



Mission Report

from a short-term mission on

Development of a new system for Economic Statistics

1-19 September 2003

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

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Messrs Tom Langer Andersen and Firmino Guiliche discussing the publishing of the short-term indicators

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List of abbreviations

CO	Scanstat Coordination Office in Statistics Denmark
CAE	Classificação de Actividades Económicas (type of economic activity)
CEMPRE	Censo de empresas 2002 (Business census 2002)
CNBS	Classificação Nacional de Bens e Serviços (product classification)
Danida	Danish International Development Assistance
DEBA	Department for Statistics on Goods and Environment
DESC	Department for Statistical Services and Business Statistics
DESE	Directorate of Statistics on Enterprises and Sector Economics
DISI	Department of Informatics and Information Systems
DPINE	Provincial delegation of INE
FUE	Ficheiro de unidades estatísticas (software for the business register bought from INE-P)
INE	Instituto Nacional de Estatística, Moçambique
INE-P	Instituto Nacional de Estatística, Portugal
MOPH Scanstat	Ministério de Obras Publicas e Habitação Consortium between Statistics Denmark, Statistics Norway and Statistics Sweden
SCB	Statistics Sweden
SEN	The national statistical system
SSB	Statistics Norway

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1 EXECUTIVE SUMMARY

The National Statistical Institute (INE) was conducting a business census (CEMPRE) 2002/2003. The data from the business census were used to establish a completely new business register, FUE. INE is preparing a new system for the short-term statistics on the staff situation, production and turnover in manufacturing industry, construction industry and services, including

- new samples from the new business register,
 - review of the contents, review of the whole survey methodology to improve the relevance to better meet user needs,
 - improve the quality in the source data as well as in the internal processing routines,
 - establish good routines and practice for the field work and the communication with the province delegations
- The main objectives for the mission were to give advice on these issues and to contribute to the design of the new system.

Mr Anderson was mainly concentrating his work on the conceptual and the subject matter oriented issues, while Mr Petersson gave more attention to the contents of the business register, the design of the sample, the data processing routines and the computer skills. Both consultants have earlier experience from several similar assignments as consultants in the development of the economic statistics in INE.

The consultants had meetings with the staff in the directorates for national accounts and sector statistics as well as the ministry of construction to review the situation and discuss the proposals.

The main recommendations are to

1. urgently finalise the discussion on the operational definition of the target population.
2. conduct a mail request to the province delegations to verify if there are known large establishments that are not yet included in the business register or miss information about the number of staff members
3. identify all large establishments in the old surveys in the new business register
4. conclude that measuring of changes is an overall objective and the main need from the national accounts
5. define the output variables in an integrated process in the review of the contents of the questionnaires
6. define the contents of the new forms in line with the recommendations and experience from feasibility in the old surveys, new classifications. Prepare written information to the respondents, to be distributed at the start of the surveys
7. define a strategy for the handling of non-response and imputations
8. strengthen the routines for data collection, especially the control of the nonresponse
9. consider to decentralise data entry and/or provide other improved tools for validation in the provinces before submitting the data to the INE central office

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10. improve the routines for macro-validation in the processing by extended use of preliminary output tables for the validation
11. establish a formal structure for use of administrative data for validation and analysis
12. develop the estimation methods focusing on indicators on the CHANGE in the economic activity
13. elaborate routines to bridge the time series between the old and the new survey, mainly by using the CEMPRE as source for re-estimation of the totals for previous years
14. establish a common data store with the versions of the datasets that are used as source for the quarterly reports
15. training of all involved staff members to establish good understanding of the user needs, the design of the surveys, estimation methods as well as to ensure good habits in all steps of the data collection and processing

Regarding the sampling for the surveys the main recommendations are:

Full coverage of all units having 30 or more employees

Random sample of establishments for smaller units by two size groups, but in some divisions according to CAE it is suggested to concentrate the surveys to the medium-sized and larger units (cut-off principle). For parts of construction sector and also some service and transport groups, such as banks, railways, telecommunication and postal services, the enterprise unit is proposed to be the unit for observation.

Consider further if/what remote district can be excluded from the surveys for resource reasons.

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Mr Cirilo Tembe and Ms Natércia

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2 RESUMO EM PORTUGUÊS

O Instituto Nacional de Estatística (INE) realizou um censo do Empresas (CEMPRE) 2002/2003. Os objectivos principais da missão foram de elaborar a estrutura bem como partes das ferramentas para um novo sistema para os inquéritos mensais nas áreas indústria, construção e serviços. As tarefas principais no processo de elaborar e introduzir o novo sistema identificou-se como:

- desenvolvimento do conceito
- estudos da estrutura do universo de empresa
- desenho da amostragem
- definir os resultados e indicadores queridos
- definir os dados para recolher
- períodos e rotinas de recolha e processamento dos dados
- acções e ferramentas para facilitar e economizar o trabalho
- rotinas para o processamento dos dados
- sistema para estimações
- rotinas para facilitar a análise e comparar os novos e os velhos inquéritos

A missão foi feita durante três semanas em setembro de 2003 por Tom Langer Andersen de Statistics Norway (SSB) and Kenny Petersson de Statistics Sweden (SCB). A missão foi feita junto com o pessoal do pelouro económico, conforme os termos de referencia (Appendix 4).

As actividades principais foram discussões e entrevistas com o pessoal do INE. Os consultores também preparou documentos para as discussões e sobre as rotinas para a amostragem e o processamento. Anexado encontra-se um documento (Appendix 15) com um resumo das etapas principais para introduzir o novo sistema, utilizado para a apresentação das propostas para o pessoal de DESE num seminário ao fim da missão. A opinião do pessoal conforme a discussão no seminário contribuiu para algumas das propostas em baixo.

As actividades foram discussões sobre maneiras para facilitar as rotinas manuais para as últimas etapas do processamento.

Os resultados/observações principais foram:

- Novo sistema para os inquéritos mensais.

Realizou-se entrevistas para avaliar a experiência do sistema para os inquéritos 2000-2003. Os principais utilizadores são as contas nacionais e a análise que faz-se para os indicadores trimestrais publicados em “A conjuntura Económica”. Realizou-se também entrevistas entre os funcionários responsáveis para recolha e processamento dos inquéritos, demonstrações de algumas das rotinas e uma reunião no Ministério de Obras Públicas e Habitação (MOPH) para informação e discussões sobre estatísticas na área de construção.

As recomendações enfocam a necessidade reforçar toda a estrutura e as rotinas quando faz-se a implementação da nova amostra 2004. O relatório dá propostas sobre o novo sistema e também sobre as rotinas para implementação do novo sistema.

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Recomenda-se alterar o desenho da amostragem para recenseamento total dos 2000 estabelecimentos com 30 ou mais membros pessoal conforme o CEMPRE nestas áreas e uma amostra aleatória de estabelecimentos entre os menores estabelecimentos.

☐ Amostragem do cadastro de estabelecimentos (FUE)

Durante a missão realizou-se uma análise da estrutura do FUE, discussões sobre o desenho da amostra, cálculos para definir como distribuir a amostra por estrato usando o método “Neyman-Allocation”. Também elaborou-se uma rotina para elaborar a amostragem usando uma versão preliminar do FUE e também realizou-se uma demonstração desta rotina.

☐ Conteúdo dos inquéritos.

Existem partes dos inquéritos que não funcionam bem. Considerando estas experiências e as propostas neste relatório recomenda-se elaborar versões preliminares para testes e discussões antes de decidir o desenho definitivo em Outubro.

☐ Rotinas para recolha de dados

A mudança para uma nova amostra é uma oportunidade para marcar também mudança para rotinas mais elaboradas sobre controles e organização do trabalho. A recomendação principal é reforçar as rotinas por meio de elaborar exemplos típicos e discutir como tratar. A parte mais prioritada e o tratamento de casos diferentes de não-respostas.

☐ Rotinas para o processamento dos dados

A mudança para um novo software para o cadastro e mudança do conteúdo dos inquéritos implica que vai ser necessário rever e actualizar todas as rotinas para entrada de dados e processamento dos inquéritos. Recomenda-se decentralizar a entrada de dados para dar ferramentas ao pessoal dos DPINs para validar os dados antes de envia-se-los para o órgão central do INE.

Durante a missão identificou-se também uma série de tarefas para executar-se no INE e nas DPINs para realizar o novo sistema para os inquéritos do curto prazo.

- A. Definir a população para os inquéritos em termos dos classificadores existentes no FUE
- B. Verificar nas províncias se existe outros estabelecimentos com 30 ou membros do pessoal que não encontra-se no FUE.
- C. Identificar todos grandes estabelecimentos nos inquéritos 2003 no FUE e elaborar uma tabela de conversão para estabelecer series temporais por nível de estabelecimento.
- D. Elaborar novos questionários incluindo ferramentas para melhorar a medida da evolução da actividade económica. Excluir ou alterar partes dos questionários que não funcionam bem nos inquéritos 2003.
- E. Definir as variáveis no novo sistema de processamento e as tabelas de saída
- F. Melhorar as rotinas manuais na recolha de dados, especialmente como tratar não-respostas

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G. Elaborar ferramentas para as DPINEs para verificar os dados e comparar as respostas de diferentes meses e trimestres usar. A solução pode ser folhas de cálculos em Excel ou rotinas para entrada de dados nas DPINEs.

H. Melhorar as rotinas para “macro-validação” por meio de elaborar e actualizar tabelas de saída para usar para validação dos dados de entrada.

I. Elaborar uma estratégia para utilizar dados administrativos, principalmente na área de construção

J. Re-estimar os indicadores para os anos 2002-2003 usando a taxa de cobertura comparado do nível total conforme o CEMPRE para elaborar ponderadores.

K. Elaborar um directório comum no servidor para as versões finais dos dados que utiliza-se para cada processamento trimestral.

L. Treinamento para os pessoal dos DPINEs e o órgão central da DESE.

As recomendações principais foram

1. finalizar a discussão sobre a definição operacional da população do alvo.
2. verificar se existe grandes estabelecimentos que não foram incluídos no FUE.
3. identificar todos grandes estabelecimentos nos inquéritos 2003 no FUE.
4. focar medida de tendências no desenho dos novos inquéritos
5. definir as variáveis de saída no processo de revisão dos questionários
6. simplificar os questionários especialmente as parte que não funcionam bem nos inquéritos 2003
7. reforçar as rotinas para recolha de dados, especialmente controle de não-respostas
8. avaliar se é possível realizar a descentralização da introdução de dados e/ou fornecer outras ferramentas para melhorar a validação nas DPINEs
9. preparar as novas rotinas para entrada e processamento dos dados
10. melhorar a utilização de macro-validação por meio de calcular tabelas de saída frequentemente durante o processamento.
11. elaborar rotinas para estimar totais do país por meio de recalculer os ponderadores nos inquéritos 2002-2003 usando os resultados do CEMPRE
12. juntar os dados dos inquéritos numa base de dados comum cada processamento trimestral
13. Treinamento do pessoal para estabelecer bom conhecimento dos métodos de estimação bem como todas as etapas do levantamento e processamento dos dados.

Agradeço todo o pessoal de INE, que tivemos a vantagem encontrar e trabalhar junto com durante a estadia no INE.

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3 INTRODUCTION

The main objectives for the mission were to assist in the design and planning of the general structure and routines in a new system for the short-term statistics in the business sector that is going to be launched in January 2004. In terms of reference (see Appendix 4) the objectives are given as follows:

- Evaluate the current methodology and processing routines used to produce economic statistics.
- Follow up recommendations from earlier missions not yet implemented.
- “Clean up” in catalogues and files. Over time the programs and datasets have piled up. There is a need to organize the file structure and delete (or separate) old and unused applications, datasets, documentations, etc. Here it is necessary to coordinate with Department of Informatics and Information system (DISI) that are in the process of developing a system for documentation to be used in INE.
- Develop further the methodology used in the production of economic statistics.
- Develop further existing applications for production of economic statistics. Certain adjustments might be necessary taken into account new methodology, and the fact that a new register will serve as a basis for new samples.
- Assist in further development of production manuals and other documentation of the production process. (Here it is also necessary to coordinate with the documentation work going on at DISI).
- Start preparing the methodology for drawing new samples based on the new business register
- Training of DESE-staff in producing good quality statistics using new methodology and applications.

The consultants gave advice on these issues in meetings with the INE staff members that are in charge of the surveys and the national accounts.

An important part is related to the building of competence. Most of the objectives set up for the mission have been fulfilled. However - many of the recommendations are yet to be implemented.

The recommendations provided in this report have been discussed on management level, and further discussions / seminars and separate meetings with the survey staffs concerned were planned to take place at the end of the mission. The report does definitely not provide a list or recipe that should be followed step-by-step although this could be possible - at least to some extent. The full value of the recommendations is not extracted until the issues that are focused on in this report have been discussed among the survey staff. In that sense we hope that the report at least to some extent can be provoking.

The mission was conducted during the period 1-19 September 2003 by Mr Tom Andersen from Statistics Norway (SSB) and Mr Kenny Petersson from Statistics Sweden (SCB).

The main counterparts were Mr Azarias Nhanzimo, Director of the Directorate of Statistics on Sectorial Economics and Enterprises, Mr Cirilo Tembe, Head of the Department of Deputy National Coordinator of the CEMPRE and Mr Calado Fijamo, Department of Informatics and System Design (DISI). The mission was planned in the Division for Economic Statistics in

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collaboration with Ms Irene Tuveng, former long-term consultant in the Scandinavian Bridging Support Program.

This report contains the views of the consultant(s), which do not necessarily correspond to the views of Danida or INE.

4 ACKNOWLEDGEMENTS

The consultants would like to express many thanks to all the people we have met and had the pleasure to work together with during the stay in Mozambique. All the kind support from INE staff has highly facilitated the work and contributed to making the stay very pleasant.

5 THE REQUIREMENTS OF THE NATIONAL ACCOUNTS

The short-term statistics are designed to cover various user needs. Special attention is given to the requirements of the National Accounts (NA) that produce and publish consistent information for the Mozambique economy. In this chapter some of the NA requirements is presented and discussed.

When designing the short-term statistical surveys the national accounts have a special role. On the one side the national accounts provide the conceptual basis for defining the variables used in the surveys. Further the accounting system influences the way surveys are designed, - in sampling, in data collection and in the logical structure of processing. The national accounts are also the most important user as concerns the amount of information requested. The NA accounting system on balancing the flows of information on a relatively detailed level enables an identification of problems or likely errors in the underlying surveys and administrative data. For the national accountant such problems must be corrected or explained. Due to that, the NA in fact have an important role in checking the quality and coherence of the economic statistics.

This double role is in fact of large value for the producers of statistics. In many countries this special relation has been formalised to improve the total user value of the products from the statistical system. INE should consider formalising the cooperation further.

The national accounts have prepared a list of indicators for which information is of special relevance.

- Production / Turnover, in current prices (value indices)
- Production / Turnover, quantities (Laspeyres volume indices)
- Production / Turnover, prices (Paasche price indices)

- Intermediate consumption / Purchase, in current prices (value indices)
- Intermediate consumption / Purchase, quantities (Laspeyre volume indices)
- Intermediate consumption / Purchase, prices (Paasche price indices)

- Gross fixed capital formation / Investments, in current prices (value indices)

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Changes in stocks of raw materials, in current prices
Changes in stocks of finished goods and work in progress, in current prices
Changes in stocks of trading goods, in current prices

Wages and salaries, in current prices (value indices)
Employment, persons (Laspeyre volume indices)
Wages and salaries, wage rates (Paasche price indices)

For each of the indicators a breakdown in 20 divisions (2-digit level according to CAE) is required. See appendix 9 for more details. Technically this breakdown is already a built in part of the statistical production systems. Further the required data should - for each division by indicator - comprise an updated set covering the last 5 quarters ending with the current.

The value indicators should be presented as elementary indices, the price indicators by using the Paasche formula, while volume indicators shall be based on the Laspeyre formula. If the short-term statistic data is aligned with the recommendations and data are consistent, only two of three indicators (value, price and volume) need to be produced directly. The short-term statistical production systems need amendments to fulfil the need for indices.

A strategic goal for INE is to establish a quarterly national account system. For several reasons there will in practise take time - most likely at least 2-3 years - before a quarterly account system can be put into operation. The lack of relevant short-term information (time-series) and lack of good quality structural information (annual) are to some extent prohibiting. Several important parts of the national accounts data requirements remain to be covered. Further - our impression is that the national accounts have their main focus on the annual accounts production system, which seems reasonable in the current situation. Establishing an information platform for the quarterly national accounts will take time.

Further - some additional variables should be part of the discussions and included in the plans for revision of the short-term statistics. These are:

Private household consumption.
Changes in inventories (or stocks) for raw materials, finished goods and trading goods.
Gross capital formation (investments).

The overall purpose of the short-term surveys is set on observing production activities, which mainly contributes to the supply of goods and services in the economy. The national accounts need more information on how the produced goods and services are distributed - in consumption, as intermediates in production. Further - more information is required on the flow of goods and services that is invested - either produced or imported.

For the next months the uncovered variables (areas) should be subject for further discussions within INE. The revision of the short-term statistical system provides some opportunities for filling gaps - first of all those related to household consumption. For the other variables more and better quality information is required.

Some types of information are available as concerns investments. For e.g. the construction sectors such information can be found using administrative data from MOPH. Further - the production information for the construction sectors will normally be investment activities for other sectors. Also for this types of data administrative sources can be of use. The data source in

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MOPH and related administrative data - if made available to INE - will most likely open for large improvements in the coverage of construction statistics.

6 CONCEPTUAL ISSUES

6.1 The purpose of short-term statistics

The short-term statistical surveys should be designed for providing information about the current economic situation within production - having a special focus on measurement of the short-term changes in production activities and employment.

Mozambique has a tradition of producing statistics on production measured in absolute levels of quantities, values etc. Although good arguments could be provided for that, the production decisions and flows of products are increasingly left to decisions of the markets. Due to this the task of measuring absolute levels and flows has become even more complex, requires larger samples etc. and in some sectors proved to be more or less impossible. The purpose has been for years to measure and monitor the changes in the economy. The current survey system does seem to be able to provide the information required due to large nonresponse and for some areas also poor quality in data.

This report recommends that INE should prioritise:

- The measurement of production indicators in current values - turnover, sales value, production values.
- The measurement of employment and wage costs
- The measurement of prices - for most of the industrial sectors

This set of indicators could be labelled as key variables that must be covered in all surveys.

The volume indicators measured in physical units should be observed - but not rule out the need for having a special focus on the key variables.

The statistical system must be developed having a special focus on the requirements of the national accounts.

The statistical system must utilise several types of sources e.g. administrative data, regular surveys, annual surveys etc. Utilising these sources in an optimal way requires analytical competence among staff.

6.1.1 The value - volume and price - quality in measurement

The task of measuring output is complicated. The task must start out by defining the product to be observed - though all the time bearing in mind the overall purpose of the statistics. The traditional production indices observe physical volume indicators in tons, pieces etc. Statistics based on such volume indicators does not function as intended. This is also the case for most INE surveys covering the industrial sectors. The indicators observed reflect at the best the gross

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production activity for the industrial sectors measured physical units. Further - the complexity in products within the various sectors indicates that a quantity- based system can only be expected to function as required for a restricted number of sectors. In addition there are many methodological pitfalls to run into - and normally one does in fact run into most of them.

It should be added that the basic purpose of a production indicator is to provide information concerning the value added. That is the gross production value excluding cost of raw materials, intermediates etc. Measuring value added is extremely complicated and resource demanding. Due to this there is an international acceptance for using gross production indicators as proxies.

There are several other possible approaches for observing output from the various industrial sectors. One is to observe the turnover, sales value and/or gross production value measured in current prices. Such information will normally be available for an enterprise and the establishments being a part thereof. These variables should be considered as rough indicators of the production activity - measured in current prices. For the purpose of estimating production indicators in fixed prices additional information concerning the prices and price changes are required.

This report suggests that INE starts a medium term transition moving from the quantity-based approach to a value based approach combined with increased observation of prices and price changes. It should be stressed once again that this does not rule out the concept of having a focus on physical volume indicators. These indicators will function complementary to the indicators based on economic data i.e. values and prices.

Further - it should be added that focusing on prices requires high precision in measurement. A focused issue related to price measurement is the bias known from international research and analysis. Most price statistics actually provides estimates on price changes that overestimate the true change. Utilised in the national accounts this implies that the growth rates in production is underestimated. This again implies that the productivity measures become incorrect - and so is the case for many of the macro economic indicators. The challenge when working with prices is to identify the quality changes in products produced or imported and sold.

6.1.2 The short-term surveys and the annual surveys

In most countries the task of providing information about structures and flows in the economy is laid on the annual surveys. The structural surveys also serve as a reference for the short-term statistical surveys as concerns their ability to measure the true changes in the economy. Thus - using the short-term statistics as an important source for the structural surveys will work counterproductive. This does not however rule out that information made available from the short-term surveys could be used in describing the structures. It is however important to avoid an overload on the short-term surveys as concerns the number and complexity of variables.

Indicators for the production activities (sales- and/or production values, prices, volumes, employment and wage costs) should continuously be prioritised. Across the statistics the ways of covering the volume dimension will differ.

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6.1.3 Maintenance of the statistical system

The purpose also implies that the statistical system is highly dependent of maintenance - and further development in quality whenever needed. To some extent this is a matter of having well functioning routines for updating of samples - of units, products and specifications etc. Such routines including analysis of non-response (partial and total), cross checking with other relevant information etc. should normally be run - at least - every second year.

On the other side a well-organised maintenance system requires capacity and competence (in statistics and analysis) as well as a system for planning and organising of the work.

6.2 The statistical products

This section discusses a proposal for a future product structure for the short-term statistical system (STS). The system is designed to produce and publish statistics on a quarterly basis. So far only the data collection system has been in operation on a monthly basis according to intension. This report suggests further adjustments in the data collection system that should enable starting publishing statistics on a more regular basis - quarterly and annually.

All statistics within the short-term statistical system (STS) should in principle have the same publishing targets as concerns frequency, scope and coverage of basic variables. All statistics should provide information on sales value (and/or gross production value), employment and wage costs. Differing from survey to survey the final products will comprise price indicators and volume indicators. To provide the latter, new approaches seem required and the solutions are likely to differ across the industries that are covered. E.g. measuring volumes in construction requires different volume indicators than what is normally used in manufacturing.

For more information - see appendix 11.

The planned product structure:

Quarterly statistics

Published: 30 days after the end of last quarter in the quarter.

Annual figures (preliminary structural information)

Published: 6 months after the end of the year of concern.

6.3 The survey unit

For most of the current surveys the establishment is chosen as the unit of observation, and the establishment is also normally the unit of analysis. The construction survey differs in that the enterprise is the unit of observation. The information requested should be broken down to establishment level. The choice of unit of observation is normally based on several types of information.

One wants to collect the data requested to a minimum cost both for the respondent (respondent burden) and for the statistical agency. Are there international recommendations or

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international data deliveries that explicitly require a special type of unit? Do the levels of detail that is planned for publishing and analysis require a special unit? The basic question to be answered is what unit (enterprise or establishment) would be the appropriate one to give good quality information most efficiently for the variables included in the survey.

The simple structure

In the case of enterprises having only one establishment the choice is simple and will not be discussed further.

The complex structure

For the larger enterprises comprising several establishments the decision becomes more complicated. Further complications are added when the enterprise has a complex structure - being vertically and/or horizontally integrated. Some examples:

A survey asking for information on investments, financing etc. will use the enterprise level due to that the decisions on investments normally are made on this level.

When asking for production data long time experience supports the choice of the establishment as the most efficient unit. This choice could also depend on the structure built when organising the enterprise. Some enterprises are e.g. organised in divisions that cover all activities within a special sector (e.g. 3-digit level according to CAE). One also has experience showing that enterprises or divisions have detailed information systems covering data on the activity in the establishments.

It is complicated to give a general recommendation on this issue. Nevertheless:

It is recommended that INE should select the enterprise as the basic unit for observation as concerns all large and complex enterprises. A presumption must be that the enterprise takes responsibility for delivering data when splits are required for producing statistics on detailed levels.

It is important to be flexible on this issue though within limits fixed by the data deliveries required. E.g. INE should send separate questionnaires to the establishments though only if that is preferred by the enterprise.

For parts of the construction sector international recommendations specify that the project should be the unit of observation, and having the enterprise as the unit receiving the questionnaire(s).

6.4 Administrative data - an important source when producing statistics

For the last decade most European statistical agencies have been working actively to expand the basis for producing statistics. Important sources and/or databases have been identified within the government sector (ministries, directorates etc), branch organisations etc. Government institutions often do their own surveys - for providing a data basis for executing the administrative tasks for which they are responsible. Some examples:

Administrative data might come from a retailer that has to give information to the tax authorities when paying e.g. the value added tax (VAT). Among several types of information the retailer must provide, is the total value of sales, or total sales for products that are subject for VAT regime.

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Information on construction activities might be found in the forms that are filled in by an applicant for e.g. building license. The license is delivered to the regional or district offices for approval and thus legalising a building project.

Some branch organisations collect information from the members e.g. being transport enterprises. Information about the enterprises might be collected for handling the situations where public focus is set on the branch, data is used as a basis for describing a branch when lobbying e.g. when changes in tax systems is on the government agenda.

These examples illustrate that information describing industrial sectors are or might be available in many organisations. The cost of collecting data have increased when measured in costs for INE, but also when taking into account that costs generated in filling in questionnaires.

It is recommended that INE should be active in taking initiatives for cooperation with government institutions that are known to have information of relevance. INE should also more actively (on staff level) work for mapping the current situation in general.

It is suggested that INE takes an initiative towards MOPH for strengthening the cooperation between the institutions. A common workshop for technical staffs in the institutions is recommended - for evaluating the data and to identify areas for closer cooperation. Such initiative could also be of interest for the ScanStat project. INE could also gain experience in this rather new field.

When evaluating an administrative source a general principle should be adopted: The differences identified should in practise be large before concluding that administrative data is not relevant for statistical purposes.

An UN principle: In general one might say that data collected for public purposes should only be collected once, but used in several contexts.

Administrative sources do not in general provide the complete basis for producing statistics. In several and important ways they do however contribute to improve statistics.

The factual information covering the industrial sectors expands substantially. This establishes a basis for improved understanding of the markets, structures and enterprise strategies.

Increase the coverage and quality of short-term statistics and structural (annual) statistics.

Improve the basis for producing population estimates.

Built in time lags in data flows

Many countries experience that some administrative sources have built in time lags as concerns updating, actuality etc.

An important implication of this is that the use of administrative data only, could lead to mismeasurement as concerns identification of the turning points in business cycles. To strengthen the statistic capability in this problem area many statistical agencies

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combine the administrative sources with regular surveys. The combination strategy allows for developing the regular surveys in design, variables, sampling etc having a special focus on the critical issues.

See appendix 12 for more about administrative sources.

7 ACTIVITIES AND OBSERVATIONS DURING THE MISSION

7.1 Review of the current system for the monthly surveys

The current system for the monthly surveys was revised 1999, when a sampling procedure was introduced. The data entry and data processing systems for these surveys were developed following a common concept and uniform database structure. The user interface was further developed during 2001. The data processing system was designed to produce tables for the core indicators from a graphical user interface with buttons for each set of tables. The system allowed the user to produce output tables for validation purposes any time during the data collection or validation process. These facilities were powerful tools for validation and analysis of the data.

The behaviour of the system, looking at source data indicates that the non-response rates seem a bit worrying for many of the surveys. The system for following up the respondents in case of non-response does not in fact seem to work as intended. Further - the evaluation of the data actually reported indicates large variation in quality. This could be a consequence of lack of motivation among respondents - and most likely this is a part of the explanation. The contents of the questionnaires indicates lack of relevance for some of the variables, which might be an even larger problem for the quality. This is an important issue which is also discussed in this report.

The data collection system is based on the province delegations (DPINE) when gathering the questionnaires. The current system for communicating data between the provinces and Maputo Central does not however work as required for producing short-term statistics. In fact - the utilisation of the provincial staff seems all too low. For several reasons one should look for other solutions in this issue. The updates of the business register require strong provincial support in maintaining the coverage and quality. Further - the local knowledge about the surveyed industries and establishments should be utilised more efficiently.

During the mission, the consultant made interviews to check how the surveys were processed and how satisfied the staff members working with the processing of the surveys were with the routines. These interviews showed that the data entry and validation routines were well established in most of the surveys, while the facilities for fixed format output tables were not used. Also parts of the validation was executed outside the system, mainly because the staff felt more comfortable with working in Excel, because there were old routines in Excel that continued to run in parallel.

The built-in routine for printing control schemes for the fieldwork, "Disciplina" was not in use in all surveys.

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The general conclusion is that the system itself functions well, but that it is not satisfactory that there is no IT expert in INE who can assist in the maintenance and training in the use of the system. If the lack of IT competence remains, one solution can be to simplify the system to avoid dependence on external technical assistance.

Written documentation of the surveys, following a standardised format, are now available. The “manual” routines for the final tabulations were not reviewed.

The publishing of the results is quite limited. Data for a selection of establishments and product in manufacturing industry are published in *A conjuntura económica*”.

The routines for the final tabulations of output tables were identified as the parts of the processing routines that would most need more attention.

7.1.1 Construction industry

1. The survey covers the following CAE groups:

- CAE 452 Buildings - residential and non residential; civil engineering
- CAE 453 Special installations; electricity, sanitation
- CAE 454. Finishing works; painting etc

2. An internal INE report covering this sector was released in the beginning of this year. The report sketches a plan for developing statistics both annual and short term. A special focus is on the annual statistical system. The report provides an analysis of the current situation pointing at the building activities as the problem area. This is due to the measurement and population problems caused by the Auto-construction system (simplified building permit). The issue were discussed thoroughly and initiatives were taken to start controlling this - in cooperation with ministries and provincial institutions.

The internal report sketches a long-term goal that both building and civil engineering activities should be covered, including investment activities. And that the system should build on administrative data as well as survey data.

This report recommends that INE continue the work started by this group. The analysis of the sector reveals several serious problems as concerns the survey capability to observe the true project population. The initiatives taken by INE cooperating with governmental institutions on the mapping of the Auto-construction system must be continued. Meetings that this mission had with MOPH have shown that the administrative information in this area is substantial. A number of principal, conceptual and practical issues concerning the ministry statistical system remain to be discussed in detail. An INE initiative for cooperation is recommended.

3. Units within construction

The current survey uses the enterprise as the unit for investigation but asks for a breakdown on establishment. It is recommended that the enterprise remains to be the unit for investigation, but the focus for observation and analysis must be on the project. Each project administration is normally found in the enterprise.

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For most variables covered the enterprise level information should be complete. For variables like building permits, number of new dwellings, useful floor area in square meters etc. the project could be the unit for observation. The enterprise should however be considered.

The units operating in the sector are either state owned, private or joint ventures. Some of the units have foreign owners. The institutional dimension should be utilised in data collection and analysis.

For all medium sized and large enterprises the coverage for most variables should be 100 per cent.

4. Standards - classification

The construction survey will use the Construction Classification (CC) in several ways. For publishing short-term statistics it is recommended that the section and division levels is used. In construction this could be Buildings (CC 1) and a split into residential (CC 11) and non-residential buildings (CC 12). For Civil Engineering (CC 2) the level of details should be discussed.

The CC also provides a classification of the projects during observation and analysis. The following breakdown should be considered used in the forms.

Housing and building	(CC 1)	Civil engineering	(CC 2)
-- Residential buildings	(CC 11)	-- Transport infrastructure	(CC 21)
-- Non-residential buildings	(CC 121, 122, 123)	-- Pipelines etc.	(CC 22)
-- Industrial buildings and warehouses	(CC 124, 125)	-- Complex construction	(CC 23)
-- Public entertainment etc.	(CC 126)	-- Other	(CC 24)
-- Other	(CC 127)		

The implication of this is that rehabilitation will be measured but not possible to separate from the total activity - as it is in the current form.

See appendix 14 for more about the classification of construction (CC) - and the implementation planned.

5. The form

The form will in this case be subject for larger changes. The use of the recommended breakdown will imply that the respondent will face changes in several ways. The respondent should in advance be informed about these changes.

For general comments on the design and layout of forms - see chapter 6.3.

Identification of the unit

-- See comments given for the manufacturing sector

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The list of variables proposed

For data collection the breakdown specified above should be considered. For publishing - a breakdown into sector levels or type of projects should be considered.

- Turnover (sales values) measured in current prices.
- New orders - only for buildings and civil engineering. Measured in current prices
- Gross production or gross product in current prices? Is it at all possible to collect data for these variables?

- Number of employed persons; a breakdown in men and women should be discussed
- Wage costs

- The price dimension is not recommended for the construction sectors. Cost indicators are however found in many countries. Monthly data in MOPH surveys could provide a basis for producing a material cost or building cost indicator.

Volume indicators measured in physical quantities

For buildings (residential)

- New floor area - type of building and investor
 - Number of new dwellings
 - Completed dwellings

 - Number of building permits authorized measured in number of dwellings and useful floor area in square meters. These indicators require use of administrative data. The work initiated for controlling the Auto-construction problems identified must be continued.

 - Hours worked
- The measurement of this variable is often complicated due to time lags in reporting. The data reported must be of good quality. All actual hours work including extra time should be included. Such data should normally be available in the project administration unit.

7.2 The nonresponse problem

As discussed and described in several of appendices and elsewhere in this report the nonresponse problem has become significant in most of the surveys. It is found among the smaller units, the medium-sized as well as the larger units. The large part of nonresponse refers normally to the unit refusal or drop out (unit nonresponse), but in most surveys also the item nonresponse has become substantial.

The nonresponse issue affects the statistical system in several ways. On the one side by increasing the variance of the estimates and thus reducing the precision of the growth rates disseminated to the users. An even more severe problem is that the causes for nonresponse might be - or likely is - a systematic feature. Thus - INE is not facing a problem of precision solely, but a problem implying systematic deviations in measurement and in results distributed to the user. INE does not know whether it is an upside or downside bias in growth rates, or the size of the bias. The lack of information on the causes for nonresponse might have substantial quality impacts on the business register. In some cases e.g. the nonresponse reflect organisational changes in enterprise.

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INE must give high priority to the nonresponse issue. Several initiatives are needed. The overall purpose must be to increase the knowledge on causes for nonresponse. For increasing the knowledge about causes for nonresponse a draft form is sketched and discussed in 6.2.1.

The causes for nonresponse are numerous and will likely differ from case to case. Often one will meet arguments that it is not possible for the respondent to give correct information. E.g. the data requested is not available in the administrative systems of the establishment. For the DPINE staffs the personal contact with the respondent when discussing nonresponse might be experienced as stressing. The staff member operates as the representative of INE. As guidelines for the staff and for achieving similar ways of treating such issues, clear routines and procedures are required. Administrative initiatives must be taken to motivate the respondents. In 6.2.2 a draft procedure / routines are sketched.

7.2.1 Controlling the nonresponse - the form

It is recommended that a form for controlling nonresponse should be a part of the revised statistical survey system to be started in January 2004. This form is to be filled in by DPINE staff only. The form should be produced on a monthly basis. The format for the "Disciplina" could be used as template.

The form defines three main types of nonresponse;

- respondent is refusing, not identified or identified but not contacted
- unit is permanently closed down
- unit has a temporarily stop covering the whole month.

The first alternative opts for an administrative reaction by DPINE or Maputo Central. If suitable tools for reactions to nonresponse is lacking, an initiative must be taken immediately to assure that the DPINEs have relevant tools. If the unit has not been identified it is crucial to verify if it really exists, -and where.

In case of refusal a clear system of administrative procedures and routines are required. See 6.2.2 where a draft routine is sketched.

The permanent close down alternative has three sub-classes for identifying the exact status of the unit. The temporarily close down alternative provides a range of technical, economic etc. causes to understand the nature of nonresponse. More details will be presented below.

If an enterprise/establishment does not respond (unit nonresponse) within the final scheduled time limit, the nonresponse form should be filled in. Independent of the causes - refusal or other - additional information is required.

If a survey form is blank i.e. delivered without relevant information, the case should be considered as a unit nonresponse. Immediate contact with the respondent should be taken to correct misunderstandings etc.

Further information concerning each separate case should be given in the nonresponse form. The following codes are to be used when filling in the nonresponse form.

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(a). Identification code

Fill in the identification code of the not responding unit (enterprise code or establishment code) i.e. the correct code referring to the unit that has received the survey form.

(b). Main causes. One of the codes must be filled in column 2.

1. Refusal or not reached 2. Unit permanently closed 3. Unit temporarily closed

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(c). Describing the type of nonresponse. To be filled in column 3.

1.	Not contacted	1.	Capacity is reduced	1.	Repair or investment works
2.	Contacted but not reached	2.	Moved to other establishment	2.	Sales problems, stocks too large
3.	Refuses to respond		within enterprise. Province?		
4.	Not identified	3.	Establishment is or will be sold	3.	Lack of raw materials, intermediates, energy
5.	Other. Specify:	4.	Other. Specify:	4.	Lack of staff
				5.	Seasonal stop
				6.	Financial problems
				7.	Other. Specify:

Controlling for nonresponse

To be filled in by DPINE staffs and returned to Maputo Central within....

Survey:	Industry	
Province:	Maputo Province	
Month - year:	11 – 2003	

Unit code (a)	Main causes (b)	Describing the cause (c)
1234567	2	1
6536536	2	2; to Sofala
7112373	1	2
7435235	1	3

A. Total number of units in the nonresponse list: 4

B. Total number of filled in forms 15

A + B 19

Total number of units in the province ¹ 19

¹ On a monthly basis only the medium sized and large units are to be controlled. On a quarterly basis even the sampled units should be controlled.

The reason for the alternatives sketched

The main causes are separated in three parts: No contact or refusal; Unit has closed down (most likely permanent); Unit has temporarily closed down. These are most likely the ones that DPINE staffs can meet. Below the answering alternatives have been given a somewhat more full description.

If main code = 1 is used then one of the codes specified below should be used:

1. The respondent (enterprise/establishment) has not been identified
2. The respondent has been identified but not reached

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3. The respondent refuses or neglects to fill in the form
4. Other - specify: (text to be formed by DPINE staff)

The code 1 alternatives require administrative initiatives. For handling the 2nd option INE must contact the enterprise or establishment to assure that there always is a back-up person that can handle the case of responding. The 3rd option requires a set of procedures and routines to handle such events. See 6.2.2.

Imputation: As long as the unit is operating an imputation should be considered in these cases.

If main code = 2 is used then one of the codes specified below should be used:

1. Permanently closed down and total capacity in enterprise reduced
2. Permanently closed down and production moved to another establishment within same enterprise - within the same province or to another province.
3. Permanently stopped with current ownership but establishment is / will be sold
4. Other - specify: (text to be formed by DPINE staff)

The code 2 alternatives might have implications for how the business register should handle the case of nonresponse. All three options imply in fact that the register should put the establishment in the province into a non-active status. When option 3 is used the business register should contact the new owner for confirmation and make the changes in the register that is required. If it is only a change of ownership the unit should remain in the survey. Option 4 is added to allow for more special or complex changes.

Imputation: When option 1 is chosen an imputation should not be done. The conclusion might be the same when option 2 is chosen. However, in this case INE must first check out whether the data not reported from the nonresponse firm is reported from another firm within the enterprise - if in the sample of the actual survey. The check might be done in the same or another province. When option 3 is chosen an imputation seems relevant. A supplementation of the sample should be considered.

If main code = 3 is used, then one or several of the codes specified below should be used:

1. Due to repair or investment works
2. Sales problems due to lack of demand or increased competition, stocks are too large
3. Lack of energy, raw materials or intermediate products
4. Lack of staff
5. Seasonal stop - normal for the business
6. Financial problems in operating the establishment
7. Other - specify: (text to be formed by DPINE staff)

If needed use several of the specified options

The code 3 alternatives differ from those discussed above. Here the causes are related to the economic or technical reasons for stop in production. On the one side this type of information gives a basis for understanding the changes in the economic activity. Such information enables a factual decision on imputation.

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7.2.2 Data collection and the role of DPINE - a draft procedure

A strategic goal for INE is to extend and deepen the role of the provinces in producing statistics. For several reasons this requires step-by-step movements gradually developing the involvement. This report suggests that a new step in the DPINE involvement should be taken - an organisational adjustment being a part of the current revision round.

The work done in 2003 on updating the population information (CEMPRE) has improved the knowledge about the units (enterprises - establishments) operating in the industrial sectors in Mozambique. The size of the populations has increased and the quality of the information about the units has improved. Good quality information about the populations is extremely important in planning and producing statistics. Maintenance of the register is crucial when producing statistics.

An important task for the DPINE staffs is to contribute to maintaining the quality of the business register. The provincial knowledge on local industries is thus extremely important. Maintaining and developing the business register (the industrial population) is in fact a continuous process. The statistical surveys play an important role in maintenance work being a source for tracking the changes.

Extending the provincial involvement in data collection will also contribute to the quality of the primary data delivered by the respondents. Local knowledge is important for the control and validation (verification) of data reported as well understanding the changes in the economic environment that is observed.

The job done by DPINE staffs should be based on a set of written procedures and routines. A procedure manual should make clear the quality requirements for the data collection tasks in the provinces. Within the area of short-term statistics the standard procedures and routines for DPINE staffs could be:

Controlling - verifying the administrative information concerning the sampled units.
Thus - contributing to the maintenance of the quality of the business register.

Distribute the survey forms to the correct units and persons responsible.

Assist the respondent in clarifying practical issues and provide additional information when needed.

Responsible for identification and follow up of units (respondents) showing any signs of irregularities in reporting. Motivating for good quality in reporting.

Collect / receive the filled in monthly form from respondents.
Shortly after delivery - check that the form is correct filled in.

Identifying irregularities:

Below two criteria are specified for use in evaluation of the filled in form. The ones specified relates to the common parts of the forms across all surveys - and should be considered as obligatory and/or logical. When the unit concerned has been operating through the month, the corresponding cells (in the filled in form) should have a positive value.

Based on discussions among INE staffs - more criteria for checking should be included.

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Across surveys differences in additional criteria should be expected.

- All key variable cells (sales value, number of employees, wage costs, prices) are of the "must-type" and should logically be filled in.
- One or several of the cells for volume indicators must also logically have a positive value filled in.

If substantial irregularities - contact the respondent for corrections etc.

Enter data using a data entry application developed in Excel for this purpose.

Data entry instructions should be specified in written and being a part of the manual describing the current best practise (procedures and routines).

Validate the data entered.

Standard tables based on current best methods should be produced as a basis for the DPINE staff to make decisions on irregularities. The principles for making decisions should be made as clear as possible.

Contact with the respondent if substantial errors is suspected. Corrections in entered data should be based on the instructions of the respondent.

Controlling unit nonresponse.

A new form is designed for use in case of nonresponse. All cases of unit nonresponse should be covered in the form. DPINE staff is responsible for collecting supplementary information according to the requirements specified in the nonresponse form. To be filled by DPINE staff only.

Prioritising when nonresponse.

A list presenting the critical units within the province. The list should be used in prioritising among units in case of a too many cases of unit nonresponse. The Maputo Central produces the list.

The transmission of data from the DPINEs to Maputo Central should comprise:

- All forms - data entered and validated
- A complete nonresponse form

These files should be e-mailed to Maputo Central for further processing. For some time it is recommended to also send a copy of the filled in (paper) form to Maputo Central to enable staff at the central level to verify that the routines for validation and data entry in the DPINEs are handled correctly.

7.2.3 Following up the nonresponse cases - a draft procedure

All statistical agencies experience that the respondents get tired of filling in the forms. We know that this leads to reduced quality in the statistics. Meetings, conversations with the respondents will normally give several types of information.

The information requested is not available

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When discussing nonresponse with the respondent one is often told that the requested information is not available in the internal information system for an enterprise or an establishment. This might of course be the case but the argument is from time to time given for the sole purpose of avoiding - ending the task of responding.

Non-availability of data is not an acceptable argument for not responding. The respondent will normally have time enough to prepare for reporting. Non-availability is in fact an argument indicating that the respondent does not give the priority needed to the task of reporting.

The establishment does not operate within the industries indicated by INE

In some cases the respondent might argue that the establishment does not operate within the industries referred to in the form. This requires an administrative initiative from INE.

In these cases the respondent should be asked to use the form to fill in the basic questions i.e. sales values / turnover, employment, wage costs and prices. Questions about volume indicators (quantities etc) will in such cases normally be those being irrelevant to the user. Further - the respondent should be asked to use the comment area (normally on page 2) to provide a more correct type of activity.

Then it is up to Maputo Central (DESE and the business register) to use the information given in deciding on the correct industrial location for the establishment within the population. If large changes in the industrial classification of the establishment are the outcome, a decision must be made on transferring the unit to another survey or not. A decision should also be made on the need for supplementing the list of establishments for the survey from which the unit has been transferred.

This type of corrections in the register must be done within fairly reasonable time limits. And - it is important that the unit concerned does not receive the same irrelevant form in the following months. A special case is when a unit is active in more than one industry, e.g. commerce and transport. In these cases, the contacts with the establishment will have to lead to a decision on how to report the establishment.

Good and efficient routines for survey management are thus extremely important.

The handling of nonresponse

A correct handling of nonresponse requires clear routines for staff but also the adequate tools for treating and meeting the situations of having several cases of nonresponse for the same respondent. Most staff members involved in this will most likely feel that the situation is complicated - also personally. Due to this, the routines and behaviour should provide clarity and guidance for the concerned staff.

In general all cases of nonresponse should be reported - using the nonresponse form.

Routine for working with nonresponse:

Definition of nonresponse:

A case of nonresponse is identified when a respondent - for the second time within a year - have not delivered the filled in form.

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This definition should be discussed.

Early identification of nonresponse is important. Internal statistics showing respondents and responding behaviour (and stability) should be produced regularly. Statistics should be produced and analysed every month both by Maputo staff and DPINE staff. Lists comparing the provinces could be of value, and should be distributed to all DPINE leaders and staffs.

Action in case of nonresponse:

DPINE staff shall contact the respondent within 2 days after the scheduled time limit for delivering the filled in form.

This contact will in fact take place anyway as a part of the DPINE task of filling in the form for nonresponse.

The list of critical units - controlling nonresponse - preventive.

In some industries smaller units (critical units) can have a large influence on the aggregates - differing across the surveys. This is e.g. especially the case within retail trade having a large number of small units in the population.

Such units can normally be identified in advance. A list containing the critical units on province level should be produced and distributed to the provincial offices. These units must be given a special follow up during data collection within the provinces and during estimation in Maputo.

Prioritising among nonresponse cases (when more than one is identified).

Always contact the larger units first - follow the list of critical units produced for the province for each of the surveys (by Maputo Central).

Also units not specified on the list should be contacted.

When contact is established:

The main task for DPINE staffs is to give information to the respondent.

Inform the respondent that the form has not been returned within the scheduled time limits - for the second time this year.

Offer assistance concerning how to fill in the form - explaining definitions of variables (understanding), what relations exist between variables etc.

At last - if respondent still is not willing: In a very polite way

make clear that this is not acceptable,

refer to the legal basis for this and that response is mandatory,

give the respondent a new scheduled time limit (+ 5 days) for filling in the form - and

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that INE/DPINE will contact the superiors in enterprise / establishment - in written (by letter) - if the form is not delivered within the enlarged time limits.

Comment:

The number of days - 5 - reflects the need for speed in the data flow between provinces and Maputo. 5 days should be the standard number of days when nonresponse occurs.

It is very important that the staffs responsible do not contribute to undermine the period of enlargement granted. A fixed number of days are used to assure that these routines are common across the provinces throughout the country.

For handling the cases of three and more nonresponse per year INE must have a set of adequate tools that makes clear to the importance of responding in time and showing that INE handles this seriously.

In most countries - also Mozambique - the task of responding is mandatory. Normally the case of not responding should lead to the use of fining. This tool has often a legal basis - also as concerns the size of fine.

Whether such a tool should be used and how far INE is willing to go is to be discussed and decided. If other tools are available and considered being efficient - these must be involved in the discussion on this issue.

The respondent must experience the use of a tool as repressive though hopefully not threatening. A way to achieve this is to produce a brochure (or look over an existing brochure) that should provide information on the rules and principles for filling in the form. This includes making clear the system for handling nonresponse.

It should also give a telephone number that the respondent can use when asking for help or for giving messages. The brochure should be delivered to the respondent both the leader of the establishment / enterprise as well as the person responsible for filling in the form. The brochure should be distributed to old and new respondents when new forms are sent out for January 2004.

When respondents contact INE staff

Meetings - interviews with respondents often indicate that the questions specified are not relevant - or worse: irrelevant. Some times the respondents communicate that there are problems when working with the variables. Some respondents have even provided advice or explicit guidance to help INE in making the questions and/or variables clear and understandable. In some cases the respondents experience is that nothing happens.

For many reasons it is very important that INE staff listens to what the respondent say, and that adequate action is taken to assure that important issues is lifted to the correct level of management. INE is a public institution that is highly dependent on the good will and cooperation as concerns the industry units and staffs. The industrial knowledge and competence that often / some times is transmitted to INE during such conversations can be of

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large value. Communication on problems in filling out a form might reflect that there are weaknesses or definitional problems in the surveys, and must be taken seriously.

7.3 The forms - variables

This chapter discusses the design of and the variables included in the existing forms used in the surveys. Analysis made on data captured indicates that the data collection system does not function as must be required. The term "system" is used for clarifying that the problems identified are generated by a number of aspects.

The large problem is the nonresponse. Most all surveys face unacceptable high rates of nonresponse - both unit nonresponse and item nonresponse. Further - the evaluation of the data actually reported indicates large variation in quality. The lack of well functioning routines and procedures in the follow up phase are of course the large challenge. See 6.2.3 for more about this. Some parts of the forms do not seem to function indicating unclear definitions or irrelevancy. While other parts seem superfluous. Further some changes are needed to create space for new or revised variables. The chapter is divided in two parts - simplifications and additional variables.

Simplifying the forms

This brief summary from the analysis on data urges for reducing the number of irrelevant cells to be filled in by the respondent (simplification).

For all forms the upper block is used for identification of the units (name, address, telephone, province, fax and Email address). This part is a permanent part of the form although in practise only used by the respondent to a limited extent.

It is recommended that the forms should be pre-printed. The text should primarily refer to the unit of observation (enterprise / establishment). The relevant unit should be identified using the enterprise and establishment codes as well. The industrial code should also be a part of this block. The name and address of course refers to the actual unit of observation.

Requests for telephone number and e-mail address should be placed at the bottom of page 2 where the respondent sign for confirmation. Information concerning changes in the legal status of the establishment or enterprise or other relevant information should be provided in the comment area on page 2.

A second block is found in most of the surveys (hotels and restaurants, transports, ports and airports, trade and services). In this block the respondent is asked to specify the type of activity concerned. In the cell below the respondent is asked to specify which type of activity that has been dominating during the current month.

This block of cells should be dropped from the revised form. It should be added that the information collected in this block is not used by the production system.

The main activity of an establishment expressed by the industrial classification code is determined by the business register. The decision is based on information from the establishments describing the main activities. Each establishment is given a primary

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industrial code, but might as well have other but secondary codes. In the production systems it is the primary code that is used. Due to this the second block questions are superfluous.

In the third block information about the employment and wage costs is requested using a split between men and women.

Although this information is of interest in a gender context the split seems superfluous in a short-term statistical survey. Subject for further discussion within INE staffs.

Additional variables for estimating economic volume indicators

The price dimension is not explicitly part of the current short-term surveys but should be considered for direct observation. Some of the surveys have values and quantity data that indirectly could be used for estimating the unit value prices (manufacturing and transport). Experiences from external trade that produce price- and volume indicators from unit values, has shown that a large degree of homogeneity is required. This is not in general the case for most manufacturing groups.

INE should include the price variable for the surveys that are not well covered by quantum variables (manufacturing, service, retail trade). The price variable should also be considered for other surveys.

Observation of prices should be based on a selection of specific products made by the responding unit. The term product must in this context not be compared with the term product or commodity as used in CNBS. Establishing price statistics requires currently close cooperation with the respondents. Some further studies are recommended. Excluding quantitative information for non-homogeneous products will reduce the response burden.

A broad coverage of output prices across industries would provide a basis when producing price statistics on intermediate products and raw materials.

For the retail trade and service sectors the estimation of economic volume indicators should utilise the CPI (Consumer Price Index) results as deflator. Meetings with the CPI staff indicate that the quality of the current price indicators is considered as not being optimal for this purpose within the service sectors.

Although having some quality problems, the CPI must be used as the basic price indicator or deflator for estimating economic volume indicators for the trade sectors.

For the deflation of service sectors the CPI must be the main source as well. Further studies and development initiatives are recommended for the CPI coverage concerning these sectors.

Information on short stops in production during the month

For most units the production process has periodical stops. As a basis for a better understanding of the variation in the responses and for developing the quality of volume indicators, more information is required on the duration of such stops.

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It is recommended that the forms include a question asking for the number of days having full stops in production during the month. The subject needs some more elaboration.

7.4 Data editing system

The screen image forms that are used for the data entry were reviewed for the manufacturing industry. The proposal is to modify the form so it shows data in the same form as in the questionnaire. The routines for comparisons with message box indicating large changes compared to the previous month were often overruled. Also the validation tests caused error messages for new products.

The implementation of new surveys with at least partly new questionnaires calls for an update of the data processing routines. There is also need for a strategic decision about variable names etc, since the variable names and formats are different in the FUE and the old business register. The activities to produce partly new data entry and data processing routines are recommended to start as soon as the contents of the questionnaires has been definitive.

7.4.1 Province delegations strengthening

The province delegations often have a more complete picture of the situation in the surveyed establishments than the central office of DESE. Therefore it is desired that the questionnaires are validated as much as possible before they are transferred from the province delegation to the central office in Maputo. The tool to achieve this would be to move the data entry to the province offices. Since the experience from data entry differs between the provinces it is likely that some provinces are better prepared to make the data entry than others. It should be noted that the size of the sample is important for decisions about decentralisation of data entry. In the monthly surveys the amount of data entry is fairly small, so to distribute the workload is not an important issue. The main reason is to make the province staff more aware of the importance of high data quality and also to give them tools to validate the questionnaires. The technical solution may need to be further developed. Since the province delegation will treat a number of different questionnaires, but normally only a few of each type it may be a good solution to use spreadsheet files with one page for each questionnaire. This concept has been used in DEMOVIS for the statistics on justice for some years, as it seems from a technical point of view satisfactory.

To define the role of the province delegations is a strategic decision and it has to be confirmed that the province offices are ready for this step. One argument in favour of a decentralisation is that it would speed up the data collection if the data entry is made in the province and the data are delivered to Maputo via email.

As concerns the treatment of nonresponse that is an important issue involving the DPINE staffs - see chapter 6.2.

7.4.2 Data entry

The data entry routines as well as the IT-systems (and databases) are supporting the manual tasks well. Some changes are however needed due to the suggested changes in forms that imply

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that new variables will be added. Further - the suggested nonresponse form will require a separate data entry routine - see chapter 6.2.

Maintenance of the unit population is an important task for all survey managements. Information from the forms implying changes in the identification and/or industrial classification of the surveyed unit will normally be detected during this phase. Information concerning changes in the surveyed units must flow efficiently from survey management to business register.

The introduction of the price variable in the form implies that the data entry screen image and corresponding programs must be redesigned.

Heads down entry is recommended to avoid extensive validation during the entry phase. A heads down approach is also recommended for increasing the speed of the production process. The term "heads down" reflects one of several principles considered / used in data entering. The heads down principle is in brief that the initial data entry phase should be performed with high speed and - in large - without stops for making judgements. An implication of adopting this technique is that most of the judgements in data editing are left out to the validation process.

In addition -some minor adjustments are recommended in the data entry system. All sums should be produced automatically from the detailed information entered. This moves the focus of the subject matter specialist to the details.

The system should during entering give reports in case of large changes for single cells. The report should be based on changes estimated when comparing current month data with last month (and/or same month last year). No reports should be given on sums. The staffs should also have easy access to validated time series for the unit concerned for at least the last 2-3 months. This provides a basis for a brief evaluation of the new data entered.

Various types of errors will normally be detected during this phase. In case of substantial deviations the unit concerned should be followed up for more information and eventually correction. It is though suggested that the follow up procedure is restricted to the medium sized and large units. To avoid repetitive contacts with a respondent during one month only the substantial deviations (large likely errors) should be subject for an immediate follow up. In general such contact can be left out awaiting the outcome from to the validation procedure.

A medium term goal should be to utilise optical reading techniques as the basic tool for data entering. Such a step will have several implications for the design of the forms and the use of open questions.

INE should clarify the procedures and routines related to the data-entering phase. These operations should be described in detail in the production documentations.

7.4.3 Validation

A macro validation procedure is recommended for the statistical short-term system. Using a macro system is recommended to move the perspective for controls somewhat closer to the user level of statistics. On this level a validation across statistics should also be possible controlling

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for consistency. It should also be added that an efficient macro system would contribute to reduced costs and less resources used.

For most of the surveys the group level (3-digit according to CAE) is recommended. This is also the most detailed level planned for dissemination of statistics. To establish more homogenous strata for validation it should be considered to utilise the employment classes developed for sampling in combination with the CAE 3-digit. This will give a further breakdown into more homogenous strata on the group level. Ultimately the level must be decided taking the actual number of observations on the validation level. If it is technically possible, a system allowing for different levels of validation across industrial sectors - also within a survey - should be considered.

The production system should provide standard tables containing all key variables on the level of validation decided. Comparisons and controls should be done both in time and across variables. The standard tables should present survey time series results for absolute figures and growth rates. A medium term target should be to estimate confidence intervals for time series data for the preceding months - to be used in validating current month data.

Supplementary tables for further analysis should be available by utilising the pivot-table system.

The validation procedure will normally be run 2-3 times. This depends on the degree of homogeneity within the validation levels decided. After data entering a first run is made - and likely errors are identified. Having a homogenous validation level most errors are likely to be found and corrected after the first run. For the more complex levels several runs are needed.

As a part of the validation phase respondents will be contacted and likely errors be corrected. In some cases the contact ends up confirming that the extreme figures initially reported is correct. In such cases decisions have to be made on whether to accept the extreme figures or to make a correction for statistical purposes. I.e. overruling the correct data or not. As a basis for such decisions principles should be developed clarifying how this should be handled.

7.4.4 Imputation

The imputation procedure is utilised in case of nonresponse - unit nonresponse and/or item nonresponse. As discussed in several parts of this report it is not at all clear that a case of nonresponse actually should be imputed.

Below the imputation principles are discussed and methods presented. First the item nonresponse is discussed and later the unit nonresponse.

Item nonresponse - imputation

The case of item nonresponse is fairly common in most surveys. These cases are for many variables more or less straightforward e.g. missing values for employment, but sales values and wage costs are reported. The imputation of item nonresponse seems obvious for variables that logically must have a positive value. This is not in general the case when asking for quantitative information to be entered in predefined groups e.g. for hotels and restaurant - type of rooms - domestic or foreign guests. The treatment of these cases should be based on principles clarifying how this should be handled.

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Deciding on imputation

In general imputations should be considered for the cases of item nonresponse. There will as discussed above be cases where a decision on imputation does not seem straightforward.

For the key variables where a positive value is the normal (and in some cases zero) an imputation seems reasonable. It is recommended to utilise the reporting performance of the unit concerned as basis for making decisions.

For the volume indicators based on physical units the surveys have different approaches. This implies that a blank cell in the form or a not specified product could be interpreted in several ways.

In the manufacturing survey the form is not pre-printed specifying the products of interest. The form leaves it all up to the respondent to fill in the text and data for the products actually produced or sold. In this case a not specified product in a month could be considered as an item nonresponse. However, relying 100 per cent on the respondent implies that it should not be treated as a case of item nonresponse.

Some of the surveys specifies the volume indicators in classes e.g. hotels. In this case a blank cell in the form could be interpreted as a missing value or a zero. For imputation in such cases several other types of information should be taken into account e.g. seasonal aspects.

A decision for imputation should as far as possible be based on facts. In general it is recommended to avoid imputations for item nonresponse in cases as discussed above. The ambiguity in making decisions normally indicates that the real problem is the survey form or definitions of variables. Priority should be given to solve this problem.

Methods in imputation

As discussed above two types of nonresponse is the common situation for most surveys.

The unit nonresponse must be imputed in a consistent manner. This implies that there must be consistence between the key variables - sales values, production values, employment, wage cost and prices. For other variables the requirement for consistency could, as discussed above, be somewhat more complicated to achieve.

The literature covering methodological issues related to nonresponse are numerous but have to a large extent grown out of the demographical surveys having the person as subject for observation. Although much is comparable, working with economic statistics, adds to the problems of nonresponse. The solutions when making imputations, put forward in this report, is based on actual practises in use in several countries.

The item nonresponse should be handled using a set of methods based on fairly simple principles. What should be imputed are in fact the growth rates for the variables concerned - and normally not the absolute figures missing.

A general principle could be:

For variables like sales values, production values etc. a fairly neutral variant is to use the growth rates estimated during validation - the last run. Cases of item nonresponse within units

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belonging to validation group e.g. 3113 (could be CAE 311 - the large units) should be imputed using the growth rate of the group.

Other principles could be used in cases where INE staffs have been able to collect relevant information. It is not recommended to deviate from a general principle in large scale.

The basic principles sketched above should be a subject for discussion before implementation. The principles should of course be changed when required. It is though not recommended to switch between principles from quarter to quarter.

Imputation - background

In the block below the q indicates the current quarter, the $q-1$ indicates the preceding quarter and the j refers to the unit concerned. The top script $q/q-1$ refers to changes from one quarter to the next. The top script CAE group refers to the 3-digit level within the industries concerned.

Imputation of item nonresponse for employment:

No growth in employment. The principle could be different for private units that seem to have a somewhat different employment policy than found among government units.

$$\text{employment}^{q,j} = \text{employment}^{q-1,j}$$

$$\text{employment}^{q,j} = \text{employment}^{q-1,j} * \text{growth in employment}^{q/q-1, \text{CAE group}} \text{ (private units)}$$

Imputation of item nonresponse for wage costs:

The growth in wage costs per worker estimated from the corresponding validation group.

$$\text{wage cost}^{q,j} = \text{wage costs}^{q-1,j} * \text{growth in wage costs}^{q/q-1, \text{CAE group}}$$

Imputation of item nonresponse for sales value:

Imputation should only allow for adjustments for changes in prices. Use the changes in prices for the validation group.

$$\text{sales values}^{q,j} = \text{sales values}^{q-1,j} * \text{growth in prices}^{q/q-1, \text{CAE group}}$$

Imputation of item nonresponse for production value:

Imputation should only allow for adjustments for changes in prices. Use the changes in prices for the validation group.

$$\text{production values}^{q,j} = \text{production values}^{q-1,j} * \text{growth in prices}^{q/q-1, \text{CAE group}}$$

Imputation of item nonresponse for prices:

The growth rate in prices estimated from the corresponding validation group.

$$\text{price}^{q,j} = \text{price}^{q-1,j} * \text{growth in prices}^{q/q-1, \text{CAE group}}$$

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Unit nonresponse - imputation

Cases of unit nonresponse are also common in most of the surveys and the overall nonresponse rate is high. See appendix 10 concerning the manufacturing sectors. In surveys having unit nonresponse rates much higher than 10-15 per cent, the contribution from imputation might be too high. In general making imputations requires much information - not only about the unit concerned, but also on how the market(s) for the units concerned works.

This report recommends that a nonresponse form should be developed and used by DPINE staff during data capturing. See chapter 6.2.1 for more about this. The form classifies three main types of nonresponse - and for each main type a set of explanations for the specific case of nonresponse. The information made available from this form will provide relevant information when deciding to impute or not. The implementation of the form for controlling nonresponse will improve the factual basis for decision-making on how to handle each case of nonresponse when deciding on imputation or not.

To work efficiently with the information from this form, data should be entered and made available in the production systems - in line with the ordinary information delivered from the responding units. The production system has a special table classifying the cases of nonresponse. This table should be adjusted to cover a somewhat wider range of cases of nonresponse.

The size of this type of nonresponse in the surveys is considered being all too high. As mentioned elsewhere in this report it is not recommended to use large-scale imputations in the current situation. The impact of the imputations will be all too large - and thus beyond what can be said to be acceptable.

Imputation should be a solution when having a special problem - not a general tool to be used in large scale. It is not recommended to impute item nonresponse for the same unit over time. This must be avoided.

The principles and methods described below should be used in a new survey regime controlling the size of nonresponse - at a low and acceptable level.

Deciding on imputation

For each separate case a decision on imputation must be made. Below some principles are developed how to approach the decision problem.

Only medium sized and large units should be subject for imputations on a monthly basis while all units should be included on a quarterly basis.

According to the form controlling for nonresponse - main types of nonresponse:

Should / could be imputed:

Units refusing to participate should be imputed.

Units that have not been reached by DPINE or have not been contacted could be considered for imputation. A confirmation is though required that the unit is operating on a normal

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basis.

Should / could be imputed - using a zero (0) value for economic activities being dependent of the current activity level:

In cases where units have seasonal full stops in production or due to vacations etc. imputations should be made.

Units being temporarily closed down should in principle be imputed.

When it is confirmed that some of the units have not been operating during the month but are identified as active an imputation should be made. For those of the units being part of a larger enterprise a provincial shut down will normally be compensated by increases in other areas and the products transported to the customers.

An imputation should be made. For the sales values, turnover, and other quantitative variables dependent of the current activity etc. the zero (0) value should be used. For other variables like employment, wage costs and prices the methods developed below should be used.

Should not be imputed:

Units being permanently closed down during the month is mainly a matter for the business register and should in principle not be imputed.

An exception could be made in cases where e.g. an establishment in Nampula has been closed down permanently. The production orders has however been transferred from the closed unit to another unit in the same enterprise - in the same (or another) province. If the receiving unit is a part of the survey sample a check should be made whether the receiving unit has reported an increase in production / sales etc. If the receiving unit reports increased production sales an imputation should not be made for the closed unit. If the receiving unit reports that production / sales have increased - or the receiving unit is not at part of the sample - an imputation should be considered.

Methods in imputation

In principle the case of unit nonresponse must be imputed working with the unit as a whole. This implies that there must be consistence between the key variables - sales values, production values, employment, wage cost and prices. The requirement for consistency should be fulfilled measured in current prices as well as fixed prices.

For other variables the requirement for consistency could as discussed above be somewhat more complicated to achieve.

As for item nonresponse it is the growth rate for the variables concerned that should be imputed - and normally not the absolute figures missing.

The principles sketched here are based on the presumption that each case of item nonresponse is a one of type. That is - the unit concerned has delivered the form for the last month.

A general principle could be:

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The principles laid down for cases of item nonresponse imputation should be used also in these cases.

For variables like sales values, production values etc this implies that the imputation only will allow for changes in prices. An implication of this is that the sales values etc. for the unit measured in fixed prices remains unchanged when compared with last quarter. For wage costs the imputation will only allow for changes found within the validation group that the unit belongs to. Thus - the wage costs will be changed measured in fixed prices, but in the same way as for the group as a whole. Number of employed persons should be unchanged.

Other principles could be used in cases where INE staff has been able to collect relevant information. It is not recommended to deviate from a general principle in large scale.

The basic principles sketched above should be a subject for discussion before implementation. The principles should of course be changed when required. It is though not recommended to switch between principles from quarter to quarter.

Imputation - background

In the block below the q indicates the current quarter, the $q-1$ indicates the preceding quarter and the j refers to the unit concerned. The top script $q/q-1$ refers to changes from one quarter to the next. The top script CAE group refers to the 3-digit level within the industries concerned.

Imputation in case of unit nonresponse:

$$\text{employment}^{q,j} = \text{employment}^{q-1,j}$$

or

$$\text{employment}^{q,j} = \text{employment}^{q-1,j} * \text{growth in employment}^{q/q-1, \text{CAE group}} \text{ (private units)}$$

$$\text{wage cost}^{q,j} = \text{wage costs}^{q-1,j} * \text{growth in wage costs}^{q/q-1, \text{CAE group}}$$

$$\text{sales values}^{q,j} = \text{sales values}^{q-1,j} * \text{growth in prices}^{q/q-1, \text{CAE group}}$$

$$\text{production values}^{q,j} = \text{production values}^{q-1,j} * \text{growth in prices}^{q/q-1, \text{CAE group}}$$

$$\text{price}^{q,j} = \text{price}^{q-1,j} * \text{growth in prices}^{q/q-1, \text{CAE group}}$$

For other variables (volume indicators) the same type of principles could be specified and used. The forms and differences in specifying and measuring the volume indicators complicate the task.

The design of the data processing system will have to ensure that it can always be verified if a value refers to the respondent's data or to an imputation. If a value is an imputation it should also be clarified how the imputation is made.

7.4.5 Estimations

The estimation process utilises a complete database containing actual observations or imputed figures according to the principles and methods described above. The database contains - in

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principle - time series for each variable on unit level. Each unit is identified by its enterprise and establishment code. What code that should be used depends on the decision made concerning the choice of unit for analysis. Further - each unit record carries:

- the industrial classification,
- the correct CAE 3-digit (if the one actually to be used differs from the information given in the industrial classification code)
- any other standard to be used in aggregation (differs from survey to survey)

In this context the estimation process is divided into three blocks involving more or less the same operations. The presentation is based on a simple case aggregating over a fixed set of variables to a specified level e.g. over all units within CAE 311 (group).

Estimation of key variables

The key variables are: sales values, production values, employment, wage costs (common for all surveys)

- The upper strata (medium sized and large units) are fully counted and no special treatment should be needed (except for correction for non-response).
- Estimate population totals for the strata covered by samples. The methods to be used should be the same as used in the current version of the estimation system.
- Sum up across the group - to quarterly totals. Result to be stored in an output database specific for the survey concerned. The final quarterly results will be stored in the common output database across all surveys.

Each block and level of aggregation should be validated. For this purpose tables are produced having a special focus on growth rates. Before publishing of statistics a final validation should be done. This procedure will for all variables handle all aggregates from grand totals and down to the group level according to CAE.

Estimation of price relatives

The form will ask for prices for the three most sold(homogeneous) products in the current month within the unit. For these products the respondent shall report prices for the current month as well as last month.

The prices observed should be defined according to the national account basic price concept. I.e. excluding all product taxes and value added tax but including product subsidies.

In addition the sales value for the same products for the current month should be reported.

The database will comprise price data that are observed directly for two-month periods. The pair of product prices need not be the same from month to month, but must be of large importance for the total sales of the establishment.

- For each unit and product a relative price will be estimated - simply dividing the current quarter price with the price of last quarter

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$$(1) \quad \text{price}_{i,q,j}^{\text{rel}} = \text{price}_{i,q,j} / \text{price}_{i,q-1,j}$$

where q refers to the current quarter, j refers to the unit and the i refers to the product (i = 1, 2, 3)

-- For each unit the total price relative will be estimated using the product price relatives and the sales values as weights.

$$(2) \quad \text{price}_{q,j}^{\text{rel}} = \sum_i (\text{sval}_{i,q,j} / \sum_i \text{sval}_{i,q,j}) * \text{price}_{i,q,j}^{\text{rel}}$$

where $\text{sval}_{i,q,j}$ refers to the sales values for product i in quarter m and for unit j.

With (2) the producer price indicator for each unit is estimated. A next step is to produce aggregate indices over CAE groups etc. This step will be developed somewhat more in chapter 6.4.6 Indices and indicators.

The price indicators or relatives are developed for the current quarter q and have their basis in the previous quarter q-1. For developing a price index covering a longer period a chaining operation is required.

$$(3) \quad \text{price}_{q/q,t-1,j}^{\text{rel}} = \sum_{q,t-1}^q \text{price}_{q,j}^{\text{rel}}$$

The chained price relative for quarter q having a basis in quarter q, year t-1 are developed multiplying the series of relatives covered by the time period specified.

The estimation for volume indicators based on measurements in physical units is not written out in this context. The principles and procedures developed could as well be used for the estimation of volume indicators. Some further studies are required for each type of indicator before entering the estimation process.

7.4.6 Indices and indicators

This chapter presents the finishing steps moving from data on unit or product level into aggregated indicators like grand totals, sector-, division- and group-totals. Two procedures will be developed in somewhat more detail here, starting out with the procedure for estimating the producer price indicator (or index). The indices produced on the aggregated levels will then be used in the next procedure, developed for estimating the value figures in fixed prices (sales, production etc). The procedures are presented using an example though not working it all out in detail.

There are in practise various formulas to be used in aggregation and production of indices. The ones recommended follow the basic national account requirements. The price index should be estimated using the Paasche price formula while the volume indices should use the Laspeyre formula. Though not being the ideal ones the two formulas has some nice features. The Laspeyre volume index multiplied with the Paasche price index gives a result equal to the value index. The same relation is found when multiplying the Laspeyre price index and the Paasche volume index.

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Indices refer to a special period where the index is equal to 100. This is labelled the reference period. In national accounts when using indices as indicators, the year before the current is normally used as a base. For publishing, the reference year might differ from the base year. Fulfilling the national account principles will thus require longer time series for each aggregate.

Estimation of indices based on data from the new or revised surveys only, will not be possible until January or 1. Quarter 2005 simply due to that consistent time series will not be available. As discussed in appendix 13 however this problem can be partially solved if resources are put into the task of bridging between the current statistics and the new ones to be initiated in January 2004.

The producer price index

Initially it must be mentioned that the producer price index system developed in chapter 6 is simplified when compared to e.g. the CPI system. First of all the number of price observations collected is in fact reduced to an acceptable minimum. This should however be considered as a start where the medium size target should be to increase the coverage. And second - the measurement problems related to qualitative changes in products have deliberately been left out in this phase. The inclusion of the price variable adds to the task of the provincial delegations and training of staff will be very important when working with the quality in and of price statistics.

According to the national account principles a Paasche formula should be used for the price index. The basis for this process is the complete database including the price relative estimated to unit level. The formula developed below should be used for all types of aggregations - and independently of the standards that are to be used.

The following notation will be used in the formula:

V refers to value figures (sales values, production values)
 j refers to the unit total price relative developed above
 q the current quarter
 t refers to the current year while t-1 refers to last year (or base year)

Pa refers to the use of a Paasche formula
 La refers to the use of a Laspeyre formula

The notation refers to "price", "volume" and "rel". The first refer to a price index, the second to a volume index while the third refers to a price relative.

Paasche price formula

$$(4) Pa_{q,t}^{\text{price}} = \frac{1}{j} [(V_{j,q,t} / V_{j,q,t}) * (1 / \text{price}_{j,q,t}^{\text{rel}})]$$

Special variables developed for assisting in aggregation:

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$$\text{var1}_{j,q,t} = V_{j,q,t} / \text{price}_{j,q,t}^{\text{rel}}$$

$$(4a) \text{Pa}_{q,t}^{\text{price}} = 1 / \sum_j (\text{var1}_{j,q,t} / V_{j,q,t})$$

Laspeyres volume formula

$$(5) \text{La}_{q,t}^{\text{volume}} = \sum_j (V_{j,q,t} * 12 / \sum_j V_{j,q,t-1}) / [1 / \sum_j \{(V_{j,q,t} / \sum_j V_{j,q,t}) * (1 / P_{j,q,t}^{\text{rel}})\}]$$

$$\text{var2}_{j,t-1} = \sum_q V_{j,q,t-1}$$

Formula (5) rewritten when using the special variables above is:

$$(5a) \text{La}_{q,t}^{\text{volume}} = \sum_j [(V_{j,q,t} * 12 / \text{var2}_{j,t-1}) * (\text{var1}_{j,q,t} / V_{j,q,t})]$$

Testing the formula:

$$(6) \text{Pa}_{q,t}^{\text{price}} * \text{La}_{q,t}^{\text{volume}} = \sum_j (V_{j,q,t} * 12 / \sum_j V_{j,q,t-1})$$

The test criterion is that the product of the price and volume indices should be equal to the value index for aggregate concerned.

The base year

From formula (5) it is easily seen that the estimation of an index for a quarter requires data for the base year as well.

The base year data will be estimated from the quarterly observations through the base year. The simple solution is to estimate an arithmetic average of the sales values, number of employees, wage costs etc concerned. See definition of $\text{var2}_{j,t-1}$ above.

For the prices this is technically somewhat more complicated but could be established using the principles developed by chaining - see chapter 6.4.5 - formula (3) as a basis. Based on the chained series the base year average could be estimated.

The reference year

The task of establishing a reference year for an aggregate series is fairly simple when time series exist.

Producing indices in time series having a fixed reference year

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The indices will be produced using the formulae specified above combined with a chaining procedure as specified in chapter 6.4.5 - formula (3).

7.4.7 Common output database

INE has expressed needs of a better organisation structure for storing the computer files that are used in the processing of the monthly surveys. A simple solution is to define what is the “final” version of the source data that are used for each quarterly report. These files are proposed to be stored in a common directory in the file server. The name of the file should indicate what survey and quarter the file refers to. If a number of files are created for each

7.4.8 Time series presentations

The new business register, FUE, can be used to recalculate the totals for the years 2002-2003. The precondition is that the units that are included in the surveys 2002-2003 are considered (more or less) representative also for the (new) units that appear in the FUE, but are not covered by the old surveys. Nevertheless, such calculations should be made for analytic purposes and also be compared with the totals that are estimated in the national accounts for these years.

7.5 The classification systems

The Classification of Construction (CC)

As a part of the current revision of short-term statistics the classification of construction (CC) will be implemented. According to the plan the new statistical system will be operating from January 2004.

The structure of CC gives a new way for planning and organising the survey and will influence the approach for how to present information on construction and civil engineering to the user. The new construction statistic will utilise the basic structure of the classification in dissemination. That is - the split in Housing and Civil engineering. Further breakdown will more or less follow the basic structure.

The overall purpose of all the statistics is to provide information on the changes in the production activities - in a broad sense. So will also be the case of the construction statistic.

The unit of observation will for statistical purposes be the project though using the enterprise as the receiver of the request for data. Due to that the population of projects is not known to INE some practical approximations will be required. The newly updated business register of INE is likely to provide relevant information concerning the total population of enterprises classified to the sections concerned (CAE 45). The survey will cover all the larger enterprises having more than 29 employees. In addition a sample will be drawn among the smaller enterprises. The size of the sample is to be decided.

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It should be added that initiatives have been taken to strengthen the cooperation between INE and MOPH. The knowledge of the ministry staffs and the long-term experience in covering the construction sectors is of utmost value when designing a new statistical survey for construction.

Although having an excellent tool (or frame) in the CC there are still large challenges in estimating the total size of the population of project. Limited information is available for the projects that has or are to be started according to the auto-construction license. An initiative taken on the auto-construction issue will contribute to improve the basis and quality of statistics.

In CC there is made a link to the national classification of goods and services (CNBS). For the construction sector (CAE 452) approximately 25 products have been defined - 10 for the construction within housing, and 15 covering the civil engineering works. These products are mostly linked to groups and classes of CC.

It is not yet decided which role the products will have during data collection. More knowledge about the data availability in the enterprises is required. The product structure of CNBS should as far possible be utilised.

As a consequence of what has been discussed the construction forms should be designed from fresh. Having the focus on the project requires a somewhat different way of thinking in the design.

The basic structure of CC will as mentioned be used in the presentation of construction statistics. The linked group of products might be the logical way of estimating population totals. The results from the new statistic for construction will be presented in A Conjuntura - as is the case to day. The statistics will also have an important user in the national accounts.

7.6 The business register

During the mission, INE was conducting the final steps in the validation of the business register before the official release that was scheduled to take place September 26. The consultants had access to a preliminary version (dated September 10). The register was used for planning the samples and as source for the discussions. A separate document with a short presentation of the business register (Appendix 6) was prepared during the first week of the mission.

The contents of the register were further reviewed in the work on the preparations for the sample design. A document for the discussion of the sample design was discussed in DESE during the second week of the mission. After that it was revised and also extended for a second round of discussion. A third version, which contains the main conclusions from the second round of discussion, is included as appendix 5.

7.7 New samples for the surveys 2004

An important part of the preparations for the design of new samples was the review of the contents of the business register, mentioned above. The consultants also reviewed the output data from the current surveys to get information about expected quality for core variables. If the

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experience shows that it is not feasible to retrieve reliable and relevant information for some areas the concept for the sample design has to be questioned.

The consultants prepared a document for the discussion of the sample design, which was based on studies of the preliminary version of the business register. A later version of this document is found as appendix 5.

The consultants also elaborated a spreadsheet solution to calculate the tentative sample distribution according to the theory for Neyman allocation. It was in practice an update of the application that was used also for the samples 1999. A short “users manual” was included in the Excel workbook file, and a combined test and demonstration was made as an on-the-job-training activity.

The proposals for the new sample design can be described, as a compromise to satisfy user needs for the national accounts and the short-term statistics on the development of the activity in the economy. The availability of other data sources that can indicate the development of the economic activity should be further discussed and taken into account in the final decisions on the scope of the surveys.

7.8 Routine for the sampling

The routines for the sampling will depend on the sample design. The main proposal is to use random sample of establishments for most areas. In some areas with a few large enterprises with a large number of establishments, it is expected to be more efficient to survey enterprises. INE is recommended to further review if surveys of enterprises are not the best tool to monitor the areas of financial services (banks and insurance) and parts of the communication sector (railways, telecommunication, postal services etc).

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Discussion of the survey on construction

Appendix 1. Persons met

National Institute of Statistics

Valeriano de Levene Vice-president of INE

Directorate of Integration, Co-ordination and External Relations (DICRE).

Marta Charuisse Standards and classifications

Jorge Utui Standards and classifications

Alda Rocha International relations

Calado P Fijamo System development, DISI

Directorate of National Accounts

Saide Dade Director

Firmino Guiliche Head of the Department for Consumer Prices

DEMOVIS

Laura Duarte DEMOVIS

Directorate of Sector Economic Statistics (DESE)

Azarias Nhanzimo Director

Natércia Macuáco Head of the Department for Goods and Environment

Cirilo Tembe Head of the Department for Services and Business register

João Nhabete Business register

Francisco Nuvunga Manufacturing industry

Maria Teresa Tovela Manufacturing industry

Valdemiro Xlhatchwayo Manufacturing industry

A number of other staff members not mentioned by name

Ministério de obras publicas e habitação (MOPH)

João Sambora Department of Economics

Horácio Carla Department of Economics

Alfredo Mandor Department of Economics

Julia Lisboa Quive

Gata Remisio

Piedade Francisco

Scandinavian Support programme

Mr Hans-Eric Altvall Team-Leader

Appendix 2. List of literature

INE: documentation of the monthly surveys in the areas of manufacturing, construction and services.

Council Regulation (EC) No 1165/98 of 19 May 1998 concerning short-term statistics (Eurostat 1998)

Commission Regulation (EC) No 588/2001 of 26 March 2001 implementing Council Regulation (EC) No 1165/98 concerning short-term statistics as regards the definition of variables (Eurostat 1998)

Methodology of Short-Term Statistics, Business statistics. Interpretation and Guidelines (Eurostat 2002)

Handbook on price and volume measurement in National Accounts (Eurostat 2001)

Prevention and Treatment of Item Nonresponse. Leeuw, Hox and Huisman. Journal of Official Statistics, Vol. 19, No. 2, 2003, pp. 153-176.



Messrs Azarias Nhanzimo and Cirilo Tembe

Appendix 3. Programme for the Mission

A number of meetings were held during the mission, most of them informal. A detailed time schedule for activities during the mission was prepared by INE.

The consultants participated in a meeting with Ministério de Obras Públicas e Habitação (MOPH) for orientation about the activities in MOPH to monitor construction projects.

A seminar was held with the production staff. The main issue were the quality aspects and possible actions to reduce the non-response rate.



Messrs Tom Langer Andersen and Francisico Nuvunga discussing data quality issues

Appendix 4. Terms of Reference

TERMS OF REFERENCE

Within the Scandinavian Bridging Support Program

For a short-term mission

1st of September – 19th of September 2003

on

Development of a new system for Economic Statistics. PART I

1 Background

INE is in the process of finalizing its first Business Census (CEMPRE 2003). The main objective with this Census is to establish a new and more complete register of enterprises and establishments in Mozambique. A business register based on data collected through the CEMPRE is planned to be in place during July 2003.

The new business register will serve as a frame for drawing new and more representative samples to the various surveys that INE conducts amongst enterprises and establishments. Today INE has in all 6 monthly sector surveys and two annual surveys. These surveys do not give good population estimates due to the lack of representative sample frames, and there are also problems within the production processes. Further development of methods and production routines is needed to be able to produce high quality and timely economic statistics based on new and more representative samples.

The mission presented in this document is the first of two planned missions during the second half of 2003, that will help INE develop a new and better production system for economic statistics based on the new business register established through the Business Census.

INE has also earlier had short-term assistance on economic statistics within the framework of the Twinning Project. In 1999 there was a short-term mission from Statistics Norway that concentrated on viewing the surveys within the Industrial sector (MOZINE 1999:9). Another mission, also from Statistics Norway, took place in the period 19th of June to the 6th of July 2000 (MOZINE 2000:12). This mission focused on production routines, methodology and dissemination of short-term statistics in general. The report from this mission drafts a complete plan for a new production system within short-term statistics.

While the two missions mentioned above focused mostly on methodological aspects, two following missions from Statistics Sweden were more related to developing the data applications for producing statistics. The main objective of a mission in October 2000 was to assist INE in the development of data processing routines for the monthly survey within the Industry sector using the tools Microsoft Access and Microsoft Excel (MOZINE 2000:10). A second mission in November 2001 continued the work to develop systems for the processing of the monthly surveys of establishments (MOZINE 2001:01).

2 Main reasons for the mission

INE needs further assistance to implement already recommended methodology and production routines for economic statistics. Due to the fact that INE is in the process of establishing a new business register, assistance is needed in the transition from the old to the new register. Hereunder to plan and draw new samples and to review, update and adjust the methodology and production routines so that INE will be able to produce high quality and timely economic statistics based on new samples from 2004.

The first of the two missions planned during the second half of 2003 will focus on viewing and develop further the methodology and applications used in the production of current economic statistics. The second mission that is planned for October will focus on the transition from the old to the new business register in planning and drawing new samples from the Business register, and help INE prepare the implementation of the new samples and revised surveys from the beginning of 2004.

3 Benefactors of the mission

The mission will benefit the users of economic statistics through that they will get better economic statistics. INE-staff working with economic statistics will improve their qualifications in the area.

4 Objectives of the mission

- Evaluate the current methodology and processing routines used to produce economic statistics.
- Follow up recommendations from earlier missions not yet implemented.
- “Clean up” in catalogues and files. Over time the programs and datasets have piled up. There is a need to organize the file structure and delete (or separate) old and unused applications, datasets, documentations, etc. Here it is necessary to coordinate with Department of Informatics and Information system (DISI) that are in the process of developing a system for documentation to be used in INE.
- Develop further the methodology used in the production of economic statistics.
- Develop further existing applications for production of economic statistics. Certain adjustments might be necessary taken into account new methodology, and the fact that a new register will serve as a basis for new samples.
- Assist in further development of production manuals and other documentation of the production process. (Here it is also necessary to coordinate with the documentation work going on at DISI).
- Start preparing the methodology for drawing new samples based on the new business register
- Training of DESE-staff in producing good quality statistics using new methodology and applications.

5 Expected results

- New and/or revised methodology for quality testing, handling of extremes, non-response and estimation is developed
- New and/or revised Access applications for producing economic statistics developed.
- Catalogues and files containing new applications, data files and documentation are more organized, and plan for further improvement on this area is prepared.
- Production manuals and other documentation of the production process.
- A draft plan for how to draw new samples (to be finalized during the second mission).
- DESE-staff is more qualified for producing and disseminating economic statistics based on new methodology and production tools.

6 Tasks to be done by INE to facilitate the mission

- Elaborate ToR for the mission
- Prepare user- and producer oriented documentation of the current statistics.
- Prepare and supply the consultant with necessary documents and information
- Supply good working conditions for the consultant

7 Consultants and Counterparts

Consultants:

Mr. Kenny Petersson from Statistics Sweden (Data processing and methodology) and
Mr. Tom Andersen from Statistics Norway (Methodology)

Main counterparts:

Mr. Azarias Nhanzimo – Director of Directorate for Sectorial statistics and Business Statistics
Mr. Cirillo Tembe – Head of Department for Statistical Services and Business Register
Ms. Natércia Macuáco – Head of Department for Statistics on Goods and Environment

8 Timing of the mission

From the 1st of September to the 19th of September 2003

Number of working days at INE-Mozambique will be 15

Number of working days at home office (SCB/SSB) will be 3.

Travel days come in addition.

9 Report

The consultants will prepare a draft 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. Statistics Denmark as Lead Party will print the final version within 3 weeks of the end of the mission.

These Terms of Reference were prepared by

Day / /

Approved by/in the name of the President of INE

Day / /

Appendix 5. New samples 2004 for short-term statistics in the sectors of manufacturing, construction and services.

1 Summary proposal

The preliminary evaluation of the sample frame, using the version of the FUE of September 10, has resulted in the following main proposals for changes compared to the sample design for the samples 1999:

- include all establishments with 30 or more employees.
- combine CAE categories further
- consider to survey only the large enterprises in the parts of the construction, service and transport sectors that are dominated by such enterprises (banks, railways, telecommunication, postal services etc).
- discuss further what/if remote districts should be excluded.
- Review further if/how regional differences can be considered in the sampling plan

2 Background

The monitoring of the economic activity in the sectors of manufacturing, construction and services is currently based on monthly surveys for establishments with 50 or more employees and samples of small establishments. The current samples were based on information in the business register of December 1999. After the results of the business census 2003 (CEMPRE) have been compiled, there is a new business register, Fichero de Unidades Estatísticas (FUE), which will serve as frame for new samples for the short-term statistics from January 2004. The plan is to prepare the samples in October 2003, to give the province offices time to identify the new sample in the field, have a first contact before the data collection starts in January 2004.

This document contains a summary of the design of the old sample and the initial studies of the structure of the new business register to be used for first discussions about the sample for the new surveys 2004.

3 The old sample

3.1 Sample design

The old samples were designed as stratified PPS, using the number of staff members as size variable, drawn systematically. The stratification was made by type of economic activity and size of the establishment in terms of number of staff members. The primary sampling unit was the establishment.

3.2 Number of staff members

In the old sample the establishments were sub-divided into four size categories according to the table below. The same categories have been used in the preparatory work for the samples for 2004.

Table 1. Classification of establishments by number of staff members.

NumPess Cat	Número do pessoal	
1	0 or missing information	Not included
2	1-9	Sample
3	10-29	Sample
4	30-49	Sample
5	50-	Total

3.3 Type of economic activity

The design of the old sample was based on the classification CAE (then called CAEN) at three-digit level, but in many cases all CAEs at the same two-digit level were allocated to the same stratum.

3.4 Regional distribution of the old sample

The old sample was not explicitly stratified by region, but the sample was drawn systematically from a file that was sorted by province, which meant that the provinces were represented proportionally in each stratum. In both cases it is a question about resources for field work in the provinces with long distances between the establishments.

As a mean to reduce the costs for the field work, the districts were divided into two categories. The first category contained districts with at least one establishment with 50 or more employees or a certain minimum total number of other establishments. The second category contained rural (remote) districts with only few establishments that were in scope for the sample. The sample was drawn only in the districts in the first category, but the weights were based on the corresponding totals for all districts.

4 The new business register (FUE)

The new business register, FUE, was a result of the business census 2002/2003 (CEMPRE). The register contains information about each establishment of all identified enterprises.

There are no links between the old business register and the new.

The core register unit is enterprise. If an enterprise has only one establishment, the data for the headquarters establishment were initially stored in the same record as the data for the enterprise (Table "EMPRESA"). INE has later started a necessary restructuring of the business

register. The solution (at least for the time being) was to include all establishments in a common (renormalized) format with data for the establishment and the enterprise in the same table. A new field SEDE_EST indicates if the establishment is the headquarters of the enterprise or not. This database was called FUE_TRAB.MDB. The structure of the FUE is further commented upon in Annex B.

5 Data situation for the sampling discussions

The review of the structure of establishments in the business register by possible stratification variables, the source data from the table EMPRESA in the database FUE_TRAB.MDB were copied to a new database FUE_FonteAmostra.MDB. The version this document refers to was available as \\Incomin_INE\CEMPRE\FUE_TRAB.MDB September 10 2003. The database FUE_FonteAmostra.MDB is not used for any processing. It is just kept as documentation of the status of the FUE when the study was made.

A second new database, FUE_Amostra.MDB was used to review the data by possible stratification variables and practical preparations for the sampling procedure. A new table Testab was created for the review. The tabulations in this document refer the table Testab in this file.

During the mission INE continued the work on validation of the establishment data, especially to create new records for the headquarters establishment, since there were not always data for the headquarters establishment in the initial data collection. There is also need for further validation to make sure that data are not duplicated if there are for example two establishment for the same enterprise, in the same province, the same CAE and the same address, in some cases even with the same number of employees.

Unfortunately it could not automatically be verified if there were records were the data for headquarters establishments were in fact the totals for the whole enterprise. If the data for the headquarters in fact refer to the total for the enterprise the sum of the dependent establishment should be smaller than the total.

There were found 469 “enterprises” with more than 10 employees in the headquarters for which the sum of the employees in the other establishments were smaller than the number of employees in the headquarters. This is in most cases no reason suspect an error, but the list may include some records for which the data for the whole enterprise are entered for the headquarters.

6 Studies for the sample design

6.1 Changes in the target population compared to 1999

The samples 1999 were drawn from a population of 12800 establishments, while the corresponding population 2002/2003 was about 40000 establishments.

Table 2. Target population for the samples 1999

AREA	1-9	10-29	30-49	50 ou mais	Grand Total
ALOJAM	72	92	22	29	215
COMER	5596	631	111	88	6426
CONST	95	115	29	109	348
INDUST	1242	472	153	291	2158
PORTAE	2	5	5	12	24
SERVIÇ	1056	359	66	80	1561
TRANS	318	129	27	71	545
RESTAU	1243	220	28	8	1499
Grand Total	9624	2023	441	688	12776

Table 3. Establishments in the FUE September 2003.

AREA	0	1-9	10-29	30-49	50 ou mais	Grand Total
INDUST	163	2 377	419	116	184	3 259
CONST	17	101	111	35	113	377
ALOJAM	17	265	117	22	29	450
RESTAU	329	5 018	191	12	25	5 575
COMER	1 204	15 346	797	192	283	17 822
SERVIÇ	570	8 529	1 543	400	380	11 422
TRANS	46	402	126	47	84	705
Grand Total	2 346	32 038	3 304	824	1 098	39 610

The largest relative increase is found for small enterprises in the service sector (restaurants, commerce and services). However, the distribution between comercio and serviços 2003 is just a rough estimate where the whole categories X50 and X51 were coded as comercio, so the two tables are not fully comparable in this respect.

Establishments without information about the number of staff members were not included in the target population for the samples 1999. The studies for the new samples indicate that most of them are in the service sector and probably also relatively small in size. The idea for the sample design is to combine the size group “0 and unknown” with the group “1-9”. Then it would be an advantage if it could be verified that the category “Unknown” does not contain any large establishments. If INE suspect that there are large establishments among the “Unknown” it is recommended to send a list in a spreadsheet format to the province delegations for verification. If this is done (and reported back) before the sample is drawn, the “new” large establishments can be included from the beginning in the lists of survey units that will be distributed when the sample is drawn.

6.2 Juridical form

The type of juridical form is probably the best variable in the FUE to exclude public administration from the sampling frame. The table shows the categories that are used to classify juridical form and a preliminary grouping of them into two main categories, FJ_A and FJ_B. The category FJ_B is proposed to be excluded from the survey, at least establishments in the service sector, of which the majority are schools in the official school system and public

health institutions. In the discussion in this paper, the establishments in category FJ_B have been included in the presented tables.

Table 4. Number of establishments in selected CAEs by area and type of juridical form.

FJR_DSG 2	FJR_DSG	ALOJA M	COME R	CONS T	INDUS T	RESTA U	SERVI Ç	TRAN S	Grand Total
FJ_A	COOPERATIVA		14	2	21	4	30		71
	EMPRESA ESTATAL	3	51		9	1	10	9	83
	EMPRESA PÚBLICA	2	1	6	9	2	33	157	210
	EMPRESÁRIO EM NOME INDIVIDUAL	284	15 021	92	2 497	5 374	1 555	159	24 982
	S.A.R.L	7	195	46	91	7	304	62	712
	SOCIEDADE POR QUOTAS	107	1 980	192	543	148	654	224	3 848
	OUTRAS	9	508	6	40	32	67	14	676
FJ_A Count		412	17 770	344	3 210	5 568	2 653	625	30 582
FJ_B	ADMINISTRAÇÃO PÚBLICA	34	13	17	16	1	8 192	75	8 348
	ASSOCIAÇÕES FUNDAÇÕES	2	13	7	28	6	330	3	389
	ONG ESTRANGEIRA		1	6	3		133	1	144
	ONG NACIONAL	2	25	3	2		114	1	147
FJ_B Count		38	52	33	49	7	8 769	80	9 028
Grand Total		450	17 822	377	3 259	5 575	11 422	705	39 610

6.3 Distribution by size

As is indicated in the tables, there are relatively few establishments with 30-49 employees. The establishments with 50 or more employees dominate among the establishments in manufacturing industry (INDUST), construction (CONST) and transport (TRANS).

Table 5. Number of staff members for establishments in the FUE September 2003 by size group and type of economic activity.

AREA	0	1-9	10-29	30-49	50 ou mais	Grand Total
INDUST	0	7 488	6 939	4 374	49 966	68 767
CONST	0	497	1 947	1 341	25 553	29 338
ALOJAM	0	1 186	1 943	813	3 145	7 087
RESTAU	0	11 762	2 696	467	3 090	18 015
COMER	0	35 118	12 600	7 085	69 528	124 331
SERVIÇ	0	27 881	25 356	15 036	63 159	131 432
TRANS	0	1 509	2 168	1 764	46 115	51 556
Grand Total	0	85 441	53 649	30 880	260 556	430 526

The 100 largest establishments account for 145 000 employees.

Table 6. Number of employees and distribution by type of economic activity for the 100 establishments with highest number of employees.

Area	Count of ESTID	Sum of NPS
Industria	15	31424
Construção	14	12675
Alojamentos e restauração	1	500
Comercio e serviços	57	64241
Transportes	13	36647
Grand Total	100	145487

A draft proposal for the sample design is to survey all establishments with 30 or more employees and to use two size-groups for stratification for the samples among the others. The groups are proposed to be 0-9 (including unknown) and 10-29 employees respectively.

6.4 Distribution by type of economic activity

The distribution of the establishments in the business register 2003 according to the stratification plan for the samples 1999 shows that most of the cells are well covered. Where there is need for changes for technical reasons is mainly in the service sector.

In the discussion of the stratification pan it has to be taken into account that the distribution by CAE refers to the **principal** type of activity. In the new business register there is also information about (incidence of) secondary type of economic activity. Using manufacturing industry as example it appears that among 2862 enterprises with the primary activity in manufacturing there were 2173 that reported no secondary activity, while 261 had a secondary activity in manufacturing. As seen in Table 7, most of these 261 enterprises had the secondary activity in the same CAE. The most common type of secondary activity in other areas was in commerce.

The table is meant to give an illustration of the complex pattern in the business sector. In some cases the secondary activity is identified as a separate establishment, in others not. It would also not be surprising if secondary activities also take place in enterprises where no such activities are registered. Typically enterprises organise their own guards and transportation services without identifying these tasks as separate types of economic activity.

The message is that the less homogenous the establishments within a CAE category are expected to be, the less important is it to have a detailed stratification by CAE.

Table 7. Number of enterprises in the FUE with primary type of activity in the area of manufacturing by type of secondary type of economic activity.

Secondary activity		Primary type of economic activity							Grand Total
Area	Stratgrp	X10	X15	X18	X23	X26	X28	X36	
INDUST	X10	1							1
	X15	1	51	1	3			3	59
	X18			7				1	8
	X23		4	3	2			3	12
	X26	2				7	4	3	16

	X28			1	4	2	21	13	41
	X36		1	2	4	5	7	105	124
INDUST Total		4	56	14	13	14	32	128	261
ALOJAM			1						1
COMER		6	95	76	17	51	30	57	332
CONST		1					14	19	34
RESTAU			22	1		1		1	25
SERVIÇ			4	8			4	9	25
TRANS			3	2		3	2	1	11
None		28	961	345	47	87	185	520	2173
Grand Total		39	1142	446	77	156	267	735	2862

Table 8. Number of establishments in the FUE September 2003 by size-group and stratum according to the stratification plan 1999.

AREA	Estrato1999	0	1-9	10-29	30-49	50 ou mais	Grand Total	
INDUST	X10		1	11	20	8	10	50
	X15		94	1 096	154	34	52	1 430
	X18		17	374	14	5	14	424
	X23		2	30	22	8	20	82
	X26		11	114	29	10	16	180
	X28		9	217	39	12	11	288
	X36		29	535	141	39	61	805
CONST	X45		17	101	111	35	113	377
ALOJAM	X551		17	265	117	22	29	450
RESTAU	X552		329	5 018	191	12	25	5 575
COMER	X50		30	663	128	30	38	889
	X51		42	785	219	46	50	1 142
	X52		1 132	13 898	450	116	195	15 791
SERVIÇ	X65		164	111	46	6	12	339
	X70		2	40	5	7	6	60
	X72		5	37	28	2	3	75
	X79		88	1 664	198	55	76	2 081
	X80		311	6 677	1 266	330	283	8 867
TRANS	X601		1	13	8	2	13	37
	X602		3	37	29	13	15	97
	X603			1		1	2	4
	X611			29	3	2	3	37
	X62		13	10	5		2	30
	X63		21	138	53	20	23	255
	X64		8	174	28	9	26	245
Grand Total			2 346	32 038	3 304	824	1 098	39 610

6.4.1 Manufacturing industry

The manufacturing industry (INDUST) was divided into 7 strata by type of economic activity in the old sample. By including all establishments with 30 or more employees in the survey, The large establishments give good information both about the total value of the production and the most important products. Many of the small strata contribute only marginally to the economy, and therefore there are good reasons to combine strata in the CAE dimension, and also to apply a cut-off strategy in some of the strata.

Table 9. Number of employees by (old) strata-groups for manufacturing industry

Estrato2004	Unknown, 0-9	10-29	30+	Grand Total
X10	44	365	1 293	1 702
X15	3 190	2 552	31 158	36 900
X18	904	217	2 859	3 980
X23	118	409	2 366	2 893
X26	458	516	2 205	3 179
X28	709	652	1 545	2 906
X36	2 065	2 228	12 914	17 207
Grand Total	7 488	6 939	54 340	68 767

6.4.2 Construction Industry

INE has initiated exchange of information with Ministério de Obras Públicas e Habitação (MOPH), which may lead to a somewhat different concept for the statistics in this area. The MOPH collects detailed information on all construction projects and the data in MOPH can serve as source for monitoring the development in the construction sector. The continued discussion between INE and MOPH will show how soon and to what extent data exchange will improve the statistics in this area.

The construction industry is heavily concentrated and the establishments with 30 or more employees account for more than 90 per cent of the employees for the establishments in the business register. The development in the large establishments gives sufficient information for the development in this sector and there is in fact no reason to survey small establishments, especially considering that there are no means to maintain a high coverage in this area either in the business register or in the individual monthly surveys. The questionnaire for construction industry is also mainly designed for collection from the larger establishments.

Data on turnover in individual establishments are also very sensitive to changes in the structure of the industry. An increase in the total turnover may be an increase in the intermediate production and consumption (services sold to other establishments) that does not reflect an increase in the total production. This is the case when establishments move from having own employees for all tasks to subcontracting specialised firms, for example for electricity, water etc.

6.4.3 Hotels and restaurants

The stratification is proposed to follow the same principles as for the old sample. There are two separate strata. The statistics for hotels is a high priority, both as an indicator on the development in the sector and for the activity in other sectors of the economy, since it also gives data on business travels. For restaurants there is probably need to further discuss the concept. Measuring the development in this sector from surveys of existing establishments may be difficult, since there are many small establishments and expansion often takes place in the form of new establishments. Therefore, it is probably better to allocate resources to the maintenance of the business register for this sector. Up-to-date information on the number of (existing, new, and closed) establishments and the number of employees in these establishments will indicate the development in this sector. Estimates of the total value of the production can probably be based on data for the large establishments and a relatively small sample of smaller establishments.

Table 10. Number of establishments in the area of hotels and restaurants by CAE level 3.

CAE		Unknown, 0-9	10-29	30-49	50+	Grand Total
551	Serviços de estabelecimentos hoteleiros	245	113	22	29	409
552	Serviços de Restauração	5268	190	11	25	5494

6.4.4 Commerce

The trade sectors account for about 50 per cent of the establishments and 60 per cent of the number of employees in the sectors that are in scope of the surveys according to the FUE. In terms of turnover Most of the establishments are small

Table 11. Number of establishments in the trade sector by size group and CAE level 3.

Estrato2004	CAE3	Cae3_abbr	0-9, unknown	10-29	30-49	50 +	Grand Total
X50	501	Venda de automóveis	13	10	6	22	51
	502	Serviços de manutenção e reparação de veículos aut	350	83	16	14	463
	503	Venda de peças e acessórios para veículos automóve	260	30	6	2	298
	504	Venda por grosso e a retalho de motociclos, suas p	51	3	2		56
X50 Total			674	126	30	38	868
X51	505	Venda a retalho de combustíveis, lubrificantes e s	113	59	14	8	194
	511	Serviços de agentes de comércio por grosso de maté	159	47	7	15	228
	512	Vendas por grosso de produtos agrícolas brutos, a	338	50	12	11	411
	513	Venda por grossode bens de consumo, excepto alimen	88	18	3	4	113
	514	Venda por grosso de bens intermédios (não agrícola	76	23	5	11	115
	515	Venda por grosso de máquinas -	20	11	2	1	34

Estrato2004	CAE3	Cae3_abbr	0-9, unknown	10-29	30-49	50 +	Grand Total
		ferramentas, de máq					
	519	Venda por grosso n.e.	14	6	2		22
X51 Total			808	214	45	50	1117
X52	521	Vendas a retalho em estabelecimentos não especiali	7215	79	16	14	7324
	522	Venda a retalho, em estabelecimentos especializad	2737	64	11	10	2822
	523	Venda a retalho, em estabelecimentos especializado	3480	194	34	22	3730
	524	Venda a retalho, em estabelecimentos, de artigos e	224	2	2	3	231
	525	Venda a retalho não efectuado em estabelecimentos	771	103	49	140	1063
	526	Serviços de reparação de calçado e outros artigos	219	4			223
X52 Total			14646	446	112	189	15393
Grand Total			16128	786	187	277	17378

Repair of vehicles (Code 502) can be said to belong to the service sector, but was included with the commerce in the initial studies, simply because of the code hierachy.

6.4.5 Services

After exclusion of schools, hospitals and other services with the juridical forms

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- ONG NACIONAL

there remained less than 2700 establishments in the CAEs in the service sector that are listed in the table below. The financial sector should probably not be included in the survey. Information from the large banks and other financial institutions are likely to give sufficient information for the development in this sector. Property management (Cae 70) is a very special sector. The sector is not well covered in the business register. For indicators on incomes from property rental there is need for other tools. The proposal is to check the 5 establishments with 30 or more employees and then decide if they should be surveyed.

If the schools and health institutions that are not classified as public administration should be included in the survey remains to be discussed. Otherwise it is likely that there is no need for substratification by CAE in this sector.

Table 12. Number of establishments in the "commercial" sector by type of economic activity and size.

Estrato2004	CAE2	Cae2_abbr	0	10-29	1-9	30-49	50 ou mais	Grand Total
X65	65	SERVIÇOS DE INTERMEDIÇÃO FINANCEIRA, EXCEPTO SEGU	162	26	50	3	9	250

Estrato2004	CAE2	Cae2_abbr	0	10-29	1-9	30-49	50 ou mais	Grand Total
	66	Seguro		7	18	1	2	28
	67	SERVIÇOS AUXILIARES DE INTERMEDIÇÃO FINANCEIRA	2	3	25	1		31
X70	70	SERVIÇOS IMOBILIÁRIOS	1	1	25	2	3	32
X72	72	SERVIÇOS INFORMÁTICOS E CONEXOS	2	17	35	1	1	56
X79	71	SERVIÇOS DE ALUGUER DE MÁQUINAS E DE EQUIPAMENTOS	4	11	65	3		83
	74	OUTROS SERVIÇOS PRESTADOS PRINCIPALMENTE ÀS EMPRESAS	13	85	337	17	50	502
	92	SERVIÇOS RECREATIVOS, CULTURAIS E DESPORTIVOS	14	27	111	17	9	178
	93	Outros serviços	50	12	046	2	1	1 111
X80	73	SERVIÇOS DE INVESTIGAÇÃO E DESENVOLVIMENTO		3	3	1		7
	80	SERVIÇOS DE EDUCAÇÃO	9	69	143	21	23	265
	85	SERVIÇOS DE SAÚDE E ACÇÃO SOCIAL	2	26	69	9	4	110
Grand Total			259	287	927	78	102	2 653

6.4.6 Transport

The establishments with 30 or more employees cover more than 90 per cent of the employment in the sector according to the business register. Therefore the proposal is to survey only establishments with 30 or more employees and leave the rest out.

Table 13. Number of employees in the transport sector by CAE3 and size group.

CAE3	Cae3_abbr	0	10-29	1-9	30-49	50 ou mais	Grand Total
601	Serviços de Transporte por Caminho-de-Ferro		116	63	78	29 172	29 429
602	Outros Serviços de Transporte Terrestre		487	181	498	2 266	3 432
603	Serviços de Transporte Por Oleodutos e Gasodutos (9	34	322	365
611	Serviços de transporte marítimo		54	130	68	213	465
612	Serviços de transporte por vias navegáveis interiores			12			12
621	Serviços regulares de transporte aéreo	0	87	36		973	1 096
622	Serviços não regulares de transporte aéreo			4			4
630	Serviços Anexos e Auxiliares dos Transportes; serv	0	918	555	752	4 456	6 681
641	Serviços de Correio		168	114	105	1 074	1 461
642	Serviços de telecomunicações	0	338	405	229	7 639	8 611
Grand Total		0	2 168	1 509	1 764	46 115	51 556

6.5 Distribution by region

There is an increasing interest in information about regional differences in the economic activity. There are two main subjects to be discussed regarding the regional distribution of the sample.

1. To what extent it is possible to allocate the samples to allow estimates by province
2. Is there reason to exclude establishments in remote district with few establishments for cost/resource reasons

The Maputo region dominates the economic activity in most of the areas. More than 50% of the establishments with 50 or more employees are located in the Maputo area (Maputo City and Maputo Province).

Table 14. Establishments with 50 or more employees by province and type of economic activity.

Província	INDUST	CONST	ALOJAM	RESTAU	COMER	SERVIÇ	TRANS	Grand Total
Niassa	2	4			6	12	1	25
Cabo Delgado	4	1	2		8	11	3	29
Nampula	14	3		1	32	26	9	85
Zambézia	12	2	1	1	17	21	2	56
Tete	1	4	1		13	11	2	32
Manica	8	6	1		14	12	2	43
Sofala	21	12	3		21	21	13	91
Inhambane	4	8	3		21	19	3	58
Gaza	2	14	1	1	14	21	3	56
Maputo Província	48	7	2	2	26	36	9	130
Maputo Cidade	68	52	15	20	111	190	37	493
Grand Total	184	113	29	25	283	380	84	1 098

By including all establishments with 30-49 in the survey, the provinces will get good coverage of the most important areas in the respective province. Where the relative coverage rate for the large establishments is low, the relative importance may also be low, unless there are many small establishments and then the coverage of the sample will instead be relatively high.

Table 15. Number of employed in establishments with 30 or more employees in per cent of all employees by province and type of survey.

Província	INDUST	CONST	ALOJAM	RESTAU	COMER	SERVIÇ	TRANS	Grand Total
Niassa	32%	78%	0%	17%	59%	56%	58%	55%
Cabo Delgado	49%	75%	66%	0%	37%	33%	62%	38%
Nampula	68%	88%	31%	6%	65%	36%	95%	59%
Zambézia	91%	66%	13%	9%	63%	32%	73%	56%
Tete	22%	100%	38%	0%	60%	28%	74%	43%
Manica	63%	93%	29%	0%	51%	31%	46%	46%
Sofala	79%	93%	62%	2%	39%	50%	91%	60%
Inhambane	37%	94%	47%	0%	72%	34%	61%	57%
Gaza	30%	95%	41%	10%	66%	39%	59%	56%
Maputo Província	88%	95%	63%	8%	72%	63%	77%	76%
Maputo Cidade	82%	91%	83%	38%	63%	84%	97%	80%

Grand Total	79%	92%	56%	20%	62%	59%	93%	68%
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Table 16. Number of establishments in the target population by size and type of economic activity for the provinces Cabo Delgado and Nampula.

Província	AREA	0	1-9	10-29	30-49	50 ou mais	Grand Total
Cabo Delgado	INDUST	2	90	10	2	4	108
	CONST		2	4	2	1	9
	ALOJAM	1	17	4		2	24
	RESTAU		157	8			165
	COMER	8	979	32	6	8	1 033
	SERVIÇ	18	396	75	13	11	513
	TRANS	3	21	5	1	3	33
Cabo Delgado Total		32	1 662	138	24	29	1 885
Nampula	INDUST	1	190	26	7	14	238
	CONST	3	6	4	4	3	20
	ALOJAM	1	27	8	3		39
	RESTAU	7	487	21	1	1	517
	COMER	24	1 282	95	18	32	1 451
	SERVIÇ	68	1 270	181	45	26	1 590
	TRANS	5	36	8	7	9	65
Nampula Total		109	3 298	343	85	85	3 920

As shown in the table by province, there are too many cells with none or few population items to enable stratification by the national stratification scheme within a province.

The old sample was allocated only to the district where there were a minimum number of establishments. The districts that were not included in the samples 1999 are included in the table below (Code DistPrio = 2). Table 10 shows the situation in the provinces Cabo Delgado and Nampula. The table shows that a number of districts that were excluded in 1999 now have establishments with 50 or more employees. If also all establishments with 30-49 employees should be surveyed, there will remain only 5 districts in each of these provinces that will not be covered by the sample.

Table 17. Number of establishments in districts that were earlier not in scope of the samples.

Província	Distrito	0	1-9	10-29	30-49	50 ou mais	Grand Total
Cabo Delgado	ANCUABE		83	7	1		91
	BALAMA	1	41	5			47
	CHIURE	2	87	7	2	2	100
	IBO		17	4			21
	MACOMIA	2	110	4	1		117
	MECUFI	2	50	8	2		62
	MELUCO		25	4			29
	MUIDUMBE	2	114	11			127
	NAMUNO	1	72	4	1		78
	NANGADE		120	3	3		126
	PALMA		79	4			83
	PEMBA-		68	4	2		74

Província	Distrito	0	1-9	10-29	30-49	50 ou mais	Grand Total
	METUGE						
	QUISSANGA		78	5			83
Cabo Delgado Total		10	944	70	12	2	1 038
Nampula	LALAUA		59	4			63
	MALEMA		136	15	2	2	155
	MECONTA	2	221	8	2	3	236
	MECUBURI		97	9		1	107
	MEMBA	7	144	8		1	160
	MOGINCUAL		117	2		1	120
	MOGOVOLAS		173	11	1	1	186
	MOMA		124	12			136
	MONAPO	3	154	10	4	2	173
	MOSSURIL		101	6	2		109
	MUECATE		77	5	1		83
	MURRUPULA	4	123	6	1		134
	NACAROA	28	59	2			89
	NAMAPA-ERATI	2	165	5	3		175
	NAMPULA		180	14	5		199
	RIBAUE		127	13	2	1	143
Nampula Total		46	2 057	130	23	12	2 268

There may be reason to organise the data collection differently for remote district. One solution could be to collect data only quarterly if the province have difficulties to contact establishments in some remote districts, even if the questionnaires are filled monthly.

INE is proposed to channel the regional demands for information on the development of the economic activity to using stock data as indicators. The new information from the business register will be a good platform for the continued work in the provinces to maintain a good coverage of the business register. The level of ambition for the annual updates of the business register is very important for the regional statistics, as well as the national, on the development in the economy.

If the updates are not executed properly, the new establishments will not included in the business register and a growth in the local economy will consequently be underestimated.

7 Tools for allocation of the samples.

A spreadsheet solution that was used for samples 1999 was updated during the mission and used as tool to calculate the desired distribution of the sample by strata accord to Neyman-Allocation. The new version of this spreadsheet was named TestabAmostraDesenhoNeyman.XLS. A small user's manual was included on a separate page in the file.

One conclusion from the test calculations is that the small establishments give only small contribution to the global estimates. It is important to notice that Neyman allocation based on the number of employed indicates how well the sample is expected to estimate the NUMBER of employed. Since the short-term indicators have as primary objective to indicate the CHANGE in the economic activity there is still reason to include small establishments in the survey.

Otherwise the result of the survey will not be able to indicate if the development is mainly an effect of increasing activity in small establishments. There is probably also a political interest to monitor the development of small businesses, since the owner of small establishments may react differently to government initiatives or changes in the market situation than large establishments. Such consideration will be the guidelines for the discussion of possible cut-off strategies in some CAEs.

8 Tools for sampling

The FUE application does not have a built-in module for sampling. To prepare a possible solution with random sampling from the database FUE_Amostra.MDB, a random number has been included in the table TESTAB. A simple solution would be to define a starting number and then select the first n establishments in each stratum by this random number.

Appendix 6. The business register (FUE) of Mozambique 2003.

1 Background

After the results of the business census 2003 (CEMPRE) have been compiled, there is a new business register, Ficheiro de Unidades Económicas (FUE). The software for the FUE was bought from INE Portugal 2002 and used for the first time for the data entry of the business census.

2 The structure of the business register (FUE)

The new register contains information about the enterprise and each establishment for all identified enterprises in the business census 2002/2003. There are no plans to establish links between the old business register and the new.

The core register unit is enterprise. If an enterprise has only one establishment, the data for the headquarters establishment is stored in the same record as the data for the enterprise (Table "EMPRESA"). Separate data for the establishment (table "ESTAB") was initially included in the database only if there were more than one establishment in the enterprise. All establishments in the same enterprise are registered with the same identification number as the headquarters. In the FUE database each establishment has an establishment number [NUM_EST]. Initially the NUM_EST was a unique number for each establishment, though the combination of the enterprise ID ("NUMERO") and the NUM_EST was defined primary key (unique identifier) of the establishment. After the data entry for the census had been completed, INE prepared a separate database FUE_TRAB.MDB with separate records for all establishments. This was a necessary step towards an establishment register, that could serve as source for sampling of establishments for the monthly statistics.

In the FUE_TRAB.MDB, however, the establishment ID, NUM_EST, was changed from a unique identification to a number that restarts at 1 for each new enterprise, which means that there is need for the two fields NUMERO and NUM_EST to identify the establishment.

The main variables that are registered in the business register are:

Code	Description	Tabela Empresa	Tabela Estab
NUMERO	Número de identificação da empresa	X	X
NOME	Nome da empresa ou do estabelecimento	X	X
NUM_EST	Núm ordem do estabelecimento dentro da empresa (0=sede)	X	X
SEDE_EST	Código 1 indica estabelecimento sede da empresa	X	X
NPC	Número de pessoa colectiva (sem dados)	X	
Z1_COD	Província	X (a sede)	X
Z2_COD	Distrito	X (a sede)	X

Code	Description	Tabela Empresa	Tabela Estab
Z3_COD	Localidade	X (a sede)	X
Z4_COD	Nível regional 4	X (a sede)	X
LAT	Latitude	X (a sede)	X
LONG	Longitude	X (a sede)	X
ALT	Altitude	X (a sede)	X
CAE	Classificação de tipo de actividade económica	X (da empresa)	X
ANO	Ano de fundação	X (da empresa)	X
MES	Número de meses funcionou 2001	X (a empresa)	X
FJR	Forma jurídica	X	
STA	Situação na actividade	X (a empresa)	X
SIN	Sector Institucional	X	
CAC	Código de actividade comercial	X	
GCI	Grupo de contribuição Industrial	X	
CPS	Capital social	X	
PTE	Percentagem de capital estrangeiro	X	
PNP	Percentagem de capital público	X	
PNV	Percentagem de capital privado	X	
NPS	Número de pessoas ao serviço	X (a empresa)	X
NPS_H	Número de pessoas ao serviço-homens	X (a empresa)	X
NPS_M	Número de pessoas ao serviço-mulheres	X (a empresa)	X
NST	Número de estabelecimentos	X	
VVN	Volume de vendas	X (a empresa)	X
DATA_DOC	Data do documento masi recente	X	
DATA_IN		X	X
NOMINHO	Designação comercial da empresa	X	
MOR	Endereço	X (a sede)	X
CTT_COD	Caixa Postal	X (a sede)	X
EMAIL	Email	X (a sede)	X
TLF_IND	Indicativo do telefone	X	X
TLF	Telefone	X	X
FAX_IND	Fax indicativo	X	X
FAX	No de fax	X	X
TIPO_QUEST	Type of questionnaire	X	

In the database FUE_TRAB.MDB the table ESTAB has been added to the table EMPRESA and the new code Sede_Est indicates if the establishment is the headquarters of the enterprise or not.

Since the new enterprise and establishment numbers are not yet established as identifiers in the field, there is still time to reconsider the identifiers of the establishments, both in the business register and in the monthly surveys.

For a number of reasons it would be easier to have only one field as unique identifier of the establishment, especially since the establishment is planned to be the primary survey unit. The advantages of independent establishment identifiers have been discussed in a number of documents. The main reasons for independent identifiers are:

- The administration of the fieldwork operations will be simplified and therefore safer.
- There is need for fewer changes in the applications for the data entry and the processing since there is only one identifier in the current system.
- The establishment can keep the same identifier also if there is a change in ownership or the company's organisation

In principle no information about the establishment should be included in the identifier, especially not information that can change, which is the case with ownership and the organisational structure of an enterprise.

To avoid that the enterprise ID and the Establishment ID are mixed up it is recommended to use different series of numbers for the enterprise and the establishment. The proposal is to introduce separate number series for establishments and enterprises, for example by letting one of the series start with number 200001. Since the establishment numbers are expected to be more used than the enterprise numbers the best solution is probably to start numbering enterprises at 200001.

THIS IS A VERY STRONG RECOMMENDATION!!

The numbers for the enterprises now run from 1 to about 46000.

There is a possibility to also include a check-digit when the numbers are created, but since the applications for the data entry automatically show the name of the establishment when the number is entered there is little risk that a typing error for the establishment number will not be revealed.

It was early proved by experience during the fieldwork for the census that the field staff had difficulties to separate the data for the enterprise and the headquarters establishment when there were more than one establishment in the enterprise. Therefore an important part of the validation process was to identify if the data the table EMPRESA referred to the headquarters establishment or the whole enterprise. Otherwise there was a risk that the total for the enterprise was introduced as a separate establishment.

The table EMPRESA in the database FUE_TRAB.MDB there were 3535 records that refer to "establishments" that are not the "headquarters" of an enterprise. These establishments belonged to 1546 different "enterprises". In total there were 43 935 different "enterprises" in the version of the table EMPRESA that was available September 1 2003. For 74 of these enterprises, there was no one that was classified as headquarters.

3 The contents of the business register FUE

The contents and also the names of many variables were changed when the new business register was introduced. Here follows a selection of the code tables for the variables for classification of enterprises and establishments that are considered to be of interest for the discussion of the design of the samples for the monthly surveys 2004.

These variables, together with regional codes and the number of staff members define the framework for the sampling procedure for the new samples 2004.

GCI	GCI_DSG
0	Ignorado
1	Grupo A
2	Grupo B
3	Grupo C
4	Questionário com algum Problema.

CAC. Código de actividade comercial

CAC	CAC_DSG
0	IGNORADO
1	IMPORTADOR
2	EXPORTADOR
3	IMPORTADOR/EXPORTADOR
4	VENDEDOR AMBULANTE
5	FEIRANTE
6	PRESTADOR DE SERVICOS
7	COMISSIONISTA
8	TRABALHADOR POR CONTA PRÓPRIA
9	INST.PART. S/ FINS LUCRATIVOS
10	ORG. ADM. PÚBLICA CENTRAL
11	ORG. ADM. PÚBLICA LOCAL
12	ORG. ADM. PÚBLICA REGIONAL
13	PENDENTE - ALGO ANORMAL

STA	STA_DSG
00	SITUAÇÃO INDEFINIDA
01	AGUARDANDO INÍCIO DE ACTIVIDADE
02	EM ACTIVIDADE
03	PARALISADA (ACTIVIDADE SUSPENSA)
04	EXTINTA (CESSAÇÃO DEF. P/OUTRAS RAZÕES)
05	OUTRA

FJR	FJR_DSG
00	IGNORADO
01	S.A.R.L
02	SOCIEDADE POR QUOTAS
03	EMPRESÁRIO EM NOME INDIVIDUAL
04	COOPERATIVA
05	EMPRESA ESTATAL
06	EMPRESA PÚBLICA
07	OUTRAS
08	ASSOCIAÇÕES E FUNDAÇÕES
09	ONG NACIONAL
10	ONG ESTRANGEIRA
11	ADMINISTRAÇÃO PÚBLICA

sin	sin_DSG	Obs
S0000	IGNORADO	Não classificadas em qualquer dos grupos anteriores
S1110	Sociedades Não Financeiras Públicas	
S1121	Sociedades Não Financeiras Privadas Grandes	
S1122	Sociedades Não Financeiras Privadas Médias	
S1123	Sociedades Não Financeiras Privadas Pequenas	
S1130	Sociedades Não Financeiras sob Controle Estrangeiro	
S1190	Sociedades Não Financeiras NE	= Não Classificadas Anteriormente
S1210	Banco Central	
S1221	Outras Sociedades de Depósitos Públicas	
S1222	Outras Sociedades de Depósitos Privadas	
S1223	Outras Sociedades de Depósito sob Controlo Estrangeiro	
S1229	Outras Sociedades de Depósitos NE	= Não Classificadas Anteriormente
S1230	Outros Intermediários Financeiros	
S1240	Auxiliares Financeiros	
S1251	Sociedades de Seguro Públicas	
S1252	Sociedades de Seguro Privadas	
S1253	Sociedades de Seguro sob Controle Estrangeiro	
S1259	Sociedades de Seguro NE	= Não Classificadas Anteriormente
S1311	Governo central	
S1312	Instituições Públicas Descentralizadas	
S1320	Administração Provincial	
S1330	Administração Autárquica	
S1340	Fundos de Segurança Social	
S1400	Famílias	
S1500	ISFL - Instuições Sem fins Lucrativos	

CAE	CAE_DSG
01	PRODUTOS DA AGRICULTURA, DA PRODUÇÃO ANIMAL, DA CAÇA E DOS SERVIÇOS RELACIONADOS
05	PRODUTOS DA PESCA E DA AQUACULTURA E SERVIÇOS RELACIONADOS
10	HULHA (INCLUI ANTRACITE), LENHITE E TURFA
11	PETRÓLEO BRUTO E GÁS NATURAL, SERVIÇOS RELACIONADOS COM A EXTRACÇÃO DE PETRÓLEO E GÁS, EXCEPTO PROSPECÇÃO
13	MINÉRIOS METÁLICOS
14	PRODUTOS DE OUTRAS INDÚSTRIAS EXTRACTIVAS
15	PRODUTOS ALIMENTARES E BEBIDAS
17	PRODUTOS TÊXTEIS
18	VESTUÁRIO E ARTIGOS DE PELES COM PÊLO
19	COURO E PELES SEM PÊLO; ARTIGOS DE COURO E DE PELES SEM PÊLO; ARTIGOS DE VIAGEM, MARROQUINARIA, DE CORREEIRO, SELEIRO E CALÇADO
21	PASTAS,PAPEL E CARTÃO E SEUS ARTIGOS
22	MATERIAL IMPRESSO, SUPORTES GRAVADOS E TRABALHOS DE IMPRESSÃO
23	COQUE,PRODUTOS PETROLÍFEROS REFINADOS E COMBUSTÍVEL NUCLEAR
24	PRODUTOS QUÍMICOS
25	ARTIGOS DE BORRACHA E MATÉRIAS PLÁSTICAS
26	OUTROS PRODUTOS MINERAIS NÃO METÁLICOS
27	METAIS DE BASE
28	PRODUTOS METÁLICOS TRANSFORMADOS , EXCEPTO MÁQUINAS E EQUIPAMENTO
29	MÁQUINAS E EQUIPAMENTOS, N.E.
31	MÁQUINAS E APARELHOS ELÉCTRICOS,N.E.
32	EQUIPAMENTOS E APARELHOS DE RÁDIO, TELEVISÃO E COMUNICAÇÃO
33	APARELHOS E INSTRUMENTOS MÉDICO-CIRÚRGICOS, ORTOPÉDICOS, DE PRECISÃO, DE ÓPTICA E DE RELOJOARIA
34	VEÍCULOS AUTOMÓVEIS, REBOQUES E SEMI-REBOQUES
35	OUTRO MATERIAL DE TRANSPORTE
36	OUTROS PRODUTOS DAS INDÚSTRIAS TRANSFORMADORAS, N.E.
37	MATERIAIS RECICLADOS
40	ELECTRICIDADE, GÁS, VAPOR E ÁGUA QUENTE
45	TRABALHOS DE CONSTRUÇÃO
50	VENDAS, SERVIÇOS DOS AGENTES DE COMÉRCIO E DE MANUTENÇÃO DE VEÍCULOS AUTOMÓVEIS E MOTOCICLOS; VENDA DE COMBUSTÍVEIS PARA VEÍCULOS
51	VENDAS POR GROSSO E SERVIÇOS DE AGENTES DE COMÉRCIO , EXCEPTO DE VEÍCULOS AUTOMÓVEIS E MOTOCICLOS

CAE	CAE_DSG
52	VENDAS A RETALHO (EXCEPTO DE VEÍCULOS AUTOMÓVEIS, MOTOCICLOS E DE COMBUSTÍVEIS PARA VEÍCULOS); REPARAÇÃO DE BENS PESSOAIS E DOMÉSTICOS
55	SERVIÇOS DE ALOJAMENTO, RESTAURAÇÃO E SIMILARES
60	SERVIÇOS DE TRANSPORTE TERRESTRE E POR CONDUTA (PIPELINES)
61	SERVIÇOS DE TRANSPORTE POR ÁGUA
62	SERVIÇOS DE TRANSPORTE AÉREO
64	SERVIÇOS DE CORREIO E TELECOMUNICAÇÕES
65	SERVIÇOS DE INTERMEDIÇÃO FINANCEIRA, EXCEPTO SEGUROS E FUNDOS DE PENSÕES
67	SERVIÇOS AUXILIARES DE INTERMEDIÇÃO FINANCEIRA
70	SERVIÇOS IMOBILIÁRIOS
71	SERVIÇOS DE ALUGUER DE MÁQUINAS E DE EQUIPAMENTOS SEM PESSOAL E DE BENS PESSOAIS DOMÉSTICOS
72	SERVIÇOS INFORMÁTICOS E CONEXOS
73	SERVIÇOS DE INVESTIGAÇÃO E DESENVOLVIMENTO
74	OUTROS SERVIÇOS PRESTADOS PRINCIPALMENTE ÀS EMPRESAS
75	SERVIÇOS DA ADMINISTRAÇÃO PÚBLICA, DEFESA E SEGURANÇA SOCIAL OBRIGATÓRIA
80	SERVIÇOS DE EDUCAÇÃO
85	SERVIÇOS DE SAÚDE E ACÇÃO SOCIAL
91	SERVIÇOS PRESTADOS POR ORGANIZAÇÕES ASSOCIATIVAS N.E.
92	SERVIÇOS RECREATIVOS, CULTURAIS E DESPORTIVOS

Appendix 7. Developing the monthly surveys of the economic activity in the sectors of manufacturing, construction, and retail trade and services.

1 Introduction

On the road to establishing the new system for the short-term statistics for the monthly surveys of the economic activity in the sectors of manufacturing, construction and services there are number of steps to be taken.

A number of activities will have to take place in order to prepare the implementation of the new system for the short-term statistics from January 2004.

For analysis of the surveys - see appendix 10.

2 Sample

2.1 Review of the business register

The Studies for the discussion of the scope of the surveys and conceptual work on the design of the survey has started. This process may reveal coding errors that can be resolved as an integrated activity.

2.2 Sampling plan

The first step in this process is to identify the target population and create an operational definition of the target population, primarily from its properties in the business register, but also to define the "ideal" target population that should have been in scope if it had been possible to identify it.

2.3 Distribution and size of the sample(s)

These issues are discussed in the mission report and especially in Annex B. These activities include defining a stratification scheme creating a sampling strategy and defining the size of the sample in each stratum.

The total size of the sample is often a compromise between user needs and available resources. The allocation of the sample depends on the objectives of the surveys, often presented as a tabulation plan.

2.4 Sampling from the business register

To make a sample from the business register according to the plan. Here the statistician often works together with a programmer.

"Statistical" validation of the sample by checking how the sample "estimates" known population totals

If the sample is design to estimate known population totals, it is wise to check how the sample estimates totals, both by stratification variables and other background variables that were not stratification variables, but still available in the business register. Such variables in the business register may be institutional sector, ownertype, province, ratio of female employees etc.

This type of validation may indicate if any of the assumptions, on which the sampling strategy was based should be questioned and if the sample design should be revised.

The intention is not to check if the sample happened to be a representative one for selected input variables and select a new with the same strategy that by chance may give better estimates for the selected variables. Then the whole idea of random sampling would be lost.

3 Review of contents and design of new forms

- Define questions and variables. Often there is need for a set of questions to know the respondents situation well enough to know how to interpret the answer to the “core” question.
- Editorial work
- Evaluation in relation to the data entry system other IT aspects to verify that code fields are large enough etc.
- Desktop testing to check if the instructions are clear for different types of respondents
- Test interviews to check mainly that if the respondents “interpret” the questions as intended
- Final revision
- Printing
- Distribution to provinces

4 Verification of the sample units

After the items of the survey have been selected from the business register, INE has a number of tools to verify the sample units.

First all large establishments in the old surveys with more than 30 employees (given that all establishments with 30 or more employees are selected) should be identified in the new “sample”. Here the number of employees in the business register is the key variable. The number of staff members in the FUE is requested to refer to the situation in November 2001 and much can have happened after that. Therefore it depends on the sampling strategy if a unit that had less than 30 employees in November 2001, but is larger according to the monthly surveys 2003, should be included in the “survey all” category. In principle it should not be included if it had the chance to be sampled in the random sampling procedure, but it may be a good practical solution to include all know establishments that have 30 or more employees. The core objective of the surveys is not to estimate levels, but changes over time.

Large establishments in the old surveys are to be identified in the FUE in the cases where that has not already been done. The reason is not only to verify that all large establishments from the old surveys are included in the new, but also to establish links to enable comparisons between the years 2003 and 2004 for the same establishments.

The routine for this activity could be to list the new samples by province and ask the province delegations to make a two-step validation of the sample.

In the first step they report information that is already available at the province delegation or can easily be checked. Especially they should be asked to include “new” establishments with 30 or more employees, if they are not included in the list. This process should be established as an annual updating process and be conducted not later than mid October in order to give the central office time to update the population before the next year.

The second step is to verify the sample in the field. This takes place when the questionnaires are distributed. At the first contact with the establishment, the information in the business register should be verified and updated. There may also be need for background information that is not included in either the monthly questionnaire or the business register.

The results are reported to DESE central office in a predefined fixed format (Disciplina). To define the contents of the “Disciplina” is one of the activities under this item.

4.1 Training for province staff

- The objectives of the surveys
- Price measurements
- How each variable is meant to be used
- Indicate doubt about the delivered data.
- Monthly and quarterly data. Urgent to answer quickly after the end of the quarter
- Important to know about estimations of changes (in contrast to point estimates)
- Important to know about samples and weighting systems
- Important to report that/if production is zero
- Establishment and enterprise
- Economic activity in more than one CAE for the same sampled unit
- Report if a sampled unit is closed
- When should the unit stay in the sample if there is a new owner and when should it not
- Routines for documentation of field operations
- Routines for documentation of contacts with the establishment
- Routines for validation of data. Comparisons with previous month

4.2 Routines for data entry

- programming
- tests
- training of staff

4.3 Computer system for validation and processing

- programming
- tests
- training of staff

4.4 Output tables

- National accounts
- Short-term indicators
- Contacts with other users
- Correspondence with other key indicators
- Publishing
- Comparative analysis of the results



Participants in the seminar for discussion of quality issues

Appendix 8. Discussion of the employment variable in the monthly surveys of the economic activity in the sectors of manufacturing, construction and services.

1 Summary

An analysis of the development of the number of employed in the establishments that have been surveyed in the monthly surveys 2000-2003 has decreased on average, while the FUE shows that there are a high number of newly established businesses. The average number of staff members seems to have increased during the first years after the business started.

This means that it is important to consider new, small establishments if the surveys should indicate the changes in the economic activity over time. By surveying the existing large establishments there will be a bias caused by the fact that the “life cycle” of an establishments typically starts with a short or longer period of increase, which in many cases follows by stagnation and possibly also a decrease. If the growth period in the “life cycle” is not considered the development of the economic activity will be underestimated.

2 Introduction

The information in the business register about the number of employed is discussed as a possible stratification variable. The quality of the employment variable is expected to be comparatively high and changes in the employment is normally a good indicator on changes in the economic activity. Employment is also a gender issue.

In the monthly surveys for the years 2000-2003 it is possible to analyse how the employment has changed in the different sectors of the economy during that period.

3 Coverage for the monthly surveys

The reference period for the information about the number of staff members in the FUE is November 2001. The data for the establishments that answered at least one month in the monthly surveys the 4th quarter have been compared with the establishments in the corresponding strata groups in the FUE. A crosstabulation of the data shows that the monthly surveys covered about 50 per cent of the employment in the areas of “Indústria”, “Construção”, “Alojamento” and “Portos e Aeroportos”, while especially the retail trade under “Comercio” had a low coverage rate.

Table 18. Number of establishments and total number of staff members. Comparison between the FUE and the average for the monthly surveys the 4th quarter 2001.

Estrato	Estabelecimentos			Pessoal		
	FUE	InqMes 2001	Q4 Taxa de Cobertura InqMES	FUE	InqMes 2001	Q4 Taxa de Cobertura InqMES
X10	50	6	12	1 702	539	32
X15	1 430	73	5	36 900	18 427	50
X18	424	29	7	3 980	3 606	91
X23	82	20	24	2 893	1 901	66
X26	180	15	8	3 179	1 699	53
X28	288	31	11	2 906	1 981	68
X36	805	58	7	17 207	4 346	25
X45	377	64	17	29 338	14 715	50
X50	889	64	7	9 789	3 475	35
X51	1 142	69	6	14 667	3 215	22
X52	15 791	75	0	99 875	2 264	2
X551	450	116	26	7 087	3 485	49
X552	5 575	111	2	18 015	1 360	8
X601	37	16	43	29 429	12 180	41
X602	97	22	23	3 432	1 868	54
X603	4		0	365		0
X611	37	3	8	477	160	34
X62	30	2	7	1 100	1 012	92
X63	255	8	3	6 681	447	7
X64	245		0	10 072		0
X65	339		0	5 228		0
X70	60	12	20	1 749	814	47
X72	75	3	4	996	80	8
X79	2 081	42	2	34 475	6 447	19
X80	8 867	15	0	88 984	560	1
Grand Total	39 610	854	2	430 526	84 581	20

4 Evolution of the employment according to the monthly surveys

A small test was made to check how the employment data has developed in the establishments in the monthly surveys. All establishments in the monthly surveys that had answered at least one month of the second quarter of the years 2000-2003 as well as at least one month of the fourth quarter of the years 2000-2002 were identified in the data files. There were 526 establishments that met these criteria with the following distribution by area of economic activity.

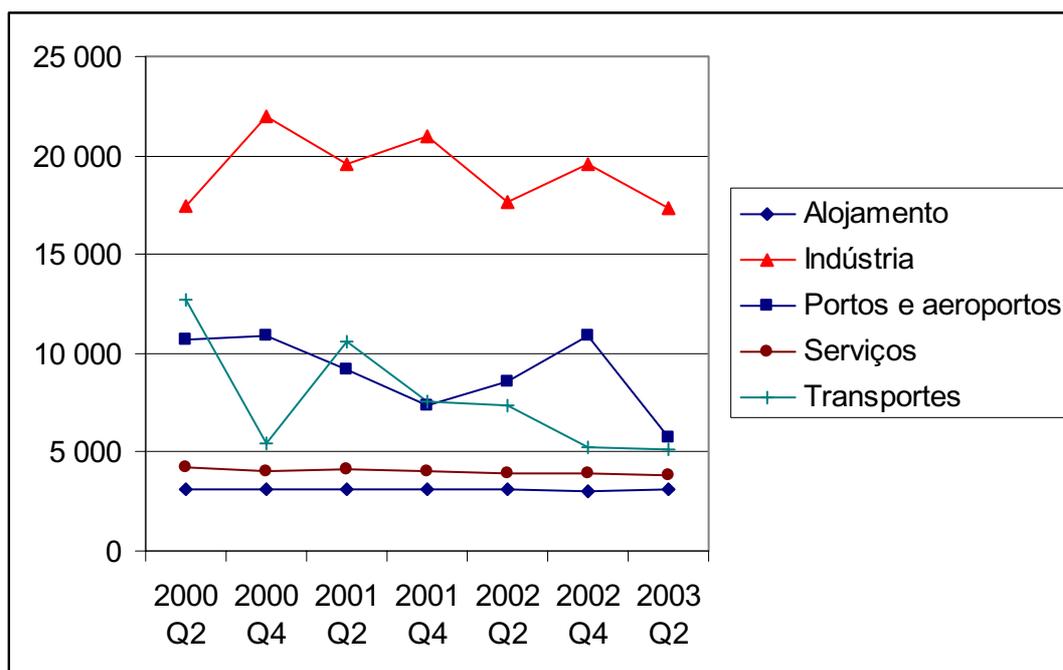
Actividade	Number of establishments
Alojamento	76
Comercio	112
Indústria	161
Portos e aeroportos	13
Restaurantes	93
Serviços	48
Transportes	23
Grand Total	526

The table below shows how the total number of employees in these 526 establishments had developed over this period.

Table 19. Number of employees in identical establishments in the monthly surveys the 2nd and the 4th quarter of the years 2000-2003.

Actividade	2000 Q2	2000 Q4	2001 Q2	2001 Q4	2002 Q2	2002 Q4	2003 Q2
Alojamento	3 144	3 160	3 166	3 097	3 081	3 034	3 156
Comercio	4 522	4 399	4 268	4 249	4 188	4 200	4 197
Indústria	17 485	21 983	19 566	20 961	17 633	19 550	17 339
Portos e aeroportos	10 706	10 909	9 140	7 383	8 590	10 897	5 714
Restaurantes	646	637	645	618	745	758	675
Serviços	4 217	4 063	4 167	3 985	3 948	3 964	3 872
Transportes	12 690	5 404	10 611	7 526	7 397	5 274	5 178
Grand Total	53 409	50 555	51 562	47 818	45 582	47 677	40 132

Figure 1. Number of employed in selected identical establishments 2000-2003.



As seen in the table, the employment has decreased in the establishments that have been good respondents for a long time in the surveys, while the CEMPRE indicated that the total employment in the sector has increased. The conclusion may be that the increase in the employment has not taken place in the establishments that existed 1999, but rather in new establishments.

In the FUE there is a variable ANO that indicates the answer to the question about “Ano de fundação” in the CEMPRE. The number of employed by the year when the business started shows that there is an increase over time, while the number of new establishments 2002/2003 was far higher than the number of remaining establishments started any of the previous years.

Table 20. Number establishments in the FUE 2003 established after 1996 by year when the business started.

ANO	ALOJAM	COMER	CONST	INDUST	RESTAU	SERVIÇ	TRANS	Grand Total
2003	3	568	1	48	107	21	2	750
2002	50	3473	24	399	980	413	46	5385
2001	26	2033	32	334	685	340	42	3492
2000	41	2237	32	316	749	336	32	3743
1999	30	1654	39	258	554	215	38	2788
1998	33	1244	48	229	469	268	40	2331
1997	27	986	25	156	333	127	46	1700

Table 21. Number of employees in establishments in the FUE 2003 started after 1996 by year when the business started and area of economic activity.

ANO	ALOJAM	COMER	CONST	INDUST	RESTAU	SERVIÇ	TRANS	Grand Total
2003	3	492	20	138	164	27	4	848
2002	533	6 331	680	2 040	1 924	1 024	463	12 995
2001	219	6 299	1 203	2 383	1 773	2 286	1 030	15 193
2000	717	7 220	758	1 914	2 066	1 700	427	14 802
1999	309	8 678	3 289	3 423	1 490	1 343	652	19 184
1998	287	4 392	8 256	12 001	1 443	3 284	1 078	30 741
1997	408	7 833	1 499	10 388	1 061	1 539	1 206	23 934

Consequently the new establishments 2002 are on average smaller in terms of the number of staff members compared to those who started a few years earlier.

Table 22. Average number of employees in establishments in the FUE 2003 started after 1996 by year when the business started and area of economic activity.

ANO	ALOJAM	COMER	CONST	INDUST	RESTAU	SERVIÇ	TRANS	Grand Total
2003	1	1	20	3	2	1	2	1
2002	11	2	28	5	2	2	10	2
2001	8	3	38	7	3	7	25	4
2000	17	3	24	6	3	5	13	4
1999	10	5	84	13	3	6	17	7
1998	9	4	172	52	3	12	27	13

1997	15	8	60	67	3	12	26	14
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The pattern in the FUE indicates that it is important to make samples among the small establishments if the main objective is to measure the change in the economic activity, since it seems that there is a growth in the high number of new establishments that were identified by the CEMPRE. On the contrary it seems that the number of employees in the older (often large) establishments has not increased during the latest few years.



The consultants and INE staff members discussing issues regarding manufacturing industry

Appendix 9. National accounts breakdown by branches

A	R01.0	Agriculture and animal production (CAE 01)
B	R02.0	Fish, aqua cultural products, and activities in related services (CAE05)
C	R03.0	Extraction industries (coal, oil and gas) (CAE 10-11)
D	R04.0	Production of food, beverages and tobacco (CAE 15)
D	R05.0	Other manufacturing industries (CAE 16-37)
E	R06.0	Production and distribution of electricity, gas and water (CAE 40-41)
F	R07.0	Construction and civil engineering (CAE 45)
G	R08.0	Wholesale and retail trade (CAE 51 and 52)
G	R09.0	Repairing services (CAE 50)
H	R10.0	Hotels and restaurants (CAE 55)
I	R11.0	Transports (CAE 60-64)
J	R12.0	Financial activities (CAE 65 and 67)
K	R13.0	Estate and related services (CAE 70-74)
L	R14.0	Public administration, defence and social securities (CAE 75)
M	R15.0	Education (CAE 80)
N	R16.0	Health services (CAE 85)
O	R17.0	Other collective activities, social and personal (CAE 90-93)
P	R18.0	Families with hired staff (CAE 95)
Q	R19.0	Ideal organisation and home services in households (CAE 93)
Q	R20.0	International organisations and foreign institutions (CAE 99)

Appendix 10. An evaluation of important surveys; manufacturing, construction, retail trade, services

Manufacturing

1. The manufacturing survey covers the divisions 10 - 37 according to CAE. The survey uses the establishment as the unit of observation.

2. The total number of units participating was 248 in 2002 of which 181 units had more than 50 employees (large units). The situation for 2003 is that 186 units are responding of which 128 is defined as large. Through the period 2001-2003 some 25 per cent of the sampled units seems to have become inactive or simply stopped responding. A further steep fall has been observed from 2002 to 2003.

This report recommends that the enterprise becomes the new unit of observation. This is especially relevant for the medium sized and large enterprises.

3. The number of units responding is in general low. Only some 65 per cent of the units return the form implying a 35 per cent unit nonresponse rate. The size of item nonresponse adds to the overall picture of nonresponse. 20 -25 per cent of the respondents do not fill in one or several of the questions covering the key variables: employment, wage costs and sales volumes. An overall picture indicates that the total nonresponse for manufacturing has been more than 50 per cent during the last years.

The nonresponse as concerns the production values and quantitative indicators is not known for all industrial groups. Data covering CAE 311 for the period 2000-2003 indicates that the item nonresponse rate for produced and sold quantities is 22 per cent. While for production and sales values the rate is 36 per cent. The 2003 figures indicate as well that there are large delays in reporting. In September 2003 only 60 per cent of the establishments participating in 2002 had returned forms covering the months in 2003.

4. Standards - classifications

The manufacturing survey uses the CAE and the CNBS. The CNBS is the new commodity classification adopted by INE. The classification will be implemented from January 2004 - mainly restricted to the manufacturing survey. The implementation will influence the task of measurement in several ways. The number of CNBS commodities are higher than the in the old classification. Thus - the level of detail is increased. This implies that a pattern should be found showing that old commodities are split into two or more CNBS commodities. Further - the unit of measurement is changed for some commodities e.g. from measuring production in m² to m³.

The transition to CNBS must be controlled. Changes in commodity level of detail or in unit of measurement is known to INE staffs. Information should in advance be given to respondents that will be influenced by changes. The respondents may have to reorganise their systems that is currently providing information according to the old classification. Information in advance will also reduce the problems when INE starts receiving the forms for January 2004. In cases where commodities have changes in unit of measurement additional information should be requested to control the transition. Such information should also simply the reconstruction of commodity time series for the previous years.

5. The form

For general comments on the design and layout of forms - see chapter 6.3.

Identification of the unit

-- Unchanged but move the questions for telephone and e-mail address to the bottom of the second page

The list of variables proposed

-- Has the establishment had stops in production during the month? Please specify the total number of days:

- Sales values measured in current prices
- Production values measured in current prices
- Number of employed persons; a breakdown in men and women should be discussed
- Wage costs

-- Producers prices - asking the respondent to specify the 3 most important products in production. Sales value, current month price and last month price should be reported.

Controlling price changes (on the second page?).

-- A qualitative question: Has the enterprise / establishment changed its prices during the current month? Please indicate the average change compared with last month. Select one of the boxes below.

- Increased more than 5 %
- Increased 3 - 5 %
- Increased 1 - 3 %
- Unchanged
- Reduced by 1 - 3 %
- Reduced more than 3 %. Please specify:

Volume indicators measured in physical quantities

-- This should be discussed. Unclear what is actually reported to day. Do the products specified by the respondent cover the total production activity? Is the quality of reported data acceptable? Are changes in quality of products observed handled? It is almost impossible to separate nonresponse from changes in production.

-- Hours worked

This is likely a better indicator for industrial sectors having complex products. Extra time worked should be included. Such data should be available in the wage offices.

-- Electricity consumption measured in kWh

Retail trade and repair, services

1. This survey covers CAE 50, 51, 52, 63, 64, 70, 71, 72, 73 and 74. The divisions 50 and 52 constitute the retail trade, while 51 is the wholesale trade. The remaining divisions belong to the service industries.

2. The total number of units participating was 290 in 2002 of which 86 units had more than 50 employees (large units). The situation for 2003 is that 243 units have been responding so far this year of which 73 is defined as large. Through the period 2001-2003 some 15 per cent of the sampled units seems to have become inactive, stopped responding or have extreme delays in reporting.

This report recommends that the enterprise becomes the new unit of observation.

3. The number of units responding is in general low. The unit nonresponse rate is 55 per cent being representative for the last 3 years. The size of item nonresponse adds to the overall nonresponse. 10 - 15 per cent of the respondents do not fill in one or several of the questions covering the key variables: employment, wage costs and sales volumes. Overall the total nonresponse for retail trade and services has been close to 50 per cent during the last years. It should be added that the remaining core of units seems to be fairly stable. This might be an indication of that the nonresponse rate is impacted by the initial severe population problems.

4. Standards - classifications

The retail trade and service survey uses the CAE.

5. The form

For general comments on the design and layout of forms - see chapter 6.3.

Identification of the unit

-- See comments given for the manufacturing sector

The list of variables proposed

-- Sales values measured in current prices
-- Number of employed persons; a breakdown in men and women should be discussed
-- Wage costs

-- Price of products

In this case the prices refers to the products sold by the retailer. The aggregate price index should serve as a deflator to be used when measuring the sales volume in fixed prices. Thus - in this case the value measured in fixed prices is not a production indicator but is used to monitor changes in the sales volumes. Retail data as well as data for service sectors are used as indicators for the private household consumption in national accounts.

To produce a deflator two approaches could be used.

-- Observe the retailers prices and estimate a price index to be used as a deflator.

-- CPI indices could serve as deflators for the trade and service sectors. The CPI measures the price paid by the consumers incl. value added tax. The producer price should be measured excluding value added tax.

Consultation with CPI staff of INE indicates that the quality of price measurement in service sectors is not good enough. INE have to decide what approach that should be used. An improvement of the CPI surveys should though be preferred.

Transports

This survey has serious measurement problems. Analysing time series for the period 2001-2003 shows that the mixed variables - passenger-kilometres or passenger-miles, and merchandise-kilometres or merchandise-miles - do not function as intended. Large variances as well as extreme observations on a quarterly basis indicate that the respondents do not have the information needed to answer these questions correctly. There are as well large deviations between the sample turnover and the sum of the components specified in the form.

As will be seen the item nonresponse is extremely high. It is recommended to leave out some of the current variables. The survey management during data capture must face these problems.

1. The survey covers - according to CAE:

- Land transport (CAE 601)
- Sea and water transport (CAE 61)
- Air transport (CAE 62)
- Transport by railway (CAE 601)
- Transport via pipelines (CAE 603)

2. Participation

The total number of units participating was 34 in 2002 of which 24 units had more than 50 employees (large units). The current situation is that 30 units have been responding so far this year of which 16 is defined as large. Through the period 2001-2003 some 35 per cent of the sampled units seems to have become inactive, stopped responding or have extreme delays in reporting.

3. The nonresponse

The unit nonresponse rate is 52 per cent being fairly stable for the last 3 years. The number of units actually reporting has been fairly stable though on a low level compared with the sample size. This indicates that the nonresponse rate is impacted by initial severe population problems.

The size of item nonresponse seems however very large. Less than 25 per cent of the units within land transports are able to answer the question concerning number of passengers transported during the month. Less than 15 per cent has filled in the questions concerning passenger-kilometres. None has chosen the passenger-miles alternative when responding. Slightly more than 50 per cent of the units have filled in the question concerning transported merchandise (ton). 1/3 of the sample has filled in the merchandise-kilometres answering alternative while none have used the alternative. The respondents answering capability /

practise seems better as concerns the value data. Only the questions on employment and wage costs are actually well covered.

4. Unit of observation

It is recommended that the enterprise becomes the new unit of observation.

5. Standards - classifications

The transport survey uses the CAE.

In addition a breakdown in type of transport is used covering passengers, merchandise and other. The basic units of measurement are number of passengers and tons as concerns merchandise. This classification is common and used in many countries. As discussed the sampled units seem to have problems in providing correct information according to this breakdown.

6. The form

For general comments on the design, layout and variables used in the form - see chapter 6.3.

Identification of the unit

-- See comments given for the manufacturing sector

The list of variables proposed

- Turnover measured in current prices
- Number of employed persons; a breakdown in men and women should be discussed
- Wage costs

Volume indicators measured in physical quantities

- Passengers transported - measured in number of persons
- Vehicles used for transporting passengers - measured in numbers
- Distance driven during transportation of passengers - measured in kilometres

- Total merchandise transported - measured in tons.
- Vehicles used for transporting merchandise - measured in numbers
- Distance driven during transportation of merchandise - measured in kilometres

The breakdown used in the current form is retained. Two new questions are added for passenger transports and for transports of merchandise. These will enable the estimation of the current mixed variables if INE prefer to do that and the data quality improves.

The additional questions also provide information concerning the utilisation of the current capital stocks of vehicles within the enterprise.

Indicator for capital stock within enterprise

- Total number of vehicles at the disposal of (owned by) the enterprise for transporting passengers

-- Total number of vehicles at the disposal of (owned by) the enterprise for transporting merchandise

The last two questions are added to provide information concerning the total stocks of vehicles. These will serve as capital stock indicators. Changes could be interpreted as investments but more information is required for estimating investments in current prices.

For discussion: Are there any administrative sources e.g. from ministries responsible for transports that are known?

Appendix 11. A structure for the statistical products

This chapter discusses and presents a product structure for the short-term statistical system (STS). The system is designed to produce and publish statistics on a monthly basis. So far only the data collection system has been in operation according to intension. This report suggests further adjustments in the data collection system that should enable starting publishing statistics on a more regular basis - monthly, quarterly and annually.

All statistics within the short-term statistical system (STS) should in principle have the same publishing targets as concerns frequency, scope and coverage of basic variables. All statistics should provide information on gross production value or sales value, prices, employment and wage costs - and volume indicators. To provide the latter new approaches seem required and the solutions selected is likely to differ across the industries covered. E.g. measuring volumes in construction requires different volume indicators than what is normally used in manufacturing.

The results will normally be presented using the CAE - the national industrial classification. All indicators will present results on 2-digit level (division). For some of the products some more details should be added - for selected important 3-digit levels (groups), regional information (to be decided).

The statistics will be presented using indices. This implies that the focus is placed on measuring the changes in the economy. The indices will use the same reference year (=100), and use methods that imply annually updates of weights.

The indicators released should in general be considered as preliminary. This is due to non-response, measurement error etc. The accuracy of results will increase as more data becomes available throughout the year (though still being considered as preliminary). In a broader sense the National Account figures released 1-2 years later provide the official and final results.

The product planned structure:

Quarterly statistics

Published: 30 days after the end of last month in the quarter.

Covers production values, volumes, prices, employment and wage costs. The variables covered can differ between the statistics.

The statistic provides results on national and regional level. It is based on full sample information comprising as well the smaller units of the economy. Population estimates.

Results will be made available on a 2-digit level (division) and for analytical purposes for selected important groups (3-digit level).

The results from this indicator will be preliminary and subject for revisions for the two quarters following the first release.

Annual figures (preliminary structural information)
Published: 6 months after the end of the year of concern.

Covers production values, volumes, prices, employment and wage costs. The variables covered can differ between the statistics. For statistics covering quantity indicators such information could be included as well - where quality of data is considered as good enough.

The annual figures provide results on national and regional level. The annual figures are based on full sample information, population estimates. Results will be made available on a 3-digit level (group) and aggregates.

As a medium-term goal this report suggested that a set of monthly indicators should be part of the product structure. These indicators should provide results on high aggregated levels, within 30 days after the end of month. The data should be based on data from the medium sized and large units. A set of monthly indicators would assure an alignment in frequency in data collection and publishing.



Participants in the seminar on data quality

Appendix 12. Administrative data - the use or reuse of public information

For the last decade most European statistical agencies have been working actively to expand the basis for producing statistics. Important sources and/or databases have been identified within the government sector (ministries, directorates etc), branch organisations etc. Government institutions often do their own surveys - for providing a data basis for executing the administrative tasks for which they are responsible. Some examples:

Administrative data might come from a retailer that has to give information to the tax authorities when paying e.g. the value added tax (VAT). Among several types of information the retailer must provide, is the total value of sales, or total sales for products that are subject for VAT regime.

Information on construction activities might found in the forms that are filled in by an applicant for e.g. building license. The license is delivered to the regional or district offices for approval and thus legalising a building project.

Some branch organisations collect information from the members e.g. being transport enterprises. Information about the enterprises might be collected for handling the situations where public focus is set on the branch, data is used as a basis for describing a branch when lobbying e.g. when changes in tax systems is on the government agenda.

These examples illustrate that information describing industrial sectors are or might be available in many organisations. The cost of collecting data have increased when measured in costs for INE, but also when taking into account that costs generated in filling in questionnaires.

It is recommended that INE should be active in taking initiatives for cooperation with government institutions that are known to have information of relevance. INE should also more actively (on staff level) work for mapping the current situation.

It is suggested that INE take an initiative towards MOPH and suggest a workshop for evaluating the data available and to identify areas for closer cooperation. Such initiative could also be of interest for the ScanStat project. It is important that INE gains experience on the various issues that likely will emerge when working in this rather new field.

Administrative data in the construction sector

Ministério de Obras Públicas e Habitação (MOPH) has the responsibility for the construction sector. In addition to utilising data from directorates, the ministry has its own surveys collecting information on most all types of building activities - by enterprise and establishment. The population covers enterprises or establishments that operates within the Mozambique construction sector. See appendix 10 for a list of the six surveys with variables.

The ministries have the professional knowledge on the industries concerned. The survey provides on the one side information for internal administrative use. Further - the statistics produced are normally read and interpreted by professional readers (ministries, other government officers, enterprise leaders etc.). The ministries are highly dependent on the quality of the statistics. In such environments the critical discussions about statistics lives - and changes / develops are likely to be introduced when needed. The ministries will as well have non-response but their position and professional relation to the enterprises (and

establishments) implies that the respondent normally gives high priority to the task of responding - being aware of the need for being precise in the data provided.

Using administrative data should most likely be cost efficient for INE. One must though bear in mind that resources for producing statistics normally will move from various costs when collecting data into the tasks and costs of adapting administrative information to the requirements for statistical purposes i.e. evaluations of sources, analysis. Some of the implications are clearly illustrated in the internal INE report studying the statistical challenges for the construction sector. The report was produced by Tuveng, Junior and Chiulele.

The importance and value of an administrative source is normally not known in advance. There are many areas where differences can be found when comparing INE definitions with seemingly equally defined variables from administrative sources. The differences can be on the definitions of populations, units of observation, the definitions of variables, coverage of the variable to be measured, processing etc.

Minutes from the meeting in MOPH, 11th September 2003

In a meeting with representatives from Ministério de Obras Públicas e Habitação (MOPH) the issues of statistics for the construction sector were discussed. MOPH has a comprehensive regular data collection for construction projects, and there is good reason to develop a cooperation and data exchange. One important issue that was discussed is the classification standard. In order to harmonise the statistics from the two source there is need for harmonised concepts and definitions. The new national classification of products and services (CNBS) has not yet been implemented in the data collection in MOPH. In a longer perspective the two data collection are expected to be fully harmonised or even integrated. The contents of the questionnaire for INEs own data collection for the construction industry will be revised during October 2003. Therefore it urgent to take further steps in the cooperation with MOPH within the next month.

Reviewing the data for two or three construction projects and compare with available data for the establishments in INEs monthly statistics may indicate how the data can be (better) harmonised. Nevertheless INE has a strong interest in the data on the total value of completed construction projects for the national accounts.

During the meeting with the ministry a set of questionnaires was distributed. The set provides information about the monthly and quarterly statistics was distributed. To give an impression of the data that is found in MOPH the list below presenting the questionnaires and contents has been prepared:

1. Construção e montagem (monthly)
Consumo de materiais (part of survey 1)
A detailed questionnaire covers in addition 24 intermediate goods
2. Produção industrial (monthly)
3. Informação das obras concluídas (quarterly - will be monthly)
This survey is used for the follow up of works done- done and finalised.
4. Número médio pessoal de ao serviço (monthly)

Remuneração mensal em mil Mtc

Detailed coverage of employment and wage costs incl. value of production.

5. Lista de projectos concluidos (quarterly - will be monthly).
6. Empresa de agua (monthly)



Participants in the meeting in MOPH

Appendix 13. Short-term statistics - comparability in time-series

This chapter focus on the importance of consistent time-series in short-term statistics. The current revision comprises several initiatives; updating the populations, drawing new samples, adjusting the questionnaires, introducing new classifications etc. All these changes are beyond no doubt necessary and will have large contributions to the future quality of the statistics. The revisions are however substantial and will imply that the time-series consistency will be influenced or even distorted. That is - unless resources are put into the task of bridging across these problems. It is recommended that any effects on consistency for cross-sector and time-series is reduced to a minimum.

The short-term surveys provide a basis for monitoring and understanding the behaviour of the economy through time during the business cycles. The surveys as a group should be considered as a system of indicators especially designed for the purpose indicated. Of importance for the users value is of course the conceptual links to the national account definitions of the variables, the methods and the use of the accounting principles.

Results from these surveys are normally presented with a large emphasis on availability of time-series. That is time-series of indices having a common reference year (=100). Growth rates are focussed in presentation indicating the pace of changes in the sectors of economy covered. To improve the user value time-series are often seasonally adjusted and presented as such or as trend series.

The mix of variables intends to serve as a basis for identifying areas having growth or recessions, and to contribute to the understanding of the changes observed in the economic environment (in wage cost, labour productivity etc). For the analysis required a special emphasis is laid on the comparability dimension. Cross-sectional consistency enables comparisons across industrial sectors, regions and countries, while time-series comparability is in fact basic. The lack of time-series severely complicates the task of analysing the sectors and relations.

Appendix 14. The classification of construction(CC)-implementation

1. As a part of the current revision of short-term statistics the classification of construction (CC) will be implemented. According to the plan the new statistical system will be operating from January 2004.

The structure of CC gives a new way for planning and organising the survey and will influence the approach for how to present information on construction and civil engineering to the user. The presentation in the forthcoming construction statistic will utilise the basic structure of the classification. That is - the split in Housing and Civil engineering. Further breakdown will more or less follow the basic structure. The classification structure should also be utilised in data collection. For this purpose a revision of the form is required.

2. The basic purpose of all the short-term statistics is to provide information on the changes in the production activities. So is also the case of construction statistics.

3. The enterprise should be the unit for investigation. The wide use of projects when organising the construction works should be utilised when designing the revised forms. The newly updated business register of INE is likely to provide relevant information concerning the total population of enterprises classified to the sections concerned (CAE 45). The survey will cover all the larger enterprises having more than 29 employees. In addition a random sample will be drawn among the smaller enterprises. The size of the sample is to be decided.

It should be added that initiatives have been taken to strengthen the cooperation between INE and MOPH. The knowledge of the ministry staffs and their long-term experience in analysing is of utmost value when designing a revised statistical survey.

Although having an excellent tool (or frame) in the CC there are still large challenges in estimating the total size of the population of project. Limited information is available for the projects that has or are to be started according to the Auto-construction license. The cooperation between INE and MOPH will contribute to improve the basis and quality of statistics

4. In CC there is a link to the national classification of goods and services (CNBS). For the construction sector (CAE 452) approximately 25 products have been defined - 10 for the construction within housing, and 15 covering the civil engineering works. These products coincide with the group- or class-level of CC.

It is not decided in detail which role the products will have in the forms - and data collection. More knowledge about the data availability in the enterprises is required. The product structure will as far possible be utilised.

5. As a consequence of what has been discussed the construction forms will be designed from fresh. Having the focus on the project requires a somewhat different way of thinking in the design.

6. The basic structure of CC will as mentioned be used in the presentation of construction statistics. The linked group of products might be the logical way of estimating population totals.

Appendix 15. As etapas principais ao caminho para introduzir um novo sistema para a estatística trimestral

1 Objectivos da missão

Os objectivos principais da missão foram de dar propostas bem como partes das ferramentas para um novo sistema para as estatísticas trimestrais nas áreas indústria, construção e serviços.

2 Tarefas concluídas

2.1 Revisão das rotinas existentes

A qualidade dos resultados em relação às exigências dos utilizadores

- existência de informação importante
- qualidade das estimativas
- cobertura dos dados
- acesso e ferramentas para análise

Qualidade do trabalho

- rotinas manuais e programas para a recolha e outras partes do processamento

As observações principais foram que não se produzem dados de qualidade suficiente para estimar a produção total do sector e que a informação para indicar as tendências na evolução da actividade na economia é bastante limitada. Também faz-se recolha de dados que não se utilizam no processamento.

2.2 Estudos do novo cadastro FUE

Elaborou-se estudos preliminares para definir a foco do novo sistema como está definido no FUE e preparar o desenho das amostras para os inquéritos do ano 2004. Uma base de dados as preparações da amostragem está elaborada e os testes preliminares foram concluídos.

3 Tarefas iniciadas e para executar antes de janeiro

3.1 INE DESE

- Verificar os grandes estabelecimentos nos inquéritos 2003 no FUE

Uma das tarefas urgentes é verificar se/que os grandes estabelecimentos nos inquéritos 2003 existem no FUE e elaborar uma ligação por meio de elaborar uma tabela que conte os códigos de identificação em ambos os cadastros.

- Listagem de todos estabelecimentos grandes para mandar para as delegações provinciais
- Amostragem

- Definir os resultados e indicadores queridos
- Definir os dados para recolher
- Conteúdo dos questionários
- Classificadores
- Testes dos questionários
- Rotinas para recolha dos dados
- Cooperação do Ministério de Obras Públicas e Habitação (MOPH) na área de construção
- Preparar ferramentas para facilitar e economizar o trabalho
- Informação em escrito sobre novas rotinas para os respondentes
- Manual para o trabalho no nível provincial

Uma recomendação é reforçar as rotinas por meio de elaborar exemplos típicos e definir em detalhes em escrito como trata-se cada caso. Também é muito importante ensinar como trata-se recusa e outros casos de faltas.

3.2 Delegação provincial

- Verificar se/que todos estabelecimentos grandes que existem 2003 também existem no FUE
- Verificar se existe grandes estabelecimentos nas listas de estabelecimentos sem informação sobre o número do pessoal
- Verificar as listas dos estabelecimentos amostrados
- Distribuir os novos questionários (e macular os velhos)
- Informação para respondentes sobre os novas rotinas e o objectivo dos inquéritos
- Formação do pessoal
- Testes dos questionários

4 Tarefas para concluir até fevereiro

- rotinas para o processamento dos dados
- ferramentas melhoradas para “macro-validação”

“Macro-validação” indica que faz-se tabelas de saída usando dados preliminares para verificar se/que os dados de entrada são correctos.

- definir em detalhes os formates etc para os resultados para as contas nacionais

A mudança para um novo software para o cadastro e mudança do conteúdo dos inquéritos implica que vai ser necessário rever e actualizar todas as rotinas para entrada de dados e processamento dos inquéritos.

- verificar se/como os respondentes respondem

A mudança para uma nova amostra é uma oportunidade para marcar também mudança para rotinas mais elaboradas sobre controles e organização do trabalho.

5 Tarefas para concluir até abril

- sistema para estimações
- rotinas para facilitar a análise e comparar os novos e os velhos inquéritos
- Estratégia para “backup” e documentação

6 Propostas sobre as amostras

Recenseamento total de estabelecimentos com 30 ou mais membros do pessoal (por volta 2000 unidades). Amostra aleatória entre os pequenos.

Recensar grande EMPRESA em alguns áreas de CAE.

7 Outras considerações

- Entrada de dados na província

Recomenda-se descentralizar a entrada de dados para dar ferramentas ao pessoal dos DPINEs para validar os dados antes de envia-se-los para o órgão central do INE.

- Perguntas mais directas sobre preços e evolução do volume de negócios
- Processamento mensal ou trimestral
- Utilização de dados administrativos de MOPH e outros
- Re- estimar o nível do universo do país para 2002-2003 por meio de elaborar novos ponderados baseados do CEMPRE
-