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**METADATA FOR SHORT-TERM INDICATORS:
INTERNATIONAL COMPARISONS AND BEST PRACTICES**

Submitted by OECD ¹

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One of the more widely-read publications of the Statistics Directorate of the OECD is the monthly *Main Economic Indicators* (MEI). This publication shows key short-term economic indicators for the 29 OECD Member countries, both by country and across countries, the latter to set the indicators in an international context. Users of the data are found in business, research institutes, governments and in the academic world and their interest is often in comparing statistics between countries. In order to enhance an understanding of what lies behind the indicators and thus to facilitate cross-country analysis, the OECD has developed a full system of metadata for the principal economic indicators.

Introduction

The term “metadata” refers to the information describing data. Very often in the literature, this is described as “data about data”. For short-term economic indicators, metadata include the title of the indicators, flags and notes for publication, definitions, sources and methods used for compilation, and also details on dissemination and release dates. Such complete and accurate metadata are essential if the user is to assess the quality and reliability of indicators. Additionally, in the area of international comparisons, metadata are essential to assess comparability between countries. They may even encourage countries to adopt ‘best practices’, which in this context means an adaptation of national practices to internationally accepted standards.

Metadata have always been considered an integral part of MEI publications. However, their availability and dissemination have varied considerably over time: 20 years ago the Organisation accorded metadata a high priority but, owing to a subsequent reduction of resources, they became less important. Now, with the momentum towards integration and globalisation, metadata are assuming a greater significance. At the “Main Economic Indicators 30th Anniversary” meeting organised in 1995, producers and users of key short-term statistics strongly emphasised the need for detailed and complete information. Following this meeting, the OECD set new priorities and allocated more resources to the development of a full system of metadata for *Main Economic Indicators*. Efforts first focused on the rationalisation of the collection of metadata and a structured approach was adopted. Subsequently work concentrated on improving the quantity and the coverage of metadata. The metadata that have been collected are disseminated through various formats, including paper publications and electronic media. When metadata are disseminated on electronic products, statistical data and metadata are fully integrated.

Procedures used for the collection of metadata and the dissemination of this information will be described in the first section of the paper. The importance of metadata for international comparisons and for improving the quality of short-term indicators will be developed in the second section. The last section includes a conclusion, a bibliography and an annex.

Collecting and Disseminating Metadata

A Standard List of Metadata items

The Statistics Directorate has co-ordinated work on metadata within the OECD. An inter-Directorate group met between 1994 and 1995. The main objective of this working group was to propose a standard, comprehensive list of metadata items covering the whole statistical production cycle. In 1995, the group agreed on an initial list designed to be relevant for different countries and different topics of short-term statistics at the OECD. It was then adapted to the practical requirements of the Statistics Directorate in the collection of metadata for *Main Economic Indicators* from national statistical agencies. From the outset, it was designed for the collection and the storage of methodological information for primary statistics (see Table 1) and is structured by main categories and sub-categories. Refer to the annex for a detailed description of each metadata item.

Collecting Metadata from Member Countries

All current detailed methodological information for *Main Economic Indicators* is collected according to this list. This information is collected directly from official national sources which supply data to the OECD. Typically these are statistical offices and central banks but also include other agencies such as ministries of finance and stock exchanges. Practical collection of information is organised according to the following steps.

- i) Determine all methodological information available at the OECD (disseminated by national sources), and organise this information into the standard structure adopted for metadata items. Metadata can be found in national paper publications, correspondence with the OECD, Internet sites, etc.;
- ii) Obtain additional information from statistical counterparts in Member countries and ask for corrections to the currently available information;
- iii) Process the information received from the countries. This may involve restructuring the different documents and notes received;
- iv) Send the revised text to the national sources in Member countries for final approval.

For national statistical agencies, the provision of metadata can be both time-consuming and very expensive in terms of resource utilisation. Very often national agencies, in order to provide the complete information requested in the list of metadata items, rely on ad hoc documents using information from different sources and supports. This may include published or internal documents, electronic files, as well as unstored expert knowledge from subject area specialists. A structured approach, as it is adopted with the standard list of metadata items, gives to national statistical agencies a complete view of the information required by the OECD. It may also encourage a similar structure in the statistical agency and thus contribute to reduced costs and burdens in the future.

In recent years, many statistical agencies have implemented on-line access to their databases for electronic dissemination of statistical data. However, only a few of them have developed on-line systems where extensive metadata can be consulted (such as Statistics New Zealand, the Federal Statistical Office of Germany or the INEGI of Mexico). There is still room for the provision via electronic means of methodological data to go along with the basic data.

Table 1
List of Metadata Items
for Main Economic Indicators

1. SOURCE	4. DATA COLLECTION (continued)
<ul style="list-style-type: none"> 1.1 Source agencies 1.2 Main national publication sources 1.3 Series title in national publications 1.4 Breakdown available 1.5 Methodological references 1.6 Run of data available 1.7 Periodicity 1.8 Unit of measurement 	<ul style="list-style-type: none"> 4.4 Administrative source items <ul style="list-style-type: none"> 4.4.1 Description 4.4.2 Update procedures 4.4.3 Quality assessment 4.4.4 Access and control for statistical usage 4.4.5 Statistical techniques for processing data 4.5 Multiple source items <ul style="list-style-type: none"> 4.5.1 Items for use of multiple sources 4.5.2 Standard combination framework 4.5.3 Statistical techniques for combining multiple sources 4.6 Reporting date in relation to the event measured 4.7 Time lapse between event and processing
2. CONCEPTS and COVERAGE	
<ul style="list-style-type: none"> 2.1 Definition 2.2 Coverage <ul style="list-style-type: none"> 2.2.1 Reference period 2.2.2 Geographical coverage 2.2.3 Classification coverage 2.2.4 Sectoral descriptions 2.2.5 Statistical population 2.2.6 Particular exclusions 	
3. STANDARDS	5. DATA MANIPULATION
<ul style="list-style-type: none"> 3.1 Standard systems / framework 3.2 Standard classifications / nomenclatures 3.3 International comparability 3.4 Departures from international standards 	<ul style="list-style-type: none"> 5.1 Aggregation / Grossing up <ul style="list-style-type: none"> 5.1.1 Aggregation method 5.1.2 Grossing up method 5.1.3 Weights for aggregation 5.2 Seasonal and other adjustments 5.3 Other manipulations
4. DATA COLLECTION	6. DATA QUALITY AND TIMELINESS
<ul style="list-style-type: none"> 4.1 Reporting units 4.2 Reporting method 4.3 Survey items <ul style="list-style-type: none"> 4.3.1 Description of questionnaire 4.3.2 Master list 4.3.3 Survey description 4.3.4 Non-response rate 	<ul style="list-style-type: none"> 6.1 Sampling errors and their corrections 6.2 Other errors and their corrections 6.3 Missing data in time series 6.4 Breaks in time series 6.5 Preliminary estimates 6.6 Revision policy 6.7 Corroborating evidence 6.8 Timeliness 6.9 Release dates

Updating Metadata and Assessing Quality

An important issue for the OECD when managing metadata is the assessment of the quality of the published information and its regular update. The quality and coherence of metadata is crucial for its use by internal and external users. Any perceived anomalies or inaccuracies in the collected metadata result in an enquiry to the national source. The intent is always to ensure that the OECD adheres to its consistent terminology and that it describes methodological information for all the OECD Member countries in a uniform way.

Detailed metadata are collected by the OECD at a given time and the information stored relates only to the current methodological description of indicators used by Member countries. In practice, methodology is reviewed and updated by national sources in their files on a regular basis when a revised classification is introduced, when international standards are adopted, when coverage is extended, etc. Thus, there is a real need for the OECD to revise and to keep up-to-date its collected metadata. A continual revision of the detailed methodological descriptions is perhaps impractical. However, a

revision on a regular basis, say every five years, would save time by reducing the number and the importance of changes in methodology and yet would still improve the global quality of the information. To date, for the subject areas and the countries where detailed methodological information has been collected, metadata have not been updated on a regular basis. This is partly because of the high cost in terms of resources and labour input needed, and also because other priorities have been set to collect information for subject areas and countries where detailed metadata are not yet available.

Since 1995, the OECD has maintained certain metadata in its Sources and Definitions database. This concise information is a subset of the detailed list of metadata items and the procedures used to collect it from statistical counterparts are similar. Sources and Definitions are collected for all OECD Member countries and refer to all indicators published in MEI. This aggregate information is kept up to date and any change in the methodology of the indicators is immediately recorded. The updated Sources and Definitions are available to users on a monthly basis. The Sources and Definitions are organised according to the structure indicated in Table 2.

Table 2
Sources and Definitions for
Main Economic Indicators

<i>Sources</i>	indicates the agency which compiled the statistics provided to the OECD.
<i>Definition</i>	provides a brief description of the concept and definition used.
<i>Coverage</i>	refers to geographical coverage, statistical population , etc.
<i>Collection</i>	describes how the data are collected by national statistical agencies.
<i>Calculation</i>	briefly describes calculation methods applied.

A Need for Co-ordination with other International Organisations

Metadata for economic indicators are collected by various international organisations and institutes such as the IMF, Eurostat and the OECD. In some cases, the same information is collected by different organisations for the same countries. This is in particular the case for the methodological information disseminated by the IMF in the Special Data Dissemination Standards for economic and financial statistics (SDDS) and for some information in the OECD's *Main Economic Indicators*. Thus, there is a real need for co-ordination between different international organisations for the collection of metadata from national agencies. This would help to reduce costs by minimising the duplication of information collected and by avoiding extra work for statistical counterparts in national agencies. Information could be collected by each organisation for its Member countries, or in its area of conceptual competence or expertise. This, of course, implies that these organisations agree on a minimum list of metadata items and on regular procedures for the management of metadata. This includes the global quality of metadata and the modalities for the regular update of this information.

In 1996, the OECD and Eurostat benefited from such a joint collection of detailed methodological information for construction price indicators. Similar co-ordination for the collection in 1998 of metadata on other topics is currently being discussed with Eurostat.

Disseminating Metadata

The OECD has recently issued several metadata publications for *Main Economic Indicators* (see Table 3).

As noted above, in 1995 the OECD started to collect methodological information for *Main Economic Indicators* according to the list of metadata items. Detailed metadata are generally collected by “subject areas” for those subjects which are covered in the monthly MEI. This information “by subject area” is collected for all the OECD Member countries. To date, detailed methodological information has been collected for quarterly national accounts², prices² (producer, consumer and construction), labour and wage indicators, share prices, interest rates and financial indicators. Work is currently under way to cover other subject areas with the collection of methodological information for retail trade and business tendency surveys indicators scheduled for 1998. Additionally, in 1996 the OECD has collected complete and detailed metadata for all principal economic indicators of Mexico and Korea, recent members of the organisation. Based on this detailed information, different Sources and Methods publications (by country or by subject area) have been issued in the past few years. These publications are supplements to the monthly MEI, and are available in English and French. They provide more in-depth information than that shown in *Sources and Definitions*.

Updated sources and definitions for all OECD Member countries are available monthly on electronic products (MEI on Statwise diskettes, and CD-ROM). Metadata are fully integrated with the data, and the complete text can be downloaded and edited on PC. A paper version of *Sources and Definitions*³ is also printed each year in English and in French. Database notes for series published in MEI are also issued each month. These notes include information about new or revised time series, changes in definitions, breaks and new national base years, etc. Finally, a complete inventory for the MEI publications (series codes, footnotes for publications, etc.) is issued twice a year.

All the methodological publications described above are also available on the OECD Internet site (<http://www.oecd.org/std/>) and can be downloaded directly.

² Information was collected using a less detailed structure.

³ Sources and definitions are also available for the publications *OECD Hot file* and *Short-term Economic Indicators: Transition Economies*, which are companion publications of the MEI.

Table 3
Metadata Publications from 1994
for OECD Main Economic Indicators¹

Publications	Publication date	Dissemination supports
Sources and Methods		
Consumer Prices ² (English and French)	1994	Paper
Producer Prices ² (English and French)	1994	Paper
Quarterly National Accounts used by OECD Member countries ² (English)	1996	Paper
Construction Prices ^{2,3} (English)	1996	Paper
Mexico (English and French)	1996	Paper
Korea (English and French)	1997	Paper
Labour and Wage Statistics (English and French)	1997	Paper
Interest Rates and Share Prices (English and French)	1998	Paper
Domestic Finance (English and French)	1998	Paper
Sources and Definitions		
Main Economic Indicators (English)	Monthly	MEI on Statwise diskettes, CD-ROM
Main Economic Indicators (English and French)	Annually, since 1996	Paper
Short-term Economic Indicators: Transition Economies ⁴ (English and French)	Annually	Paper
OECD Hot file ⁵ (English)	Weekly	Hot on Statwise diskette ⁶
Database Notes		
Main Economic Indicators (English)	Monthly	Paper
Database Inventory		
Main Economic Indicators (English)	Bi-annual	Paper
1. All these publications are available on Internet (http://www.oecd.org/std/) 2. Prepared using a less detailed structure for metadata items. 3. With Eurostat. 4. Companion publication of the MEI, covering indicators for transition economies. 5. Selection of essential international economic indicators taken from the MEI publication. 6. On Internet only.		

Assessing International Comparability and Improving Data quality

Standardisation and International Comparability

The MEI publication includes short-term indicators for all OECD Member countries and shows them in an international context. This possibility for international comparability can be viewed as value added to the data. However, everything obviously relies on the extent to which the national indicators are, in fact, similar. Developing and implementing international standards for economic indicators helps to ensure international comparability. A case in point is the Standardised Unemployment Rates data published in MEI. These labour market indicators are calculated by the OECD and Eurostat⁴ according to the guidelines of the 13th Conference of Labour Statisticians (generally referred to as the ILO

⁴ From Autumn 1996, Standardised Unemployment Rates for the European Union countries are the Comparable unemployment rates calculated by Eurostat. The OECD remains responsible for the collection of data and the calculation of Standardised Unemployment Rates for non-Eurostat countries.

guidelines). Here the data are strictly comparable on an international basis because of the harmonisation of the definitions, concepts and calculation methods used to compile the data.

But in most cases, the short-term economic indicators published in MEI are compiled according to national practices. This is the case, for instance, for consumer prices or industrial production indicators. However, indicators are usually considered to be sufficiently comparable to be presented in the same table and to enable meaningful comparisons between countries, particularly if discrepancies in their compilation can be frequently observed and relayed to the data user. These differences may refer to each stage of the statistical production process. That is, data collection (geographical coverage, particular exclusions, sampling methods); aggregation and calculations methods; concepts and definitions used; classifications and international standards employed, etc.

Metadata are thus the key element in the assessment of international comparability and cross-country analysis. Table notes in publications, sources, definitions and methods are of a prime importance in highlighting differences between countries and deviations from international standards. This information is essential for the user in the selection and the correct interpretation of the data. The Sources and Methods by subject, together with the Sources and Definitions publications, give accurate tools to the user for determining the effectiveness, i.e. the strengths and weaknesses, of any cross-country comparisons, even when such comparisons are at a very detailed level. As a help in this regard, the Sources and Methods publications often contain summary tables detailing the crucial features for each country so that the reader may have a single reference for the required information.

Metadata and Best Practices

The detailed methodological information for *Main Economic Indicators* also provides useful information for national statistical agencies. It provides an accurate tool to compare national practices in the compilation of indicators between agencies in different countries. This may help and encourage Member countries to adopt best practices in the compilation of short-term statistics. Best practices refer to guiding principles for compilation of statistics and cover all the stages of compilation: data collection, coverage and data manipulation, as well as use of international standards and classifications. A better harmonisation of approach between different countries will obviously improve the general quality and coverage of key economic indicators.

Conclusion

Metadata for short-term economic indicators are essential for understanding the underlying data and for assessing the quality and the reliability of the indicators. In particular, metadata give to data users the key elements for cross country analysis and international comparisons. Methodological publications on the principal economic indicators enable national statistical agencies to compare their methodologies with those used in other countries. They may encourage countries to adopt best practices and thus improve the quality and coverage of short-term indicators.

Because they are a repository of knowledge, language skills and expertise, international organisations are well placed to collect metadata for different countries. The OECD organises the collection of metadata for the principal economic indicators according to a standard list of items. This structured approach helps to reduce the burden of metadata collection from statistical counterparts. The cost for national agencies could be reduced even more significantly if international agencies enhanced co-operation in the collection of information and if an agreed upon list of metadata items were established within both national and international agencies. The OECD list of metadata items could be a starting point for such developments.

The collection of information organised by the OECD in a structured approach also benefits national agencies. As mentioned recently by statisticians at the Reserve Bank of Australia and at the INEGI of Mexico, this can help the national agencies to get a more complete picture of their data. It can also provide a useful basis and starting point for national agencies to develop documentation and metadata for their own indicators.

Future work on metadata at the OECD will concentrate on collecting metadata for subject areas where at present only little information is available. It is planned in 1998 to collect methodological information for the business tendency surveys and for domestic trade indicators.

Finally, the OECD system of metadata for the principal economic indicators could be developed and improved in different ways by:

- developing and implementing new products for users where data and detailed metadata are fully integrated;
- reviewing on a regular basis and keeping up to date the detailed methodological information collected from Member countries;
- giving a “time” dimension to the metadata: detailed information could be collected and stored for the successive methodological revision implemented by national sources (not only for the most recent period as is the case at present). This would provide users with a useful background for a finer analysis of the improvements in methodology and implementation by national sources.

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See also OECD, Internet site: <http://www.oecd.org/std/>

Annex
List of Metadata Items for Main Economic Indicators
Detailed description

1. SOURCE	
1.1 Source agencies	Agencies involved in the collection, compilation and publication of the indicator.
1.2 Main national publication sources	Key publications in which the indicators can be found. This would also include electronic media.
1.3 Series title in national publications	Series title - in original language with translation into English - in published source.
1.4 Breakdown available	The different breakdowns for which the indicator is published. An example of this would be employment available by: sex, industry, occupation, region, etc.
1.5 Methodological references	Title of articles on methodology or methodological descriptions together with the title of the publication in which they can be found.
1.6 Run of data available	The historical period for which the data are published or available from the national source.
1.7 Periodicity	Frequency of the data in published source.
1.8 Unit of measurement	Unit in which the indicator is expressed. An example would be "number of jobs of employees" or "number of persons", or "francs".
2. CONCEPTS and COVERAGE	
2.1 Definition	Definition of the indicator.
2.2 Coverage	
2.2.1 Reference period	Period to which the indicator refers. This could be end of month, pay period including the 12th of the month, the entire month, etc.
2.2.2 Geographical coverage	An example would be "Great Britain" or "United Kingdom", or "Germany" or "Western Germany".
2.2.3 Classification coverage	This refers to the items in a national classification covered by the particular indicator. An example would be ISIC divisions 2, 3 and 4 to describe the coverage of the index of industrial production.
2.2.4 Sectoral descriptions	An overview of the sectors pertinent to 'Statistical population' and 'Particular exclusions'. An example would be a description of a national financial system in order to clarify the coverage by sector of financial indicators.
2.2.5 Statistical population	This is the reference population covered by the statistics. An example would be "all establishments with more than 8 employees" or "the non-institutional population aged 16 and over", etc.

2.2.6 Particular exclusions	This item lists notable exclusions to the data. Examples would be excluding the armed forces when describing the labour force, or excluding bonuses when describing an indicator of earnings, etc.
3. STANDARDS	
3.1 Standard systems/framework	This item refers to recognised international/national standards for compiling the data. Examples would be "System of National Accounts 93" or "Labour accounts".
3.2 Standard classifications/ nomenclatures	Classifications used to describe the data. Examples are Economic Activity Classification, NACE or ISIC, or any national classification particular to a country.
3.3 International comparability	Conformity with national standards, for example unemployment in accordance with ILO guidelines, should be noted here.
3.4 Departures from international standards	Departures from international standard such as in the case of unemployment "job search period is two months".
4. DATA COLLECTION	
4.1 Reporting units	The unit which reports the information. Examples are establishment, enterprise, household, individuals, etc.
4.2 Reporting method	This item describes how data are collected. Examples are household survey, enterprise survey, count of administrative data, etc.
4.3 Survey items 4.3.1 Description of questionnaire	This item describes how the questionnaire is delivered and filled in e.g. hand held computers by interviewers. It also describes the kind of information requested in the form e.g. demographic details, sales date, etc.
4.3.2 Master list	This the master list or sample frame from which the sample is drawn. It could be the list of individual corresponding to the latest census results, the Business register of establishments, etc.
4.3.3 Survey description	This items describes how the survey is drawn, whether a stratified or random sample, etc. the size of the sample is noted also.
4.3.4 Non-response rate	The size of the non-response rate should be given and any details on how non-response is followed up.
4.4 Administrative source(s) items 4.4.1 Description	Primary purpose (e.g. tax returns) and name and legal status. Agency responsible for management. List of administrative information of statistical interest (usually includes Identification Numbers where relevant).
4.4.2 Update procedures	Whether decentralised or centralised.

<p>4.4.3 Quality assessment</p> <p>4.4.4 Access and control for statistical usage</p> <p>4.4.5 Statistical techniques for processing data</p> <p>4.5 Multiple sources items</p> <p>4.5.1 Items for use of multiple sources</p> <p>4.5.2 Standard combination framework</p>	<ul style="list-style-type: none"> • Consistency in space (problems connected with decentralised procedures involving several contributors). • Consistency in time (such as breaks in historical data due to administrative changes). • Existence of quality and coherence checks by source. • Adequacy of administrative source for statistical use (such as definitions and concepts, coverage). • Quality of coding system and other considerations of precision. <p>Is their input by statistical agency in design. What are the access conditions for the statistical agency.</p> <p>Describe estimation procedures.</p> <p>Which sources are combined and how they are combined.</p> <p>E.g. SNA -- national account compilation uses many different sources.</p>
<p>4.5.3 Statistical techniques for combining multiple sources</p> <p>4.6 Reporting date in relation to the event measured</p> <p>4.7 Time lapse between event and processing</p>	<p>E.g. Calibration or reconciliation techniques such as modelling or post-stratification</p>
<p>5. DATA MANIPULATION</p>	
<p>5.1 Aggregations/Grossing up</p> <p>5.1.1 Aggregation method</p> <p>5.1.2 Grossing up method</p> <p>5.1.3 Weights for aggregation</p> <p>5.2 Seasonal and other adjustments</p>	<p>Explanations should be given here on how data are aggregated from elementary cell levels.</p> <p>Explanations here concern how estimates are made of the population from the sample e.g. how the latest results of the census of population is used to gross up variables calculated from the sample.</p> <p>The source used for estimating weights should be described as well as to what the weights refer. For example weights for aggregating CPIs might be a family expenditure question of 1995 where consumer spending on the different items are the basis for the weights, or value added in the different sector could be used to weight indices of industrial production.</p> <p>The method used to seasonally adjust the data and other adjustments i.e. for the number of working days.</p>

5.3 Other manipulations	A type of manipulation to be described here would be the conversion of part-time and full-time employment to full-time equivalent. Another example would be the calculation of man-hours.
6. DATA QUALITY AND TIMELINESS	
6.1 Sampling errors and their corrections	When sampling errors are calculated and published the estimates should be given here. Any corrections for bias could be described here. An example of missing data is for reasons of a strike in a factory (production of cars) or if a treasury bill was not issued for a particular month.
6.2 Other errors and their corrections	
6.3 Missing data in time series	
6.4 Breaks in time series	Under this item should be changes to definitions, collection methods, new weighting systems etc. which could have had an influence on the coherence of the time series. Dates should be given of when the changes took place. A description of quality of preliminary estimates, and policy of the institute concerning their publication. Revision policy of the agency compiling the statistics. An example would be of matching unemployment data as measured in a household survey with that from administrative records. Time elapsed between the publication data or release date of the statistics and the reference period. Calendar of release dates.
6.5 Preliminary estimates	
6.6 Revision policy	
6.7 Corroborating evidence	
6.8 Timeliness	
6.9 Release dates	