

# Statistical Business Register

## Implementation of ISIC Revision 4

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## Outline

- Objectives of ISIC Revision 4
- Issues of the transition to a new classification
- Recoding of a Business Register
- Treatment of time series in UNIDO
- Summary and conclusions

## ISIC REVISION 4

- Objectives: improving and strengthening its **relevance** and **comparability** with other classifications, while considering its **continuity**.
  - **Relevance** reflects the need to incorporate new economic production structures and activities;
  - **Comparability** determines the identified need for a convergence of
    - ANZSIC: Australian and New Zealand Standard Industrial Classification
    - NACE: General Industrial Classification of Economic Activities within the European Communities
    - NAICS: North American Industry Classification System
    - Other activity classifications used around the world.
  - **Continuity** - changes should only be made where the benefits in terms of relevance or comparability outweighed the costs in terms of changes made to the previous versions of the classification.

## Transition to a new classification

- The transition to a new classification - a very complex process: involves virtually all aspects of the compilation and presentation of the relevant statistics;
- Even more valid for the transition to a new classification of economic activities - used in a myriad of statistics; a high level of coordination is therefore required;

## Transition to a new classification

- **Advantages:** data are available according to an up-to-date classification with an improved depiction of current economic structures
- **Disadvantages:** (from the perspective of many data users) –
  - Breaks in the time series.
  - Back-casting is necessary in order to minimise these problems.
  - Not all statistics can be transferred to the new classification at the same time (different statistics are published in different classifications)
  - Certain statistics will need to be compiled according to both the old and the new classifications in parallel

## Transition to a new classification

- An important basic prerequisite: recoding of **all statistical units in the business register** to comply with the new classification;
- The units have to be coded according to both the old and new classifications in parallel for a certain period of time;
- Involve all institutions that list the units in their registers according to the ISIC (or the corresponding national) classification (tax administration, social insurance registers, etc.)

## Analysis of the correspondence ISIC R3 → ISIC R4

- Recoding of every statistical unit - a time and money consuming task
- Start with an estimation of the expected workload.
- How many enterprises/establishments can be recoded automatically?
- For how many enterprises/establishments some kind of investigation work is needed?
- → Use the correspondence table between the old and the new classification.

## Recoding types

- In principle, the relationship between elements in R3 and R4 may be one of the following four types:
  - **1:1 cases:** One element in the old classification can be found in the new classification in the same way.
  - **1:n cases:** One element in the old classification has been subdivided into two or more elements in the new classification.
  - **n:1 cases:** Several elements in the old classification have been aggregated to form one element in the new classification.
  - **m:n cases:** Parts of different elements of the old classification have been reassembled so that the new elements are not simply aggregates of old elements or disaggregates of one old element. These are typical configurations in classification revisions.
- It is clear that only 1:1 and n:1 cases can be recoded automatically.



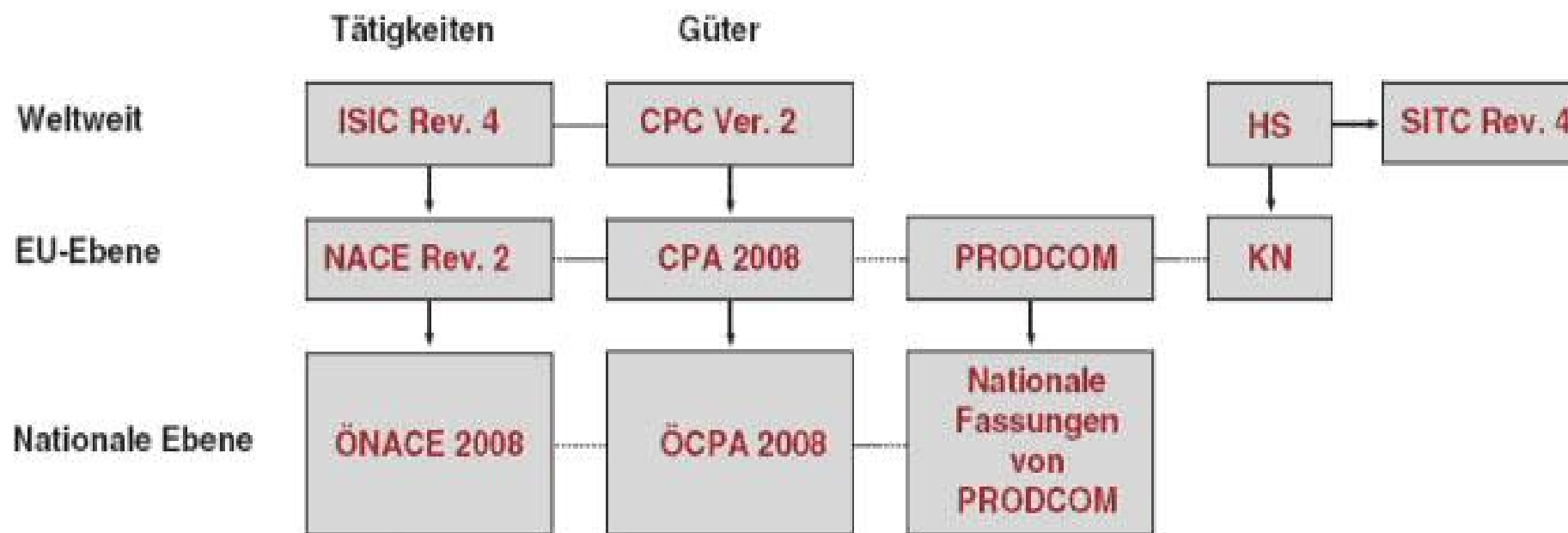
## National classifications

- An NSO can use either directly ISIC classification or a national one
- In a national classification it is possible to have subclasses, created to represent the national economics conditions.
- Example:
  - **ISIC Revision 4**
  - **NACE 2.0** (in EU member countries, almost 1:1 to ISIC) Mapped to national classifications, e.g.
    - **ÖNACE 2008** in Austria with a 6-digit sub-class level, which is a breakdown of the 4-digit class level - 380.000 enterprises;
    - **TOL 2008** in Finland, 500000 enterprises;
    - etc.

## National classifications

The integrated system of International Economics classifications

### Das integrierte System der internationalen Wirtschaftsklassifikationen



Source: Statistics Austria

## Number of elements in ISIC Rev 3, NACE Rev. 1.1 and ÖNACE 2003

Hierarchical levels		ISIC Rev. 3.1	NACE 1.1	ÖNACE 2003
<b>Sections</b>	A, B, <b>C, D, E</b> , ...Q	17(3)	17	17
<b>Divisions</b>	01,... <b>10</b> ,..., <b>15</b> , ..., <b>37</b> , <b>40, 41</b> ... 99	62(23)	62	62
<b>Groups</b>	011, ... <b>111</b> , <b>112</b> , ... <b>151</b> , ..., <b>371, 372</b> , <b>410</b> , ... <b>410</b> , ..., 990		224	224
<b>Classes</b>	0111, ... <b>1010</b> , ..., <b>1511</b> , ..., <b>3720</b> , ..., <b>4100</b> , ..., 9900		514	514
<b>Sub-classes</b>	-	-	-	722

## 1. Automatic recoding

**Example: ÖNACE 2003 -- ÖNACE 2008 for the Austrian BR**

<b>Basis</b>	<b>Number of sub-classes</b>	<b>Percentage of subclasses</b>	<b>Number of enterprises</b>	<b>Percentage of enterprises</b>
4-digit level	359	50%	190.000	50%
6-digit level	105	15%	64.600	17%
additional 1:1 classes	78	11%	15.200	4%
Other surveys (PRODCOM)			7.600	2%
<b>TOTAL</b>	<b>542</b>	<b>76%</b>	<b>277.400</b>	<b>73%</b>

## 2. Gathering of information

- With regard to the main activity of the enterprise
- In the previous example – for about one quarter of the enterprises is necessary to gather information
- Main premises:
  - **Response burden:** in order to avoid an additional burden for the enterprises by further statistical surveys, all other kinds of information sources – to a reasonable extent – should be exploited before making direct contact with the enterprises.
  - **Probabilistic recoding:** Since a probabilistic recoding always uses the classification which is most probable, without considering any information on the particular enterprise itself, this kind of recoding should only be used in individual cases and only if indeed no information whatsoever could be obtained on the enterprise

## Strategy based on the number of enterprises

1. For sub-classes that contain only few enterprises (say less than 200), information on the activity shall be obtained as far as possible by internal investigation (internet, administrative data, etc.).
2. For sub-classes that contain many enterprises (say more than 200), tailor-made questionnaires are to be developed – unless special sources of information were available – that shall retrieve exactly the activities relevant for the sub-class.

## a) Information search by internal investigation

1. **Utilization of existing data bases:** (e.g. available on the internet: Economic Chamber, Associations, etc.).
2. **Google search:** (e.g. the homepage of the enterprise or other information - trader lists, industry data bases, etc.)
3. **Telephone contact:** (only possible if a telephone number is available)
4. **Recoding without information:** only used in exceptional cases. If for example 80% of the activities of a present sub-class go into the new sub-class A and 20% to the new sub-class B, the enterprise in question will be classified under A.

### **b) Information search by using special sources of information**

- In a few classes it is apparent that although they contain many enterprises (which would have been an indicator for the development of a questionnaire version), special information sources are available which enable a recoding. I do not know how far this applies to manufacturing



### c) Developing tailor-made questionnaires

- For the remaining classes tailor-made questionnaires can be developed;
- **Example:** In Austria these amount to about 42,000 enterprises; in total 12 questionnaires; none of them pertain to manufacturing.

## Quality assessments

- Quality assessments and plausibility checks: after completion of the recoding operations (ISIC R3 and ISIC R4 codes have been assigned for each record in the register (enterprise or establishment).
- It is impossible to look at each individual enterprise → the checks have to be prepared and developed at the preliminary stages of the project.

## Quality assessments

- Compare the number of units classified in ISIC R3 and ISIC R4: according to old and new ISIC at all classification levels;
- Check for empty sub-classes: Are there classes without any records allocated (in some cases this may be correct);
- Check specific classes with few enterprises: (e.g. mineral oil processing in Austria) - each accounts for a high proportion of the whole class;
- Check recoding relations: (although the recoding process should guarantee that no recoding takes place outside the correspondence);
- Check size ratios in 1:1 recoding;
- Check classes that can be recoded automatically.

## UNIDO Experience

- **INDSTAT 2:** In 2008 UNIDO converted the complete database of International Industrial Statistics in ISIC Revision (3-digits) into a database in ISIC Revision 3 (2-digits) and jointed it with the existing database in ISIC Revision 3 2-digits: combines historical time series data from 1963 to 2009 for 163 countries.
- UNIDO Publications by ISIC classification
  - **Yearbook 2011:** 8 country tables in ISIC Revision 4
  - **Yearbook 2012:** 40 country tables in ISIC Revision 4 (22 of them are OECD)
  - **Databases 2012:** INDSTAT 2, INDSTAT 4 and IDSB: still in ISIC Revision 3

## UNIDO Experience: Examples

- **Yearbook 2012:**
  - 40 country tables in ISIC Revision 4 (22 of them are OECD)
  - Convert data from Rev.4 to Rev.3 to be published in particular tables showing for individual countries and areas basic indicators that are characteristic of the manufacturing branches (61 branches reported in accordance with a three-digit code):
    - Costs of input materials and utilities, Costs of labour, Operating surplus
  - Handling of Index of Industrial Production (IIP) series (23 divisions reported in accordance with a two-digit code)

Table 1.11

SELECTED CHARACTERISTICS OF BRANCHES, SELECTED YEARS AND COUNTRIES

Processed meat,fish,fruit,vegetables,fats (ISIC 161)														
Country or area	Latest year (LY)	Value added per employee (current 1000 dollars)		Wages and salaries per employee (current 1000 dollars)		Percentage in output <sup>a/</sup>								
		2000	LY	2000	LY	Costs of input materials and utilities			Costs of labour			Operating surplus		
						2000	2005	LY	2000	2005	LY	2000	2005	LY
Industrialized Countries														
CIS														
Azerbaijan	2009	—	61.5	0.2	2.6	—	82.1	69.3	3.2	0.8	1.3	...	17.1	29.4
Georgia	2009	3.4	6.5	0.2	2.4	71.0	88.5	81.7	1.7	3.7	6.7	27.3	7.9	11.5
Kyrgyzstan	2009	—	15.2	0.2	1.1	—	78.6	29.2	3.1	6.6	5.0	...	14.8	65.8
Russian Federation	2009	—	25.1	0.8	5.7	—	69.8	71.9	8.4	5.5	6.4	...	24.7	21.7
Ukraine	2009	—	...	0.4	2.4	—	...	...	4.9	3.9	3.5	...	...	...
EU-15														
Austria	2008	44.0	79.4	20.9	39.0	72.9	74.1	77.5	12.9	12.4	11.0	14.2	13.5	11.5
Belgium	2008	49.7	96.4	22.5	43.5	83.1	83.4	86.0	7.7	7.4	6.3	9.3	9.3	7.7
Denmark	2008	44.5	89.5	29.8	62.6	76.3	77.7	79.6	15.9	14.8	12.8	7.8	7.5	7.5
Finland	2008	39.3	77.4	22.6	40.9	75.0	74.9	79.5	14.3	14.7	10.8	10.6	10.4	9.7
France	2007	30.5	55.5	17.2	31.5	81.7	81.0	81.6	10.3	10.7	10.5	8.0	8.3	7.9
Germany	2008	27.6	57.4	16.3	31.1	79.1	81.0	84.0	12.3	10.6	8.7	8.6	8.4	7.3
Greece	2007	—	58.8	...	25.3	—	71.6	72.7	...	12.1	11.8	...	16.3	15.5
Ireland	2008	35.0	72.8	17.7	43.3	82.4	79.7	83.2	8.9	10.9	10.0	8.7	9.4	6.8
Italy	2008	42.3	74.4	17.1	33.9	84.5	84.3	86.4	6.3	6.1	6.2	9.2	9.6	7.4
Luxembourg	2007	28.3	56.7	22.6	38.4	71.3	64.2	63.8	23.0	31.6	23.3	5.7	4.2	12.9
Netherlands	2006	48.6	81.7	24.5	39.0	84.0	...	84.9	7.9	...	7.2	8.1	...	7.9
Portugal	2008	14.8	33.9	7.8	16.1	85.2	82.1	83.9	7.8	8.5	7.6	7.0	9.5	8.5
Spain	2008	28.7	68.8	13.7	30.0	82.5	81.7	81.9	8.3	7.8	7.9	9.1	10.5	10.2
Sweden	2008	46.4	77.6	24.4	42.6	75.6	79.2	81.1	12.8	11.4	10.4	11.6	9.3	8.5
United Kingdom	2008	38.0	66.4	21.2	36.0	71.1	72.2	76.1	16.1	14.5	12.9	12.8	13.2	10.9
EU-12														
Bulgaria	2009	1.9	8.9	0.9	3.7	87.8	86.5	86.1	5.8	4.1	5.8	6.4	9.3	8.1
Cyprus	2009	24.5	50.0	12.0	25.4	81.8	82.2	80.9	9.0	9.0	9.7	9.3	8.8	9.4
Czech Republic	2007	6.8	21.0	3.3	9.4	85.6	84.2	83.5	6.9	7.4	7.4	7.5	8.4	9.2
Estonia	2009	5.6	20.5	2.8	10.5	76.5	79.9	77.9	11.7	9.6	11.4	11.8	10.4	10.7
Hungary	2008	8.9	23.0	3.6	11.3	81.2	81.7	82.9	7.6	8.8	8.3	11.1	9.5	8.7
Latvia	2009	5.5	11.7	2.2	6.7	70.5	78.1	81.1	11.8	8.9	10.7	17.8	13.0	8.1
Lithuania	2009	3.4	13.5	1.8	6.3	83.7	84.7	82.7	8.5	7.2	8.1	7.8	8.1	9.3
Poland	2008	6.2	22.9	...	11.5	85.2	84.2	83.5	...	7.2	8.2	...	8.7	8.2
Romania	2009	...	14.6	...	5.5	84.2	86.9	82.8	...	5.9	6.4	...	7.2	10.7
Slovenia	2009	15.5	32.0	11.5	21.2	80.0	80.0	79.4	14.9	15.4	13.7	5.1	4.6	6.9
Other Europe														
Norway	2006	46.8	75.6	28.2	52.9	79.3	82.4	83.1	12.5	10.7	11.8	8.3	6.9	5.1

a/ At current prices

Table 1.5

DISTRIBUTION OF WORLD VALUE ADDED, SELECTED DIVISIONS AND YEARS <sup>a/</sup>  
(Percentage)

ISIC Division	Year	Industrialized countries								Developing countries			World
		All countries	CIS	Europe			East Asia	North America	Others	All countries	NICs	Others <sup>br</sup>	
				EU-15	EU-12	Other							
15 Food and beverages	2000	70.8	1.7	25.4	2.1	0.7	20.5	17.5	2.9	29.2	16.9	12.3	100.0
	2005	64.1	2.2	23.3	2.1	0.5	17.2	16.1	2.7	35.9	16.8	19.1	100.0
	2009	56.7	2.2	20.5	2.2	0.5	14.5	14.5	2.3	43.3	16.8	26.5	100.0
16 Tobacco products	2000	41.1	1.0	11.7	1.3	2.4	11.9	11.2	1.6	58.9	20.0	38.9	100.0
	2005	30.3	1.0	7.4	0.9	2.3	9.7	7.6	1.4	69.7	15.7	54.0	100.0
	2009	22.7	0.8	5.1	0.6	2.5	8.3	4.3	1.1	77.3	13.6	63.7	100.0
17 Textiles	2000	54.4	0.9	24.7	1.7	0.4	11.5	13.7	1.5	45.6	22.3	23.3	100.0
	2005	39.7	1.0	18.0	1.6	0.3	7.0	10.6	1.2	60.3	19.0	41.3	100.0
	2009	27.3	0.8	13.2	1.3	0.3	5.1	5.8	0.8	72.7	16.8	55.9	100.0
18 Wearing apparel, fur	2000	64.1	1.0	20.9	3.3	0.5	19.5	17.4	1.5	35.9	18.0	17.9	100.0
	2005	43.4	1.1	15.2	3.0	0.6	12.1	9.9	1.5	56.6	19.2	37.4	100.0
	2009	31.4	0.8	12.5	2.2	0.5	7.7	6.5	1.2	68.6	15.9	52.7	100.0
19 Leather, leather products and footwear	2000	56.2	0.8	31.3	2.8	0.3	9.8	9.9	1.3	43.8	22.4	21.4	100.0
	2005	37.0	1.1	20.1	2.3	0.2	6.4	5.8	1.1	63.0	21.0	42.0	100.0
	2009	25.7	1.1	13.7	2.2	0.1	4.1	3.7	0.8	74.3	17.4	56.9	100.0
20 Wood products (excl. furniture)	2000	84.6	0.8	25.9	2.8	3.2	10.3	39.0	2.6	15.4	10.6	4.8	100.0
	2005	80.6	1.2	24.2	3.3	3.0	7.5	38.7	2.7	19.4	10.7	8.7	100.0
	2009	71.8	1.2	26.3	4.5	3.4	6.9	26.9	2.6	28.2	9.7	18.5	100.0
21 Paper and paper products	2000	83.4	1.2	25.5	1.1	1.0	20.0	30.4	4.2	16.6	10.1	6.5	100.0
	2005	77.2	1.5	24.6	1.3	0.8	18.6	26.3	4.1	22.8	10.4	12.4	100.0
	2009	69.2	1.6	24.1	1.5	0.6	17.7	20.3	3.4	30.8	10.2	20.6	100.0
22 Printing and publishing	2000	91.2	0.3	33.3	1.4	1.8	23.2	29.9	1.3	8.8	5.7	3.1	100.0
	2005	87.8	0.5	33.5	1.8	1.6	22.2	26.8	1.4	12.2	6.6	5.6	100.0
	2009	84.9	0.5	33.4	2.0	1.6	24.3	21.8	1.3	15.1	6.9	8.2	100.0
23 Coke, refined petroleum products, nuclear fuel	2000	59.2	1.4	10.7	1.4	1.0	32.6	11.2	0.9	40.8	23.2	17.6	100.0
	2005	52.0	1.5	9.0	1.3	0.9	27.7	10.9	0.7	48.0	24.2	23.8	100.0
	2009	46.1	1.6	8.5	1.3	0.8	24.8	8.5	0.6	53.9	23.3	30.6	100.0
24 Chemicals and chemical products	2000	75.8	1.0	27.9	1.0	1.9	17.8	24.7	1.5	24.2	13.3	10.9	100.0
	2005	68.6	1.0	25.6	1.0	2.0	15.1	22.6	1.3	31.4	12.8	18.6	100.0
	2009	58.6	0.9	23.2	1.1	2.2	12.8	18.2	1.2	40.4	13.5	28.9	100.0

a/ At constant 2000 prices.  
b/ Including China.



## Summary and conclusions

- Overview of an implementation process and methods used
- Examples are based on the implementation in Statistics Austria:  
[http://www.statistik.at/web\\_en/classifications/implementation\\_of\\_the\\_onace2008/index.html](http://www.statistik.at/web_en/classifications/implementation_of_the_onace2008/index.html)
  - Nearby 73% of the enterprises could be recoded automatically, for the rest additional surveys or investigations were necessary
- Double coding of the statistical units in BR according to ISIC Rev. 3 and Rev. 4 has to continue for some time
- Plausibility and quality checks
- Examples of UNIDO handling of time series in deferent revisions