How to improve the quality of regional accounts estimates

Henk Nijmeijer

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Explanation of symbols

.	= data not available
*	= provisional figure
**	= revised provisional figure
x	= publication prohibited (confidential figure)
–	= nil or less than half of unit concerned
–	= (between two figures) inclusive
0 (0,0)	= less than half of unit concerned
blank	= not applicable
2010–2011	= 2010 to 2011 inclusive
2010/2011	= average of 2010 up to and including 2011
2010/'11	= crop year, financial year, school year etc. beginning in 2010 and ending in 2011
2008/'09–2010/'11	= crop year, financial year, etc. 2008/'09 to 2010/'11 inclusive

Due to rounding, some totals may not correspond with the sum of the separate figures.

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How to improve the quality of regional accounts estimates

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Abstract

In the European Union, tens of billions of euros are spent on regional policy every year. A major part of this amount is allocated on the basis of regional gross domestic product per capita. Because of the administrative use of this statistical estimate, the requirements for the quality of these figures are very strict. This quality is, however, not easy to specify by means of a confidence interval. What can be done to monitor the quality as a basis for improvement? In this paper an inventory is drawn up of recent work on the quality of regional accounts estimates. Special attention is paid to the instrument of process tables. In the last five years process tables have been developed for the national accounts (GNI Committee) as well as the regional accounts. The focus of the regional accounts process tables is on the treatment of multi-regional companies and the sources for top-down methods. The regional accounts should be compiled in close cooperation with the national accounts. The quality of the national accounts estimates and - indirectly - the regional accounts estimates, could be improved by the findings of the regional accounts compilation process.

Keywords: Regional Accounts, Quality, Accuracy, Process Tables

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1. Introduction

Regional gross value added (GVA) and the derived figure on gross domestic product (GDP) per region are the most important results of the regional accounts. Regional GVA is based on a variety of sources (surveys, administrative sources, etc.). All these sources have their own errors; sampling errors and non-sampling errors. It is quite conceivable that the final result (estimate) deviates by a few million euro from the 'real' figure. Statisticians are used to this uncertainty. For statistical use (analysis for scientifical or policy reasons), this is accepted[2]. However, things change when statistics are used for administrative purposes and a difference of a few million euro is the difference between a region receiving or not receiving hundreds of millions euro subsidy from Brussels. And this is exactly the case. GDP per capita per region (average for three years) is qualifying for the eligibility for objective 1 of the cohesion funds. The boundary is exactly 75 percent of the European average of GDP per capita at market prices (in purchasing power parities). A tremendous amount of money is involved here. In the period 2007-2013 more than 300 billion euro is available for the cohesion funds (EU, 2005). This is about 36 percent of the total budget of the EU. A considerable part of this amount will be allocated on the basis of regional GDP per capita.

Although no 'simple' confidence interval is available, this does not mean nothing can be done to gain an insight into the quality of regional accounts. As stated in the recent European Statistics Code of Practice (Eurostat, 2005): "All ESS members commit themselves to work and cooperate according to the principles fixed in the 'Quality declaration of the European Statistical System'." Quality monitoring is essential. In this paper an inventory is drawn up of recent work on the quality of regional accounts estimates (section 3), preceded by a short review of general quality aspects (section 2). A very promising development is that of the instrument of process tables. This subject is treated in section 4, with special attention for the Dutch experiences

National accountants sometimes consider regional accounts as a subject of secondary importance. After all, it's 'just' a matter of dividing the national totals of the national accounts. The financial interest has already been indicated above. What's more, national accountants should take advantage of the regional accounts. The distance between the regional accounts figures and economic reality is smaller and errors

[2] Although research in 2000 (Nijmeijer and Eding) showed that (regional) scientists are not extremely occupied with uncertainty of statistical data.

which are detected during the regional accounts production process can also improve the national accounts estimates.

The place of the regional accounts in the organisation is treated in section 3.6. Section 5 contains the conclusions and recommendations.

2. General quality aspects

2.1 Dimensions of quality

The quality declaration of the European statistical system states that "We provide the European Union and the world with high quality information on the economy and society at the European, national and regional levels and make the information available to everyone for decision-making purposes, research and debate." The definition of quality in statistics is multi-dimensional. Eurostat's definition of quality of statistics identifies the following six criteria (Eurostat, 2003):

- relevance;
- accuracy;
- timeliness and punctuality;
- accessibility and clarity;
- comparability;
- coherence.

The focus of this paper is limited to the dimensions accuracy and comparability.

2.2 Accuracy and comparability

On its own, the level of regional GDP is meaningless. It always has to be set against the national figure or the GDP for other regions in the same country or that of other regions in other countries (or a European average). For comparability reasons, it is imperative that the same concepts and definitions are applied. Furthermore, there are always arbitrary matters in specific cases (about transactions or units). Besides theoretic discussions, it is more important that all member states act in the same way.

Gross national income (GNI) is by far the most important criterion for the contribution of the member states to the European Union, the so-called own resources. It is not surprising that much attention is paid to the quality of this figure, more specifically to its accuracy and exhaustiveness. Exhaustiveness in this case refers to various additional estimates which are necessary because this information is lacking in the regular statistics (the underground economy for instance). Accuracy

refers to the closeness of the estimated value to the (unknown) true value that the statistics were intended to measure (Carson and Laliberté, 2002). Because of the tremendous financial interest, the European Court of Auditors monitor conscientiously the assessment of the quality of the GNI estimates. The European Court of Auditors has asked the GNI Committee several times to investigate the possibility of measuring the accuracy of GNI (at that time GNP) by means of confidence intervals. In their final report, a task force of the GNI Committee on this subject concludes that the calculation of objective confidence intervals is not yet possible. Confidence intervals only cover errors associated with probability sampling. Errors associated with non-probability sampling and non-sampling errors are very difficult if not impossible to quantify and nothing guarantees that sampling errors associated with probability sampling make up the major part of total errors (Eurostat, 2001).

Completely in line with nearly simultaneous developments in the field of quality research at the IMF (development of the Data Quality Assessment Framework, see Bloem and Khawaja, 2001 and Carson, 2001) and the Leadership Group (LEG) on Quality (Eurostat, 2001), the above-mentioned task force proposed that the focus be shifted from the statistical product (the GNI estimate) to the process of compiling national accounts. More simply: good source data, the right definitions and classifications, high quality staff and sound techniques and methods guarantee a good product. The key word in judging the process is transparency (see also: Nijmeijer and Hiemstra, 2004). National accountants have to show and justify which figures are used and which adjustments are made. For this purpose a tool has been developed: the process table. In this table the quantitative dimension of the successive steps in the GNI compilation process are shown. Process tables are discussed in greater detail in section 4.

What has been stated above is unquestionably also applicable to regional accounts. For regional GDP too, it is impossible to calculate a ‘simple’ confidence interval. Below the possibilities to improve the quality of the process of compiling regional accounts are discussed.

3. Specific quality aspects of regional accounts estimates

3.1 Introduction

In the period 2001-2005 a major quality project on regional statistics was initiated by Eurostat. The project was led by Statistics Netherlands and encompassed the following subjects: regional GVA, gross fixed capital formation (GFCF) and employment; regional population; regional unemployment. Country reports were compiled (EU15, later increased with eight new member states, and Bulgaria and Romania) and summary quality reports. The final report (De Vet, 2005) was presented at the Working Party on Regional and Urban Statistics on 19 October 2005.

Some specific conclusions concerning regional GVA:

- Quantitative information about non-response, coverage of units and the testing of assumptions is missing for a large number of countries. However, these topics are very relevant for a correct allocation of value added to the regions;
- A comparison with alternative compilation methods has not been done by any country.

Some major recommendations:

- Quality reviews should be part of a regular work programme. Occasional projects on this subject do not always receive the desired priority;
- A detailed methodology (inventory) should be part of the quality reviews;
- Process tables should become an integral part of the compilation process;
- Install a task force for the further development and implementation of the process.

The recommended task force ('on quality monitoring of regional accounts') was installed and first met on 23 September 2005. It has been agreed to limit the activities of the task force to regional GVA (in current prices). The focus is on the lay-out of a regional accounts process table and the requirements for an inventory on the compilation of regional GVA. The task force intends to finish its activities in the summer of 2006.

3.2 Concepts

For comparability reasons it is essential that sound agreements are made for issues such as the classification of regions and industries. These are laid down in a number

of regulations: NACE Rev.1 (Council Regulation no. 3037/90) determines the industry classification; NUTS (European Parliament and Council Regulation no. 1059/2003) divides the EU territory into a hierarchical structure of territorial units.

The System of National Accounts 1993 (SNA 1993) touches briefly on regional accounts (chapter XIX, par. 19.88-19.96). In the update of the SNA, which is currently being prepared, regional accounts is not a 'topic'. The European variant of the SNA, the European System of Accounts 1995 (ESA 1995) devotes a chapter to the subject of the regional accounts: chapter 13. Besides this chapter in the ESA 1995 there is a manual on the compilation of regional GVA and GFCF (Eurostat, 1995). This is a rather non-committal text containing among other things suggestions about sources and methods to treat multi-regional units. Following the update of the SNA, a new version of the ESA will be drawn up. Despite the fact that the new (or updated) SNA will not change drastically with respect to the regional accounts, the new ESA chapter on regional accounts should be extended for reasons of accuracy.

There are two more reasons to give extra attention to conceptual issues concerning regional accounts in the new ESA. Firstly the ongoing globalisation and European integration, and secondly changes in economic reality caused by a variety of technical developments. The impact of both developments on the regional accounts is substantial but goes further than the regional accounts. The concept of residential units is essential in ESA 1995 (Par. 2.04). The corresponding economic territory is described as: "the geographic territory administered by a good government within which persons, goods, services and capital move freely". Was this not precisely one of the main targets of the European Union? What was always a problem for the regional accounts, i.e. the absence of a delimited economy, now goes for the member states of the European Union too. If the national accounts of the member states shift more and more in the direction of regional accounts of Europe, then perhaps national accountants could learn something from the experiences of regional accountants with multi-regional units, for example. Anyway, besides conceptual problems, it is about good sources. To make meaningful national accounts, nations must be 'describable', analogous to the requirements of data availability of units in SNA and ESA.

In addition to the European integration, there is in general an increased development of globalisation. Within one enterprise, goods and services can be transported across borders. Apart from conceptual problems (e.g. the lack of market prices for internal transactions), the practical issue is whether national statistical institutes (NSIs) are able to collect the data needed to compile national accounts. See also the paper 'Globalisation and the Effect on National Accounts: Practical Issues' (Van Stokrom et al, 2006).

Lastly, changes of the economic reality caused by (or made possible by) technical developments, whether or not in combination with the development of internationalisation: are the current concepts geared to the economic reality of the

21st century? We only have to think of everyday occurrences such as on-line sales and help-desk services by call centres in a completely different country, etc. Are the traditional concepts of resident units and economic territory still valid today?

3.3 Framework

The regional accounts cannot be regarded as national accounts in miniature. The regional economy is not delimited and on a regional level, there is no compilation of a complete framework of sector accounts. Furthermore, regional GVA is only calculated in current prices. In most countries changes in constant prices (economic growth) are calculated afterwards. Regional price differences (or better: differences in price changes) are supposed to be lacking within an industry. In most countries only a limited generation of income account and sometimes a production account of the total economy is compiled per region. The following variables on a regional level are compulsory (EU, 1996) for Eurostat: GVA, compensation of employees, GFCF and employment. Except for a limited primary and secondary distribution of income account of the sector households, no sector accounts are requested. Yearly regional input-output tables, not to mention regional supply and use tables, are very rare. Apart from other problems, the absence of data on interregional trade is the biggest bottleneck. Because of the lack of a complete accounting framework, there is no consistency check by means of balancing items. So determining regional GVA is actually an issue of division (of the national accounts totals). Besides sound sources and methods (see the next section), the appropriate level of compilation is of the utmost importance. Although regional GVA is compulsory at the level of NACE A3 x NUTS 3 and at the level of NACE A17 x NUTS 2, in all member states the figures are compiled in much greater detail. In the Netherlands the regional accounts are compiled for 52 regions, which is slightly more detailed than the NUTS 3 level, and for 118 industries. For confidentiality reasons, dissemination at this level is out of the question, but for the quality of the resulting totals, a sufficient detailed level of compilation is essential. Differences per industry (GVA per employee, for instance) are extremely large. Dividing national figures on a aggregation level which is too high, results in poor quality regional estimates. Of course there is always a limit to the capacity (budget). In the Netherlands the 118 industries of the regional accounts are also used for the compilation of provisional years and for quarterly accounts estimates. The final national accounts are compiled at the level of some 250 industries.

Although the regional accounts are not compiled with a complete accounting framework, for the labour accounts this is being considered. Several relevant sources for the labour accounts are already available (labour force, employment, unemployment, commuting, etc.) and the demand for regional data on labour is increasing. It is expected that in the near future regional data on hours worked will become compulsory. The background of this extension is of course the improvement

of figures on labour productivity (also in the perspective of the Lisbon objectives). Besides the interest of good and consistent labour data, there is a derived interest for the quality of regional GVA via the most important component of GVA: compensation of employees. In the course of 2006, Statistics Netherlands will examine whether and how it will compile regional labour accounts.

3.4 Sources and methods

Regional accounts start with the national figures of national accounts, full stop. Whatever the quality of these national totals, the sum of the regional figures must equal the national accounts figure. Obviously imperfections in the national accounts figures have a negative effect on the quality of the regional accounts figures. So, improvement of the accuracy of national accounts estimates also improves the accuracy of regional accounts estimates. See section 3.6 for more details.

In an ideal situation, regional accounts and national accounts make use of the same sources. In many cases, however, surveys conducted for national purposes are not suitable for regional uses. To reduce the so-called administrative burden of companies, more and more use is being made of administrative data. Although this does have disadvantages, as these data are collected for non-statistical purposes, and hence the underlying definitions are not under the direct control of statisticians, the use of administrative data offers great possibilities for regional purposes. Unlike survey data, administrative data give an integral overview of all elements. In the past, hardware and software limitations restricted the size of the files but that time is now behind us. There is still one big issue: irrespective of the source of the data, there is always the problem of multi-regional units. Fiscal authorities are not interested, at least not in the Netherlands, in information per establishment. If the unit concerned is a kind of activity unit as desired according to ESA 1995, the information should be split up between the regions where this unit has establishments. For this purpose, additional information is needed, from own surveys or administrative sources. ESA 1995 (par.13.15) distinguishes three methods of regionalisation: bottom-up methods, top-down methods and mixed methods.

The bottom-up methods of estimation involve the use of information on units resident in the region. The regional values must add up to the corresponding national value. In practice this never happens. There are always differences for instance as a result of integration adjustments. These differences are subsequently divided proportionally. Of course the difference between the sum of the regional figures and the national total should be monitored closely (see section 4).

Top-down methods involve the distribution of a national figure among regions, without attempting to single out resident units, by means of a distribution key which reflects as closely as possible the feature to be estimated. For the accuracy of the outcome, two elements are important, the appropriate level of detail and the validity

of the distribution key. The importance of a sufficiently detailed approach has already been emphasised in section 3.3. The validity of the distribution key should be examined thoroughly. GVA of an industry with a substantial share of self-employed persons should not, for instance, be divided top-down with the numbers of jobs of employees of that particular industry.

Lastly, the mixed methods. Bottom-up methods are rarely encountered in their pure form. Often a mixed method is applied because of the sources. GVA of regional units (non multi-regional units) is available for bottom-up use, GVA of multi-regional units has to be split up between the regions concerned, using a distribution key. In most cases jobs or compensation of employees is available for this purpose.

Special attention is required for the treatment (in case of top-down or mixed methods) of multi-regional units in the case of separate head offices and of capital intensive industries. The average wage level in head offices is usually higher than in production locations, and this should be accounted for in the regional GVA. In the case of capital intensive industries, like oil refineries, the region where the production plant is situated should be allocated a larger part of total GVA. Compensation of employees generally accounts for a major part of GVA. In the case of capital intensive industries, consumption of fixed capital may also form a substantial part of GVA. Knowledge of the nature of the establishments of the different industries is indispensable for high quality regional accounts.

3.5 Transparency

The work of national accountants is sometimes referred to as ‘voodoo’ or, more mildly, ‘black box’. It is time to open the black box. The resulting transparency serves several purposes: giving account to the users of the statistics in general, and to Eurostat in particular, but particularly improving accuracy. Not only will things become clearer for the accountants themselves, but transparency also offers possibilities for audits of colleagues. Errors and inconsistencies will become evident sooner, and colleagues will have the opportunity to suggest improvements for sources or methods. Two instruments are available for transparency purposes: documentation and process tables. Process tables are in fact a specific case of documentation; they are discussed further in section 4.

The Gross National Income Inventory of the member states is part of an assessment procedure laid down in the so-called GNI regulation. No such regulation exists for regional GDP or GVA. In the above-mentioned task force on quality monitoring of regional accounts, arrangements have been made for a regional GVA inventory on a voluntary basis. It is not very useful to repeat the work of the GNI inventory. The focus of a regional GVA inventory should be on sources and methods to compile regional figures, especially the validity of the proxy indicators used. Which assumptions (‘model’) are applied and how is the validity of the indicator examined.

An additional advantage of the compilation of a regional GVA inventory is that regional accountants of different member states can learn from each other by way of the inventory. Just as in the case of the GNI inventory, it is not useful to compile an inventory every year. Normally sources and methods hardly change between two major revisions. Occasional changes between two major revisions could be reported to Eurostat by means of a quality report accompanying the figures.

3.6 Organisation

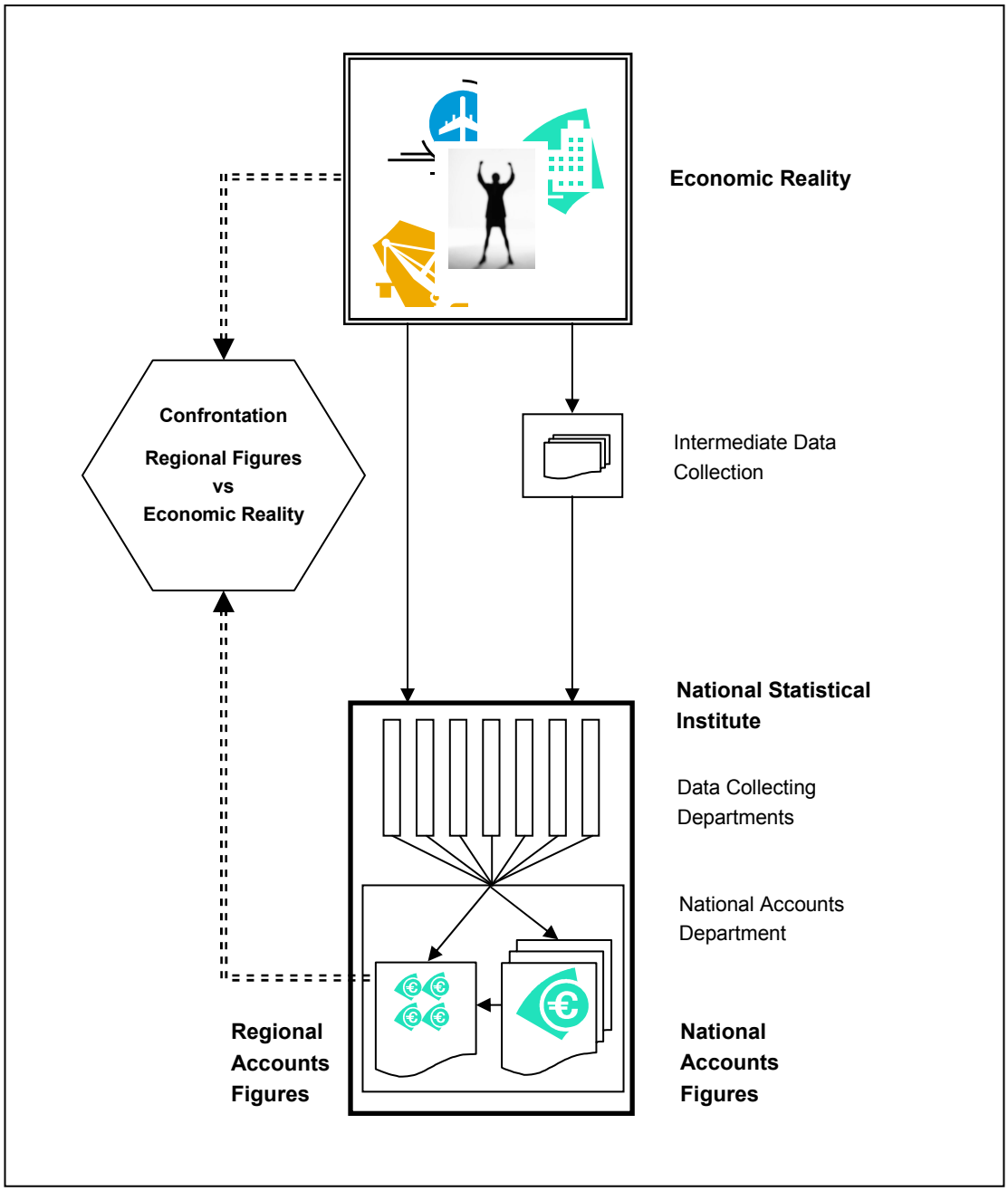
In most countries, systems for the production of national and regional accounts are largely separate processes. Regional accounts are based on an ex post allocation of national totals to regions. See also Allsopp (2003, p.59). Before discussing possible improvements it is good to realise that compilation of regional accounts at the national statistical institutes is already of major importance. The same concepts, definitions and sources are used for all regional estimates. Compilation of regional accounts by several institutions (private institutes, local authorities, universities) undoubtedly results in regional figures that do not add up to the national accounts totals. What's more, there is a possibility that regional institutions are not fully independent. Local interests could get involved.

Although there is intensive cooperation for the collection of sources from data collecting departments, in the Netherlands, too, the production processes of the regional and national accounts could be integrated further. One of the main results of the national accounts, GVA per industry, is actually the starting point of the regional accounts calculations and analyses. During the compilation process of the regional accounts, errors are sometimes detected in the source files. If this is a source also used for the national accounts, the error is also incorporated in the national figures. Unfortunately this cannot be corrected because in most cases the year concerned has been 'closed'. It is not surprising that these errors are detected during the regional accounts production process. Splitting up an industry into 52 parts (regions) implies that changes are magnified. What looks plausible in the national figures (a change of 8 percent for instance), turns out to be the weighted average of three changes on the regional level of 4, 20 and 2 percent. Closer examination shows possibly that the 20 percent change is not correct. Section 4 goes more deeply into the procedure. To be perfectly clear, this is not a plea to redo the work of the data collecting departments within Statistics Netherlands. The quality of the data is their responsibility in the first place but national (and regional) accountants should be able to verify the information on the level of individual units, especially in case of large companies.

Because of the 'recognisability' of the results, regional accounts estimates have to meet stringent requirements. To put it in black-and-white: with respect to the national accounts estimates, no one knows best; with respect to the regional accounts estimates, everyone knows best. The levels or changes of the national accounts

figures are abstract in a sense. The amounts (hundreds of billion euro) are beyond the imagination of ordinary people. The amounts in the regional accounts are much smaller and what is more important, only a few companies are involved. People who know the region can hold the regional accounts figures 'against the light'. Figure 1. illustrates the situation.

Figure 1. Economic reality, national and regional accounts



For accuracy reasons national and regional accounts should work together more closely. Errors detected during the compilation process of the regional accounts should increase the quality of the national accounts estimates. A higher quality of the national accounts estimates also improves the regional accounts figures. In this context, a plea is made in favour of holding the so- called micro-macro link as long as possible during the national accounts compilation process. Of course, the link with the micro data must be cut through during the integration process. Balancing adjustments are made on the level of industries, not of individual companies. But right up to the integration process the large units in particular should stay in the files as separate records. If the quality of the data of these large companies (micro) is not good, the resulting estimates (macro) will not be good either. The 'gigo-principle' is still valid: garbage in – garbage out. The link with the regional accounts offers an opportunity to increase the accuracy. The same goes for the link between national accounts production and generation of income accounts (supply and use tables) on the one hand, and labour accounts on the other hand. A closer cooperation between national and regional accounts will probably result in a certain efficiency benefit, which is a welcome bonus, but the original target is to improve the quality (accuracy) of the estimates.

This is explicitly not a plea to integrate the regional accounts completely in the national accounts production process. Closer cooperation, yes; but the expertise on methods to regionalise and, for instance, the extra-regio should be maintained together in one part of the organisation.

4. Process tables

4.1 Background / introduction

For the national accounts a process table was developed as a consequence of the research into the possibilities to measure the accuracy of GNI by means of a confidence interval. After a pilot with ten member states, the GNI Committee agreed that the national process table will be an integral part of the (already very elaborate) GNI inventory. An extensive compilation guide has been compiled for the process table as well as for the GNI inventory (Eurostat, 2005b en Eurostat, 2005c). Figure 2 shows how the GNI process table is organised. Vertically the table consists of three blocks: Basis for NA figures, Adjustments and the Final NA figures. The basis for NA Figures is sub-divided into:

- Surveys and censuses (1);
- Administrative records (2);
- Combined data (3);
- Extrapolations and models (4);
- Other source data (5).

The adjustments are subdivided into:

- Data validation adjustments (6);
- Conceptual adjustments (7);
- Cut-off adjustments (8);
- Exhaustiveness adjustments (9);
- Balancing adjustments (10).

Figure 2. GNI Process table

	Basis for NA figures					Adjustments					Final NA figures
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	
Production approach											
Expenditure approach											
Income approach											
Gross Domestic Product											
Transition GDP ⇒ GNI											
Gross National Income											

On the rows the three measures to compile GDP and the transition from GDP to GNI are displayed. The production measure section is based on the NACE A17 breakdown of economic activities. Within each category a distinction is made between output, intermediate consumption and gross value added. The expenditure measure section contains lines for the standard components (household final consumption expenditure broken down at the COICOP 1-digit level, etc.). The income measure section, lastly, distinguishes compensation of employees, gross operating surplus and mixed income, and taxes and subsidies on production and imports.

The national process table is actually a condensed quantitative overview of the inventory. To be clear, so far the process table does not contain information on the quality (accuracy) of the sources or adjustments. During the pilot, the member states and Eurostat experienced the process table as a welcome supplement to the GNI inventory for the assessment procedure. Filling in the table was rather time consuming. The required data are not available ready-made (at the right level of detail). Now the decision has been taken to compile a process table every revision period, the objective should be to produce the required figures automatically by the production systems in use for the national accounts. An important conclusion of the pilot was that the process table in itself is not a quality table. It gives a condensed

and structured quantitative description of the GNI compilation process. No more and no less (Nijmeijer, 2003). Another conclusion within Statistics Netherlands was that a process table, but at a more detailed level, can be an important management tool. The table gives a structured representation of the sources used and the activities of the national accounts department (the adjustments). An extensive process table can help to determine priorities and to point out white spaces.

4.2 Regional process tables EU

Simultaneously with but independently from the compilation of the process table for GNI, the Dutch regional accounts department was working on a variant of a process table (De Vet, 2002). This process table was used for the big Eurostat regional quality project. During the discussions in the meetings of the task force on quality monitoring of regional accounts, the general feeling was that this process table was too elaborate. The workload was considered much too high. At the same time everyone thought it was an excellent tool. At the last task force meeting, a simplified version of the regional accounts process table was agreed on. Annex 1 shows this version. The table is meant for figures per industry (NACE A17) for the regional NUTS 2 level. The figures are aggregated, the regional figures are not shown separately. The focus of the regional accounts process table (or 'Regional GVA compilation table') is of course on the sources and methods used to regionalise the national accounts totals. Besides the totals (per industry) there are three blocks:

- Data from surveys (bottom-up);
- Data from surveys broken down from national figures (top-down);
- Data from administrative sources.

The essential feature is the split between mono-regional and multi-regional data. The first test results are promising. For a good understanding of, for instance, the differences between member states, it is necessary that the inventory contains elaborate explanations on these issues. The regional process table should be an integral part of the regional GVA inventory, just as the GNI process table.

The regional process table gives a structured insight into the sources and methods used. Because of the large differences in sources between member states, a clear compilation guide is indispensable, not so much for profound discussions but to have a quick guide at hand for the person who fills in the table. This is important for maximum comparability. For the national process table, too, a compilation guide is available (Eurostat, 2005c).

The regional accounts process table, combined with a regional GVA inventory, can become an important tool for the assessment of the quality of regional accounts estimates. Apart from the table as presented to Eurostat, the regional accounts

process table could fulfil an important function within the national statistical institutes. In the next section the Dutch experiences will be discussed.

4.3 Regional process tables; Dutch experiences

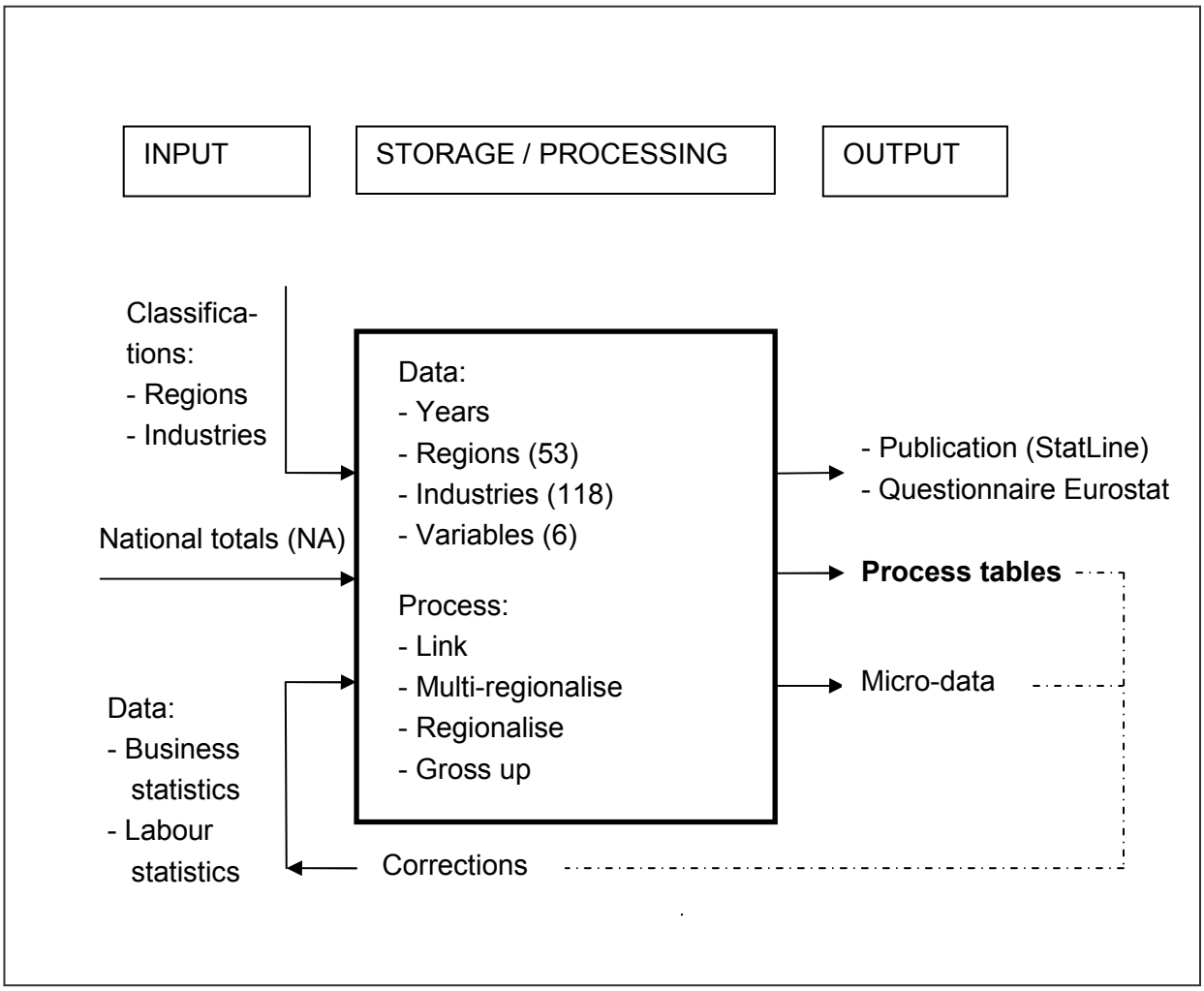
Regional GVA for the Netherlands is compiled and analysed for 52 regions (plus the extra-regio). These regions can be aggregated to the 40 NUTS 3 regions and the 12 NUTS 2 regions.

The industry level which is applied is that of 118 industry groups. These groups can be aggregated to the requested NACE A17 level.

About two-thirds of the 118 industries are compiled in the following way (see figure 3 for a diagram of the Dutch regional accounts production process):

Information on production and intermediate consumption (and other variables) is derived from the Structural Business Statistics (SBS) survey on the level of individual kind-of-activity-units (for units with 20 employees and more in general). If a unit has only one establishment or various establishments within one region, the information is assigned to this region. If, on the other hand, a unit has establishments in different regions, the information is divided over these regions, usually by the number of employees. The number of employees per region originates from the yearly survey on jobs and wages. So these two sources are linked on the level of individual units. For the smaller companies, a regional estimate of production and intermediate consumption is made by combining survey results and the total number of jobs per region. The figures calculated in this way are aggregated per industry and compared with the national total from the national accounts.

Figure 3. Dutch Regional Accounts Production Process



For each industry compiled as described above, since 2003 a process table has automatically been filled in ('by one press on the button'). This process table, with a lay-out that is more or less the same as the table in annex 1, but with data per region, also shows information on the distinction between response/ non-response in the SBS survey.

The process table currently used in the Netherlands shows amounts of the following items per region and industry group:

- Regional (individual units SBS, mono-regional);
- Multi-regional (individual units SBS, split up by number of jobs);
- Estimate small companies (aggregated SBS data, combined with the number of jobs);
- Alignment to national accounts total;

- Total.

In addition to this information, the process table shows a number of relevant ratios (again per region and industry group):

- Value added per employee;
- Compensation of employees per employee;
- Production per employee;
- Intermediate consumption per production.

Besides the process tables, but actually they can be considered as part of the process tables, the regional accounts production system produces so-called confrontation tables. These tables show the figures (per region and industry group) for every variable (production, intermediate consumption, gross value added, compensation of employees, operating surplus and number of employees) for a number of years. The figures are displayed in three ways: levels, absolute changes, relative changes.

Plausibility checks are applied to this information:

- plausible regional distribution;
- size of changes (year-on-year, absolute and relative) compared to changes of national totals;
- can major (regional) economic events be recognised (big strikes, break-out of swine fever, etc.);
- size of the 'gap' between regional estimates and national total;
- size of deviations in above-mentioned ratios (compared to national accounts ratios);
- Consistency: e.g. does production increase while the labour force decreases?

Figures which are considered not plausible are examined more closely, under the motto: explain or adjust. It is absolutely out of the question to 'smooth' the figures without reason. Economic reality can be volatile; large changes may occur but they must be explained. Closer examination means in practice a closer look at the micro data. If errors are found, adjustments are made and the new estimates are processed and of course new process tables are made. The adjustments are shown in a separate column of the process table. Explanations of correct (but volatile) figures are laid down in so-called technical production reports, which, together with the final process tables, form a documentation set. This documentation is very useful for answering questions about specific (volatile) figures, and also turned out to be very useful during the compilation process one year later. Good documentation is also indispensable for continuity in the case of staff changes.

Explanations of deviating figures that turned out to be correct, mostly concern closures or removals of companies or establishments. Corrections are often connected with economic dynamics (mergers, splitting up of companies, etc.) that are not recorded (or not recorded in time) in the sources. Because the national accounts, too, are to an important extent based on SBS data, information on major adjustments is communicated to the national accountants concerned. Often the reporting year of the national accounts has already been 'closed' at that time. If that is the case, these corrections cannot be incorporated in the national figures. Mostly the impact on the national figures is limited. This is not true for the regional accounts. While a company can have a national share within an industry of only a few percent, on a regional level this may easily be 20 or 30 percent. Still the regional accounts have to fit the national accounts figures exactly. In practice this can lead to constraints.

Case: Regional accounts findings, national accounts adjustment

During the production process of the regional accounts, the figures on this industry (group) in one region deviated strongly. More detailed research showed that one specific company was responsible for these deviating figures. Gross value added per employee, for instance, was extremely high. The company concerned was part of a multinational enterprise which produces hardware and software and supports computer networks. The central sales office for Europe is established in the Netherlands, while assembly plants are located abroad.
Consultation with the national accounts experts showed that the aggregated national figures for this industry had been accepted initially. Further research revealed that the Dutch establishment accounted for the total turnover but that the expenses were partially underrated. After thorough discussions, the national figures of this company were adjusted. Fortunately, in this case the national figures had not yet been 'closed', so there was an opportunity to improve the national accounts figures with the findings of the regional accounts production process. The impact of the adjustment on the quality of the national figures was not negligible, the impact on the regional figures was considerable.

Closer cooperation of the national and regional accounts production process could have major advantages. Apart from efficiency gains, as a result the quality of the national accounts but certainly the quality of the regional accounts could be improved. Because of the multi-regional units, regional accounts (of good quality) cannot be compiled otherwise than on the level of individual units. If information (on imperfections) on this level is available, it should be used.

There is already close cooperation between the national and the regional accounts concerning the source data. Some years ago this was not yet the case and this situation not only caused duplications, but differences between the sources always remained. The next step is to work together on the assessment of the data used. Another possible improvement is the communication/documentation concerning major adjustments in the national accounts. These adjustments sometimes contain a regional dimension.

Apart from the function of detecting errors in the data used and the function of documentation, the (final) regional accounts process tables can also serve as an information source for management purposes. Priorities for the assignment of (always limited) capacity can partly be based on the information in a process table: the share of each part is shown in one condensed overview. Another aspect is the recognition of weak spots and white spaces for the compilation of regional accounts. For which industries are (recommended) bottom-up data available, which groups are compiled top-down. This information can be used as input for discussions with representatives of the data collecting departments within Statistics Netherlands.

Lastly, the use of regional process tables for purposes of analysis. A regional accounts process table shows which part of regional GVA and, for instance, employment belongs to multi-regional units. This gives information on the degree to which the region concerned is ‘interwoven’ with the rest of the economy. This is interesting information for regional economic policy-makers.

5. Conclusions and recommendations

Because of the administrative use of regional accounts estimates for the eligibility for objective 1 of the structural funds, the requirements for the accuracy of regional GVA are high. Apart from this specific purpose, European statisticians should comply with the quality commitment as recently laid down in the European Statistics Code of Practice.

Regarding the concepts, it is important that during the forthcoming update of the European System of Accounts, the regional accounts chapter is reviewed thoroughly, if only to incorporate the consequences of European integration, globalisation and the changes of the economic reality caused by technical developments.

Regional accounts (in most countries) are not compiled using a complete framework like national accounts. It is important that compilation and analysis is done on a sufficiently detailed level.

Partly because of the increased interest in regional labour productivity, Statistics Netherlands will investigate the development of a regional labour accounts framework.

Although it is not possible to indicate the accuracy of regional GVA with a simple margin of confidence, there are several possibilities to improve accuracy and comparability.

A regional GVA inventory and a regional process table ('Regional GVA compilation table') are excellent means to increase transparency.

A regional GVA inventory should aim especially at sources and methods used to regionalise national totals.

A regional accounts process table can serve several purposes. Besides giving account to Eurostat within the scope of a quality assessment, a (detailed) process table is perfectly suitable for plausibility checks. If accuracy is interpreted as the absence of (big) errors, then the process table is a perfect tool to improve accuracy. Experiences at Statistics Netherlands in the last three years are very positive. About two-thirds of the 118 industries concerned are checked by means of a process table. For the remaining industry groups a process table has yet to be designed.

Besides process tables, in the Dutch regional accounts production processs, confrontation tables and technical production reports are drawn up. Also concerning these tools, the experiences at Statistics Netherlands are very positive.

The completely automatic compilation of process tables (and confronatation tables) is an absolute condition. Compilation ad hoc is much too time consuming.

Because the plausibility check takes place at the level of regions (52) x industries (118), it is not surprising that errors are detected which remain concealed in the national accounts compilation process. For the quality of national accounts estimates as well as regional accounts estimates, it would be good if adjustments could be processed in a coordinated way. For this reason the two production processes should be geared to each other. This endorses one of the most important recommendations of the UK Review of statistics for economic policy-making (Allsopp, 2003 and 2004, recommendation 9).

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Annex 1.

Regional GVA Compilation Table

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Gross Value added / Output / Intermediate consumption by NUTS2 region														
Industries A 17	Source for reference period T												Alignment to National Accounts	Total
	GVA data from surveys **(bottom-up)**					GVA survey data broken down from national figures **(top-down)**		Data from administrative sources				Sub-total		
	Exhaustive coverage		sample data		Data based on extra-polations	Closely related indicator, like the share of number of jobs per region	Data based on extra-polations and/or less related indicators	GVA of mono-regional units	GVA of multi regional units	Closely related indicator, like the share of number of jobs per region	Adjust-ment			
	mono-regional	multi-regional	mono-regional	multi-regional										
1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*
A P														
A to P														