Mission Report

From a short-term mission on

Improving the Compilation System of National Accounts

22 March- 1 April 2004

TA for the Scandinavian Support Program to Strengthen the Institutional Capacity of the National Statistics, Mozambique

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Table of contents

Executive summary

The tasks of the mission were to analyse the present compilation system for national accounts; to outline ways of improving the system including the organisation and structure of Excel files; and to lay the foundation for an SNA database.

A comprehensive integrated systems approach to national accounts compilation has been developed for Mozambique. From an IT point of view, the system is basically a large set of spreadsheets interconnected by links. It has mushroomed over the years to an extent where the overview of the system and all files included may have been lost. The lack of a file server has resulted in duplicate files contributing to the complexity of the system.

The mission presented two options for the organisation of the Excel files. The first organises the files primarily after the major areas of the system; basic data; products; economic activities; institutional sectors; and integrated tables. Although with some exceptions, the Excel files would include estimates for all years in this option. The second option organises the files primarily after years and for each year after area. In this option the Excel files would include estimates only for two consecutive years.

The mission indicated some guidelines for good Excel conduct, which will have to be made more specific as the revised system is set up.

A user interface for access to the files of the system would give an overview of its components and point to the various files included. Certain tasks can also be automated by using the programming language of Excel, Visual Basic for Applications.

Result data from the Excel files can be exported to and stored in a database. Data from this database can then be loaded back into the Excel files. The mission started the development of such a database and illustrated an example to INE, national accounts staff as well as IT-staff.

Further programming of the database and the user interface can partly be done by the IT-expert at home. This should be followed by a short-term mission during the second quarter.

A new long-term adviser in national accounts will be engaged from August this year (ToR Appendix 3) and will assist in the development of the revised system.

1   Introduction

A mission from Statistics Sweden and Denmark Statistics visited the Instituto Nacional Estatistica (INE) from 22 March to 1 April 2004 with the task to review the compilation system for the national accounts. The consultants were Mr. Jan Redeby,

national accounts expert from Statistics Sweden, and Mr. Søren Netterstrøm, IT-expert from Denmark Statistics. The terms of reference are attached as Appendix 1.

The mission worked with Ms. Mónica Magaua, Head of the Department for National Accounts, and Dr. Fernanda Teixeira, long-term advisor (IMF) in the GDDS-project for Lusophone Africa. Meetings were held with Mr. Said Dade, Director of National Accounts and Global Indicators, the national accounts staff and with staff at the IT-department at INE.

INE has put together a plan for the development of its national accounts for the coming two and a half years with the following major tasks:

- Compile estimates using present methods and system for the years 1996-2003 on the 1996 base year (to be finalised 2004);
- Compile benchmark estimates for 2003, which will be the new base year for the estimates at constant prices (2004-05); and
- Develop quarterly national accounts (2005-206, provisional results August 2006).

The compilation of new benchmark estimates and the change of base year is a convenient opportunity to review and implement changes to the system.

2   The compilation system for national accounts

2.1 Background

Starting in 1997, a benchmark exercise has been carried out regarding the estimates for 1996. In that process INE adopted an application developed in Microsoft Excel and based on a Systems Approach to National Accounts Compilation[1] and is basically a large set of spreadsheets interconnected by links. As the system has progressed to include additional years, the number of files has grown considerably. It is now difficult to get an overview of the system and keep track of all files included and the links between them. In addition, the previous lack of a file server has resulted in a number of duplicates as files needed to be copied among the national accounts staff.

A previous mission[2] pointed to a number of problems inherent in large Excel system and indicated three alternatives for a future IT-system, one of them being to review and simplify the current system. INE has opted for that alternative with good reason. From a conceptual point of view, the principles followed in the compilation approach are very good and sound. Secondly, a considerable amount has been invested in the compilation of a handbook for Mozambique, although it still has to be finalised. Finally, the system is well known by the staff and has made a considerable contribution to their understanding of national accounts.

2.2 Structure

The conceptual framework of the system and the envisaged flow of data are documented in the UN-handbook (see footnote 1) and papers presenting the implementa-

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[1] Published in the series Studies in Methods, Handbook of National Accounting, Series F, No 77, United Nations, New York, 1999

[2] Liv Hobbelstad Simpson and Ole Berner, Nov/Dec 2003; report no. MZ:2003:23.

tion of the system in Mozambique[3]. The starting point is the entry and adjustment of various intermediate source data into three dimensions of the system:

– Goods and services (products)
– Industries (economic activities)
– Institutional sectors

In practice, the module for industries is largely derived from the module for products as sources relating to economic activities – e.g. business surveys – have so far been very scarce. Balancing and reconciliation of the system is made in three core tables of the 1993 SNA.

– Supply and use table (SUT)
– Cross-classification of industries and sectors (CCIS)
– Integrated economic accounts (IEA)

These features are reflected in the organisation of the files as shown below.

Table 1 Organisation of files

X:\Cn96\				1)
	BS\	Agri\	96\	2a)
		- - - - - - -	- -	
		-	01\	
		Transp\		
		Equi\	96\	Dados\ 2b)
			- -	
			01\	
	SI\	SiNF\	96\	3)
		- - - - - -	- -	
		SiRM	01\	
	QEI\	96\		4)
		- -		
		01\		

1) The system is contained in the folder \Cn96\ under the root, where Cn stands for Contas nacionais and 96 indicates the benchmark and base year. X stands for the drive letter.

2a) The folder \Cn96\BS\ contains the files for goods and services (bens e serviços) with separate subfolders containing source data for different areas. Under those there is one subfolder for each year. The folder \Cn96\BS\Agri\97\, for instance, contains various Excel files with source data for agriculture for 1997.

2b) The folder \Cn96\BS\Equi\ also contains one subfolder for each year. For example the subfolder \Cn96\BS\Equi\97\ contains

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[3] Saide Dade, O Sistema das Contas Nacionais de Moçambique, paper presented at the workshop for African countries with Portuguese as an official language in September 2003. A version in English was presented at a SADC-meeting in February 2004 (Saide Dade, The Mozambique approach to 1993 SNA compilation).

- the subfolder \Cn96\BS\Equi\97\Dados\ containing files for estimating and balancing detailed goods and services
- files where all goods and services are balanced and estimates of economic activities are derived.

3) The folder \Cn96\SI\ contains the files for institutional sectors with a separate subfolder for each year. These subfolders contain the files with basic data as well as the result files designed in the national accounts format.

4) The folder \Cn96\QEI\ contains the files for the three core tables of the 1993 SNA (see above) as well as transaction matrices. There is one subfolder for each year.

The various national accounts workbooks are linked to each other in a way reflecting the flow of calculations and the logical structure of the system. However, several links are quite complex, and as the system has developed it has become increasingly difficult to monitor the links. There is no automated procedure to ensure that all links are properly updated. Furthermore, the workbooks are not protected against accidental changes. The insertion of a row or column, for example, would result in incorrect data in destination files.

2.2 Revised system

A file server and network has recently been set up at INE. The following assumes that all the files in the revised system will reside there.

Five kinds of additions or changes to the current system can be considered to make it more stable and get a better overview.

a) Revise the structure of the files and/or their locations;
b) Adopt guidelines for formatting of files and good Excel conduct;
c) Introduce a user interface as well as automation of certain tasks; and
d) Develop a database for storage of result data from the Excel files.
e) Add functions of Excel

a) Revised structure and file locations

Two alternative ways for the file structure are shown in Table 2.

Table 2 Two options for the organisation of files

Option 1			Option 2	
X:\Cn\			X:\Cn\	
	Dados\	Agricultura\ - - - - - - - Industria\ etc.	2003\	Dados\ Produtos\ Ramos\ Sectores\ Quadros\ Operações\
	Produtos\ Ramos\ Sectores\ Quadros\ Operações\		2004\ etc.	Dados\ Produtos\ Ramos\ Sectores\ Quadros\ Operações\

In both options the system would reside in the folder \Cn\ under the root as the case is now; no need of indicating the benchmark/base year in the name of that folder. Then, in option 1 the files are organised after area and in option 2 after year.

Option 1 organises the files after area, where each area will contain files containing estimates for all years.

\Dados\ will contain files with source data from various surveys and administrative data. It will probably be necessary to organise the source files in subfolders, e.g. \Dados\Agricultura\ for data on agriculture.

\Produtos\ will contain the files for product balances (commodity flows), one file for each product. With the present detail there would be 143 product files that should be named according to the code used in the system, i.e. P001.xls for wheat, etc. These files would include all years, each contained in its separate sheet. The format will be the same as now with a different layout for the benchmark year. In addition there would be two sheets showing time series, one for current and one for constant prices.

\Ramos\ will contain the files for economic activities. Currently, these are derived from the product estimates, which mean that data will flow from the product files. However, the files should also cater for estimates of source data from establishments. The activity files should be structured similarly to the product files: there should be one file for each activity with one year in one sheet and additional sheets showing time series. With the current detail there would be 42 files named by the activity codes – R01-1.xls, etc.

\Sectores\ will contain the files for institutional sectors. As these files can include a big amount of data with many variables for each sector, it might be practical with separate files for each sector and year. As the case is now the file name should include the sector code and year, e.g. S131-2003.xls for central government, year 2003. Summary files for each sector containing time series should also be included.

\Quadros\ will contain files for three core tables of the SNA: the supply and use table (QRE); the integrated economic accounts (QEI); and the cross-classification of industries and sectors (CCSI). The files containing the equilibrium of all product balances constitute part of the supply and use table and should also be included in this folder. There will be one file for each year named as follows: Equilibrios-2003.xls, QRE-2003.xls, QEI-2003.xls, CCSI)-2003.xls, etc.

\Operações\ will contain the transaction matrices with one file each type of transaction with one sheet for each year. The files should reflect the transaction codes in the 1993 SNA, for example D41.xls for interest.

Option 2 organises the files after year and for each year after area. The contents of the subfolders under each year are basically the same as described above for option 1. However, the files for products and economic activities would only contain estimates for the current and the previous year. More than one product and activity could then be included in each activity. In option 2 there may also be a need of a folder \Séries\ containing files with time series linked to the files under \2003\, \2004\, etc.

Whichever of the two options is selected – or a modified third option – it is important to provide for and clearly identify provisional estimates, which should be saved separately. There is also a need of designing result files for analysis and publication containing time series and make them part of the system.

b) Good Excel conduct

With several persons viewing and using same Excel files there is a need of clarity in the design and formats of the worksheets and the relationships between them as well as of certain guidelines and rules for working with the files. Some points are indicated here.

- Excel includes possibilities to lock cells and protect worksheets and files from changes whether unintended or not. It is not possible, for instance, to insert rows and columns in a protected sheet. Moreover it is not possible to change locked cells, which is useful for cells that contain results with formulas for a chain of calculations.

- Excel files can be protected by passwords required to open them as read and write.

- Formats of cells can be used to indicate certain things, for example that an entry is provisional or that it contains source data. The fonts can be given different colours and formatted in **bold** or *italics*. The background can be given a colour, cells can be framed, etc. It would help to introduce certain rules for formatting. Formats introduced by one individual will only be understandable to that person but look like a **Chr**istmas *tree* to others.

- Numbers – except index numbers and percentages – should be formatted with a thousand separator and without any decimal place. It is easier to read and interpret 43 067 132 compared to 43067132. Currently values are shown as million Meticais. It should be considered to display only billion Meticais.

- Excel allows a virtually unlimited number of sheets in one file. In practice, however, too many sheets in one file tend be unmanageable as the overview of the contents gets lost. It is better to restrict the number of sheets and spread them over different files.

- It is easy to loose track and control of formulas with links to other files. Therefore, linked formulas should be restricted and nobody must be allowed to introduce links at will.

Exact rules for formats and Excel conduct should be identified later when setting up the system and Excel files for the new benchmark exercise.

c) User interface and automation of certain tasks

A user interface for the system would give an overview of its components and point to the various files included. These could be opened from the user interface rather than by the normal Excel commands. Figure 1 gives an example from SNAPC, another Excel application for national accounts. The example shows the user interface for opening files containing production and generation of income accounts for economic activities. By clicking a rectangle, the files for that economic activity will be listed and the user can select the one to open.

Automation of certain task such as updating of the system can also be designed using the programming language of Excel, Visual Basic for Applications.

Figure 1 Example of a user interface

Production – GDP by activity	
Totals	Summary workbooks containing all industries
ISIC A	Agriculture
ISIC B	Fishing
ISIC C	Mining and quarrying
ISIC D	Manufacturing
ISIC E	Electricity and water supply
ISIC F	Construction
ISIC G	Wholesale and retail trade; repair of motor vehicles, personal and household goods
ISIC H	Hotels and restaurants
ISIC I	Transport, storage and communications
ISIC J	Financial intermediation
ISIC K	Real estate, renting and business services
ISIC M–P	Community, social and personal service activities (excl. government)
Government	Producers of government services
Taxes, subsidies	Taxes and subsidies on products

d) Database for storage of result data from the Excel files

In order to avoid links between the various Excel files all exchange of data within the system could be maintained by utilizing a simple database. The database itself should be in Microsoft Access, in order to avoid additional costs for software.

Whenever a figure that is entered or calculated in a specific Excel file, this figure is stored to the database with a set of references to the classifications that uniquely identifies the figure, including a reference to a classification of concepts (value in current prices, etc.). Any figure should only be produces in one sheet.

Other sheets needing the figure (for further calculations), gets the figure through a reference to the database.

Like with references to other sheets, the operator of a sheet may postpone the update of figures from the database, as the producer of new or revised figures may postpone the dissemination of these, to allow updates only to take place when all figures in a certain range has been updated.

The database should contain information for each figure on where and when it was produced and which sheets are using the figure.

During the mission an example was developed and demonstrated to INE. An instruction was put together for INE to try the sample files. It is attached as Appendix 2.

The database may also be used to keep track of all workbooks used by the system and this way feed a flexible menu system.

e) Adding functions to Excel

Using VBA it is easy to extend the functionality of Excel. A simple example were given for a solution to the recurring problem of division by zero, that may not be considered an error if both divisor and dividend is zero.

The problem can be solved with Excel formulas, but it is easier and more elegant to do this with a user-defined function.

3 Conclusions and recommendations

According to the plan for development of national accounts (see section 1 above), INE will decide on the scope and classifications for the new benchmark estimates before August this year. Around that time the compilation of basic data in the revised system can commence. However, it is not possible to have all the revised spreadsheets in place before that. This would also not be necessary, but selected spreadsheets must be available so that the new estimates can begin to be processed. A new long term adviser in national accounts will be engaged from August this year will assist in that task as well as the further development of the revised system.

There will be a better overview of the system if the file locations are reorganised. Two alternatives are presented above. The mission is inclined towards option 1 where estimates of several years are included in one file. However, INE should evaluate the two options against their experiences of the present set up.

Two additions to the Excel application would make it more of an IT-system. First, a user interface should be developed as well as automation of certain tasks. Second, result data from the Excel files should be stored in a database with automation of the transfers of data between the Excel sheets and the database. A draft design was demonstrated during the mission. Further programming can partly be done by the IT-expert at home, and another short-term mission should take place during the second quarter.

It is not worthwhile making changes to the system for the estimates of 2002 and 2003 with the current sources and methods on the 1996 base year. The current system as it is should be used for that task. However, it could be considered to store the results in the database.

4   Appendices

Appendix 1

<center>

TERMS OF REFERENCE
Within the Scandinavian Support Program
For a short-term mission from 22/03 to 01/04/04
On
Improving the Compilation System of National Accounts

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1.   Background

In implementing the 1993 SNA, the National Institute of Statistics (INE) carried out a benchmark exercise regarding the estimates for 1996, which was developed in Microsoft Excel with assistance of the United Nations Statistical Division (UNSD). The software has been developed in accordance with the SNA 1993 compilation methodology and the UNSD Handbook of National Accounting "A System Approach to National Accounting Compilation" in the application of practical aspects. From a conceptual point of view, the National Accounts principles followed in the compilation approach is methodologically sound. However, as the software has progressed to include additional years, the number of interconnected files has grown considerably and it has become difficult to get an overview of the system and keep track of all files included. Hence, there is a need to review and improve the structure of the compilation system, notably simplify the location of files and interconnection through links, which could make the system much more efficient and easier to operate by the staff.

This mission has a high focus on IT. A thorough understanding of National Accounts concepts is however also required so the mission is best performed by two experts who can combine National Accounts and IT expertise.

2.   **Main Reasons for the Mission**

The introduction of the new benchmark year 2002 in 2004 with new data sources and changed content of classifications for sectors, industries and products creates a unique possibility to evaluate the changes required to improve the use of the system. To take full advantage of this 'new start' for the system, it is also an opportunity to consider improvements in the compilation system and the scope of the National Accounts compilation, minimizing the manual intervention and making it much more efficient and easier to operate by the staff.

3.   Beneficiaries of the Mission

The mission will primarily benefit the staff at INE and especially the National Accounts Department by providing knowledge and improved software for National Accounts compilation. The beneficiaries in the long run will be the users of NA

<center>11</center>

through improved regularity, timeliness and contents quality of the National Accounts.

4. Objectives of the Mission

Investigate the preconditions for improvement of the IT framework for the future compilation of comprehensive and integrated National Accounts in Mozambique. More specifically:

- § Analyze the present system and identify areas for improvement of the system so that it can be manageable and the processes be simplified to enable repetitions of the compilation processes with data for new years and with a high level of error protection
- § Create the basis for a restructuring of the compilation system, which will support the work with implementing new data sources later in 2004.
- § Ensure that the resulting benchmark system is well-structured and documented so that it can be used for repetitive future compilations.
- § Improve the structure of the compilation system, notably the location of files and interconnection through links, leading to a creation of and **SNA database**.

5. Expected Results

- § A description of the data-flow and procedures in the present system from an IT-system perspective. The description should cover all stages in the compilation process from receiving source data to the publication tables.
- § Improved framework for the 2002-benchmark version of the system so that it can be manageable and the processes be simplified to enable repetitions of the compilation processes with data for new years and with a high level of error protection;
- § Guidelines for 'good Excel conduct'
- § Suggestions on a **SNA database** in which a new structure could make the it much more efficient and easier to operate by the staff;
- § Suggestion about the organization of computer directories and workbooks for the new benchmark year, which can serve as a framework for the benchmark compilation of the major data-sources in 2004.
- § Suggestions about the compilation process to support the future planning of the sequence of activities and the division of labour.
- § Technical Report containing – among other things- the new structure of files, the data-flow and procedures in the system from an IT-system perspective, considerations and recommendations about establishing new benchmark year in 2004;

6. Work to be carried out by the Consultants

- § Meet with the NA Director, Head of department, consultants including the IT-consultant, and other key-persons related to NA;
- § Describe, review and evaluate the dataflow, processes and procedure documentation of the present NA-system and the organization of files;
- § Meet the NA staff and analyze the working processes and their sequence in the compilation process.

§   Suggest a new layout for the spreadsheets and the structure of files.

As the duration of the mission at INE is very short, preparation is a priority. Emphasis should be on taking the status paper enclosed in appendix as a starting point.

7. Agenda for the Mission

To be prepared, but should include the following:
§   Interviews and meetings to gather information
§   Review the pc-network and the working files in the present system.
§   Assessment, evaluation and elaboration of suggestions in cooperation with NA Director, Head of department, Head of IT Department and the consultants
§   Discussions of suggestions with the NA director, the Head of Department, the IT Head of Department and the consultants related to NA.

8. Tasks to be done by INE to facilitate the Mission

§   Elaborate the Terms of Reference for the mission
§   Prepare and supply the consultant with necessary documents and information
§   Arrange meetings with key persons
§   Supply good working conditions for the consultant

9. Consultants and Counterpart

Consultants: Jan Redeby and Søren Netterstøm
Counterpart: Saide Dade and Monica Magaua

10. Timing of the mission

The mission will take place 22/03 to 01/04/04

11. Report

The consultants will prepare a draft Technical Report to be discussed with INE before leaving Maputo. They will submit a final draft to INE for final comments within one week of the end of the mission.

Excel Access Link using Templates

This is a short description of an Excel tool, that allows for a flexible interaction between a series of Excel Spreadsheets and a Microsoft Access database. It is designed with a system for National Accounts in mind.

The intension is that all links between spreadsheets should be avoided and replaced by links through the database. Any sheet may publish data (by saving them in the database) that can then be obtained by other sheets.

The database

The database consists of a number of tables. Each table has rows and columns.
Each row in a table represents one specific cell in a source spreadsheet.
To identify the cell, a number of classification variables are used. For each such variable there must be 1 column in the table. There must be one column to hold the value, one column to hold any comment and one column to hold the formula of the source cell if any. Finally there is one column for username; one for timestamp and one for name of the Excel workbook from which data was saved.

Below is an example for a Product table. The names of the columns need not match the example.

Feltnavn	Datatype	
Year	Tekst	Classification
ProductCode	Tekst	Classification
TransactionsCode	Tekst	Classification
Concept	Tekst	Classification
Value	Tal	The value of the cell
Comment	Notat	Any comment to the cell
Formula	Tekst	Formula of the cell if applicable
UserName	Tekst	User who saved this data
TimeStamp	Tekst	Time data was save
ExcelFile	Tekst	Workbook from this data from saved

Figure 1.

The Excel workbook

All workbooks must be based on the BasicTemplate.xls files, found in the folder ...\Basic Template. The template holds a code module, needed for the operation of the system.

In the workbook, a number of data areas should be defined. Each data area represents a contiguous range of cells and is given a name. So the data area has a number of rows and columns. The rows are connected to one of the classification columns in the

database and the columns to another classification column. In the Example below, rows are connected to transaction and columns to concept.

Figure 2.

The data area starts in C4 and goes to N45 (outside what is shown). Column A does contain the codes of transaction; there are here no codes for concept. See later. Observe that column A is not part of the data area.

The rows 18, 19 and 20 are included in the area, but are not connected to the database, as they have no code associated. Similar rows could be excluded if they only hold calculated values. Columns can be excluded in a similar way, so it is not all cells in the data area that actually is connected with the database.

However, our table had 4 classifications. What to do with Year and Product Code? Actually, in this case Year is contained in cell A1 and product code in cell A2.

Linking to the database

To link the dataarea to a spreadsheet, we use a definition area. The definition area has the same shape, as the dataarea is a named area. It has one extra column to the left and one extra row at the top. It is normally put on a special sheet that is hidden once the application is ready for production.

The following figure shows the definition area corresponding to the previous data area. The definition area is marked with a yellow background in this example.
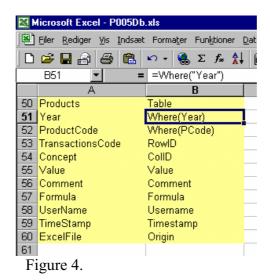
15

Figure 3.

Observe that column A contains the Transaction code and row 3 the Concept Codes (C03Qo etc). Cell B4 corresponds to the upper left corner of the dataarea, in this case C4 in the fig 2.

Observe that the content of cell B4 is =PutDb(). This is the trigger to tell the system to save the corresponding cell in the database, when asked to do so. Observe rows 18-19 does not have a =PutDb(), so they are not saved.

If the cells were to be retrieved from the database, the content should be =GetDb()

Define tables and columns in database

Figure 4 shows another named area of the spreadsheet, that links to the database table and columns. The first columns contains the names of database elements (table and columns), the second column contains information on how each column participate. The first row should contain the name of the table and should be followed by one row for each column in that table.

Figure 4.

As you can se, the columns names correspond to the names in figure 1.

The following table shows the keywords used in the second column

Product	Table	Product is the table name in the database
Year	=Where("Year")	The column Year should have a value = the named Cell Year
ProductCode	=Where("PCode")	The column ProductCode should have a value = the named PCode
TransactionCode	RowId	Row Id (in figure 3) gives the TransactionCode
Concept	ColID	Column ID (in figure 3) give the Concept
Value	Value	The column Value will hold the Cell Value
Comment	Comment	The column Comment will hold any comments
Formula	Formula	The column Formula will hold the Formula if any
UserName	Username	Username has the name of the user that saved the data
Timestamp	Timestamp	Timestamp when the cell was updated
ExcelFile	Origin	The Excel file from where the cell was written

Putting it together

Now it is time to put the elements together. One of the Templates must have a range named DBLinks.

	A	B	C	D	E
1	Name of Data Area	Name of TabelAreaDefinition	Name of DbDefinition	Constant1	Functions
2	Data1996	Temp1996	DBL1996	1996	PutDb
3					

Figure 5

DBLinks is the only fixed name of any range in the system. I may have one or many rows, one for each data area in the workbook. Note that DBLinks should cover all rows used.
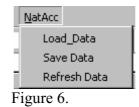
Column 1 is the name of the DataArea (figure 2), Column 2 is the name of the Definition Area (figure 3) and Column 3 is the name of the area defining table and columns in the database (figure 4).

Column 4 may contain a constant, se later for the use of that. Column 5 indicates, that the Definition area only contains PutDb's. Acceptable values are: 'PutDB', 'GetDB' and 'Mixed'.

So now we have a link between the data area, the definition area and the area defining the database.

Putting it to work

Any spreadsheet based on the Basic Template (or on a sheet based on Basic Template) should have the menu item NatAcc

Figure 6.

Load Data will scan the DBLinks area for lines marked as GetDB or Mixed. For all such areas, the data area will be loaded for the database, where the corresponding definition cell contains =GetDB().

Save Data in a similar way saves all cell where DBlinks contains PutDb or Mixed and the definition area =PutDB()

Refresh Data reload saved data. So it works on the same cells as Save Data.

Keeping the database and workbook in sync.

As you enter data into the spreadsheet to cells marked as PutDb, the changes are not automatically reflected in the database. Not until you use the Save Data menu, data is actually made available to other sheets through the database.

If you make changes and do not save data yourself, when closing the workbook, you will be asked if you want to save changes to the database now. You may not want to do so, because you are in progress with a number of changes, that you want to publish at once to keep consistency in the information in the database, while the sheet is temporarily unconsistent.

When you open a sheet, a test to the database will be performed for all cells marked with GetDb. If there are any differences, you can select to load new data from the database. But you may also postpone this if you want to carry on working on the previous version of the data.

Working with many data areas with the same structure

A workbook may contain a number of data areas that can be defined by the same data definition areas. In the proceeding example, one area would contain data for one year, the next area for another year.

One option would be to have separate datalinks for each data area. They would all look like the datalink in figure 4, with the exception of the row declaring Year, that would have to point to different cells holding the different years.

Figure 7.

Figure 7 illustrates the use of Constant. For the Years 1997 to 2001, there are different data areas and but the all use the same data definition area (Temp1997) and DB Definition (DBL1997). Constant contains the year.
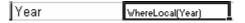
DBL1997 now looks like

Figure 8.

Year is now declared as Constant, referring to the Constant in the DBLinks table.

WHERELOCAL

Another option for working with multiple similar data areas is to use the WhereLocal function. This requires that each area is located on a separate sheet.
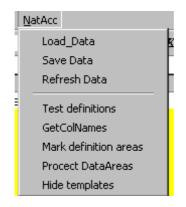
For Year this would look like

written in the cell as =WhereLocal("Year")

Year should be a data area defined on the sheet containing data for 1997. This cell should have the value 1997. Say that this is the cell A2. The sheet containing 1998, should have 1998 in cell A2, the sheet for 1999 should have 1999 in A2 and so on.
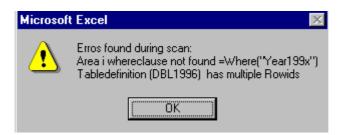
More menu items

On the sheet 'template', you should find a push-button labelled 'Add definition menues'.

If you pres the button, the menues now is expanded giving you five new items.

Test Definitions will test your definitions and issue a message describing any errors.

Press Ok and correct any Errors.

If there are no errors you get the message box

It should be noted, that this test is executed any time you load, save or refresh data, so if there are errors you get the first message box and operations are halted.

GetColNames is a help to build the DB definitions.

Enter the name of the table in the first line and select the Cell. Then press GetColNames and all the Column names from the Database will appear on the following lines. All you have to do now is fill in the second Column of the Db Definitions.

Mark definition errors will simply colour the areas holding DbLinks, all data definition and database definition areas, so it's easy to see what they cover.

Protect Data Areas locks all cells in data areas that either has a Getdb reference or includes a formula. If the sheet is unprotected at the beginning, all other cells of the sheet will be unlocked. After completing locking of cells, the sheet is protected. You could of course unprotect the sheet and do further protection as needed (headers etc).

Hide templates will hide all data sheets holding DbLinks, any data definition area or DB definition area. This should be done when the sheet is completed.

Appendix 3

Terms of reference – national accounts adviser

General responsibilities and tasks

The adviser shall assist INE in the elaboration of plans, guidelines and procedure for the compilation of annual and quarterly national accounts. He will report to the Team Leader and shall collaborate with and assist the Vice-President, the Head of the Directorate for National Accounts and Global Indicators and other staff at INE. The adviser shall provide assistance, guidance, advice and training related to national accounts.

The adviser will work at INE for about ten months during period August 2004 – December 2005.

Specific tasks

The specific tasks shall include but not necessarily be limited to:

- Support the improvement of source data for the national accounts;

- Consolidate and improve the current production of the annual national accounts, in particular the compilation of a new benchmark estimate for 2003:

- Support the review of the current compilation system aiming at making it easier to handle and overview; and

- Support the establishment and production of quarterly national accounts.

Qualifications

- A masters degree in economics;

- At least 10 years working experience with national accounts;

- Substantial experience of statistical systems and the development of national accounts systems in particular;

- Substantial experience of the 1993 SNA;

- Experience from advisory positions and/or training;

- Familiarity with Scandinavian development assistance in general; and

- Fluency in written and spoken English and adequate working knowledge of Portuguese.

Working language

Portuguese and English

Approximate schedule

Ten months include about 41-42 working weeks. In addition to this the adviser will have part time training in Portuguese in August/September 2004.

Year	Month	Weeks	Comment
2004	August	1	Part time training in Portuguese
	September	5	from late August
	October	3	
	November	1	End of month
	December	3	
2005	January	3	
	February	4	
	March	3	
	April	1	Beginning of month
	May	1	End of month
	June	2	Beginning of month
	July	2	End of month
	August	4	
	September	4	
	October	3	
	November	1	
	December	3	
	Total	44	