage salons - Number of appointments: Escort services; Pet services - Number of operations: Coin-operated photo booths; Coin-operated weighing machines

CPI is Consumer price index.
PPI is Services producer price index.

Turnover data are defined as receipts from sales excluding VAT and other taxes on products plus any subsidies on products.
Preferred deflators to use are mostly consumer price indices with some services producer price indices.

Alternative	Other	ISIC class
Gross turnover deflated by partially representative price indices Turnover from survey of providers of laundry and cleaning services or administrative data taken from tax returns | Deflated by partially representative PPIs and CPIs or a general price index Or **Volume indicators** Examples are: - Number of kilograms cleaned - Number of 'standard loads'	**Volume indicators** Examples are: - Employment	*9301*
Gross turnover deflated by partially representative price indices Turnover from survey of hairdressers and providers of other beauty treatment services or administrative data taken from tax returns | Deflated by partially representative CPIs or a general price index Or **Volume indicators** Examples are: - Number of appointments	**Volume indicators** Examples are: - Employment	*9302*
Gross turnover deflated by partially representative price indices Turnover from survey of providers of burial and cremation services or administrative data taken from tax returns | Deflated by partially representative CPIs and PPIs or a general price index Or **Volume indicators** Examples are: - Number of deaths - Number of coffins	**Volume indicators** Examples are: - Employment	*9303*
Gross turnover deflated by partially representative price indices Turnover from survey of providers of other personal services or administrative data taken from tax returns | Deflated by partially representative CPIs or a general price index Or **Volume indicators** Examples are: - Number of clients - Number of coin-operated machines	**Volume indicators** Examples are: - Employment	*9309*

Division 95: Activities of private households as employers of domestic staff

This division covers the activities of households as employers of domestic personnel such as maids, cooks, waiters, valets, butlers, laundresses, gardeners, gatekeepers, stable-lads, chauffeurs, caretakers, governesses, babysitters, tutors, secretaries etc.. These services cannot be provided by companies.

This division has only one class: ***9500 - Activities of private households as employers of domestic staff.*** The product, which is self-consumed, is considered non-market and assessed according to the cost of the personnel in the national accounts.

ISIC class	Description	Explanatory notes	Preferred
9500	***Activities of private households as employers of domestic staff***	Includes the activities of households as employers of all types of domestic personnel	**Compensation of employees paid adjusted for payment in kind** Earnings of domestic staff from labour force surveys or administrative data taken from tax returns | Weighted appropriate price indices Examples are: - CPI: Domestic services Or **Volume indicators** Examples are: - Number of domestic employees: Maids, cooks and waiters; Valets and butlers; Gardeners and stable hands; Chauffeurs; Governesses and tutors; Secretaries

CPI is Consumer price index.

The valuation of output is defined by ESA 1995 as equivalent to the **compensation of employees paid,** including any income in kind. In practice it may be difficult to collect reliable short-term data as small sample sizes and poor classification may lead to inappropriate volatility.

Alternative	Other	ISIC class
Compensation of employees paid Earnings of domestic staff from labour force surveys or administrative data taken from tax returns Weighted appropriate price indices Examples are: - CPI: Domestic services Or **Volume indicators** Examples are: - Number of domestic employees: Live-in Live-out Inside work Outside work	**Volume indicators** Examples are: - Number of employees	***9500***

Division 96: Undifferentiated goods-producing activities of private

This division covers the activities of households that are engaged in a variety of activities that produce goods for their own subsistence (otherwise known as undifferentiated subsistence goods-producing activities). If households are also engaged in the production of marketed goods, they are classified to the appropriate goods-producing industry of ISIC. If they are principally engaged in a specific goods-producing subsistence activity, they are classified to the appropriate goods-producing subsistence activity.

This division has only one class: ***9600 - Undifferentiated goods-producing activities of private households for own use.*** The product, which is self-consumed, is considered non-market and assessed according to the cost of the personnel in the national accounts.

ISIC class	Description	Explanatory notes	Preferred
9600	***Undifferentiated goods-producing activities of private households for own use***	Includes hunting and gathering, farming, the production of shelter and clothing and other goods produced by the household for its own use subsistence.	**Compensation of employees paid** Earnings of domestic staff from labour force surveys or administrative data taken from tax returns | Weighted appropriate price indices Examples are: - CPI: Domestic services Or **Volume indicators** Examples are: - Number of domestic employees: Live-in farm hands; Live-in stable-hands; Live-in gardeners; Live-out farm hands; Live-out stable-hands; Live-out gardeners

CPI is Consumer price index.

households for own use

The valuation of output is defined by ESA 1995 as equivalent to the **compensation of employees paid,** including any income in kind. In practice it may be difficult to collect reliable short-term data as small sample sizes and poor classification may lead to inappropriate volatility.

Alternative	Other	ISIC class
Price index deflated at source Examples are: - CPI: Domestic services Or **Volume indicators** Examples are: - Number of domestic employees: Live-in Live-out	**Volume indicators** Examples are: - Number of employees	***9600***

Division 97: Undifferentiated service-producing activities of private

This division covers the activities of households that are engaged in a variety of activities that produce services for their own subsistence (otherwise known as undifferentiated subsistence services-producing activities). If households are also engaged in the production of multiple goods for subsistence purposes, they are classified to the undifferentiated goods-producing subsistence activities of households.

This division has only one class: ***9700 - Undifferentiated service-producing activities of private households for own use.*** The product, which is self-consumed, is considered non-market and assessed according to the cost of the personnel in the national accounts.

ISIC class	Description	Explanatory notes	Preferred
9700	***Undifferentiated service-producing activities of private households for own use***	Includes cooking, teaching, caring for household members and other services produced by the household for its own use subsistence	**Compensation of employees paid** Earnings of domestic staff from labour force surveys or administrative data taken from tax returns | Weighted appropriate price indices Examples are: - CPI: Domestic services Or **Volume indicators** Examples are: - Number of domestic employees: Live-in cooks; Live-in governesses and tutors; Live-in nurses and carers; Live-out cooks; Live-out governesses and tutors; Live-out nurses and carers

CPI is Consumer price index.

households for own use

The valuation of output is defined by ESA 1995 as equivalent to the **compensation of employees paid,** including any income in kind. In practice it may be difficult to collect reliable short-term data as small sample sizes and poor classification may lead to inappropriate volatility.

Alternative	Other	ISIC class
Price index deflated at source Examples are: - CPI: Domestic services Or **Volume indicators** Examples are: - Number of domestic employees: Live-in Live-out	**Volume indicators** Examples are: - Number of employees	***9700***

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Compilation Manual for an Index of Services Production

The OECD *Compilation Manual for an Index of Services Production* contains guidelines and methodologies to measure short-term production activities of the services sector by national agencies and international organisations. The *Manual* fills a gap in existing international statistical standards for guidelines and recommendations on the compilation of output indicators for the services sector of OECD member countries.

This *Manual* provides both conceptual and practical recommendations for the compilation of a production index to measure short-term economic activity in the services sector, an index of services production (ISP). An ISP would provide economic analysts with information that would complement an index of industrial production (IIP) on the short-term movements of an economy, and national accountants with relevant and timely information on the performance of the services sector that could be used to compile quarterly national accounts.

The *Manual* presents a standard set of statistical units, classifications, and terminologies for variables relevant for the services sector developed by the OECD Short-term Economic Statistics Working Party. The Manual also contains a list of recommended variables and deflators, along with their sources for all services activities for Tabulation categories G through P of ISIC Revision 3. A set of preferred, alternative and other methods are presented in 27 tables for 4-digit ISIC level of each 2-digit ISIC group.

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