Distr.
GENERAL

CES/AC.68/2004/6
6 April 2004

ENGLISH ONLY

STATISTICAL COMMISSION and ECONOMIC COMMISSION FOR EUROPE

ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT (OECD)

CONFERENCE OF EUROPEAN STATISTICIANS

COMMISSION OF THE EUROPEAN COMMUNITIES (EUROSTAT)

Joint UNECE/Eurostat/OECD Meeting on National Accounts
(Geneva, 28-30 April 2004)

NORWEGIAN EXPERIENCES ON TREATMENT OF CHANGES IN METHODOLOGIES AND CLASSIFICATIONS WHEN COMPILING LONG TIME SERIES OF NATIONAL ACCOUNTS

Paper submitted by Statistics Norway[1]

ESTABLISHING NA LONG TIME SERIES IN NORWAY

Demand for long time series

1. The Norwegian System of National Accounts (NNA) has a long tradition compared with most other countries. In this article, however, it is not the long history of national accounts that is the topic to be reviewed, but the long time series of national accounts instead. This goes right into the main uses of national accounts, as the development of a total economy over time is one of four main categories of uses mentioned in the opening section of ESA95 (see paragraph 1.03 on Framework for analysis and policy). The other three categories mentioned are the structure of a total economy, specific parts or aspects of a total economy, and a total economy in relation to other total economies.

2. Analysis of a total economy over time, whatever the horizon may be (either short on seasonal patterns and most recent development trends, or growth rates analysed over a longer perspective), has always been at the centre of interest in national accounts (NA) compilation.

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When referring to long time series of NA, we probably conceive this to mean at least two decades of NA time series, which in most instances usually falls outside the time scope when publishing NA estimates. Therefore, the topic of long time series deserves special attention.

3. Why is that? Of course, there are demands directed at NA compilers. Nationally (while also internationally), there are strong demands by researchers for long NA time series - both annually and quarterly - on which to base their econometric and similar types of macroeconomic analysis. Analysing NA data may not necessarily be confined to the main NA aggregates. More often, econometric studies of this kind use disaggregated NA data (for instance, related to certain areas like household consumption or gross capital formation). However, there are also long-time structural needs defined in economic modelling as well. Internationally, organisations like Eurostat and OECD demand long time series for international reporting, such as providing the main NA aggregates more than 30 years back to 1970. Providing NA databases in such a way for various international needs may seem self-evident and need not be elaborated here.

4. At the level of data compilers, there is good reason to emphasise another interesting feature. In the NSIs - at least in Statistics Norway - the NA unit is the only statistical environment that is totally dedicated to the phenomenon of time series in the meaning of consistency through time. This is important to bear in mind, as there is usually more work to establishing long time series than merely organising statistical inputs to be applied for NA outputs. Most often, this additional work includes adjusting input data for NA compliance, consistency in various respects, and meeting the quality requirements set.

Long time series and revision strategy

5. In discussing long time series of NA, compilers find this issue closely connected to revisions of NA estimates. Therefore, some words about revision strategy are needed here. Most countries - or should we say all countries - are concerned that long time series cannot just be constructed from extending existing time series year by year. There is more to it: definitions, classifications and other principles are to be changed from time to time, when the international community decides, and methodology may be changed, when either the NSIs or international organisations find it necessary. And, in referring to the treatment of basic statistics as pointed out above, sufficient resources are normally not available to ensure consistency in time on an annual working basis. Therefore, ad hoc revisions are required.

6. National accounts are compiled in different versions: annual aggregated accounts are normally compiled in three consecutive provisional versions (in 2003 and 2004, two such versions only) and a final one, and occasionally a main revision later on. Following the establishing of modern national accounts some 50 years ago, there have been four more main revisions in Norway; revised estimates have been initially published in 1962, 1973, 1995 and 2002. In the context of this article, it is the main revisions that call for interest; the preceding revisions are not reviewed here as they are merely routine revisions for updating estimates of the most recent years as more relevant and reliable information become available for NA use.

7. Main revisions in Norway have been relatively few - a lesson for the future should be to have such revisions more often (see further on). The five main revisions mentioned have either involved new principles (definitional changes) - the initial one in 1952, the third in 1973 (implementing SNA68) and the fourth in 1995 (implementing SNA93/ESA95) - or basically

non-definitional revisions - the second one in 1962 and the latest in 2002. Norwegian experiences on treating changes in methodologies and classifications when compiling long time series of national accounts (as the title suggests), therefore should concentrate on what happened in the 1995 and 1973 main revisions. While the 1995 experience (and the related work that followed afterwards for some few years) will have a main focus here, we should refrain from going into details as regards the 1973 experience (since it is such a long time ago) and rather refer, although summarised, to the most recent non-definitional main revision in 2002. In fact, the 2002 revision was not entirely non-definitional, and in particular it brought about several classification changes into the present NNA.

Timing the main revision work

8. Norwegian experiences in timing the main revision work have followed a more or less common pattern in recent decades. Backward compilation has been performed in two or more steps, while chaining estimates of the sub-periods into one. Compilers are offered some delay between the first and second wave in this respect. Usually the second wave is performed in the same way as the first wave, i.e. Statistics Norway has followed the same detailed procedure in both instances. If a third wave occurs, as in the SNA68 implementation, it is conceived in a more summarised way (more aggregated level). The third wave of the SNA93/ESA95, for the 1970s, was however carried out in full details (specifications as ordinary final annual accounts), but still there was an adaptation for using - at least partly and more so further back in time - the methodology of annual changes (value indices) rather than direct absolute levels.

9. The normal timing pattern has been to choose a benchmark year from which to carry a first wave compilation forward in time, and from which to carry a second wave compilation backward in time. It should be noted, however, that 'benchmark year' and 'benchmarking' here mean something different from the usual comprehension of benchmarks and extrapolations. Here in the NNA, the role of benchmarks and extrapolations is quite limited: it has been convenient and useful to establish revised levels for the NNA estimates for a benchmark year in the first place, selecting a year that is "normal" (avoiding a year of extraordinary events), and in particular with the best scope for possible uses of sources available. In the ESA1995 implementation, the year 1988 played such a role (not in all respects, however, as working back from benchmark 1991 was a better strategy for part of the institutional sector accounts) and the year 1998 had the same sort of benchmark role in the 2002 main revision. But given that annual sources are available, the role of extrapolations is restricted to the main revision process only and not to sources. It means that new levels initially obtained for the benchmark year are extrapolated to other years in the sense that revised time series are being established, normally from the same quality of sources that have been introduced for the benchmark year.

10. Below, benchmarks and periods of forward and backward revision are illustrated for each of the main revisions. Most recent forward estimates are quarterly estimates, while third wave-backward is more summarised than is the second wave-backward.

Main revision	Benchmark	First wave - forward	Second wave - backward	Third wave
1973	1967	1967-1972	1967-1962 (in 1979)	1962-1949 (1981)
1995	1988	1988-1994	1988-1978 (in 1997)	1978-1970

				(2003)
2002	1998	1998-2001	1998-1990 (in 2002, too)	

The NA estimates referred to always include both current and constant-price estimates.

Organising the main revision work

11. More important lessons have been learned. Above all, before the practical compilation work started, much time and resources were used to define and specify the exact frame under which the compilation should take place. In other words, the accounting system with the coding structure was established in advance. The importance of efficient technical infrastructure in revisions of time series was thus stressed. This involves a means for handling important data from other units of Statistics Norway, i.e. a means for establishing efficient data flows from other data bases (base statistics) to the ones of the NA unit (enabling NA estimates to be compiled). Apart from the most recent quarterly accounts, it should be underlined that the revised NA time series from the main revision work - both forward and backward in time and for both current and constant price estimates - are all prepared in the framework of the detailed specifications of the annual accounts (see para. 37 and following below).

12. Another important strategy lesson concerned human resources. In terms of transparency, the benchmark year model was considered to be both logical and orderly by the staff. In this model, all sort of problems were encountered and they should be taken into account for subsequent years. All major definitional changes should be repeated for all years, while less important changes could be excluded for the summarised third wave compilation at least (in some cases, probably also for the second wave - backwards). When it came to non-definitional changes, as in the 2002 revision, it became evident through using new methodologies in directly treating new sources (in particular, annual accounting statistics based on the Structural Business Statistics Regulation) that new sources in most cases were relevant for just the second half of the second wave period. The methodology chosen to accompany this situation involved partly smoothing the series to meet the previous 1990 level (The expression 'partly smoothing' is used to modify this technicality as development in 1990-1995 was sometimes not affected in a proportionate way to that recorded for 1995-2000.).

13. The latter phenomenon was the exception from the general rule that implied a break in the time series between one sub-period to another (for subsequent chaining). The third solution - indicating a footnote when a break (or change of any kind) occurs within a sub-period (e.g. less important revisions starting from a particular year) - was experienced relatively rarely.

14. Finally, in terms of strategy and principles followed in the main revisions, consistency within different parts of NA estimates was considered of utmost importance. A most coordinated effort was followed to simultaneously align the following in the revision process; the central frame annual accounts, the labour accounts, the balance of payments, the satellite accounts of tourism and the underlying government accounts - all except the latter are the

responsibility of the NA unit in Statistics Norway. In other words, internal coordination has a strong priority in the NA work in Norway.

CHANGES IN OVERALL SYSTEMS - NORWEGIAN EXPERIENCES

Planning the implementation

15. The implementation of overall international revisions of NA systems by NSIs presents occasions for changes in methodology and classifications - conceptually in terms of definitions and other principles. Leaving the classifications for the next section, we shall first look at Norwegian experiences from the implementation of SNA93/ESA95.

16. The 1995 revision had three main objectives: (i) to implement new and extensive basic statistics into the NA, (ii) to integrate institutional sector accounts with the detailed Supply and Use Tables, and (iii) to implement the new international guidelines on NA. The first objective was mostly concerned with quality achievement, the second aimed at better coverage, coherence and data flow, while fulfilment of the third objective would improve international comparability.

17. As about 20 years had elapsed since Statistics Norway last undertook a main revision of the NA, it became evident that extensive basic statistics not utilised until then would have a sizable effect on the NA figures. Not only was value added of service industries underestimated, but in fact more than $^4/_5$ of the GDP revision could be traced back to this first objective (non-definitional changes), also taking into account improved and altered estimation methods. Specifically for the services area, more than ¾ of the value added revision from the incorporation of new basic statistics was caused by non-definitional changes.

18. Norway was the first country to adopt ESA95 when the revised NA figures were released in June 1995. Work on the SNA93/ESA95 had already started 3-4 years earlier with the anticipation of the contents of the new system and planning the framework and amendments for its implementation. More than 100 specific changes in the SNA93 as compared with SNA68 highlighted the main differences between the two systems. Most of these changes were, in fact, taken on board in the revision. Still, some important revision tasks had to be postponed due to time constraints or lack of data. These included revising non-financial assets and consumption of fixed capital, introducing new variables and tables that required new statistical data, and approaching a more complete coverage of the various types of changes in balance sheets.

Main experiences gained in the implementation of SNA93/ESA95

19. Experiences of the first objective were surprisingly positive, measured from the main users of the revised NA data. As already stated, in such a long due and defensive situation where the "wrong time series of the 1970s and 1980s" had not been revised for a time span of more than 20 years, the lesson to emerge was that estimates should ideally be revised every 5 - 7 years. A new main revision was in fact held 7 years later in 2002. Despite this lesson, external users did not really criticise Statistics Norway in a negative way upon the publication of sensational large revisions in 1995. Presenting the new NA estimates as being more qualitative - expressed in a positive way by the Director of Statistics Norway rather than pointing to admittedly wrong estimates in the past - and as a very fast adoption to the new

international NA standard, meant that this was seen as a comfortable and positive event for Statistics Norway. This was in some contrast to the experience gained when the revised SNA68 estimates were presented; at that time Statistics Norway had to make several consecutive press releases explaining the 'whys and hows'.

20. Concerning the second objective, better coherence had been experienced, involving a common database for the two main parts of the national accounts and the balance of payments, including a direct link to government accounting data. The main revision of NA thus had consequences for the compilation of balance of payments statistics and government accounts as well. More specifically, three important requirements were recognized, leading to the application SNA-NT (System of National Accounts - Norwegian Technology) as the chosen solution: (i) The data structure in the new system should reflect new accounting statistics becoming available, (ii) calculations/reconciliations should be carried out interactively and in parallel (not sequentially) and all corrections documented, and (iii) identical infrastructure for all sub-systems should be aimed at if possible.

21. As regards the third objective, it was truly the most comprehensive main revision carried out in the Norwegian national accounts. Almost a full adoption was achieved in a coordinated effort that also involved somewhat more resources for the NA unit than employed before the revision. Unfortunately, as net income concepts are usually considered the most relevant, the postponement for non-financial assets and consumption of fixed capital - though remedied in 1997 - implied revised income aggregates on a gross basis for a two-year period. For the sake of international reporting, new variables and tables that required new statistical data should have been fulfilled by 1999, in retrospect mostly satisfied, although there is still more work to be done on smaller items such as valuables, works of originals, etc. Successfully articulating changes in balance sheets - such as other changes in volume, revaluation, and neutral and real holding gains and losses - requires most countries to have a very long-term perspective, and represents a very challenging part of the new system.

22. More specifically on long time series, and referring to paragraph 10 above, the second and third wave of revising the previous NA estimates for the 1980s and 1970s was made for releases in 1996 and 2000, respectively. Revised quarterly estimates were also prepared for the period back to 1978. To supplement this picture, some resources (although not comprehensive) are being put into a project on establishing historic NA time series that should align to the revised time series as far back as 1970. This would involve just main aggregates, but aims to cover the preceding 135 years from 1835. As seen above, the SNA68 revision carried time series back to 1949 only. However, the main revision before, referred to as the 1962 revision, involved, as part of an international project, an effort to construct long time series of NA as far back as 1865 (in a separate publication issued in 1965).

Integrating other important statistical systems

23. In Norway, much importance has been assigned to integrated solutions involving the national accounts, the complementary BOP system and the satellite-type systems on labour accounts and tourism in particular. The integration within the core national accounts is taken for granted, so to speak, i.e. between the quarterly and annual national accounts, between institutional sector accounts and the central framework accounts (also referred to as real economy NA data), and between main NA aggregates and the detailed supply and use tables (SUT). The latter integration has always been a main feature of the Norwegian national

accounts (since the early 1950s when modern NA was conceived in Norway). Statistics Norway was very pleased to see that the national experience on SUT was taken on board internationally as a basic NA foundation and international standard 40 years later in SNA93/ESA95. The core accounts or central frame of the present Norwegian NA comprise the "Integrated economic accounts with institutional sector accounts" and an integrated set of annual SUT in current and constant prices. The balancing of the SUT in constant prices is carried out on a detailed product level, in a complete deflation process and double deflation method used for value added. Based on time series for the SUT in current prices and the previous year's prices, annual chained Laspeyres volume indices and Paasche price indices are compiled, and by using detailed SUT, the consistency of the price and volume indices is maintained.

24. In terms of integration and IT systems, it should be pointed out that the choice of IT systems for the national accounts was an important aspect of the 1995 implementation work. Statistics Norway established integrated solutions under the label of SNA-NT - on Windows and Oracle - involving all versions of NA except quarterly accounts, also including BOP and satellite accounts of tourism and environment (NOREEA). A similar solution was established for sectoral financial flows (FIBA), in which first stage common metadata (definitions, accounting systems, codes etc.) was achieved for the flow (of funds) accounts as well as balance sheets. SNA-NT will also be used for more projects in progress, i.e. quarterly institutional sector accounts and new quarterly and annual balance of payments based on UT-data (direct survey data on relations abroad to replace settlements data or foreign exchange statistics).

25. IT-solutions and organising revision work are interrelated issues. Increased attention on income distribution issues and financial flows in the NA context called for increased flexibility and efficiency in NA compilation. It became more important to have data easily flowing within a database system for the respective parts of the statistical systems and having the separate sub-systems reconciled, and in several directions. Important as well was a two-way efficient utilisation of data, i.e. for both sectors involved in individual payments.

26. Since BOP is considered as the mirror of the rest-of-the world sector of NA, the harmonisation meant conceptually that new BOP routines had to be introduced. While BOP earlier had its own separate coding system - and therefore could not easily operate feedbacks between the two systems - it became imperative to have a common coding and production system for the two systems. This became quite advantageous also across several units involved in NA and BOP work within Statistics Norway and related to the adaptation of new data available (foremost accounting statistics) and new data requirements. Other aims included a more decentralised reconciliation and more transparency. The latter meant common coding system, common tools for converting and transformation, calculation procedures and common documentation, when used in different parts of the system (creating a common IT-environment).

Main experiences gained in the 2002 main revision

27. In reviewing the time series of NA for the period 1970 onwards, the 1995 main revision introduced a new picture of increased levels throughout the whole period. The 2002 main revision, however, as indicated already, left the estimates of the 1970-1990 period unchanged (as per the 1995 revision) and revised the time series from 1991 onwards - mostly by smoothing for the 1991-1995 sub-period and significantly upwards for the 1996- 2001 sub-period. This reflected which period the new sources are referring to, the presumption being that

not much new and basic information was available for the first half of the 1990s, and the overall and convenient consideration that the NA time series before 1990 ought to be unchanged, reflecting the thorough revision held earlier with the SNA93/ESA95 implementation.

28. The new accounting statistics, initiated and introduced into basic statistics from 1996 onwards, based on Structural Business Statistics (SBS) and considered most useful for upgrading the quality of the NA estimation for a long range of industries, encouraged Statistics Norway in 1999 to go for a new revision of the national accounts. This revision - still to be considered a main revision - was planned on a more limited scale than the previous 1995 main revision. The purpose this time was to utilise the new structural business statistics (SBS) and other new statistics in a coordinated and concentrated effort to improve the quality of the NA time series. Again, many divisions within Statistics Norway contributed to the work involved in the project.

29. The new accounting statistics are adapted to the EU Regulation on Structural Business Statistics. The statistics are based upon information from a specific tax questionnaire with an enterprise, as the statistical unit, producing figures for both local KAUs (establishments) and enterprises. Routines have been set up for converting and redefining individual variables in the SBS according to NA industries and concepts. Statistics Norway publishes annual SBS-based statistics 1½ to 2 years after the end of the statistical year in the following areas: manufacturing and mining and quarrying, construction, wholesale and retail trade, hotels and restaurants, transport (not including ocean transport), post and telecommunications, real estate, renting and business statistics, and personal services.

30. The most important results of the 2002 revision are summarised in 9 items: (i) incorporation of new level figures for output, intermediate consumption, compensation of employees and investments from the SBS-based statistics for service and construction industries; (ii) revision of figures for employed persons, full-time equivalent persons, and hours worked that were consistent with the revisions mentioned above; (iii) incorporation of new price indices including, among others, new indices for exports and imports and quality adjusted indices for individual capital goods; (iv) utilisation of trade margin surveys in the retail trade (1996) and the wholesale trade (1998) to revise gross trade margins in the wholesale and retail trades; (v) revision of figures for dwelling services based on survey data regarding rents in 1998, 1999 and 2000; (vi) revision of figures for exports of services on the basis of new information for the years after 1995; (vii) incorporation of new international standards of classifications for household final consumption expenditure, for non-profit institutions serving households, and for general government; (viii) revision of capital and consumption of fixed capital estimates, with the introduction of new estimates of lifetime and new depreciation methods for general government; and (ix) incorporation of new accounting statistics for private non-financial corporations in 1999 in the institutional sector accounts.

31. Item (viii) on classifications is to be described below.

CHANGES IN NA CLASSIFICATIONS - NORWEGIAN EXPERIENCES

Main classification schemes in Norwegian national accounts

32. Classifications represent important ingredients in the national accounts. There are several which are all summarised in a separate annex of the SNA93 and ESA95. In Norway, the main classification schemes used for the estimation of GDP according to the production approach are the activity classification based on NACE Rev.1 and the product classification based on CPA. They replaced in the 1995 revision the former activity classification based on ISIC Rev.2 and a product classification that was an aggregated version of the Harmonised System - adjusted to Norwegian production - and the previous nomenclature based on CCCN applied as customs tariff.

33. The main classification schemes used in the NNA for the expenditure approach in the field of consumption are the purpose or purpose-like classifications of COICOP and COFOG. They are used for final consumption expenditure of households and general government respectively. The existing international versions were implemented in the 2002 main revision (see below for more detail). They replace the versions presented in the SNA93 and ESA95. Less importantly, consumption of non-profit institutions serving households (NPISH) has been introduced and specified by five items. Other classifications used are the classification of fixed assets and of activities used for gross fixed capital formation (GFCF), and the breakdown of categories of inventories, and of exports and imports.

34. The main classification scheme used in the NNA for the estimation of GDP according to the income approach is again the activity classification based on NACE Rev.1. The activity classification applies to all income approach aggregates; compensation of employees, operating surplus/mixed income, consumption of fixed capital, other taxes on production and other subsidies on production.

35. The institutional sector classification is the classification needed for the superstructure of NA and institutional sector accounts in particular. The five main sectors of SNA/ESA are all specified in the NNA, with the NPISH sector being developed over the most recent decade. Despite the numerous sub-sectors introduced already, particularly for financial corporations and general government, there is an ongoing focus on expanding the sub-sectors for non-financial corporations and for households. This is in order to differentiate between public, national, private and foreign controlled institutional units, and socio-economic groups of households. Thus, the satellite account perception of linking micro and macro worlds has been under consideration in the case of households.

36. Classification of financial assets should also be mentioned as part of the main classification schemes used in NNA.

Degree of specification of the main classification used in NNA

37. In the NNA, there are at present 149 activities specified in terms of NACE specifications, totalling 178 activities when cross-classified by categories of production (types of producer). Norway is keeping - and has always kept - a detailed profile for the activity classification in the national accounts. A shift from goods to more services in the NNA has been accompanied by a shift from goods-producing activities to more service-producing activities being specified. There is now a 60-40 distribution between goods-producing and services-producing activities.

38. The breakdown by categories of production - market, own final use and other non-

market - is handled through the coding system (prefixes) by introducing separate categories for market production, production for own final use and three categories for other non-market production, i.e. in central government, local government and NPIs serving households. There are 142 market production activities specified, 7 activities of production for own final use, and altogether 29 non-market production activities. The latter activities are composed of 13 central government activities, 9 local government activities and 7 activities of non-profit institutions serving households.

39. In the NNA, the total number of products is about 1250, of which almost 700 are goods, about 300 are services, while the remaining products are of a supporting nature introduced for technical reasons. There is thus a 70 - 30 distribution between goods and services as concerns characteristic products of the activities of national accounts. Prior to the 1995 revision, nearly 1750 products were specified in the final annual accounts, of which 1550 were goods and 200 services.

40. COICOP for household consumption expenditure in the NNA (the 2002 main revision version) is relatively detailed, specifying 93 consumption groups, although reduced from 112 consumption groups in the previous NNA (1995 version) and more significantly down from 145 consumption groups before then. The new classification, as in the previous ones, is structured at three different levels of aggregation. While consumption groups relating to goods have been reduced from 98 to 69 in the NNA (1995) and further to 54 in the present NNA, services consumption groups have been increased from 37 to 43, and now to 39 services groups.

41. Another feature built into the COICOP of NNA is a differentiation introduced for the purposes of tourism. COICOP for household consumption expenditure thus has a three-split differentiation (different prefix codes) for non-tourist residents plus tourist residents abroad, resident tourists in Norway and non-resident tourists in Norway. The first category contains most of the 93 COICOP groups (89 in fact) since the four groups of other imputed rentals (car rentals), passenger long distance transport, package tours (resident tourists only) and expenses for accommodation services are tourism groups exclusively (residents and non-residents). COICOP of resident tourists in Norway are specified in 28 groups, while COICOP of non-resident tourists in Norway are specified in as many as 46 groups.

42. COFOG was already introduced in Norway in 1985. In the NNA (1995 version), there were 55 COFOG groups specified, of which 51 in central government and 25 in local government, within the framework of 14 (15) main groups. In the NNA (2002 version) and the present COFOG framework of 10 main groups, the number of COFOG groups has been amended to 53 in central government and 27 in local government, i.e. a small increase. COFOG in the NNA has got a new dimension by being cross-classified by products and subsequently linked with the activities.

43. The classification by type of fixed assets is also relatively detailed. The number of groups has been increased from 34 earlier to 57 in the NNA, of which also 4 intangible fixed assets. This level of specification has been kept in the 2002 main revision, i.e. 56 types of fixed assets. GFCF is also broken down by kind of activities. While earlier about 130 out of 160 activities used for the compilation of production estimates were introduced for fixed capital formation, this number has been further expanded in the NNA to be in full accordance with the activity classification in production.

44. For the other final uses, there are less detailed breakdowns by categories. As the main breakdown for changes in inventories is by products (goods), only 4 categories of inventories are specified. Altogether, 12 categories have been introduced for exports of goods and services and imports of goods and services (6 categories of exports and 6 categories of imports). Here also, the main breakdown is by products.

45. Institutional sector classification and classification of financial assets are both fairly detailed as well: approximately 20 sub-sectors constitute the institutional sector framework, while 10 main groups with corresponding sub-groups constitute financial assets (financial instruments).

Main experiences gained in the implementation of SNA93/ESA95

46. As already indicated, Statistics Norway put fairly large resources into the planning of which classification schemes should be implemented, and when and how, in the NNA. This eventually materialized in the accounting structure adopted for the NA with accompanying codes and terms introduced. Although the revision of international classifications to a certain degree has come in parallel waves with the change of NA systems internationally, it has not always been straightforward to implement the new classification schemes immediately. The underlying classifications used in the existing basic statistics usually make restraints, but not always. For example, in the 1995 revision, the NACE Rev.1-based classification was in fact introduced in the NNA before it was introduced in the basic statistics generally. In the following section, four areas of NA classification - activities, products, individual consumption and government expenditures - are described in more detail, with a particular view to experiences gained in this respect with the NNA compilation in Statistics Norway.

Activities: From ISIC Rev.2 to NACE Rev.1-based industries in NNA

47. The present Norwegian industrial classification, mainly designed for use in Norway's official statistics (SIC94), was adopted and published in October 1994. At that time, the 1995 main revision in national accounts had been under way for several years. The activity classification for use in the NNA when implementing SNA93 and ESA95 could not continue to be ISIC Rev.2-based; here was a strong case for delay but, nevertheless, Statistics Norway for a number of other reasons found this to be inconclusive (20 years since last main revision, etc.). In particular, for the detailed treatment of manufacturing industries, the NA unit had to re-codify manufacturing statistics to the new nomenclature, an extremely laborious task. Later in the revision process, amendments had to be made when the first results of the true NACE-based manufacturing statistics became available. The re-codifying work of the manufacturing units according to NACE Rev.1 was completed after the release of the revised NA during summer 1995. While the re-codifying work of the manufacturing statistics was made for one year only (1992), the NA unit had to re-codify back to 1988.

48. It was experienced then that a great number of LKAUs (establishments) were created or shut down over the years. In the reclassifying process, new establishments were codified according to NACE Rev.1 at the unit level. The method used was a CPA-based one, i.e. the 4-digit CPA item with the highest value determined its corresponding NACE industry. This method - for the sake of continuity – was the necessary choice for 1992 in the NA as well, despite deviations created by the manufacturing statistics team, deviations that were looked into and a common solution agreed upon throughout. Experience proved that the CPA-based method

worked well. Later adaptation of the new basic statistics on manufacturing, SBS and Prodcom statistics in particular, was again a time-consuming process. This was due to the detailed requirement set by the NA in terms of the detailed SUT framework and the time series perspective, obvious to NA but usually not given the same kind of attention at the level of the basic statistics. Units being reclassified between industries were quite an exposed problem in converting SBS data to NNA use. However, close contact between the NA unit and the subject-matter units helped to clarify the issues.

49. Special national circumstances should be considered in designing NA activity classifications. In the case of Norway, for instance, activity breakdowns should be made for oil and gas activities, electricity supply, various transport activities, the split between fishing and fish farming etc. The NNA-industry of building and repairing of oil platforms and modules is even at the level of 5-digit NACE. On average, the activity classification in the NNA is typically between 2-digit and 3-digit NACE. The superstructure by type of producers is very important in the NNA as it is for the main NA users, including model-builders of the Research Department in Statistics Norway. This also applies to the more aggregated activity classification used in quarterly national accounts - around 60 industries (and 80 products) specified.

Products: From HS/CCCN to CPA-based products in the NNA

50. Norway has continued to apply a relatively detailed product classification scheme, although efforts have been made to reduce the number of products and product flows significantly to a more manageable body of details, in particular for manufactured goods (see numbers above). The average number of NNA products per NNA activity is between 6 and 7. In general, the NNA product details are typically somewhere between 5-digit and 6-digit CPA.

51. The distinction between market output, output for own final use and other non-market output is not entirely and systematically drawn up in this context as products. It means, for instance, that special products for own final use have been specified (different trade margins from market products). For products of non-market services of central and local government, it has been convenient - e.g. for deflation purposes - to specify directly a double set of products, one for services as such and one for fees connected to the same services, and this solution significantly increases the total number of products.

52. For technical and other reasons, there are 250-300 products introduced in the NNA-product design, approximately one half refers to the government cases just mentioned, the other half introduced for technical reasons (such as bundles of office accessories) or products otherwise defined as not being characteristic of any activities (such as own-account construction, etc.). Another category of "products" is items that are aggregated fixed assets through which GFCF (or net acquisition of existing fixed assets) is cross-classified for industry destinations.

53. In terms of the issue of long time series, using CPA rather than the alternative product classification of CPC in NNA, NA treatment and problems are closely connected with the corresponding ones find for the activities mentioned above.

Individual consumption: From SNA68-based groups to COICOP in NNA

54. The classification scheme used in the NNA for household final consumption expenditure and household actual consumption (i.e. individual consumption) is the present COICOP that was adopted by the UN Statistical Commission in 1999. A 3-level structure has been retained in the NNA from before, using the coding structure in a hierarchical manner. The composition between consumption goods and consumption services has been changed significantly towards more service specifications. In addition, the two correction items (direct purchases abroad by residents and direct purchases in Norway by non-residents) are continuing to be used provisionally in the NNA. For the time being, information is lacking on COICOP groups for distribution of direct purchases abroad by residents. As illustrated above, information is available on distribution of direct purchases in Norway by non-residents (46 COICOP groups). One step forward towards the suggested ESA95 recording would be to delete the second correction item and deduct non-residents' purchases at the individual COICOP level. This will, however, imply a quasi-solution between the domestic concept used today and the ultimate national concept of ESA95 for individual items.

55. Two deviations from COICOP are that narcotics and prostitution have not been accounted for, i.e. have not been estimated so far. The number of food items (consumption groups) was cut in half in the 1995 revision, the reasons for which were that less interest was being paid to food details by purpose (given the fact that same food product details are being preserved in the NNA) and to simplify their treatment in estimation, to give just one example of amendment.

56. In the 1995 main revision, when the NNA adopted exactly the same structure as in COICOP (although confined to 10 main groups at that time), it should be noted that in preparing the detailed 3-digit classification work a background OECD-paper from 1986 on this issue was taken into account. There were no problems in reporting at 2-digit level though.

Government expenditures: From early COFOG to present COFOG in NNA

57. Compared with COFOG groups of the ESA95, three more items were introduced in the NNA in the 1995 revision. The first additional item was incorporated into the main group 07: Environment affairs and pollution abatement. Then there were nursing and care services, which were provisionally introduced as an addition due to the fact that health and social work services are not always separable, in particular in local government. The third addition was financial transactions (quite negligible), not broken down by functions in the ESA and SNA.

58. In the NNA, COFOG has been cross-classified by products. Each of the 68 COFOG groups now has a product breakdown from the CPA-based product classification generally applied in the NNA. The COFOG-by-product flows have been set up in a rather pragmatic way. The current items and sub-items of the government accounts formed the starting point. A relevant NNA product was connected to each of these items, in some instances easily determined and in other instances more difficult to determine when certain reasonable conventions or considerations had to be taken into account. Indirectly, the link between COFOG and NNA products was established at a detailed level, and a level more detailed for central government than for local government accounting flows.

SUMMARY AND CONCLUSIONS

59. Norwegian experiences on treatment of changes in methodologies and classifications when compiling long time series of national accounts could be summarized in terms of 10 points of lessons and self-evaluation from the point of view of Statistics Norway.

Points of lesson	**Self-evaluation of Statistics Norway**
1. Strong demand from outside and in particular inside Statistics Norway has given urgency to long time series work.	Econometric and similar types of macroeconomic analysis depend on long time series data, also to some extent for economic models.
2. Strong dedication to establishing time series in the spirit of consistency through time.	Issue of long time series is closely connected to revisions of NA estimates
3. Ad hoc main revisions of NA over 50 years NA history in Norway: 1952 (pioneer work), 1962 (non-definitional), 1973 (SNA68 implemented), 1995 (SNA93 and ESA95 implemented) and 2002 (non-definitional, SBS implemented).	Better regularity recommended from this experience is every 5 - 7 years; in particular the more than 20 years interval between SNA68 and SNA93/ESA95 was difficult (for both producer and users) in terms of large revision in main aggregates.
4. Main revision is time-consuming work, using increased resources over several years, starting out from benchmark year work, to create time series forward in a first wave, and further to time series backward in second and third waves.	This way of timing main revision work was found to be organisationally transparent and reasonable in terms of utilisation of resources.

Points of lesson	**Self-evaluation of Statistics Norway**
5. Important to prepare good foundations in terms of efficient technical infrastructure, an articulated accounting system with the coding structure in place in advance, and the handling of important base statistics between the relevant databases.	It was important to upgrade the technical procedures and data flow systems to become a positive by-product of the latest main revisions, as IT-solutions and organising revision work are interrelated issues.
6. Consistency within different parts of NA estimates is considered of utmost importance, i.e. coordinated effort to align central frame NA, the labour accounts, the balance of payments, the satellite accounts of tourism and underlying government accounts.	Common technical solutions were established and enabled good internal coordination.
7. Presenting new results should be well prepared and profiled by top NSI management.	Statistics Norway learned from earlier negative experience to stress increased quality rather than explaining errors of the past.
8. Absolutely all changes in definitions are not possible to implement at one time, although most conceptual changes should be covered simultaneously.	New statistics have to be developed in some areas before NA implementation.
9. Changes in international classifications require coordinated implementation nationally in base statistics and NA.	Difficult experience on implementing NACE Rev.1 in advance influenced the work on implementing functional classifications: to have COICOP implemented first in HBS and CPI before NA, and COFOG implemented at same time in government accounts and NA.
10. Important to find relevant level and structures of classifications for NA implementation.	Following a detailed approach has been successful in the NNA, but also making adjustments for less burden in manufacturing has been advantageous, while still more emphasis on services and intangibles should be made in future.