



This module is part of the

## Memobust Handbook

on Methodology of Modern Business Statistics

26 March 2014

# Theme: Derivation of Statistical Units

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## **General section**

### **1. Summary**

This module describes the derivation of the main statistical units which should be made available in a Statistical Business Register (SBR) in order to be used in the production of statistics.

The following units are described: Enterprise Group, Enterprise and local unit. Enterprise groups are a combination of one or more enterprises which operate in certain location (local units). Where the enterprise group is the unit for making statistics concerning financing, the enterprise is aimed at production and the local unit divides the information on enterprise level into geographical parts.

The enterprise group is often first determined based on the result of finding the largest combination of legal units under common control. These enterprise groups have one or more market oriented activities which they carry out. Often these activities will result in enterprises. The enterprises carry out their activities on specific locations. Based on the different locations of the enterprises where the actual activities are carried out, it is possible to derive local units.

### **2. General description**

#### *2.1 Introduction*

Statistical units are entities about which information is sought and about which statistics are ultimately compiled. Statistical units are at the basis of statistical aggregates. The different regulations concerning (the use of) statistical units are aimed at (international) comparable statistics, which cannot be realised unless standardisation is applied to both definitions and classifications. One prerequisite to be able to compare two or more statistical collections, which cover the same economic activity over time, is that the comparison applies to the same units. The statistical unit serves as a tool to measure in an unduplicated and exhaustive manner several aspects of the economy.

The following statistical units for the production system are defined (European Parliament, 1993):

- the enterprise;
- the institutional unit;
- the enterprise group;
- the kind-of-activity unit (KAU);
- the unit of homogeneous production (UHP);
- the local unit;
- the local kind-of-activity unit (local KAU);
- the local unit of homogeneous production (local UHP).

For a detailed discussion of statistical units, the reader is referred to the module “Statistical Registers and Frames – The Statistical Units and the Business Register”. Part of this discussion is repeated here to make this module as self-contained as possible.

*NOTE: Each (economic) statistic is created with a certain target population which consist of a certain statistical unit.*

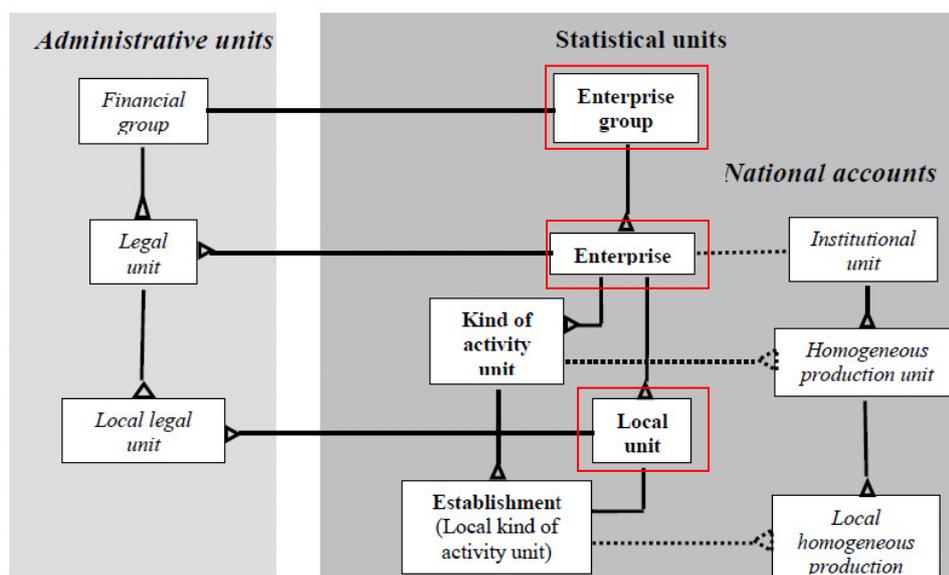
*Example:*

- *Structural Business Statistics (SBS) cover the 'business economy' (NACE Rev. 2 Sections B to N and Division 95) which includes industry, construction, and distributive trades and services. SBS are based on the Enterprise.*
- *National Accounts describe the economic activity of a nation. NA describe the production process according to statistical units which are defined according to their economic behaviour, economic function and economic objectives. NA are based on the institutional unit.*

There is an administrative way and there is the statistical way of looking at the different units.

Figure 1 depicts several important relationships:

- the relationship of administrative units;
- the relationships between the different statistical units;
- the relationship between the administrative and the statistical world.



*Figure 1. Relationship between the different statistical units*

The SBR should hold the following statistical units: the Enterprise, the Enterprise Group and the local unit (European Union, 2008). Only these must be included in the SBR<sup>1</sup>. The statistical units defined in the SBR regulation concerns only those statistical units which are needed for statistics. The other statistical units (e.g., KAU, UHP) are defined in different regulations. The Legal unit is also defined in

<sup>1</sup> The legal unit is not an actual statistical unit, but it is often an important building block for deriving the statistical units.

this regulation as the legal unit (and the local legal unit) is in many cases the starting point for creating the statistical units.

## 2.2 *New definitions*

In 2012 Eurostat started with an investigation for the revision of the statistical unit regulation. The new definitions are still being defined and it will take some time before the new regulation will be accepted. As a result of this, this module uses the ‘old’ statistical unit definitions as they are defined in council regulation 696/93.

## 2.3 *Statistical units*

One of the most important goals of economic statistics is to describe the economic transactions (and their developments) not on a micro level but in an aggregated way on a macro level. The aggregated information provides insight of a certain group over a certain amount of time. Economic activities are performed by individuals and organisations of individuals. When describing the economic process in a correct and real way it is needed to identify units which act in reality as the actual actors in the economic process.

Actual actors can be read as autonomous units which are part of the process. Autonomy should be treated from an economic aspect (free to decide on production factors, etc.). Autonomy can also be present on different levels: global, national, regional.

There are two main statistical units, the Enterprise Group and the Enterprise. The enterprises have local activities which are carried out in local units. The aims of both statistical units is completely different, but they are closely related. It is assumed that correct information concerning financing, profit, accounts, etc. can be obtained at the level of the Enterprise Group, whereas relevant information concerning the production process (e.g., turnover, value added, persons employed, etc.) can be obtained at the level of the Enterprise.

This section describes these statistical units.

### 2.3.1 *Enterprise*

The key statistical unit is the enterprise. This unit describes the actual active actors in the market oriented production process (of services and goods).

Since legal units are a construct of law and administration and thus do not always reflect economic reality, there is a need for creating Enterprises. There may be legal or fiscal advantages of separating production factors into two or more different legal units (see the box below for an example). In the economic view, these individual legal units cannot act without the others and should be seen as one unit.

The Enterprise is an economic entity which can correspond to a grouping of several legal units. Some legal units, in fact, perform (ancillary) activities exclusively for other legal units and their existence can only be explained by administrative factors (e.g., tax reasons), without them being of any economic significance (United Nations, 2007).

*Example: Consider an enterprise group in NACE 3512 Transmission of electricity. Within this group certain enterprises can be operational. One example of an enterprise can be trade of electricity.*

*Example: There are two legal units which are part of the same Enterprise Group, one is a production legal unit and the other is a transport legal unit. This transport legal unit exclusively exports goods for one other company which is part of the same Enterprise Group.*

*In this example the transporting legal unit is not market oriented and can be seen as an ancillary activity within this enterprise. As a result this legal unit should be included into the same enterprise as the actual production unit is.*

### 2.3.2 Enterprise Group

In some cases enterprises are grouped together under the control of the same (ultimate) owner. This is done to achieve economic advantages (such as economies of scale, control of a wider market, etc.). The integration of enterprises into one group can be vertical or horizontal. The enterprise group as a unit is useful for financial analyses and for studying company strategies. Often the enterprise groups are too varied in nature to serve as a unit for statistical surveys and analysis. For this reason the enterprise should be used.

An enterprise group is a set of enterprises controlled by the group head. The group head is a parent legal unit which is not controlled either directly or indirectly by any other legal unit. All the subsidiary enterprises of the enterprise group are considered to be (indirect) subsidiaries of the parent enterprise. It is useful to recognise all (majority and minority) links between the group head and the controlled enterprise via the network of subsidiaries and sub-subsidiaries. This allows the group's entire organisation to be depicted (United Nations, 2007).

Enterprise groups take decisions which might have an impact on the production process and might affect the whole group. This is dependent on the aspect of autonomy. Enterprises have a certain degree of autonomy for which they are responsible for taking decisions separate of the whole of the group. It seems logical to take the enterprise group as a starting point when finding the enterprises belonging to the enterprise group.

Enterprise groups are not bounded by geographical borders. Enterprise groups often divide their activities over different countries depending on their special needs. This module describes the 'national' part of the enterprise groups<sup>2</sup>.

### 2.3.3 Local Unit

An enterprise is often active at more than one location, and for some statistical purposes<sup>3</sup> it is useful to see this geographical distinction.

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<sup>2</sup> As stated before in Section 2.2, the definitions of the statistical unit are currently being revised. One of the modifications will be the international aspect which will be included in the new definition or in the implementation of the new definition.

<sup>3</sup> Statistics on regions enables identification of more detailed geographic patterns and trends concerning production (factors) than national data.

A geographically identified place must be interpreted on a strict basis: two units belonging to the same enterprise at different locations (e.g., two different addresses) must be seen as two local units.

There is a direct relationship between the enterprise and the local unit. Logically this requires that the enterprises are derived first before the local units can be derived.

Since the enterprise can have more than one activity which may result in different Kind of Activity Units within the enterprise, it is also possible that local units carry out more than one activity. These different activities can be allocated to different local kind of activity units.

## *2.4 The derivation of the statistical units*

This section describes the delineation of enterprise groups, enterprises and the local units. This description poses no requirements for the organisational structure within a statistical office or on the implementation of the (business register) systems where the statistical units are stored.

The following description assumes that for the delineation of the statistical units all information is available. With all information is meant not only all information available in administrative sources, but also statistical information, international trade information, possible information as a result of direct contact with the enterprise group etc.

As stated before the enterprise group is the best starting point for delineating the enterprises. Therefore the construction of the enterprise groups is the first step.

### *2.4.1 Legal Unit*

Before the derivation of the statistical units can be started, the legal units must be identified and described. Without legal units it is difficult to define statistical units and almost impossible to identify the link between statistical units and administrative information. Legal units are the building blocks of the statistical units.

Legal units include:

- legal persons whose existence is recognised by law independently of the individuals or institutions which may own them or are members of them;
- natural persons who are engaged in an economic activity in their own right.

The legal unit (or part of it) forms, either by itself or sometimes in combination with other legal units, the legal basis for the statistical unit known as the 'enterprise'.

#### *2.4.1.1 Economic/statistical relevance*

Administrative sources most often have different goals for registering their administrative units. An important aspect of the SBR is to filter out those units which are not relevant to describe the national economic statistical figures.

Economic relevance can roughly be divided in two parts, financial (Enterprise Group) or production (Enterprise)<sup>4</sup>. This is often done for the business demography, but legal units can exist without

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<sup>4</sup> Different statistics might demand different definitions concerning inactivity.

carrying out any economic activity. They are legally alive and have a legal personality but are economically 'inactive'. A few examples of inactive/dormant legal units are:

- businesses set up to facilitate inward or outward overseas investment or for other international trade purposes;
- businesses that are not yet trading but have registered with the intention of starting trading in the future;
- businesses that have ceased trading but not yet de-registered as legal units;
- businesses that are only active during a specific period in the year;
- etc.

These legal units might be inactive or dormant (used when periodically inactive) but could play an important role when creating the cluster of control which results in the set of legal units which defines the enterprise group.

In order to define if a legal unit is economically relevant a few characteristics can be used. Examples are: the persons employed, the activity of the legal unit, turnover. Two clear indications that a legal unit is economically active and should be part of an enterprise:

- if persons employed  $> 0$ ;
- if persons employed = 0 and turnover  $> 0$ .

This indicates that this legal unit is statistically relevant and should lead or be part of an enterprise.

Also information on ancillary activities, indications of bankruptcy might be used as input in the decision whether a legal unit is economic active.

*NOTE: The above does not state that the legal units which are not economically relevant will not or cannot be part of enterprises. It only states that these legal units are not economically relevant by themselves and therefore will not be the cause of the derivation of an enterprise.*

*Often these units have activities which they perform solely for other units within the enterprise group.*

## 2.4.2 Enterprise Group

### 2.4.2.1 Structure of the Enterprise Group

Enterprise groups are an association of enterprises bound together by legal and/or financial links. As an operational definition, it can be stated that the enterprise group is the largest collection of legal units which are under the same control. This set/combination of legal units is derived based on the legal and/or financial control links which these legal units have among each other. Control is exercised on whole legal units.

Based on the control aspect, build the cluster of control which will result in the largest set of legal units which are controlled by the same ultimate unit. See Figure 2 which provides an example how to delineate this largest set of units under common control.

In this figure the 'structure of ownership' shows all available ownership relationships between the legal units. Some of the relationships are control relationships, some will result in 'indirect' control, some are minority ownership relationships which will not be part of a control chain. The structure of control is the result of deriving the complete cluster of control relationships between the legal units and defining which legal units are under common control. Some conclusions based on Figure 2 are:

- Legal unit A controls legal unit B and C and, as a result, legal unit A indirectly controls legal unit D for 70%.
- Legal unit E is controlled by legal unit A and legal unit F both for 50%. As a result no legal unit has the absolute control of legal unit E. Since legal unit E controls no other legal unit this legal unit is an Enterprise Group by itself.

*NOTE: Figure 2 is a simplified model depicting an example of deriving the units which are under common control.*

*Since control is a very complex concept which has different meanings and exceptions, the model described is just to provide an idea.*

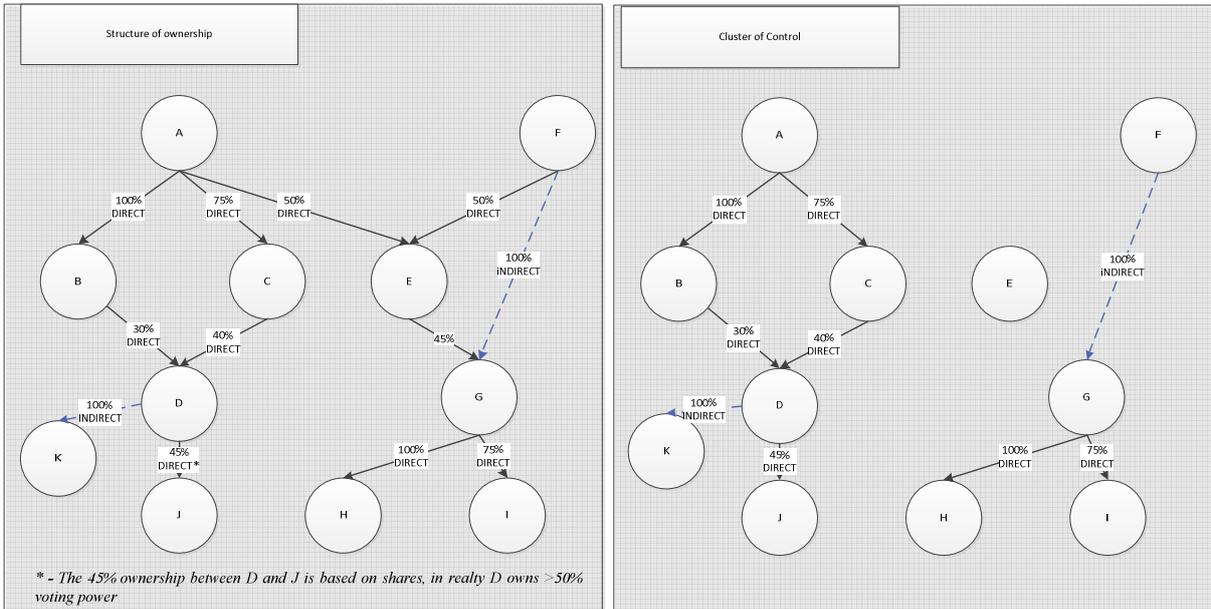


Figure 2. Structure of ownership and the Cluster of Control

Within the set of legal units at least one of the legal units has to be statistically relevant (from a financial point of view). If none of the legal units involved is statistically relevant, no active Enterprise Group can be created, since the whole group is not economically active (the group can be seen as dormant)<sup>5</sup>.

<sup>5</sup> These non-active groups can be included in the business register as dormant.

### 2.4.3 Enterprise

Delineating the Enterprises starts with the complete set of legal units which are defined in the Enterprise Group. Within this set of legal units, subsets of legal units have to be identified which will result in Enterprises.

#### 2.4.3.1 Structure of the Enterprise

Within each enterprise group at least one activity is exercised, but it is possible that more than one activity is performed. This section describes the delineation process of enterprises within this set of legal units (which result in an enterprise group).

The structure of an enterprise is delineated in the following steps.

1. Investigate the operational structure (activities) of the enterprise group

The aim of this step is to describe the organisation of the enterprise group from an operational point of view. With the operational structure is meant which are the most important activities of the enterprise group for their environment.

The operational structure of a group is often different from the administrative structure of the group. The administrative structure is designed to have financial or legal benefits. In this step it is important to discover those parts of the group which play a vital role. These parts will result in the activities of the group. The organisation chart of a group provides these insights.

For each activity the following information has to be defined:

- Internal/external flows have to be quantified. Is this activity for the majority intra group oriented?
- Degree of autonomy. Possible indications are the liberty to choose their own suppliers, decide on their own marketing, in what way they can determine the deployment of production factors. If possible determine the intra group flows, which will provide information on the dependencies between the different operations.
- In what way is this activity described? Has the company organised their bookkeeping around these operational structures?

2. Identify the activities which are externally oriented

Enterprises are externally oriented. Their products/services are meant for outside the Enterprise Group. Based on the information which was extracted in the previous step it is possible to identify the externally oriented activities.

3. Combine the activities which are externally oriented into autonomous clusters

Autonomy (in its different forms) is a key attribute of an enterprise. Autonomy only exists when to a certain degree the enterprise can make its own decisions and is not dependent on intra group entities for their survival.

For each operation it is known whether it depends on another operation. This information was gathered in a previous step. Based on this information externally oriented clusters will be combined with not externally oriented operations into autonomous clusters. If externally oriented clusters depend on (larger) not externally oriented clusters, the externally oriented operation

carries out the last part in the production process (e.g., the selling). This step ensures that the not externally oriented activities are part of one of the enterprises. This combining of activities is done when they comprise a production process. Criteria for this could be:

- a. Shared use of production factors
- b. Having the same management

The combining into one autonomous cluster is useful only if the company is able to provide relevant figures for this entity.

4. Extend these autonomous clusters with operation entities (not externally oriented) that serve only them. This concerns the allocation of operational entities of the EG that are not externally oriented and that provide products to exactly one other operational entity belonging to the autonomous cluster. Such operational entities may carry out an ancillary activity, but this is by no means necessary: they may provide an intermediate product which is processed further by the autonomous cluster or which may form part of the product of the cluster (so-called partial activities).
5. Allocate all other not externally oriented activities to the autonomous clusters. It is possible that there are still operational entities left. These are obviously not externally oriented and are by necessity oriented towards more than one autonomous cluster. The allocation of these operational entities would have to be based, in principle, on the proportion of the flows of goods and services.

The next step is not essential in the derivation of the enterprise, but is a vital step in enabling the use of administrative data. Administrative data can be aggregated to the enterprise level which results in new relevant information.

6. Link enterprises to the legal units which are part of an Enterprise Group. The result of this step is that data from administrative sources for describing enterprises can be used, by linking enterprises to legal units which consist of administrative units.

*NOTE: Enterprise Groups vary in complexity. The majority of the Enterprise Groups are relatively simple groups which can be derived in an automated way. Large complex Enterprise Groups on the other hand can be difficult to derive. These groups often have very complex legal/administrative/financial constructions which provide them the best position in the real world. The challenge is to derive the correct statistical units from this complex construction.*

*The complex Enterprise Groups require a manual approach (profiling) since automated rules which treat easy and complex constructions lead to very complex algorithms.*

*The profiling process defines the statistical units in collaboration with the Enterprise Group. This collaboration ensures that the Enterprise Group can also provide meaningful information on the statistical units which have been manually created.*

*NOTE: The derivation described above assumed that all possible information is available. In many cases this is not the case (much information is not accessible or referring to the correct unit or period) and when it is the case it is a costly process using all those data.*

*Many countries also feel the pressure of making more use of administrative data in order to lessen the administrative burden on the enterprise and also to lessen the burden on the statistical office in deriving the statistical unit.*

*A challenge with administrative data is that they provide insight in a legal/administrative world. This legal/administrative world has different purposes than describing the actual economic situation. The challenge is defining a way to interpret the legal/administrative world into a statistical world.*

*For a more detailed discussion on the challenge of using administrative data the reader is referred to the module “Data Collection – Collection and Use of Secondary Data”.*

#### 2.4.4 Local Unit

Enterprises carry out their activities at certain geographical places. The geographical information of the enterprises should be used to derive the local units.

##### 2.4.4.1 Structure of the Local Unit

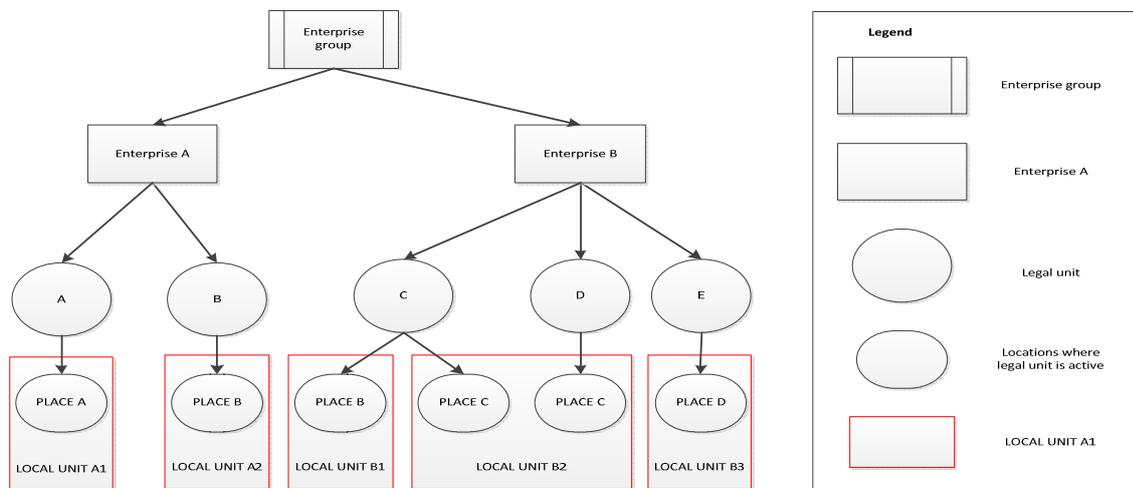
Collect all information concerning the actual locations where the enterprise carries out their activities. Keep in mind that:

- Local units should have a unique location. This location is characterised by the address, a street or a region where it is located. A rule which can be used is that at the location of the local unit products, materials could be stored.
- Local units can, as a general rule, only exist if at least one person is working at that certain location. But sometimes it consists of only a PO-Box where nobody is working.
- An enterprise can have one or more locations where activities are carried out. Therefore the enterprise can consist of more than one local unit.
- Activity of the local unit. There must be consistency between the local units figures compared to the enterprise figures. For this to be achieved it is essential that the activity code of the local unit is equal to the activity code of the enterprise to which it belongs. This can be achieved by using the activity code of the enterprise on local unit level. Each local unit has its own economic activity (code), but in order to obtain consistency between national and regional accounts, one may use the economic activity (code) of the enterprise to compile regional economic indicators.

*Example on deriving local units using legal local units:*

*One of the possible sources for geographical information on the enterprises can be derived from the legal local units. A legal local unit is a part of a legal unit that is located at a certain address. In other countries where there are no local legal units other types of information on geographical locations can be used. A legal local unit can operate in several different industries. In practice, a legal local unit is in most cases equal to the local unit. By linking these local legal units to the legal units and the enterprises the geographical activity is available for these enterprises. Local units are created within Enterprises. One important rule is that regional figures can be added up to the higher level.*

*Figure 3 shows an example how to derive these local units.*



*Figure 3. Local Units*

### 3. Design issues

### 4. Available software tools

### 5. Decision tree of methods

### 6. Glossary

For definitions of terms used in this module, please refer to the separate “Glossary” provided as part of the handbook.

## 7. References

European Union (1993), *European Parliament and the Council of the European Union [1993]: Council regulation (EEC) no 696/93 of 15 March 1993 on the statistical units for the observation and analysis of the production system in the community.*<sup>6</sup>

European Union (2008), *Regulation (EC) no 177/2008 of the European Parliament and of the Council of 20 February 2008 establishing a common framework for business registers for statistical purposes.*<sup>7</sup>

Eurostat (2010), *Business registers, recommendations manual.* Luxembourg.<sup>8</sup>

United Nations (2007), *Statistical Units.* New York.<sup>9</sup>

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<sup>6</sup> <http://eur-lex.europa.eu/lexuriserv/lexuriserv.do?uri=celex:31993r0696:en:html>

<sup>7</sup> <http://eur-lex.europa.eu/lexuriserv/lexuriserv.do?uri=oj:l:2008:061:0006:01:en:html>

<sup>8</sup> <http://ec.europa.eu/eurostat/ramon/statmanuals/files/ks-32-10-216-en-c-en.pdf>

<sup>9</sup> <http://unstats.un.org/unsd/isdts/docs/statisticalunits.pdf>

## **Interconnections with other modules**

### **8. Related themes described in other modules**

1. Statistical Registers and Frames – Main Module
2. Statistical Registers and Frames – The Populations, Frames, and Units of Business Surveys
3. Statistical Registers and Frames – Building and Maintaining Statistical Registers to Support Business Surveys
4. Statistical Registers and Frames – Survey Frames for Business Surveys
5. Statistical Registers and Frames – The Design of Statistical Registers and Survey Frames
6. Statistical Registers and Frames – The Statistical Units and the Business Register
7. Statistical Registers and Frames – Quality of Statistical Registers and Frames
8. Data Collection – Collection and Use of Secondary Data

### **9. Methods explicitly referred to in this module**

- 1.

### **10. Mathematical techniques explicitly referred to in this module**

- 1.

### **11. GSBPM phases explicitly referred to in this module**

- 1.

### **12. Tools explicitly referred to in this module**

- 1.

### **13. Process steps explicitly referred to in this module**

- 1.

## Administrative section

### 14. Module code

Derivation of Statistical Units-T-Derivation of Statistical Units

### 15. Version history

Version	Date	Description of changes	Author	Institute
0.1	22-04-2013	first version	Barry Coenen	CBS (Netherlands)
0.2	18-09-2013	second version	Barry Coenen	CBS (Netherlands)
0.3	04-11-2013	updated based on review	Barry Coenen	CBS (Netherlands)
0.4	06-01-2014	updated based on review	Barry Coenen	CBS (Netherlands)
0.5	04-02-2014	updated based on review	Barry Coenen	CBS (Netherlands)
0.5.1	06-02-2014	preliminary release		
1.0	26-03-2014	final version within the Memobust project		

### 16. Template version and print date

Template version used	1.0 p 4 d.d. 22-11-2012
Print date	21-3-2014 17:40