

Defining Industries in the New Economy

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1. Aim and structure of this paper

European business statistics are based on various types of statistical units, such as enterprises and kind-of-activity units (KAUs), which are classified according to the industrial classification of the EU, NACE Rev.1. For the industries that result, statistics report on a number of variables. The central question of this paper is whether these industries, based on definitions originating from the early 1990s, are adequate for business statistics of the New Economy.

Since an industry is defined by the combination of a statistical unit type and a category of an industrial classification (i.e., a classification of economic activities), both aspects will be looked at. Can the present statistical unit types remain the basis of business statistics of the New Economy? And what are the requirements for the methodology of industrial classifications, in order to keep them up to date in a changing economy? These questions will be considered from the European (EU) perspective.

In order to deal with these issues, in section two several problems for business statistics are identified that possibly arise from the New Economy. The subsequent section discusses the methodology of the European system of business statistics in respect of industries, followed by various suggestions for improvements in section four. In a recent European research project, known as the Clamour project, several ideas have been developed that are particularly relevant in view of the New Economy. These are presented in section five, followed by conclusions in section six.

2. The consequences of the New Economy for statistics on industries

The main issues seem to be the following:

new ways of doing business

As a consequence of the New Economy, new business models are applied. The Internet plays an increasing role in the communication between businesses and consumers, and businesses among themselves. New networks of businesses emerge. Some businesses are “virtual” in the sense that they exist on the Internet rather than physically. The organisation of distribution is changing in a profound way. The question is, can the present statistical unit types, as used in

¹ The opinions expressed in this paper do not necessarily reflect those of Statistics Netherlands.

the European system of business statistics, accommodate the new ways in which business is conducted?

new technologies in industrial classifications

There are many new technologies around, but the developments in IT and their consequences are generally considered the main characteristics of the New Economy. Do industrial classifications represent the new economic activities properly, and with enough detail? This is not a new question, the economy has always been changing, and NACE Rev.1 has to be updated, of course, as is planned already for 2007. For now the question is rather, do the criteria traditionally used for defining the categories of the classification have to be modified? Can the new categories also be characterised in terms of their inputs, processes and outputs? And is the methodology used when NACE Rev.1 was designed still up-to-date?

globalisation and the New Economy

The New Economy is profoundly changing international business. Many areas are affected. Software, for instance, can be produced virtually everywhere. The allocation of resources by businesses is increasingly done from an international perspective, affecting physical production as well as services, including distribution. The question is whether national statistics become less relevant or even provide a distorted picture, by cutting international businesses into possibly artificial or less relevant national parts.

the speed of change

In some parts of the economy, changes take place with an astonishing speed. Dotcom businesses come and go, and business structures change very rapidly in some sectors. This leads to several challenges to statistics. The statistical units and classification categories that together define industries must be sufficiently stable, but in some areas the volatility of the economic structure is extremely high. Updating and implementing industrial classifications takes a very long time, so that when a revision is fully implemented, it reflects the situation of a couple of years earlier. And are the changes themselves properly reported in statistics?

new and growing demand for information

The demand for information on the New Economy is huge. This involves all of the topics mentioned before: information on the way business is organised, on new economic activities, on the international dimension of the New Economy, and on structural changes. The new and growing demand is wider than the subjects mentioned so far and includes, for instance, the need to get more and better product information, but here this paper focuses on the industries themselves rather than their output.

data availability and data collection

The New Economy poses opportunities as well as threats to data collection. Electronic ways of data collection are becoming increasingly common, and the level of detail of the available information is often huge. Administrative data sources tend to become increasingly accessible for statistical agencies. Efforts to agree on standards for electronic business reporting have the potential to be beneficial to business statistics. However, data collection is very difficult if business structures change very rapidly or if businesses are spread over several countries.

Virtual businesses may also be difficult to track. And the use of electronic data from businesses or from administrative sources requires an effort to establish the corresponding statistical unit(s) and translate the administrative concepts into statistical ones, including classifications.

3. Industries in the European system of business statistics

Is the present European system of business statistics well equipped for the provision of industrial data on the New Economy? This concerns both the statistical units of the system and the methodology of its industrial classification, NACE Rev.1.

statistical units

Apart from national accounts, the core unit of European business statistics is the enterprise, defined as “the smallest combination of legal units that is an organisational unit producing goods or services, which benefits from a certain degree of autonomy in decision-making, especially for the allocation of current resources”. Unlike the legal unit, the creation of which in some cases can only be explained by administrative factors (e.g., creation for tax reasons), the enterprise is the economic actor in the process of production.

There is no doubt that information on the economic actors of the production process is at least as relevant for understanding the New Economy as it used to be for the Old Economy, regardless possible additional data needs concerning the New Economy. If the enterprise is of a virtual nature, this does not reduce its relevance for data users. And if the rate of change is very high, this underlines the need to produce statistics on those changes but does not make the enterprise less relevant.

Data availability on the enterprise is another matter. So far the enterprise has been considered a unit for which data on the inputs and outputs of the production process can be assumed to be available, because the autonomy of the management of the enterprise implies that it keeps such data for its own purposes. Without data on what it does, it cannot exist. This does not imply that it is willing to provide the data, but that is another problem, which is currently dealt with by statistical techniques such as imputation.

The principle that enterprise autonomy implies data availability (for its own purposes) is no less valid for New Economy enterprises such as dotcoms. As long as these enterprises can be detected, the same methods can be applied as for more traditional enterprises. Provided the administrative legislation keeps up with the New Economy, administrative sources can be used to identify their existence as they are used for other enterprises. In that case the challenge to statistical agencies is to improve their techniques to compensate for the practical collection problems mentioned in section two. But the enterprise as the core statistical unit is not in doubt.

Concerning statistical unit types other than the enterprise, the role of the KAU is presently in discussion in relation with the data for structural (i.e., annual) business statistics and short-term statistics. It is possible that in the long run only one type of statistical unit will be used for these statistics. This unit will probably be very close to the enterprise, with a strong data availability requirement [Eurostat, 2001]. Anyway, the developments in respect of the unit for the statistics mentioned are not specifically related to the New Economy. The statistical unit

types defined for regional purposes, the local unit and the local KAU, respectively, are not affected either. The conclusion is justified that the system of statistical units does not have to be fundamentally changed because of the New Economy.

industrial classification

Is the same true for the methodology of NACE Rev.1? A problem with NACE Rev.1 at the moment is that no precise methodological basis has been agreed on, contrary to its North American counterpart, NAICS. The most important issue is the relationship with statistical units [Struijs, 1991]. What is the unit type for which the activities are meant to be represented by NACE? It stands to reason to choose the enterprise for this purpose, given its relevance to and central position in the European system of business statistics. This would also benefit statistics on the New Economy, to which the enterprise is relevant as well, as has been shown.

Another question is the choice and relative weight of the criteria that define the categories of NACE. Inputs, type of production process and outputs are the main criteria of NACE Rev.1, with emphasis on outputs, but more clarity is needed as to the way in which these criteria are applied, in particular the output criterion. In any case, these classification criteria are also relevant to the needs for data on the New Economy. Of course, new processes and new products have to be identified and defined in a precise way and taken into account at the next revision of NACE. But this does not affect the basic methodology of this classification.

There is one aspect of the methodology of NACE that needs special attention in view of the New Economy: how to deal with the high dynamics of some areas of economic activity. This has two sides. First, the frequency and way of updating NACE could be modernised, by shortening the updating process and by intermediate updating for the areas most affected. Second, in areas where the structure of economic activity is unstable, it may be wise not to pursue too much detail. This could be partly compensated by providing detailed product information per category of NACE. Besides, it is not desirable to have NACE follow product classifications too closely. In many areas the structure of production is such that combinations of products are produced which are wide apart in product classifications, for instance goods on the one hand and services related to those goods on the other.

For the industrial classifications the conclusion is that the methodology of NACE does not have to be fundamentally changed because of the New Economy, it rather has to be further developed and specified in several ways as explained above.

4. Possible improvements of the European system of business statistics

The observation that the current methodological basis of European business statistics is still largely appropriate for describing the New Economy does not mean that all issues mentioned in section two have been solved. In addition to the suggestions made in the previous section, the statistical system can be supplemented and upgraded in several ways, in particular in respect of the following:

information on changes

The system of European business statistics does not contain much explicit information on changes in the population of businesses. The evolvement of industries can be derived from the

comparison of the values of variables for different years (time series), but the differences from year to year are generally not explained. Relating such differences to the changes that occur to the population of businesses, such as the birth, merger and activity changes of businesses would give the users of industrial data a much deeper insight in the evolvement of industries. Information on population changes is especially relevant to the New Economy, because the population dynamics is very high in most areas where new technologies are applied.

A framework for statistics on changes in the population of businesses is described in an article by Struijs and Willeboordse [1995]. There a classification of changes is presented, consisting of the following categories:

1. *change of characteristic*
2. *change of existence*
 - 2.1. *birth*
 - 2.2. *death*
3. *change of structure*
 - 3.1. *concentration*
 - 3.1.1. *merger*
 - 3.1.2. *takeover*
 - 3.2. *deconcentration*
 - 3.2.1. *break-up*
 - 3.2.2. *split-off*
 - 3.3. *restructuring*

The change of characteristic refers to business attributes such as activity code and size class. In the article, the application of the classification of changes is illustrated for one industry. It requires clear continuity rules for the business and definitions of the change categories, to be applied in statistical business registers. In the EU, the classification has been worked out for enterprises in the recommendations manual for business registers, but apart from statistics on the number of births and deaths of enterprises, statistics about the impact that business population changes have on business statistics remain to be developed.

Special attention has also to be paid to changes in industrial classifications themselves. Once a clear methodology for NACE has been worked out, including its updating strategy, it may become possible to provide statistical data on shifts in the contents of the categories of NACE. Ideally, this will be related to statistical data on changes in technology and processes, and in outputs, especially new products.

information on enterprise groups

The European set of definitions of statistical units includes the enterprise group, but at the European level statistics for this unit still have to be developed. There is a considerable demand for information on this unit type, if only at the national level. This demand includes financial variables at group level and structural information such as its composition in terms of legal units, enterprises, and activities. Enterprise groups defined at the national level are also relevant from a practical point of view, they play a key role in profiling.

Business structures and industries nowadays cannot be understood without knowledge of the group structures and their evolvement. This is especially true in respect of the New Economy, where enterprise groups typically show successions of structural changes. When developing statistics on enterprise groups, it is important to pay attention to the time dimension. As is the

case for enterprises, not only information on levels, but also on changes and their impact is needed. The subject of enterprise groups is currently being studied at the European level; users interested in data on the New Economy will benefit from the results.

information on globalisation

As explained in section two, the emergence of the New Economy has important links with the process of globalisation, for which there is a growing demand for information. In respect of industries, however, not much information on the international dimension is available. Industrial data at the European level are obtained by adding national data. In essence, industries are defined nationally, in the sense that they consist of statistical units within national boundaries, classified to the same category of NACE. To get truly European industrial data, the enterprise has to be defined at the European level, with no restriction to the national economic area. This is also true for the enterprise group.

Defining enterprise-based industries at the national level has several disadvantages. At the European level this leads to an overestimation of the number of enterprises, of which the size is underestimated: large international enterprises are counted as several, national, smaller ones. Variables that are sensitive to consolidation effects may be distorted, and there are also classification effects. Enterprises are classified according to their principal activity, and the principal activity of a national enterprise may be different from the principal activity of the European enterprise to which it belongs. Ratios such as turnover per employee may also be affected by the choice of the national rather than the European enterprise for defining industries. Data on changes are affected as well.

The main bottleneck for the compilation of data on industries defined at the European level has to do with data availability and consistency. National statistical agencies are not in a position to collect data on units operating outside the national jurisdiction. The collection of information on European enterprises implies international information exchanges on international links between units, involving the EU Member States and probably Eurostat. And the actual data collection requires strong international coordination. Such arrangements will be difficult to design and agree on, but it is worthwhile pursuing them.

5. Recent research: the Clamour project

The definition of industries in the light of new demands for information was one of the subjects of a recent European research project, called Clamour. The project results can be used for adjusting the European system of business statistics to the needs related to the New Economy. Clamour was part of the so-called Fifth Framework research programme, with partners in five countries, and consisted of several parts: a study on the user needs regarding statistical units and activity classifications; the development of a model of the structure and activities of businesses; the application of this model to the area of statistical units; research on various methodological aspects of activity classifications; model-based data collection on the structure and activities of businesses; and related linguistic research.

Particularly relevant to the subject of the present paper is the model [Van der Hoeven et al, 2001] and reports on the use of the model for statistical unit purposes [Lok et al, 2002] and classification purposes [Bayram et al, 2002]. Detailed information on the project and its results can be found on a dedicated website (see references below), from which the reports

can also be downloaded. The relevance of the Clamour project for the definition of industries, taking into account statistical requirements concerning the New Economy, is manifold:

- The model represents all data needed for defining all current statistical unit types of the EU. Definitions of these units in terms of the model have been produced and actually implemented by means of an algorithm for their derivation on the basis of data collected as defined by the model. These methods can also be applied to new unit types, if an analysis of user needs regarding the New Economy concludes that this is desirable.
- In addition to data on business structures, the model represents a framework for all data needed for defining industrial classifications. A methodology for the design of industrial classifications has also been developed, which takes into account the user needs for industrial data including those in respect of the New Economy. This methodology makes the role of the classification criteria explicit. A key element of the methodology is the choice of a statistical unit type on which the industrial classification is to be based.
- The project included an analysis of the possibilities and consequences of creating more than one activity classifications, in order to accommodate the wide variety of user needs. It could be worthwhile to consider building such a system of multiple classifications if specific user needs in respect of the New Economy can be identified.
- The project explored new ways of data collection that take into account data availability and response burden on the one hand and data needs on the other. In particular, a model-based electronic questionnaire was developed.
- Providing tools for the improvement of international harmonisation of industries (units as well as classification categories) was one of the project aims. In fact, a number of possible improvements in this respect were identified. For instance, ambiguities in statistical unit definitions were found when expressing them in terms of the model.

6. Conclusions

The main conclusion that can be drawn from the foregoing is that the European system of business statistics comprises already the main features for the provision of industrial data on the New Economy. However, although the system does not have to be substantially redesigned, several improvements are desirable, and a number of additions to the system may be recommended if current and new data needs are to be met. The main suggestions made in this paper are the following:

- Declare the enterprise to be the statistical unit type, the activities of which NACE is meant to reflect;
- Clarify the methodology of the application of the classification criteria of NACE;
- Do not create too much detail in instable areas of NACE and do not follow product classifications too closely in NACE; however, provide more detailed product information per category of NACE;
- Shorten the updating process of NACE and allow intermediate updating for rapidly changing areas;
- Provide statistical information on shifts in the contents of NACE categories, changes in technologies and processes, and in outputs, especially new products;
- Provide statistical information on changes in business populations and their impact on time-series;

- Provide statistical information on nationally defined enterprise groups and changes therein, and their impact on industrial data;
- Make arrangements for the international coordination and exchange of data on enterprises and enterprise groups defined within the boundaries of the EU rather than within national boundaries;
- Develop statistics for such EU enterprises and enterprise groups;
- Consider the development of a system of multiple activity classifications;
- For the methodological issues mentioned, make use of the results of the Clamour project.

These suggestions together form an ambitious programme for Eurostat and the EU Member States for years to come.

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