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**Index of Industrial Production:
Summary of practices in OECD Countries**

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1. Introduction

An index of industrial production (IIP) measures changes over time in the volume of work done in various sectors of industry, limited to the production of commodities, excluding agriculture and services, i.e. mining and quarrying, manufacturing, electricity, gas and water, and construction. More precisely, it is defined as the ratio of the volume of commodities produced within a specified group of industries in a given time period to the volume produced in the same group of industries in a specified base period. The commodities included are all those that contribute to gross output of the specified industries, and may include commodities that are not primary to the industries.

Because of the strong relationship between changes in the level of industrial production and economic fluctuations in the remainder of economies in many countries, IIP is considered to be one of the main indicators for short-term economic analysis. At the same time, IIP is used as core ingredient in the compilation of annual and quarterly national accounts in many countries. Furthermore, the availability of IIP on a monthly basis lends many countries to use it as a reference series in the compilation of cyclical indicators which are important tools to predict future turning points in business cycles.

This paper provides a summary of OECD Member countries' practices in the compilation of monthly IIP. These practices are presented in terms of three main categories, sources and standards, coverage and data manipulation, in order to identify the most common practices in the compilation of IIP amongst OECD Member countries.

This paper is organised as follows. Section 2 reviews issues relating to the compilation of production statistics in general and presents the international guidelines to compile IIP. Section 3 provides an overview on the OECD Member countries' practices in the compilation of IIP. Section 4 presents the concluding remarks. Finally, OECD Member countries' practices in the compilation of IIP are summarised in a series of Tables in annex 1 and an example to compile IIP is given in annex 2.

2. Overview on the Production statistics

The production index provides a general measure of changes in the volume of output of goods produced in various production units over a given period of time. As can be seen in the description of the country indicators in Section 3 below, production is measured in a variety of ways. Many countries base their indicator on quantity data, some use deflated sales or turnover data, whilst others base their indicators on inputs such as hours worked or electricity used. Most use a combination of these methodologies.

The Systems of National Accounts 1993 (1993 SNA) defines a volume index that “measures the average of the proportionate changes in the quantities of a specified set of goods and services between two periods of time.” [1993 SNA] The quantities compared must be homogenous while the changes for different goods and services must be weighted by their economic importance as measured by their values in one or other, or both, periods. Values of production, sales, etc. may be used in the compilation of volume indices. If every transaction value in such an expenditure aggregate is considered as a product of the volume of goods sold and the unit price, it is apparent that attention can be concentrated on volume movement.

Both the SNA and the European System of Accounts (ESA)¹ states that in general the best method of estimating volume changes for flows of goods or services is deflating value data with price indices. However, in periods of high inflation there is greater difficulty in measuring both current price data and in compiling price indices. In these circumstances it may be more appropriate to estimate volumes directly.

This approach entails the selection of a number of representative individual commodities expressed solely in physical quantity terms. The number of commodities chosen by OECD Member countries varies from a

¹. *European System of Accounts* (ESA 1995), Eurostat, Luxembourg, 1996, page 235.

few hundred to several thousand, the aim being to ensure that in total the number selected account for a high proportion of total output, sales, etc.

Branches and the commodities representing them are normally chosen with reference to their importance to total industry output in the base year, and on the availability of the required data. This is generally undertaken using annual or less frequent branch census data.

Generally a basket of representative products (or product groups) is observed for each branch to calculate a reliable index. The products are identified and defined with the aid of one of the international product classifications such as the United Nations *Central Product Classification (CPC)*² or the European Union equivalent, the *Classification of Products by Activity (CPA)*³. The products chosen are representative of the output of the branch and their share in respect of total branch output is able to be determined. Each individual commodity is also chosen for its suitability to represent a smaller number of product groups each of which can be further attributed to a branch class. This is done to ensure that any particular branch class is adequately represented by one or more of its main products.

Where quantity data are used care is taken by national statistical organisations to ensure that the quantities refer to products that are as homogeneous as possible. Physical and other characteristics are taken into consideration when identifying products where there may be differences in quality. Differences in quality are reflected by:

- physical characteristics;
- deliveries in different locations;
- deliveries at different times of the year;
- differences in conditions of sale or the circumstances or environment in which the goods or services are supplied.

For transactions in goods it is relatively easy in many cases to define the physical unit involved in the transaction and therefore the price per unit. In a number of cases, e.g. unique capital or “complex” goods, it is more difficult.

The coverage of monthly and quarterly collections used to collect data for the compilation of sub annual indicators of production generally exclude small units, except for activities where the combined output of such units account for a significant portion of total output.

International guidelines and recommendations

The most relevant international guidelines and recommendations for the compilation of IIP are those published by the United Nations in *Studies in Methods - Index Numbers of Industrial Production, Series F No. 1 (1950)*. Recommendations for the compilation of annual statistics for industry are also given in the UN publication, i.e. *International Recommendations for Industrial Statistics* (UN Statistical Papers, 1983, Series M, No. 48 Rev. 1). More specific guidelines for member countries of the European Union have been published by Eurostat in *Methodology of Industrial Short-term Indicators: Rules and Recommendations* (Eurostat, 1996).

Comparisons of key elements of methodology in the compilation of IIP between countries are presented in Section 3 below. These comparisons are based only on the information relating to Indicators of Industrial Activity (IIA) database. Although most of information are directly supplied by OECD Member countries,

². *Provisional Central Product Classification*, United Nations Statistical Papers, Series M, No. 77, New York, 1999.

³. *Classification of Products by Activity*, Eurostat, Luxembourg.

it is still possible that there exist some discrepancies between the information in IIA database and those from the national sources because of revisions, etc.

3. Practices of OECD Member countries in the compilation of IIP

Based on the information available in IIA database, most OECD Member countries compile monthly IIP. Exceptions are Australia, Canada, New Zealand and Iceland. However, Canada compiles monthly GDP. In this Section, practices of OECD Member countries in the compilation of IIP are described in terms of followings:

- sources and standards: statistical agency; classification used; compatibility with international classifications;
- coverage: sectors of classification; statistical units; coverage of indicator; and
- data manipulation: index compilation; weighting; estimation of non-replies; adjustment (seasonal, working days).

Sources and Standards

Source agency

IIP for most OECD Member countries are compiled and disseminated by their national statistical offices. The exceptions are the US and Japan where IIP are compiled by the Federal Reserve System and the Ministry of Industry and Trade, respectively (see Table 1).

Industrial Classification

As they are shown in Table 1, most OECD Member countries have established their own industry classifications in order to describe the industrial structures of own economies. They were developed based either on International Standard Industrial Classification Revision 3 (ISIC rev. 3) or the equivalent European Union classification, the Statistical Classification of Economic Activities in the European Community, Revision 1 (NACE rev. 1). Thus, in most instances these are directly comparable, in particular at higher levels of aggregation, with existing standard international classification such as ISIC rev. 3 or NACE rev. 1.

Coverage

Sector of Classification

The United Nations publication, *International Recommendations for Industrial Statistics*, describes the industrial sector to include: Tabulation Category C (Mining and quarrying: Divisions 10-14); Tabulation Category D (Manufacturing: Divisions 15-37); Tabulation Category E (Electricity, gas and water supply: Divisions 40-41); and Tabulation Category F (Construction).

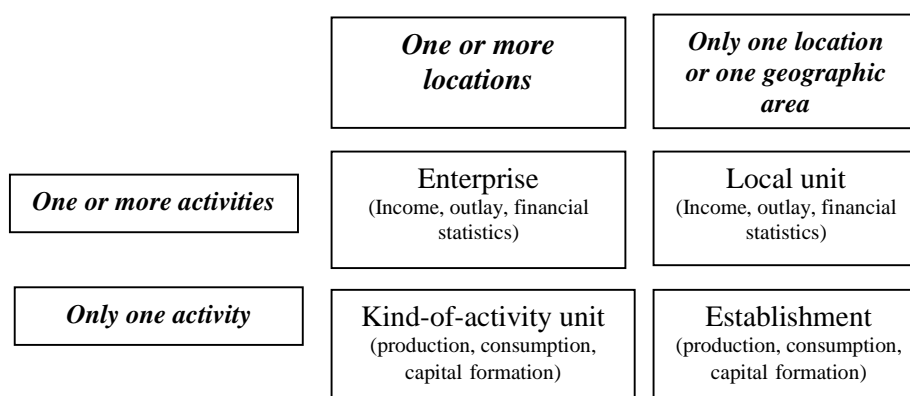
The situation with respect to the activities included in production statistics by OECD Member countries is summarised in Table 2. As can be seen, almost all the countries cover mining, manufacturing, and electricity, gas and water, while there is some variation in the inclusion/exclusion of specific activities such as quarrying, energy, some manufacturing and construction.

Statistical Unit

The statistical unit is the entity for which the required items of data are compiled. As many enterprises make more than one product, a choice has to be made as to whether one is measuring the output of the entire enterprise, or only of its main product. In OECD Member countries, it is often assumed that the output of the main product is representative of the output of the entire enterprise.

ISIC is thought to offer the best practical response to the desire for units of homogeneous production or activity in normal market situations. Both ISIC Rev. 3 and the System of National Accounts (SNA)⁴ recommend use of value added to determine the main activity. However, in practice, this is not always possible. It is therefore recommended that either the proportion of gross output or the proportion of employment be used.

The usefulness of using standard classifications would be reduced if they were applied to statistical units not defined in a standard way. The units on which data are collected also have to be as homogeneous as possible. In that context, four observation units can be used, depending on the information to be collected and the type of location. The following diagram shows these different concepts:



These concepts are defined as follows:

- The enterprise is an institutional unit or the smallest combination of institutional units that encloses and directly controls all necessary functions to carry out its production activities.
- The kind of activity unit is an enterprise or part of an enterprise which engages in one kind of economic activity without being restricted to the geographical area in which this activity is carried out.
- The local unit is an enterprise or part of an enterprise which carries out heterogeneous economic activities at or from one location.
- The establishment is an enterprise or part of an enterprise which independently engages in one, or predominantly one, kind of economic activity at or from one location or within one geographical area, for which data are available, or can meaningfully be compiled, that allow the calculation of the operating surplus⁵.

The UN publication, *International Recommendations for Industrial Statistics*, does not recommend any particular type of unit for the compilation of data used in the compilation of production indices, however,

⁴. *System of National Accounts*, 1993, UNECE, IMF, OECD, UN, World Bank.

⁵. The establishment is called the local kind-of-activity (KAU) in ESA 1995.

the SNA recommends use of the establishment as the basic statistical unit for the production and generation of income accounts. An establishment is equivalent to the local kind-of-activity unit (LKAU) defined in ESA. Whilst both establishment unit and LKAU strive for homogeneity in terms of the activity of the units from which information is collected, both accept the reality of secondary activity by some units.

Whilst ideal situation would be to observe the activities of homogenous production units engaged in only a single activity reality generally dictates a choice between one of the following options for the collection of information:

- Collect only establishment data;
- Collect combined information in respect of all activities (principal and secondary) from the establishment; or
- Collect data from enterprise only in respect of principal production.

The selection of the statistical unit by individual OECD Member countries is invariably a function of the availability of coverage sources on the register frame used as a basis for data collection and the availability of statistical data from these sources. As Table 2 shows, variations in the type of units from which OECD countries collect short term industrial data are not widely spread. Most common ones are establishment, kind-of activity unit or LKAU. However, five countries, (i.e. Denmark, France, Hungary, Italy, and Poland) collect information on production activity from enterprise. Based on the criteria explained in the above first three types, establishment, kind-of activity unit or LKAU, are engaged in only single activity while the last type, enterprise, is engaged in one or more activities.

Coverage of indicators

The number of commodities chosen by OECD Member countries varies from a few hundred to several thousand, the aim being to ensure that in total the number selected account for a high proportion of total output, sales, etc. At the two-digit ISIC levels the selected products on average account for about 70% of the total branch output except Japan (60%) and Turkey (monthly data covers 66.7% while 84.2% for quarterly). However, the basic aim is to compile an index that accurately shows period to period movements, not absolute levels.

Data Manipulation

There are two primary methods in current use for computing an IIP:

- The index is calculated as the ratio obtained by dividing (a) the weighted sum of the quantities of a fixed set of commodities produced in the given period by (b) the same weighted sum but for the base period. The set of commodities should be representative of the production of the specified industries, preferably covering 70 percent or more of total production within each industry. The weights use the prices of the commodities in the base period, thus defining a Laspeyres type volume index. Alternatively, countries use weights based on prices in the current period (Paasche index).
- The index is calculated as the ratio obtained by dividing (a) the sum over the specified industries of the gross output within each industry in current prices by (b) a producer price index (PPI) for that industry (a process known as deflation). The resulting series is then re-referenced such that the value in a base period is equal to 100. If a Laspeyres type PPI is used for deflation the resulting volume index is a Paasche type index. Alternatively, if a Paasche type PPI is used then a Lapeyres type volume index results.

Index compilation (see annex 2 for an example for Dutch method)

Both the 1993 SNA and ESA 1995 recommend that countries should, where possible, use annual chain indices for measuring growth rates in volumes of production. Fixed base indices may also be used when the volume measures for components and aggregates have to be additively consistent for purposes of economic analysis and modelling.

Table 3 shows that most OECD Member countries use the fixed weight Laspeyres index with base year of 1995. Six countries, i.e. Belgium, Finland, Ireland, Netherlands, Norway and Switzerland, use Laspeyres chain index (see annex 2 for an example for Dutch method) and two countries, i.e. Hungary and Sweden, use Paasche index. At the same time, there are considerable variations in the base year amongst OECD Member countries while most common one is 1995.

Weighting

The most commonly used method entails use of value added with data generally being derived from manufacturing censuses. Weights based on sales and production are also used though to a lesser extent. Some countries use different weights at different stages of aggregation, for example, value of production weights to aggregate at product level and value added at factor cost for higher level of aggregation.

Due to the occurrence of structural change the composition of production in industry changes over time. For example, the absolute decline of heavy industry may result in a relative increase in the size of industry branches involved in the production of consumer goods or food processing. As a result of changes there is a need to frequently change the weights used. The type of weights used for aggregation of the indices published in IIA and the reference year for the weights are shown in Table 3.

Most OECD Member countries use value added at factor cost of the base year as weights. However, a few countries (i.e. Belgium and Turkey) use value added at market prices as their weights. On the other hand, Finland use commodity value and Ireland use value of production (minus inputs of materials and industrial services) for their weights.

Estimation of non-replies

Most of OECD Member countries estimate the data where no response is received except Korea and Finland. In Hungary, non-responses from enterprises with equal to or more than 50 employees are estimated but ones with less than 50 employees are not.

There are significant variations in the methodologies to estimate non-replies between OECD countries. For example, Mexico estimates the data according to trends in establishment behaviour and would be seasonality in the industry. On the other hand, Japan uses following three methods:

- using real volume/value for previous month;
- using a technique based on growth rate of the known average in a specific commodity; and
- using a technique based on growth rate of the seasonal adjusted indicator in a specific commodity.

Adjustments

Seasonal adjustment removes movements caused by repetitive climatic or institutional events, thereby making the underlying activity more apparent. Individual series and major aggregates can be seasonally adjusted independently. The seasonally adjusted IIP can be calculated by aggregating the seasonally adjusted major market groups, and may not precisely equal an aggregation of the seasonally adjusted industry groups. In addition, because the seasonal adjustment of aggregates is done separately, the

seasonally adjusted value of a given market or industry group may not be equal to an aggregation of its seasonally adjusted components.

Most of OECD countries use X11 ARIMA or X12 ARIMA model to calculate seasonally adjusted series. The seasonal adjustment technique relies heavily on the use of moving averages, which become less reliable towards the end of the series. To minimise this problem, the series could be projected one more year so that the last real data point is 12 months from the end point of the extended series. An ARIMA model is used to project the series. With the reference month, a selection of a new ARIMA model for each industry is made, then held constant and used in the concurrent seasonal adjustment procedure throughout the next twelve months.

Japan uses own methodology developed the Japanese Ministry of Trade and Industry (MITI formula III R) and Belgium use TRAMO/SEATS. At present, eight countries do not provide seasonally adjusted IIP.

Trading-day adjustment, a smoothing procedure, alters the distribution of monthly output to reflect changes in production that would occur if all months contained the same number and type of days. Most OECD countries calculate IIP with trading-day adjustment (see Table 3).

Availability of IIP data in OECD publications

The indices of industrial production for OECD Member countries are published in the quarterly *Indicators of Industrial Activity (IIA)*. This publication presents monthly original (or adjusted for inequality in the number of working days in the month) and seasonally adjusted IIP classified by category, division and group of industrial activities (categories C, D and E) following the ISIC rev. 3 for OECD countries (except Iceland) and main economic groupings. They are published as indices on the base 1995 = 100.

Total IIPs for OECD countries are also shown in Part One (with the exception of Mexico) of monthly *Main Economic Indicators (MEI)*. They refer to the goods produced by establishments engaged in mining (including oil extraction), manufacturing, and the production of electricity, gas and water. The index for Mexico includes construction. At present, OECD calculates IIPs for three countries which do not provide their own IIPs to OECD, i.e. Canada, Australia and New Zealand.

In Part Two of MEI, indices of production are disaggregated in a number of ways. For some countries, indices are presented on the basis of the ISIC Rev. 3 components of industry described above. Other types of disgregations presented include: durable manufactures and non-durable manufactures; investment goods, consumer goods, intermediate goods. More detailed disaggregations on the basis of ISIC for OECD

CONCLUSIONS

It has been shown that the methodologies used by the OECD Member countries to compile IIPs are similar with one another. For most OECD countries, monthly IIPs are compiled and disseminated by the National Statistical Offices according to their national classifications of industry which are based on international classifications such as ISIC rev.3 or equivalent NACE rev. 1. Most countries collect information from establishments or kind-of-activity units whose main production activities are ISIC Tabulation Categories C, D, E and F with some exceptions. And monthly production indicators for most countries cover more than 70% of total production values in those industries.

Most commonly used methodologies in the compilation of IIP is fixed weight Laspeyres index with based year of 1995 and weights calculated from gross factor value added at factor cost of the base year. Countries make own estimates if there are non-replies and seasonal and working day adjustments are common practices among OECD Member countries.

Thus, IIPs of OECD countries seem internationally comparable even if differences in practice still exist. This enables to compare and to aggregate the several index numbers by main industrial groups for important regions such as Europe, OECD, G-7 and to carry out international economic analysis.

However, it should be noted that there remain areas for further improvement, in particular in the context of the globalization of the world economy. UN expert group meeting on index numbers of industrial production will be held in June 2000 to discuss new recommendations for the compilation of IIP.

Annex 1

Table 1: Sources and Standards

Country	Source agency	Classification used	Compatibility with ISIC or NACE
Canada	Statistics Canada	Canadian Standard Industry Classification of 1980 (1980 SIC)	No direct corresponds to SNA industry code and ISIC
Mexico	INEGI	1993 Mexican System of National Account Classification (SCNM)	Corresponds to ISIC Rev. 3 at 4-digit
United States	Federal Reserve System	1992 Standard Industrial Classification (SIC)	Corresponds to <u>ISIC Rev.2</u>
Australia	ABS	Australian and New Zealand Standard Industrial Classification (ANZSIC)	Corresponds to ISIC Rev. 3 at 4-digit
Japan	MITI	Japan Standard Industrial Classification (JSIC, Rev.10)	Corresponds to ISIC Rev. 3
Korea	NSO	Korean Standard Industrial Classification (KSIC)	Corresponds to ISIC Rev. 3
New Zealand	Statistics New Zealand	New Zealand Standard Industrial Classification (NZSIC)	Corresponds to ANZSIC and thus to ISIC Rev. 3 at 4-digit
Austria	CSO (ÖSTAT)	Austrian version of NACE Rev. 1 (ÖNACE 1995)	Completely corresponds to NACE Rev. 1 at 4-digit
Belgium	INS (STABEL)	Industrial Short-Term Indicators (ISTI) based on NACE Rev. 1	Completely corresponds to NACE Rev. 1 at 4-digit and ISIC Rev. 3 at 2-digit
Czech Republic	CSO	Standard Classification of Production (SKP)	Completely corresponds to NACE Rev. 1
Denmark	NIS	Dansk Branchekode 1993 (DB 1993)	Corresponds to NACE Rev. 1
Finland	Statistics Finland	Finish Standard Industrial Classification 1995 (SIC 1995)	Corresponds to NACE Rev. 1 at 3-digit with a few exceptions and ISIC Rev. 3 at 2-digit
France	INSEE	Two kinds of industrial classifications - Nomenclature d'Activité Française (NAF-1993) - Classification des Produits Français (CPF-1993)	Complete correspondence between NAF and NACE Rev. 1 and ISIC Rev. 3
Germany	Statistisches Bundesamt	Klassifikation der Wirtschaftszweige, Ausgabe 1993 (WZ 1993)	Corresponds to NACE Rev. 1 and can be converted to ISIC Rev. 3
Greece	NSSG	STAKOD 1980 (STAKOD 1991 will be used for indices with base year 1993)	STAKOD 80: corresponds to <u>ISIC Rev. 2</u> STAKOD 91: corresponds to NACE Rev. 1
Hungary	HCSO	Hungarian Standard Industrial Classification of All Economic Activities (TEAOR 1998)	Conforms with NACE Rev. 1 and ISIC Rev. 3 at 2-digit
Iceland	NA	NA	NA
Ireland	CSO	NACE 70 (NACE Rev. 1 will be available)	Corresponds to <u>ISIC Rev. 2</u>
Italy	ISTAT	Classificazione delle attività economiche (ATECO 1991)	Corresponds to NACE Rev. 1 (section-class) and to ISIC Rev. 3 (section-division)
Luxembourg	STATEC	NACELUX Rev. 1	Corresponds to NACE Rev. 1 at 5-digit (additional) and ISIC Rev. 3 at 2-digit
Netherlands	CBS	Standaard Bedrijfsindeling (SBI 1993)	Adjusted to NACE Rev. 1 and ISIC Rev. 3
Norway	Statistics Norway	Standard Industrial Classification (SIC 1994)	Follows NACE Rev. 1 and ISIC Rev. 3 but goes up to 5-digit
Poland	CSO	Europejska Działalności (EKD): Polish version of NACE Rev. 1	Completely corresponds to NACE Rev. 1 and ISIC Rev. 3
Portugal	INE	Classificação Portuguesa de Actividades Económicas-Revisão 2 (CAE Rev. 2; 1992)	Compatible with NACE Rev. 1 at 4-digit and ISIC Rev. 3
Spain	INE	Clasificación Nacional de Actividades Económicas (CNAE- 1993)	Corresponds to NACE Rev. 1 at 2-digit and ISIC Rev. 3 at 2-digit
Sweden	SCB	Swedish Standard for Industrial Classification 1992 (SE-SIC 1992)	Corresponds to NACE Rev. 1 at 4-digit and ISIC Rev. 3 at 2-digit
Switzerland	OFS	Nomenclature Générale des Activités économiques 1995 (NOGA)	Completely corresponds to NACE Rev. 1 at 4-digit and ISIC Rev. 3
Turkey	DIE (SIS)	ISIC Rev. 3	Corresponds to NACE Rev. 1 at 2-digit
United Kingdom	ONS	1992 Standard Industrial Classification (SIC 1992)	Corresponds to NACE Rev. 1 at 4-digit and 5-digit was added

NA: Information is not available.

Table 2: Coverage

Country	Sector of classification	Statistical units	Coverage of indicator
Canada***	All industries/sectors of the economy for which a market economy exists are included.	Whole Canadian establishments	100%
Mexico	ISIC Tabulation Category C (mining: branches), D (manufacturing except for ISIC groups 182, 201, 233, 333, 353 and part of 232), E and F**	6,877 establishments (2.6% of total population in 1994)	Index covers 71% of production value
United States	Mining, manufacturing, and electricity, gas utilities industry	NA	NA
Australia***	ISIC Tabulation Category C, D and E (except service to mining)	20% (22,000) of total establishments	22.6% of GDP at market prices
Japan	ISIC Tabulation Category C, D and E	Establishments (on 3,100 commodities)	60% of production value added
Korea	ISIC Tabulation Category C, D and E	8,700 establishments (on 678)	84.7% of total industrial value added in 1995
New Zealand***	ISIC Tabulation Category D (except C and E)	2,000 KAU	2,000 units from population of 17,000
Austria	ISIC Tabulation Category C and D (most of), E Construction and civil engineering (publish separately)	13,700 establishments (LKAU)	75% of production value in energy and mining and manufacturing
Belgium	ISIC Tabulation Category C, D, E and F*	11,000 LKAU (out of 35,731)	93% of total value added
Czech Republic	ISIC Tabulation Category C, D and E	About 1,000 <u>industrial products and services</u>	88.6% of constant field amounts?
Denmark	ISIC Tabulation Category C and D (except E)	All <u>enterprises</u> with more than 20 employees (about 3,000 enterprises)	80% of turnover
Finland	ISIC Tabulation Category C, D and E	1,500 LKAU(out of 6,000)	80% of total value
France	ISIC Tabulation Category C, D, E and F*	About 7,136 <u>enterprises</u>	71% of value added of industries
Germany	ISIC Tabulation Category C, D, E and F*	28,000 KAU (on 1,000 items)	77% of production for all units with more than 20 employees
Greece	ISIC Tabulation Category C, D and E	2,090 establishments	NA
Hungary	ISIC Tabulation Category C, D and E	All <u>enterprises</u> with equal to or more than 50 employees and sample for ones with less than 50	95% of production value
Iceland	NA	NA	NA
Ireland	ISIC Tabulation Category C, D and E	1,600 establishments (30% of ones with more than 2 employees)	90% of total net output
Italy	ISIC Tabulation Category C, D and E	8,000 <u>enterprises</u>	80% of value added in 1990
Luxembourg	ISIC Tabulation Category C, D and E (except gas)	185 LKAU (25%)	90% of gross value added in 1995
Netherlands	ISIC Tabulation Category C, D and E	6,393 KAU	90% of value added at market price
Norway	ISIC Tabulation Category C, D and E	1,900 LKAU (15%)	80% of turnover
Poland	ISIC Tabulation Category C, D and E	14,000 <u>enterprises</u>	90% of sold production
Portugal	ISIC Tabulation Category C, D and E	2,500 establishments	80% of sales
Spain	ISIC Tabulation Category C, D and E (with some exception)	9,000 establishments	95% of production
Sweden	ISIC Tabulation Category C, D (except E)	KAU	NA
Switzerland	ISIC Tabulation Category C, D, E and F*	9,000 KAU (33.3% of total)	70% of total turnover
Turkey	ISIC Tabulation Category C, D and E	2,922 establishments (quarterly); 1,340(monthly)	84.2% (quarterly) and 66.7% (monthly) of gross value added
United Kingdom	ISIC Tabulation Category C, D and E	9,000 establishments/KAU	NA

*: Separate IIPs for ISIC Tabulation Category C, D and E are available.

** : Separate IIPs for ISIC Tabulation Category C, D and E are not available.

***: countries that do not compile IIP. Thus, all information are on the production statistics.

NA: Information is not available.

Table 3: Data Manipulation

Country	Index compilation (frequency; base year)	Weighting	Estimates of non- replies	Adjustment	
				Seasonal	working days
Canada	No index	NAP	NAP	NAP	NAP
Mexico	Fixed weight Laspeyres index (M; 1993)	Value added in 1993 GDP	X	X11 ARIMA/88	<u>No</u>
United States	Fixed weight Laspeyres index (M; 1992)	Value added output from 1992 census	NA	X11 ARIMA	X
Australia	No index	NAP	NAP	NAP	NAP
Japan	Fixed weight Laspeyres index (M; 1995)	Value added at factor cost in 1995 Manufacturing census	X	ITI formula III R	NA
Korea	Fixed weight Laspeyres index (M; 1995)	Value added in 1995 Mining and Manufacturing Survey	<u>No</u>	X12 ARIMA	<u>No</u>
New Zealand	No index	NAP	NAP	NAP	NAP
Austria	Fixed weight Laspeyres index (M; 1995)	Value added of 1995	X	<u>No</u>	X
Belgium	Laspeyres <u>chain</u> index (M; 1995)	Value added at <u>market prices</u>	X	RAMO/SEATS	X
Czech Republic	Fixed weight Laspeyres index (M; 1995)	Value added of 1995	X	<u>No</u> ??	<u>No</u>
Denmark	Fixed weight Laspeyres index (M; 1995)	Value added of production at factor cost in 1995	X	X11	<u>No</u>
Finland	Laspeyres <u>chain</u> index (M; 1995)	Value added of production at factor cost in 1995	<u>No</u>	X11 ARIMA	X
France	Fixed weight Laspeyres index (M; 1990)	Gross value added at factor cost in 1990	X	X11 ARIMA	<u>No</u>
Germany	Fixed weight Laspeyres index (M; 1995)	Gross value added at factor cost in 1995	X	X11 (modified version)	NA
Greece	Fixed weight Laspeyres index (M; 1980)	Gross value added at factor cost in 1980	NA	<u>No</u>	X
Hungary	<u>Paasche</u> chain index (M;1992)	<u>Gross output</u>	X*	X11 ARIMA/2000	<u>No</u>
Iceland	NA	NA	NA	NA	NA
Ireland	Laspeyres <u>chain</u> index (M; 1985)	<u>Value of production minus inputs of materials and industrial services in 1985</u>	X	X11 variant	X
Italy	Fixed weight Laspeyres index (M; 1990)	Production value and value added of production at factor cost in 1990	X	X11 ARIMA	X
Luxembourg	Fixed weight Laspeyres index (M; 1995)	Gross value added of production at factor cost in 1995	X	<u>No</u>	X
Netherlands	Laspeyres <u>chain</u> index (M; 1995)	Value added of production at factor cost in t-1	X	X12 ARIMA (soon)	X
Norway	Laspeyres <u>chain</u> index (M; 1995)	Value added of production at factor cost	X	X11 ARIMA	X
Poland	Laspeyres index (M; 1994)	NA	X	X11 ARIMA	<u>No</u>
Portugal	Fixed weight Laspeyres index (M; 1995)	Value added at factor cost in 1995	NA	<u>No</u>	X
Spain	Fixed weight Laspeyres index (M; 1990)	Value added at factor cost and value of production in 1990	X	<u>No</u>	<u>No</u>
Sweden	<u>Paasche</u> index for most branch (some Laspeyres)	Value added of 1995	NA	X11	X
Switzerland	Laspeyres <u>chain</u> index (Q?; 1995)	Value added at factor cost (1993) and <u>turnover</u> (1992)	NA	<u>No</u>	X
Turkey	Fixed weight Laspeyres index (M, Q; 1992)	Value added at <u>market price</u> in 1992	X	<u>No</u>	<u>No</u>
United Kingdom	Fixed weight Laspeyres index (M; 1990)	Value added at factor cost in 1990	X	X11 ARIMA	X

*: Non-responses from enterprises with equal to or more than 50 employees are estimated but ones with less than 50 employees are not.

NA: Information is not available; NAP: Not Applicable

X: Yes ; M: monthly; Q: quarterly

Annex 2: Construction of IIP for Netherlands

Ideally the measuring of the development of value added at factor costs at a monthly base is done with the following formula (Laspeyeres volume index):

$$Q_t^L = \frac{\sum_{i=1}^n p_{i,t-12} \times q_{i,t} - \sum_{j=1}^m \alpha_{j,t-12} \times \delta_{j,t}}{\sum_{i=1}^n p_{i,t-12} \times q_{i,t-12} - \sum_{j=1}^m \alpha_{j,t-12} \times \delta_{j,t-12}},$$

Where:

Q_t^L : Development of the quantity of production in a branch of industry in month t compared with the same month last year;

q_t resp q_{t-12} : quantity of goods produced in month t respect to $t-12$;

p_t resp p_{t-12} : price of goods produced in month t respect to $t-12$;

δ_t resp δ_{t-12} : quantity of consumed raw materials in month t respect to $t-12$;

α_t resp α_{t-12} : price of consumed raw materials in month t respect to $t-12$; and

i 's are products and j 's are materials used as input.

In practice, because of limitation of the available information this ideal index can only be approximated.

Formula indexnumbers base year:

$$I_{i,m} = \frac{\sum \text{basicindicator}_{h,m}}{\sum \text{basicindicator}_{h,y} / 12} \times 100,$$

where

I : Index number base year;

m : calculation month;

i : sbi-(sub)class;

y: calculation year;

h : indicator.

The basicindicator is depending on sbi-(sub)class

Calculation index numbers $y-1=100$

$$N_{i,m,y-1=100} = \frac{\sum_{i \in cde} \text{basicindicator}_{m-12} \times \frac{\sum_{i \in cde, p \in B} \text{basicindicator}_m}{\sum_{i \in cde, p \in B} \text{basicindicator}_{m-12}}}{\frac{\sum_{i \in cde, p \in S} \text{basicindicator}_{y-1}}{12}} \times 100,$$

where

N : Index number $y-1=100$;

$y-1$: previous year;

m-12 : same month of the previous year;
 B : $bg(y) \cdot bg(y-1)$;
 S : units in population in all months of the previous year;
 bg : respondent;
 cde: Nace-groups Mining and quarrying, manufacturing and electricity, gas and water supply.

Aggregates of sbi-(sub)classes to sbi-groups (3digit)

$$N_{k,m,y-1=100} = \frac{\sum_{i,j} N \times W_{i,j}}{\sum W_{i,j}},$$

where

k : 3-digit sbi-group (e.g. i+j=k);
 W : Internal weight of sbi-(sub)class.

Aggregation to higher levels:

$$N_{m,cde(y-1=100)} = \frac{\sum_{n=1}^{cde} TW_{n,y-1} \times I_{n,m(y-1=100)}}{\sum_{n=1}^{cde} TW_{n,y-1}},$$

where TW = Value added at factor costs derived from the National accounts.

Chain formula:

$$N_{k,m,by=100} = \frac{N_{k,m(y-1=100)}}{N_{k,m-12(y-1=100)}} \times N_{k,m-12(by=100)}$$

by : Base year