1. Introduction

The Information and Communication Technology sector (hereafter called the ICT sector) can be characterised as a focal point for the economic and social development in the Nordic countries as in other parts of the developed world. The importance of the ICT sector can be analysed from two aspects; firstly as a traditional supply side approach where the performance of the ICT sector is analysed in terms of employment, production of goods and services and creation of value added. Secondly, due to the pervasive nature of the products produced by the ICT sector, the sector is of importance for the performance of the remaining sectors of the economy (use of computers for production and administrative purposes, e-commerce, etc.) and for the organisation of the daily life of the citizens in the Nordic countries using mobile phones, watching television or using the Internet via a PC. This publication is a description of the ICT sector as an economic sector describing the development and growth of the sector in terms of employment and economic indicators.

Due to the importance of the ICT sector, the statistical offices in the Nordic countries as in other parts of the world have been confronted with needs for statistical information about the ICT sector and its activities. The first step has been the elaboration of a definition of the ICT sector. This definitorial work has mainly been carried out in the context of the OECD Working Party on Indicators for the Information Society (WPIIS), and as a result of discussions in this group an agreed definition was reached in 1998.

1.1 Definition of ICT Sector

The principles underlying the definition of the ICT sector are the following[1]:

For *manufacturing* industries, the products of a candidate industry:

- Must be intended to fulfil the function of information processing and communication including transmission and display.
- Must use electronic processing to detect, measure and/or record physical phenomena or to control a physical process.

For *services* industries, the products of a candidate industry:

- Must be intended to enable the function of information processing and communication by electronic means.

As a consequence of international comparability across countries, the definition was agreed on the level of classes of the International Standard Industrial Classification (ISIC rev. 3), including 11 ISIC classes, cf. annex I. As the Nordic statistical offices are in a position of using more

[1] OECD: Measuring the ICT Sector, Paris 2000

detailed national activity classifications in their statistical production, this publication uses a more precise delineation of the ICT sector, as certain wholesale activities are left out of the definition used in this publication, cf. annex II for more details.[2]

In 1998, the 5 Nordic statistical offices published the first international comparable statistics on the ICT sector using the agreed, harmonised definition by OECD.[3] Due to the revised definition of the ICT sector used in this publication, the statistical information from the previous publication cannot be directly compared with the statistics in this publication.

For analytical purposes, this publication operates with the following groupings of the economic activities within the ICT sector:

- *ICT Manufacturing Industry*
- *ICT Services*, of which
    - *Wholesale*
    - *Telecommunications*
    - *Consultancy services*

1.2 Definition of ICT products

The optimal procedure for defining the ICT sector would have been to start by defining the ICT products, and consequently defining the enterprises producing these goods and services. But due to the limited feasibility of collecting data and producing statistics comprising internationally harmonised definitions and concepts at the product level, first priority has been given to the activity approach.

As this publication also includes statistics on ICT commodities, it has been necessary to elaborate a classification of commodities lacking internationally agreed standards. The approach has initially been to limit the ICT products to the products which by definition belongs to the agreed ICT activity classes, cf. the Central Product Classification.[4] The second phase has been to examine these commodities and delete the ones which have not been judged to fulfil the criteria of being intended to fulfil the function of information processing and communication including transmission and display or using electronic processing to detect, measure and/or record physical phenomena or to control a physical process.

As a result, the analysis of this publication operates with 222 commodities defined as ICT commodities, cf. annex I. An internationally agreed

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[2] Paper presented by the Nordic statistical offices at the WPIIS meeting April 2000

[3] Nordic Council of Ministers: The Information and Communication Technology Sector in the Nordic Countries - a first statistical description, in TemaNord MEDIA 1998:587, København 1998

[4] United Nations: Central Product Classification (CPC) Version 1, New York 1998.

definition of ICT products is foreseen to be the outcome of the OECD WPIIS meeting in April 2001. Following this decision, a revision of the used delineation of ICT commodities can be foreseen for the update in 2001 of this publication on the Nordic ICT sector.

1.3 Data sources, variables and definitions used

This publication is based on official statistics from the Nordic national statistical institutes and as a consequence of the cross-cutting nature of the ICT sector, the data used for this publication has been subtracted from different statistical sources as general enterprise statistics, sector specific statistics, foreign trade statistics or Research and Development statistics. For this reason tables in different chapters might not be totally comparable.

In this publication the following indicators for measuring the importance and dynamics of the ICT sector have been set up:

- *Employment information*
    - Number of persons employed
    - Number of employees
    - Persons employed broken down by gender
    - Persons employed broken down by age
    - Persons employed broken down by level of education

- *Economic information*
    - Turnover
    - Gross value added
    - Wages and salaries
    - Research and Development expenditures

- *Information about commodities*
    - Export and import of commodities

The *definitions* of the variables chosen are closely related to the definitions used by Eurostat as provided in *"Methodological Manual of Business Statistics"*[5], but as existing national statistics are used there are national differences in the definition of the variables. Consequently, these differences have to be accepted presupposing that results are not misleading in comparisons across countries. But it is important to underline that statistical information in this publication mainly should be interpreted as reflecting the national structures within the ICT sector. Thus the absolute figures presented in the annex tables should only be compared across countries with utmost caution.

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[5] Eurostat Units D1-D2: Methodological Manual of Business Statistics, Chapter "General Framework" (Annex 1: Definition of variables), 1996

Information on foreign trade with ICT products

There exists no international agreement or recommendation of any harmonised definition for ICT products. Eurostat has provided a preliminary list of products which has been used by the group. The present examination of ICT imports and exports is based on the product group categories, i.e. telecommunications equipment, consumer electronics, computers, electronic components, office machinery, instruments and equipment for detecting, measuring, checking and controlling physical phenomena or processes (see detailed list in Annex I). The preliminary list from Eurostat provides the ICT products defined in PRODCOM(98)[6] and also a key to the HS[7] and CPC[8] classifications. Key to any other classification can be provided by the national statistical agencies.

Information on Research and Development

Future development of the ICT sector depends highly on the expenditures on research and development. The recent publication "Measuring the ICT sector" by OECD is used to give information on this subject[9].

Time series

The group has wanted to present as long a *time serie* as possible within the limits of the project. A restriction to the earliest year to be covered is presented by the implementation of the harmonised European activity nomenclature, NACE, in each country, as this nomenclature is the basis of the definition. In four of the countries (Finland, Iceland, Norway and Sweden) the implementation has taken place from the reference year 1993, and in Denmark from 1992.

One of the main items of this project is to present comparable data for all the Nordic countries. To profile the ICT sector the group has tried to establish comparable data on the total private sector[10].

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[6] Production Communautaire, Eurostat

[7] The Harmonised Commodity Description and Coding System, Eurostat

[8] Central Product Classification, Eurostat

[9] Consequently, the definition of the ICT sector and the private sector used in this part of the publication differs from the definition used in the other chapters of this publication.

[10] The delineation of the private sector used in this publication covers the NACE rev. 1 groups 15-37 (manufacturing industry), 45 (construction), 50-74 (distributive trade, hotels and restaurants, transportation, business services), 92 (entertainments) and 93 (Other services activities). This definition excludes a number of activities which - to a large extent - are public or non-profit activities such as Public administration, defense and social security (75), Education (80), Health services and social care (85), Sewage, refuse collection and disposal (90), Organisations (91) Private households with employed persons (95) and International organisations (99).

In order to obtain as high a level of comparability as possible, most of the tables are presented in one of two dimensions:

1) Percentages illustrating the relative importance of a certain variable in relation to other parts of the economy.

2) Index figures which are used mainly to compare the development over time.

Given the rather short period of time covered by the tables it was decided not to make corrections for inflation, but to use the reported values in current prices.