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ISIC and CPC Maintenance and Revision Policies

John Murphy, USA

Ana Franco, Eurostat

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John Murphy, USA¹ Ana Franco, Eurostat

The maintenance and revision of the International Standard Industrial Classification of All Economic Activities (ISIC) and the Central Product Classification (CPC) has been somewhat reactive and undertaken in response to external drivers such as changes to the System of National Accounts, the Balance of Payments Manual or the Harmonized System. Changes and updates have been made to ISIC and the CPC since their introduction at varying intervals of time. In the past, the Expert Group has tentatively adopted a policy for minor updates to ISIC each five years with more major revisions considered on a ten year cycle. The CPC would be reviewed more frequently.

For this, or any formal revision policy, to be effective a set of procedures and consistent terminology must be available to guide the changes. The procedures should address scope, timeframes, terminology, and the mechanisms that will be used to solicit broad international input. Each of these topics is addressed in separate sections of this document. The first topic is terminology and scope because that must be clear to understand the timeframe dimensions of the process and to guide the outreach and communication process. The paper concludes with a discussion of the mechanisms used to gather international input and support.

Terminology and Scope

Consistent terminology is necessary for common understanding. ISIC and the CPC have formal terminology for all components of the systems. This includes official names, detailed titles for each level of the structures, rules for the content and presentation of explanatory notes, and other technical descriptors that are consistently applied in the construction of the systems and manuals.

ISIC is identified by revision numbers. The CPC is identified by version numbers. With each set of changes, the revision or version number is incremented. The most recent iterations of the industry and product classifications are ISIC Revision 4 and CPC Version 2. In 2002, a decimal increment was used for the first time when ISIC went to Rev. 3.1 and the CPC went to Ver. 1.1.

The Expert Group tentatively adopted two types of changes to the industry and product classifications - the <u>update</u> and the <u>revision</u>. No definitions have been developed to define the scope of update or revision. Past changes provide some insight but more formal requirements are necessary. Using the current naming practices and tentative revision cycles proposed by the Expert Group, an update would be identified by a decimal increment to the version or revision number and a revision would result in an integer increment to the version or revision.

In order to formalize the conventions, criteria should be developed to distinguish between an update identified by a decimal and an integer increment to the revision or version. At the extremes, this is a

¹ The opinions expressed by the author do not necessarily represent the official positions of the United States or the Census Bureau.

relatively straight forward process. An integer increment to the revision or version would be used when there is substantial change to the classification such as a renumbering of the entire system or a change in concepts that impacts the application and use of the classification. At the other extreme, a decimal increment would be used when there are no changes to the structure and only changes are made to add clarity to definitions and titles without a corresponding change in content. The wide area in between these extremes is where a formal policy for naming conventions will prove useful.

Possible Criteria for Revision (integer increments):

- 1. Renumbering of all or a substantial portion of the structure
- 2. Restructuring and regrouping a substantial portion of the classification (25%? 50%?, new section, division, or group for ISIC, new group or class for the CPC)
- 3. New concepts for defining classes in ISIC or subclasses in the CPC (such as the application of a consistent concept throughout the classification)

Possible Criteria for Update (decimal increments):

- 1. A class in ISIC or subclass in the CPC is added or removed from the classification within the existing structure
- 2. Realignment of content of classes in ISIC or subclasses in the CPC (e.g., one activity moves to another class in ISIC)
- 3. Multiple classes in ISIC or subclasses in the CPC are added or removed from the classification but the basic structure remains substantially unchanged.

These possible criteria still leave wide latitude for revision or version identification but do inform a basic level of decision making. If these conventions were applied to previous iterations of the classification, particularly the 2002 iterations, would they have been considered updates or revisions?

The changes from ISIC Revision 3 to Revision 3.1 for the most part involved movement of activities between existing classes and several new classes broken out within the existing structure of ISIC Rev. 3. This would neatly fall within the parameters for a decimal increment with one exception. There was a scope and concept revision with the addition of new groups for the undifferentiated goods and services producing activities of households. Even with that exception, most practitioners would consider the move from ISIC Rev. 3 to Rev 3.1 as an update under the spirit of the proposed rules.

The changes from CPC Version 1 to Version 1.1 were more substantial. Division 53 was removed entirely and Divisions 85-87 in Version 1 were completely revised and presented as Divisions 85-89 with new concepts, classes, and subclasses. It can be argued that the changes involved were beyond what would be normal for an update using the proposed criteria above. If those rules were applied, the CPC would have been moved to Version 2.0 at that time rather than identified as a minor update with the change to Version 1.1. The changes from Version 1.1 to Version 2.0 while more numerous, were generally the type of changes that would be considered in an update rather than a version change. Again, there is an exception for the reorganization of transportation services from mode to passenger/freight at higher levels. All things considered, decimal increment rather than an integer increment to the version could

have been used to describe the changes between CPC Ver. 1.1 and CPC Version 2 using the criteria listed above.

These examples show that a clear line between update and revision will not always be possible. The Expert Group will have to consider the type of change, amount of change, and implementation workload when deciding to label a change as an update or a revision. The Expert Group should also stress that updates are just as important as revisions and all changes should be implemented in a timely manner. The terminology of update and revision describes the magnitude of change but the terms should not imply discretionary and mandatory.

Periodicity of Reviews and Changes

One of the most important features of a reference classification is that it allows for consistent presentation of statistics over time that reflect the economic realities of the subject economy. As the economies using a classification change, the classification must also change to remain relevant and useful. Time series can be the enemy of relevance in a dynamic world and vice versa. Too much reliance on one side or the other can diminish the value of the statistics disseminated using a reference classification.

The approximate revision cycle for the reference industry and product classifications shows an increasingly shorter timeframe between changes.

ISIC

ISIC was initially adopted in 1948

ISIC Rev 2 was adopted in 1968

ISIC Rev 3 was adopted in 1989 (decade long review process)

ISIC Rev 3.1 was adopted in 2002

ISIC Rev 4 was adopted in 2006 (structure approved in 2006, manual published in 2008)

CPC

CPC Provisional was approved in 1989

CPC V 1.0 was approved in 1997

CPC V 1.1 was approved in 2002

CPC V 2.0 structure was approved in 2006 (published in 2008)

There are most likely many reasons for the decreasing time between changes in the reference classifications. One of the most significant is the increased use of information processing technologies.

The rapid technological advances created new industries and products that needed to be tracked using the reference classifications. The same technological advances allowed for easier implementation of revised classifications and improved time series linkages. Ten years is a lifetime for computer hardware and software. Even with advances in processing, time series breaks are sometimes necessary though they degrade the usefulness of statistics for temporal analysis. The tension between time series and relevance must be managed in a program of revisions to ISIC and the CPC.

The Expert Group tentatively supported a two stage revision process for ISIC with reviews for update every five years and more extensive revisions (if necessary) every 10 years. The Expert Group felt that the product classification should be more dynamic and changes considered more frequently.

To balance time series and relevance, the need for multiple years of data for analysis, seasonal adjustment, and other purposes must be weighed against changes in the economy. Since ISIC was introduced in 1948, there have been substantial changes to the world. The 1950s saw the first nuclear power plant, Univac, the polio vaccine, Sputnik, the Boeing 707, and the invention of the integrated circuit. The 1960s saw communication and weather satellites, industrial robots, human heart transplants, and the invention of the electron microscope. The 1970s saw floppy disks, bar codes, the microprocessor, CAT scans, compact discs, Skylab, and the VCR. The 1980s saw IBM introduce the first MS-DOS personal computer, the discovery of AIDS, the first cellular phones, the space shuttle, and France's TGV train. The 1990s saw the cloning of sheep, exponential growth of the Internet, the Hubble telescope, second generation cellular phone networks, and commercialization of genetically modified crops. The 2000s saw growth in the use of RFID, privately funded space travel, advances in hybrid cars, DVDs, MP3 files, and DVRs. Each of these illustrative advances spawned new businesses and encouraged existing businesses to transform their operations. It is also interesting to note that the speed of development has increased while the lifecycles of various technologies have shortened.

With the illustrative list of advances by decade as background, a time frame for ISIC revision of more than a decade would pose a substantial risk to the relevance of the classifications. In this sense, the tentative ISIC revision cycle of the Expert Group accommodates the reality of change. It must also be remembered that revisions to ISIC and the CPC take a considerable amount of time to implement throughout the world and disruptive changes can create a substantial workload for backcasting.

There are other practical reasons to maintain a set review process for the reference classifications. When there is a schedule, requirements for change can be designed into processes and systems in anticipation of the need for updates. With a decade or more between changes, those implementing the change have often moved on and then each change to the classification requires reinvention of the wheel.

In the context of a well integrated industry and product classification system, more frequent revisions to the product classification within a more static industry classification system is a useful way to identify new goods and services while maintaining time series at the industry level. In that sense, the tentative decision for more frequent revisions to the CPC accommodates the goal of the systems. However, care must be taken when the industry is the primary source of information and little or no supporting

product data is collected or provided in official statistics. That can result in important shifts in the characteristics of industries being masked within a static total. One product gains importance but that movement is offset by a decline in importance for another product. The net result of no change does not accurately show the dynamic nature of change within the industry. The work of the Voorburg Group over the past several years shows that for service industries, there is comparatively little product coverage in turnover and price data.

The CPC for goods is tied closely to the Harmonized System (HS). All changes to the HS should be identified in the CPC in a timely manner. The CPC is not necessarily constrained by the HS and deviates when there is sufficient reason to do so. Even so, the need to capture change argues for a CPC revision cycle of two to three years for a well integrated system.

The reality on the ground does call for caution. The time schedules for both ISIC and the CPC will need to be consistent but the scope will need to be more flexible because they are generally not used in a well integrated fashion. Changes to ISIC may need to be more extensive at five year intervals than a simple update because of the paucity of product data.

Outreach and Communication Processes

There are two separate issues with outreach and communication processes when considering updates or revisions to ISIC and the CPC. First, a formal process of soliciting input from users throughout the world on desirable changes when beginning the scheduled reviews of the classifications is needed. Second, there must be formal mechanisms to collect and act on implementation and interpretation questions and problems.

The process used for the fourth revision of ISIC and the development of version two of the CPC is proposed for future revisions of the standard economic classifications. The process consisted of the development of a questionnaire for national statistical offices soliciting input and commentary on necessary or desirable changes to the classifications. An example of the questionnaire is included as Appendix 2. This process was successful in collecting international opinions and positions on broad issues such as the concepts of ISIC and the CPC as well as detailed requests for changes to the classifications.

A technical subgroup (TSG) was created to evaluate the responses and make formal recommendations to the Expert Group. In a series of meetings over almost two years, the TSG considered all of the responses and developed recommendations for changes to ISIC and the CPC. The process resulted in a proposed structure for each classification that was approved by the Expert Group and subsequently approved by the Statistical Commission for use. While this process was time consuming and fairly resource intensive, it was successful in ensuring that the revision process was open, transparent, and considered all inputs.

After the formal adoption of a classification and related documentation (introductory guidelines, explanatory notes, companion guide etc.) and, in the phase of the national implementation, a certain number of problems of interpretation may occur or errors/inconsistencies may be detected.

The continuous update of the classification and/or its documentation is not advisable, due to the fact that changes can have a negative impact on data produced. Non-harmonized introduction of breaks in time series will be disastrous for the comparability of national data using the data from different countries or the analysis of time series.

On the other hand, disregarding errors or inconsistencies detected or not dealing with coding problems faced by the users will have a similar impact, because each country will look for a solution independently with no assurance of consistency.

Therefore, a decision making process for such changes needs to be formalized, and different ways for presenting changes could be explored.

Different steps for the updating mechanism can be identified:

- 1. Collect information on the problems spotted by users during implementation of the classification.
- 2. Agree on a solution for each case! This requires a decision mechanism which includes an agreement on a date for implementation if significant changes.
- 3. Document all decisions!
- 4. Use the output of the correction/clarification as an input in the process of the next update/revision of the classification(s) concerned.

Collection of information on possible problems

The collection of information on the problems detected by users, during implementation of the classification can take different forms:

- Spontaneous request of help to UN from a country, by Email, letters, phone calls etc.
- Organizing a web based discussion forum where users are able to express their concerns about issues related to the classification and receive feedback from other users.
- Organizing a questionnaire to users where they are asked for comments on possible classifications related problems encountered.

Eurostat experience shows, that a web based discussion forum is an excellent tool for collecting and discussing issues related to the implementation and application of a classification. Not only problems are identified but also information on solutions applied by countries can be found. This of course requires active participation of the members of the forum.

Moreover, the three methods of collecting information can cohabit, and the forum can be used to discuss possible solutions, when problems are addressed in a spontaneous contact with the UN, or within an organized collection of problem cases, such as by a questionnaire and no clear answer can be provided.

In any case, questions which already are covered in the guidance material provided for the classification should be sorted out from those where the material is not clear enough and additional clarifications could prove to be helpful.

Agreement on a common solution

Obvious errors or inconsistencies do typically not raise much discussion. Nevertheless coding problems can result in different interpretations and are not always easy to tackle. In the discussion forum, convergence is not always evident and after some time of discussion the tendency often is that no common position seems to emerge. In this case a decision should, whenever possible, be taken, taking into account the different positions, even though it can be just a convention.

This decision could be taken by the Technical Expert Group on classifications. Therefore, as a permanent item in their agenda meetings should deal with "rulings", and where the list of rulings could be adopted. The date of entry into force would be just after each TEG meeting or on the 1/1 of the year following the meeting.

This periodicity is nevertheless, not always frequent enough and in this case the members of the TEG group could be consulted via the web based UN classifications discussion forum.

Documentation

All errors or inconsistencies detected should be traced. This also applies to problems related to interpretation of the definitions or explanatory notes, encountered by several countries.

The recording of this information can take different forms and a possible solution could be a "rulings" data base, where the structure of the classification is linked to the explanatory notes and for each class where any "ruling" decision was taken a field with the decision and the date of entry into force is mentioned. When several classes are affected by the same "ruling" (e.g. blur borderlines between classes) the decision and date of implementation should be repeated in each class concerned.

The database should be accessible to all users on the web and linked to all other documentation of the classification.

Use it in next revision

Obviously, errors or inconsistencies detected should be corrected in following revision of the classification. The same applies for clarifications which can be included in the explanatory notes/definitions of the revised version. For this reason is important to keep records of all in a centralized way.

A coordinated approach to the timing of updates/revisions of classifications is crucial when interlinked concepts and definitions form an integral part of other classifications. In order to optimize the relevance of an updated/revised classification, classifications that serve as reference for concepts and definitions

should ideally be subject to review. This requires establishing a time table, where relevance aspects are taken into account. Apart from the relevance aspect, regional/national versions and their legal framework at regional/national level is often an issue that needs to be taken into account.

Summary

The three "Rs" have changed from Reading, wRiting, and aRithmetic to reduce, reuse, and recycle. Just as the spoken language changes over time, language used to present statistics must also change. To address this need for change in an orderly manner, the Expert Group should adopt a more formal set of requirements regarding ISIC and the CPC. Terminology to describe the magnitude of change in ISIC and CPC should use the terms update and revision. Version identifiers should be incremented by a decimal for updates and incremented by an integer for revisions. ISIC should be reviewed each five years for needed updates with more substantial revisions generally considered every ten years. The CPC should be more continuously reviewed with updates if needed every two or three years. This pattern of potential updates and revisions should not be set in stone but rather used to guide the process. There will be times when a revision to ISIC may need to occur at the five year mark, the ten year mark, or even the fifteen year mark. The key is a review and evaluation every five years to determine what is necessary to maintain the industry classification.

Appendix 1: US Standard Industry Classification Revision History

In the United States, the Standard Industrial Classification (SIC) was initially developed in the 1930s and revised periodically until it was replaced by NAICS in 1997. The SIC (and NAICS) are identified by the year of adoption rather than version or revision numbers. The United States has made a distinction between an update and a revision using the terminology proposed by the Expert Group. A more complete (though approximate) timeline shows the following revisions to the US SIC:

Initial development of the SIC – approximately 1939

Revision - 1945

Revision – 1957

Revision - 1967

Revision – 1972

Revision – 1982 (cancelled and not implemented)

Revision – 1987

On average, the classification was revised once every 10 years. The North American Industry Classification System (NAICS) replaced the SIC in 1997. The new system was developed jointly by the statistical agencies in the United States, Canada, and Mexico and involved a number of changes. The most publicized change was the application of a consistent concept throughout the classification to define industries. A less publicized change was the adoption of a five year review cycle. Each five years, the custodians of the classification would review the status of the classification to determine what, if any, changes might be needed. To date, NAICS has been updated at each five year interval.

The modifications to NAICS can be loosely classified as updates or revisions based on the level of change adopted with each version. The change from 1997 to 2002 could be labeled a revision because of structure and concept changes to wholesale trade and construction. The changes in 2007 and 2012 could be labeled updates because changes to industries were generally within the existing structure of NAICS and did not involve substantial concept changes.

Appendix 2: Example Questionnaire

Technical sub-group of the UN expert group on classifications

June 21-22, 2001

Questionnaire on main issues for the revision of ISIC and CPC for 2007

Introduction

The United Nations Statistical Commission has at its sessions in 1999 and 2000 agreed to a timetable and set goals for revising the International Standard Industrial Classification (ISIC) and the Central Product Classification (CPC). Considering the relationship and timetable of revisions for other classifications, it was recommended that updates or revisions of the classifications be carried out in 5 year intervals, specifically an update in 2002 and a revision in 2007. A goal for the ISIC revision for 2007 is to bring about convergence between major existing activity classifications. As this would likely have a major impact on the structure of ISIC, it was agreed to carry out only a limited update in 2002, to avoid two major revisions of the classification in a five year interval. The update was intended to address some immediate needs of data users and producers, such as those relating to the newly evolved Information Sector.

The Expert Group on International Economic and Social Classifications has at its last meeting reviewed the final proposal for the update to the International Standard Industrial Classification (ISIC Rev.3.1) and will recommend that the United Nations Statistical Commission adopt this classification as the new international standard.

At the same time the preparation for the revision of ISIC in 2007 has begun. This questionnaire represents the first step in a world-wide evaluation process to define the scope of the revision to ISIC in 2007.

What is the purpose of this questionnaire?

The preparation of a strategy and a proposal for a future classifications revision requires an assessment of the need for change to the classification. ISIC, CPC or national classifications based on these are used in a large number of countries for a variety of statistics. The changes in the economy since the last revision of ISIC have led to the desire to update the classifications.

To ensure that the classifications remain useful tools for compiling statistics at the national level and for international comparison, input from a variety of users of the classification into the revision process is necessary.

This questionnaire is a first solicitation of proposals, description of problems and general comments on the current version of ISIC that countries and other users wish to be considered in the revision process.

The Technical Subgroup of the Expert Group on International and Social Classifications has discussed an initial list of issues that are deemed important for the revision process and will need investigation and discussion. At this point, **this list is only illustrative and does not attempt to be exclusive**. It can only serve as a guideline for input from countries into the revision process.

This questionnaire has been divided into three sections, dealing with:

- 1. Conceptual and structural issues;
- 2. Cross-cutting issues;
- 3. Boundary definition and detail issues.

This distinction has been made for structural reasons only and should not preclude other categories of problems or proposals. Problems may cut across these areas and can be listed in any of these categories or separately.

What should you do with this questionnaire?

The responses to this questionnaire will serve as the basis for the discussions on purpose and scope of the ISIC revision in 2007. Your input is therefore extremely important.

This questionnaire should be discussed with a wide range of users of the classification in your office or in your country. This can include classifications experts as well as producers of statistics using ISIC.

The responses should address, whereever applicable:

- 1. opinions on the issues raised in the questionnaire;
- 2. additional issues in each of the three sections outlined below;
- 3. listings of new activities that are not covered in the current version of ISIC

Your response to this questionnaire should be sent to the United Nations Statistics Division by 1 October 2001 to allow for inclusion in the list of working issues for the 2007 revision of ISIC.

While the main focus of the questionnaire is on ISIC, your feedback will also be useful in the revision of the CPC. Any additional comments that you might have regarding the revision of the CPC will also be welcomed.

Issues related to ISIC

A. Conceptual and structural issues

- 1. ISIC is a classification of economic activities, which are grouped together into categories from lower to higher levels of detail. Different criteria can be used to group activities, including inputs, production process and outputs. Currently, ISIC uses a mixed approach, depending on the sector. Should one or more of these criteria be applied more consistently in the revised ISIC?
- 2. There is a relationship between economic activities and products. The former lead to the production of the latter. The definition of products in existing or revised product classifications, such as the HS and CPC, can be used to define the boundaries of activity categories. The relationship between the two can range from complete independence to strict linkage on a one-to-one basis. To what extent should the ISIC revision take into account relevant product classifications?
- 3. The application of these principles leads to the definition of categories at various levels of detail. Is the level of detail in ISIC adequate? Should more detailed categories be introduced and if so, in what sectors and for what purpose? Should more detail be added to better reflect the informal sector of the economy? Are there areas of ISIC in which there is too much detail? Which ones?
- 4. Currently ISIC has 17 tabulation categories, which are the highest level groupings in the classification structure. Are there too many high level categories? Should any be combined? Alternatively, should any new high level categories be added? Which ones?
- 5. The application of the classification requires that certain rules be followed to classify units correctly. Certain rules deal with units engaged in multiple economic activities. Should the rules regarding the classification of units engaged in vertically integrated activities and other types of combined activities be changed? What about the rules for top down coding? Or the use of value added to determine which activities will determine the code for a unit engaged in multiple activities?

For each of these issues, please provide your views concerning the importance and relevance of the issue. Please add any other structural and conceptual issues you would like to see addressed in the revision.

B. Cross-cutting issues

Cross-cutting issues are issues that affect many parts of the classification. They concern economic activities that are spread throughout the economy.

- 1. How should ISIC reflect the growing importance of "information" in the economy and in society? Should a high level category be introduced to deal with this? What should the boundaries be? The OECD has defined Information and telecommunication technologies (ICTs) whereas NAICS has adopted the Information sector (division 51). To what extent should the ISIC revision be guided by these examples?
- 2. How should repair and maintenance activities be treated? They are currently mainly included in the manufacturing sector in ISIC but are in a separate sub-sector in NAICS.
- 3. How should installation activities be treated? Should they be part of the manufacturing of parts or of equipment, part of construction or in other areas of the classification?
- 4. How should support activities be treated? Some industries include service activities specific to them, while in other cases service activities are separately accounted for. Should there be a more consistent treatment of service activities as a separate category, closer aligned with the industries they support or should the treatment be depending on the type of industry and service?

For each of these issues, please provide your views concerning the importance and relevance of the issue. Please add any other cross-cutting issues you would like to see addressed in the revision.

- C. Content and boundary issues
 - 1. There are many gray areas at the boundary between primary industries and manufacturing. For example, in the case agriculture and manufacturing, is cotton ginning an agricultural activity or a manufacturing activity? How can such issues be dealt with? Are there any guiding principles that can be used?
 - 2. In the area of distributive trades, changes in the organisation of trade, including electronic commerce, have introduced many new complexities in terms of what is traded, and by whom. What products are tradeable? What activities are included in distributive trade? What criteria should be used for disaggregation?
 - 3. Should new detailed categories be introduced to facilitate the compilation of:
 - Environmental activities?
 - Tourism activities?
 - Others?

- 4. The following list includes areas in which there are significant economic changes that can be addressed in the revision:
 - Information and communications
 - Internet activities
 - Employment services
 - The provision of health care services
 - Government services and public administration

Are these areas the correct ones? Are there other areas that should be addressed?

- 5. Globalisation, deregulation and information technology have introduced many changes in the organisation of production. Activities that were previously integrated are being subcontracted more frequently. This leads to the creation of specialised units as subcontractors and can also change the nature of the activity of the contracting businesses. What changes need to be made to ISIC to reflect these changes?
- 6. In ISIC Rev.3, Division 50 was introduced for the various selling and repairing activities related to automobiles. Is there any value to this approach? Should it be retained for the next revision?
- 7. In ISIC Rev.3, Division 37 was introduced for recycling activities. This division was narrowly defined and creates boundary problems with Manufacturing and Wholesale trade, as well as the general notion of recycling for many policy issues. Should recycling be redefined or grouped with other activities? Are there more appropriate definitions for recycling activities?

For each of these issues, please provide your views concerning the importance and relevance of the issue. Please add any other content or boundary issues you would like to see addressed in the revision.

Issues related to the CPC

There is no pre-drafted list of issues relating to the CPC at this time. However, you are requested to list any issues, in categories similar to those described above or others. The issues received will then form the basis for the revision process of the CPC.