



Comparative Analysis on Industrial Classification of China and International Standard Industrial Classification

Zhuo Wang

National Bureau of Statistics of China, Beijing, China – wangzhuo@gj.stats.cn

Abstract: The thesis presents comparative analysis between industrial classification of China and international standard industrial classification. The analysis goes through the aspect among basic component, implementation rules, structures and contents on the section and division levels and the correspondent tables and links. The paper gives detailed explanations on several sections where typical differences between the Chinese and international classifications exist. Finally, conclude on the advancements of newly revised industrial classification in China, also present suggestions for improving on the next revision.

Keywords: Industrial Classification for National Economic Activities; International Standard Industrial Classification; Structure and category

1. Introduction

All economic phenomena that are to be described in the form of statistics require systematic classification. The International Standard Industrial Classification of All Economic Activities (ISIC) is the international reference classification of productive activities. Its main purpose is to provide a set of activity categories that can be utilized for the collection and reporting of statistics according to such activities. Since the adoption of the original version of ISIC in 1948, the majority of countries around the world have used ISIC as their national activity classification or have developed national classifications derived from ISIC. The Revision 4 of ISIC has been approved as the new international standard classification in 2006. Wide use has been made of ISIC Rev.4 both nationally and internationally, in classifying data according to kind of economic activity in the fields of economic and social statistics.

Industrial Classification for National Economic Activities(ICNEA) is the national version of the standard industrial classification in China, compatible with ISIC. Its used in kind of economic activity in the fields of economic and social statistics, such as for economic census, national accounts, business registry, employment statistics and others. The 2011 Revision of ICNEA(ICNEA 2011) has been taken effect as the new national standard classification which absorbed main features of ISIC Rev.4 compared from the previous version for the purpose of international data comparison.

The following parts will present the similarity and main differences between these two classifications.

2. Similarity with ISIC Rev.4

2.1 Similarity in general principle and rules

In order to attain international comparability, ICNEA 2011 adopted the same general principle, definitions and classification rules from ISIC Rev.4.

As was followed through ISIC Rev.4, the approach of classifying according to activities carried out has been followed in ICNEA 2011, and all categories at each level of the classification are also mutually exclusive.

The principles and criteria that have been used to define and delineate categories of ICNEA 2011 are similar to those used in ISIC Rev.4. The criteria is based on the inputs of goods, services and factors of production, the process and technology of production, the characteristics of outputs, and the use to



which the outputs are put. Economic activities that are similar in respect of these criteria have been grouped together in the categories.

2.2 ICNEA 2011 directly adopted the application rules from ISIC Rev.4

ICNEA 2011 adopted application rules such as the define of principal, secondary and ancillary activities, identification of statistical units, treatment of mixed activities, outsourcing activities on a fee or contract basis, etc. For instance, in case of a statistical unit engages in a variety of activities, in order to arrive at a single ICNEA code for these units, ICNEA 2011 provides a set of rules that have to be applied in the process of classifying a given unit, and all of the rules are completely aligning with those regulated in ISIC Rev.4.

2.3 Same to ISIC Rev.4 in coding system and structure

ICNEA 2011 makes use of capital letters coding the sections, four-level coding for detailed structures, paralleling with the ISIC Rev.4 coding system. While the sections are assigned capital letters, the Arabic numbers assigned to a given category of ICNEA may be read as follows: the first and second digits, taken together, indicate the division in which the category is included; the first three digits identify the group; and all four digits indicate the class.

2.4 Similar approach in developing explanatory note and index

The content and scope of each category in the classification should be defined through a detailed explanatory note, which also highlights boundary issues by providing examples of activities that may appear similar but are classified elsewhere. In order to apply the classification to a particular statistical unit, information on the activity in which the unit engages was obtained. This information is then used to find the category in ICNEA 2011 that corresponds to this activity, based on the definitions provided in the explanatory note.

Alphabetical and numerical indexes are designed to be of assistance in using ICNEA 2011 which makes a very useful tools for further detailing classification categories and greatly simplify its application for both statistical and non-statistical purposes.

At present, the ICNEA index can be used by statistical producers and through internet, together with the codes, category names, explanatory notes and correspondent tables linking to ISIC. The index also covers the historical versions of the ICNEA, ISIC, and all the related correspondent tables.

3. Linking to ISIC Rev.4

At its thirty-seventh session, the United Nations Statistical Commission recommended that countries adapt their national classifications in a way that allows them to report data at least at the two-digit level of ISIC Rev.4 without loss of information.

Correspondent tables are an important tool for comparing statistical data that have been collected and presented using different classifications. A complete detailed correspondence between ICNEA 2011 and ISIC Rev.4 is developed¹ at the four digital level of the two classifications, which overfull satisfied the requirement of international comparison and data supply at two-digit level of ISIC Rev.4. The following table identified which classes are categorized in 1:1, M:1, 1:N and M:N² relationships, based on existing correspondence table.

¹ The previous version of ICNEA published in the year of 2002 was also linked to the relevant version of ISIC Rev.3.

² Possible linkage types between the two classifications are commonly referred to as: 1 to 1, M to 1 (many-to-one), 1 to N (one-to-many) and M to N (many-to many).

Table 1 Segment on linking status from ICNEA 2011 to ISIC Rev.4

At the most detailed level, i.e. Class level.	Type of linking	Number of categories
	1:1	161
	M:1	847
	1:N	6
	M:N	80

4. Differences and incongruities to ISIC Rev.4

4.1 ICNEA 2011 developed detail from ISIC Rev.4 at lower levels

National analysis often requires greater detail than is required or possible for international comparison purposes. The 2011 revision of ICNEA provides substantially more detail at all levels than ISIC Rev.4. This increased detail basically responds to requests by both producers and users of statistics. ISIC Rev.4 categories are generally be further detailed to better reflect the structure of the national economy of the country.

For table up-below, ICNEA 2011 now comprises 20 sections, which are then further subdivided into a total of 96 divisions, 432 groups and 1094 classes. The added detail has considerably increased the number of categories at lower levels compared with ISIC Rev.4.

Table 2 ICNEA 2011 and ISIC Rev.4

ICNEA 2011			ISIC Rev.4		
Structure	Code	Number of categories	Structure	Code	Number of categories
Section	Capital letters(A-T)	20	Section	Capital letters(A-U)	21
Division	First and second digits(01-96)	96	Division	First and second digits(01-99)	88
Group	First three digits	432	Group	First three digits	238
Class	All four digits	1094	Class	All four digits	419

4.2 Difference between high level structures

At the highest level of ICNEA 2011, some sections can be easily compared to those in ISIC rev.4. At the section level, ICNEA is always making efforts to increase the similarity to ISIC. The difference at the high level structure decreased as the revision progresses. In the 1994 version of ICNEA, there are 6 sections that have the same scope and similar title with ISIC Rev.3 out of the overall 16 sections; in 2002 version the number of same scope sections increased to 9 out of the overall 20 sections; and in 2011 version the number increased to 11 out of the overall 20 sections.

4.3 Main differences at the lower levels

The main differences between the two classifications at the lower levels are caused by reorganization of ISIC headings and levels. The reason for reorganizing an ISIC category is to serve national statistical needs that cannot be fulfilled by ISIC Rev.4 as it stands.

4.3.1 Support activities to agriculture can be of particular relevance for the national aggregation on overall service industry. These activities are classified in several separate classes in ISIC Rev.4.

Therefore ICNEA 2011 add additional category which aggregate the support services together so that “Service industry” can be specifically monitored and easily be extracted.

4.3.2 In the industry domain of food manufacture and textile manufacture, differences remain between the categories both at the group level and class level. The main reason that lead to those differences, is the adoption of deciding criteria used in the classification. ISIC Rev.4 selected process and technology of production to define individual group and class, however ICNEA 2011 puts high lights on characteristics of output and use to which outputs are put, which become more important to directly reflect economic feature and satisfy the request form data producer and policy maker. For instance, “spinning, weaving and finishing of textiles” in ISIC Rev.4, was further divided into “preparation and spinning of textile fibres”, “weaving of textiles” and “finishing of textiles”, which clearly following the production procedure. However, in ICNEA 2011, the counterpart category is further subdivided into “cotton manufacture”, “wool manufacture” and “fibre and silk manufacture”, following the material of textile which reflecting the statistical tradition and management subjection from government ministries. The similar situation exists under the categories of manufacture of sports goods, manufacture of official equipment, cultural goods, etc.

4.3.3 For concern on “Industry”, the traditional statistical concept in China included the industries combining of mining and quarrying, manufacture, electricity, gas, steam, and water supply. The statistical producer and policy maker want to keep the option open on clearly present the aggregation on “Industry”. In order to satisfy the inquiry, ICNEA 2011 didn’t follow the option of ISIC Rev.4 on adding section E: “Water supply; sewerage, waste management and remediation activities”, in which the contained content of remediation activities was reallocated from manufacturing section from the previous version. The related contents are still separately allocated in three sections of ICNEA 2011. Because the way in which ISIC rev.4 dispose section E, will break the routine statistical data collection method for “Industry”.

4.3.4 As in ISIC Rev.4, ICNEA 2011 also provides separate categories for the repair of all kinds of goods. However, no single high-level category exists that would cover all repair activities. The only difference is that in ICNEA 2011, repair of motor vehicles and of motorcycles is classified from manufacture section into the section of household services but not together with sale of motor vehicles, as practiced in ISIC Rev.4. The current arrangement of repair in ICNEA 2011 provides possibility of merging separate categories into a high-level category that would cover all repair activities.

4.3.5 The purpose of adding the new section “J Information and communication” in ISIC Rev,4 is to reflect merging industry and make comparability to related regional classifications³. The alteration brings in major changes in identification on manufacture or service, because Section J clearly provide service activities, but combined several categories which used to be in the section of manufacturing previously. ICNEA 2011 didn’t follow the option of adding new section of information and communication, the related activities are still separately allocated in several sections, but section of manufacture is not involved.

5. Conclusion

5.1 The degree of convergence increased

The design of structure and categories decides the format by which the information will be collected and sorted on economic activities. The correlation between the national classification and its counterpart international recommended classification can be revealed from following aspects: first,

³ Related regional classifications includes North American Industry Classification System; Statistical classification of economic activities in the European Community, etc.



similarity in structure and category layout; second, the correspondence linking between two classifications, in order to realized international comparison directly or at an aggregated level. For the countries simply using ISIC Rev.4 without modifications would easily realize complete consistency in the aspect of structure and category layout. As for the country like China, a nationally modified version of ISIC Rev.4 may be better suited to address specific data needs.

One of the important criteria in process of revising ICNEA 2011 is to make reference on ISIC Rev.4. Consequently, there is a substantial increase of similarity in the application rules and category layout, which also helped clarify the details in corresponding table.

5.2 The prospective arrangement in several domains

ICNEA has always prospectively arranged structures and categories in several promising domains. For instance, in version 2002, ICNEA has already add details on fishing activities, separate section for manufacture of electrical equipment, and draw out the publishing activities from the manufacture section, which were all then practiced in the revised version of ISIC Rev.4. ICNEA 2011 might expect the emphasized industries to become important in the future because they represent a growing industry.

5.3 Give full consideration to the future trend of development for industries

According to the development trend of the rapid growth in service industry, ICNEA 2011 takes full account of the service industry related activities at the structure and detailed levels. “Classification for Three National Economic Sectors⁴ then can clearly be aggregated on the basis of merged group of support services to agriculture, forestry, hunting and trapping, fishing and aquaculture, which may be an alternative option on the next revision of ISIC.

5.4 Factors interact with each other and are finally balanced to formulate categories in ICNEA

As was followed through ISIC Rev.4, the approach of classifying according to homogeneity of activities carried out has been followed in ICNEA 2011. Although the principles and criteria that have been used to define and delineate categories of ICNEA 2011 are similar to those used in ISIC Rev.4, the main reason that contribute the differences in organize the structure and category, is the adoption of deciding criteria at different levels of the classification. Generally speaking, in ISIC, at the most detailed level of the classification, preference has been given to the process and technology of production to define individual ISIC classes. At higher levels, characteristics of outputs and the use to which outputs are put become more important to create analytically useful aggregation categories. While in ICNEA 2011, characteristics of outputs and the use to which outputs are put are the most important criteria in most levels both detailed and higher.

Another national factors involved is that the policy makers might want to collect data for internal purposes on specific industries subject to the obligations of government ministries. The requirement reinforced the option on criteria of characteristics of outputs and purpose of products which also reflects functions of different government ministries.

In addition, practical considerations are also important factors that have influenced the way categories have been defined, such as the organization style of economic production, the features of economic development and the importance of the activities to be included. In general, separate classes are provided for kinds of activity that are prevalent at the country level or that are of particular importance in the macro-economy.

⁴ Classification for Three National Economic Sectors is the classification dividing national economic industries into primary industry, secondary industry and service industry.



The more factors to be considered, the more difficulties will come out in selection and balancing, and the more complexity will be encountered in designing process of the classification. Factors interact with each other and are finally balanced to formulate categories in ICNEA 2011. The alternative approach is to decrease the decision factors, and do not integration multiple objectives and purposes together into one classification.

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