

Implementing a national version of ISIC Rev.4

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Regional Workshop on ISIC Rev.4 implementation

Amman 28.09-1.10.2014



Outline

- 1 Introduction
- 2 Implementation process
- 3 Institutional setup
- 4 Summary and conclusions
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Overview

- The implementation of ISIC Rev. 4 in the national business registers and its application in the various statistical domains is one of the main challenges for the national statistical institutes in the recent years.
- Implementation of ISIC Rev.4 is a complex and resource intensive process
- The quality and comparability of the statistics produced according to ISIC will depend largely on the correctness of the codes assigned to the statistical units. In turn, the correctness of the codes will depend on the information available for determining them and the tools and procedures used.
- An implementation plan that outlines time line, activities and responsibilities should be developed to ensure a successful operation.



Major tasks and challenges

- Defining a new classification and associated tools
- Reclassification of all units on the business register according to the revised classification
- Maintaining two classifications for an interim period
- Sampling and weighting under the new classification
- Simultaneous estimation and results assessment under both new and old classification
- Construction of industry weights for short term statistics
- Construction of back series in terms of the revised classification
- Handling of the national accounts move to the revised classification



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Implementation process

Overall implementation process

The overall implementation process can be separated into three different components which are closely related and will depend on each other. These elements will be discussed in detail, now follows an overview.

The components of the implementation process are:

- ① Structuring national classifications
- ② Adaptation of business register
- ③ Sample designs and weights for surveys as well as backcasting of past data



Implementation process: National version of ISIC Rev. 4

Structuring national classification

- **Goal:** Creation of a new national version of national classification (NSIC) according to ISIC Rev.4 for national use
- Should involve other stakeholder/users/data providers
- Determination of needs
- Determination of new structure
- Development of explanatory notes, indexes, correspondence tables

How can national classifications be structured?

- ① Using ISIC as a starting point
- ② Based on historical national versions
- ③ Starting completely from scratch



Implementation process: National version of ISIC Rev. 4

Reasons for a national version:

- Language version/translation
- Adaptations and additions to the explanatory notes
- Alphabetical index
- National publication and database
- National subdivisions

Concepts of a national version:

- Kinds of subdivisions/levels
- Coding
- Activity areas



Implementation process: National version of ISIC Rev. 4

Steps of implementation:

- Analysis of current national version
- User needs
- Criteria for national subclasses
 - size/importance
 - conceptually meaningful
 - recognisably activity
 - conceptually sound
 - easy to identify
 - increase homogeneity
- Implementation in the various statistical domains



Implementation process: Register update

Register update process

- Switchover in the Business register to the new version of NSIC.
- **Recoding**
 - The primary goal of recoding the business register is to update the codes of the units in the register to the new classification
 - Verifying the current coding of the units is not a primary objective, although wrong codes may be detected (and corrected along the way)
 - All types of units in the business register have to be covered.
- **Double coding**
 - all units in the business register are simultaneously coded by the new and old revision
 - for a given period of time



Recoding and double coding of the Business register

General approach

- The "recoding" suggests that existing information will be used to arrive at the new classification code, rather than a straight "coding" of each unit in the register
- Since the old code is known, the existing correspondence table should be used to find out where this unit is coded in the new classification
- Applying the correspondence table to the code of a given unit results in a list of possible codes for that unit in the new classification



Recoding and double coding of the Business register

Categories of correspondence:

- One old code corresponds exactly to one new code (**one to one**)
- Two or more old codes correspond together to exactly one new code **many to one**
- One old code splits into two or more new codes **one to many**
- Two or more old codes correspond together to two or more new codes **many to many**



Recoding and double coding of the Business register

Types of correspondence: example NACE 2.0 in Austria

- **1-to-1 correspondences:** 195 classes in NACE Rev. 1.1 correspond exactly to one class in NACE Rev. 2 and vice-versa;
- **n-to-1 correspondences:** 86 cases, where two or more classes in NACE Rev. 1.1 correspond to one class in NACE Rev. 2;
- **1-to-n correspondences:** 18 cases, where one NACE Rev. 1.1 class is split into two or more classes in NACE Rev. 2;
- **n-to-m correspondences:** 215 cases, where two or more classes in NACE Rev. 1.1 correspond to two or more classes in NACE Rev. 2.



Recoding and double coding of the Business register

Based on known correspondence table, and the types of correspondence, one can use different methods:

- Direct (straight) recoding because of 1:1 or n:1
- Use of additional info from NSO or external registers
- Recoding by using information from other surveys, e.g. from production statistics (Prodcom survey in EU)
- Recoding by using yellow pages, internet or similar sources
- Still remaining classes/subclasses? (single codes or parts of single codes)
 - Development of dedicated surveys
 - Profiling
 - Probabilistic models



Recoding and double coding of the Business register

Dual coding:

- Period in which all units are classified according to old and new classification
- Length of dual coding period
- Changes of the activity of a unit means changes of both the old and new code
- New units to be classified according to new and old code



Application in statistical programs

Challenges faced in sampling and estimaton

- Sampling procedures have to be updated for the new classification
- Scope of categories may have changed (new economic activities in scope, etc.)
- Should (at least for the transition period) produce estimates for old and new classification
- Overall sample size may increase
 - To increase reliability of dual-coded results
 - To compensate for startup problems of the new classification (misclassification of units)
 - To allow for increase of detail required in new classification
 - To better evaluate coherence between old and new classification



Application in statistical programs

- The amount of work regarding sampling and estimation depends on the level of detail for back casting
- The change of industrial classification provides an excellent opportunity to substantially improve sample and estimation design
- A major drawback of such redesigns is that it often has systematic effects on the outcomes of the survey, leading to discontinuities in the series.
- An important aspect of a survey redesign is to minimize this inconvenience for data users. This can be accomplished by quantifying the effect of the redesign on the outcomes of the main parameters.



Application in statistical programs

Sampling under new ISIC classification

- There are different types of sampling schemes available.
 - cut off designs,
 - panel designs,
 - simple random sampling,
 - stratified simple random sampling,
 - systematic sampling.
- Probably the most common designs in use in National Statistics Institutes around the world are cut-off designs, stratified designs and combinations of the two.



Sampling under new ISIC classification

Example for a short-term survey: time table for transition

Year t_0 , January	BR recoded to old and new classification
Year t_0	Continue sampling according to old NSIC but use BR information to tabulate the existing sample against the new strata in new NSIC. Use this scheme as the first attempt at the sample on the new basis. For strata that are weak, in terms of their sample size, estimate the numbers required for acceptable results on the new NSIC and seek approval to carry out this top-up of the sample
Year $t_0 + 1$, January	Draw the sample on new NSIC (initially: old sample tabulated against the new industries and new strata, with weakest strata under the new NSIC boosted by a top-up of the sample)
Year $t_0 + 1$	Calculate variance of the elements in the sample in each of the strata based on returned data. Use sample variances as approximations of the population variances and use Neyman allocation to calculate new samples.
Year $t_0 + 2$, January	Re-allocate the sample based on reported data (in a more efficient way now). The top-up sample can cease. Survey can be conducted according to new NSIC.



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Implementation plan

Implementation plan

- The implementation of ISIC Rev. 4 or its national versions is a complex operation. The number of work packages involved and the number of different people required carrying them out, causes such a high degree of complexity that it is too much for one project.
- The most appropriate way to manage this complexity is to consider the operation as **a program** consisting of individual but related **projects**.
- Three distinct groups of activities that comprise their own project can be distinguished:
 - **the NSIC group**: responsible for the creation of the national version of ISIC Rev 4 with the subdivisions for national use,
 - **the Register group**: responsible for the switch-over in the BR,
 - **the Statistics group**: responsible for the co-ordination of simultaneous switch-over in statistics to the new classification and the control of the quality of time series.

Implementation plan

Project plans

- Each project is described in a separate project plan.
- That project plan describes the way the project objective is reached, including processes and schedule as well as organization and resources.
- A communication plan should be developed which describes the overall communications approach and provides guidance for all communication activities.
- Each project plan starts with a description of the objective.
- Then processes and schedule as well as organization and resources will be described, and finally the communication plan as a separate plan.



Coordination

Coordination

- Groups involved in the three processes need to be coordinated ⇒ need for a programme manager
- Establishing of a project working group dealing all steps of the implementation process
 - including all relevant organizational units of the national statistical institute,
 - also EDP units
 - regular meetings
- Tasks of the implementation group: Coordination in:
 - developing general implementation concepts and plans for all domains
 - considering adaptations of legislation
 - monitoring implementation process
 - contacting external institutions (data suppliers)
 - reporting to the management

Organizational structure



Organizational structure

- To ensure a successful operation, a formal organization structure should be in place that:
 - Delineates and assigns responsibilities for the project components
 - Coordinates work between the project components
 - Ensures quality

Organizational structure

- Project managers are responsible for work within their designated project groups
- They are coordinated by the Programme manager, who works under guidance from the Programme Board
- Quality control mechanisms should be in place, reporting back to the Programme Board
 - Quality control covers work by all project groups

Organizational structure

Communication

- Communication is an important element of the organizational structure
- Information needs to be exchanged between the different projects, in particular during preparations for the next phase
- Information also needs to be made available to key users and data suppliers out side of the statistical office
 - administrative registers
 - enterprisers and other institutions



Organizational structure

Communication

- Communication to the users of the classification (potential data providers)
 - Need to get other users involved in setup and keep them updated on work and impact according to a fixed schedule
 - ministries and other administrations
 - research institutes
 - professional organizations
 - general public
- The Programme manager has a key function in ensuring that communication is working



Resources

Resources

- Resource allocation and estimation is required:
 - For work force: which skills and expertise?
 - For equipment: what capacity, kind of software, tools for coding etc.
 - For information: the content, quality, completeness, how up to date and how to the point.
- Resource planning is needed to allocate the resources knowing their constraints and requirements.
- The resource plan should cover when, how many, what kind of and where the resources are required



National legislation

National legislation

- If the use of the national activity classification is embedded in national legislation, additional steps have to be taken that the relevant laws be adjusted
 - This will require additional time that needs to be considered in the process time table
 - Communication with users/entities that are affected by the change in classification and depend on the enactment of the law, should be maintained



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Summary and conclusions

- The implementation of ISIC Rev. 4 in the national business registers and its application in the various statistical domains is one of the main challenges for the national statistical institutes in the recent years.
- Three components of the implementation process are identified:
 - ① the national version of the classification;
 - ② the implementation in the Business Register;
 - ③ the implementation in the different statistical domains
- The most appropriate way to manage this complexity is to consider the operation as **a program** consisting of individual but related **projects**, each project with an own project plan.
- To ensure a successful operation, a formal organization structure should be in place.







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References I

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Different presentations and other materials from seminars and workshops.
-  EUROSTAT-1
Setting up the implementation plan for NACE Rev. 2 in the NSI
-  EUROSTAT-2
Implementation of NACE Rev. 2 in the Business Registers
-  EUROSTAT-3
Methodological aspects related to sampling designs and weights estimations



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THANK YOU FOR YOUR ATTENTION

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