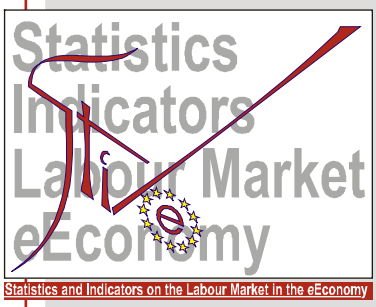


# Mobility in the eEconomy

*Deliverable 6.2 - Report on the use of administrative data to indicate ICT sector mobility in Belgium, including the comparison with LFS mobility and recommendations on better measurement of mobility in the (EU) LFS*

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This project is funded under the ‘Information Society Technologies Programme of the European Commission’ (IST-2000-32099).

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1

# Introduction

This report represents the second deliverable for workpackage 6 of the STILE project. Entitled *Mobility in the eEconomy*, workpackage 6 seeks to reveal determinants of the mobility of ICT workers, to detail the inflow and outflow of ICT workers mobility and to look at the effect gender, age and educational background have on the ICT jobs being created. Two principal sources have been used to do so: the labour force survey and the Belgian Datawarehouse Labour Market of administrative data. This report concentrates on the second of those sources, namely the Belgian Datawarehouse Labour Market (DWH).

In line with overall STILE project goals, this workpackage aims to 'innovate methodologies for the statistical monitoring of the European labour market in the *e*Economy'. By looking to develop the methods for exploiting labour force survey data for measuring mobility in the *e*Economy, this work is of particular relevance to the IST programme objective: Cross-Programme Action 8 'Statistical tools, methods, indicators and applications for the Information Society' and its focus on 'statistical disclosure control and improvement in quality and in timely and low-cost data production'.

## 1.1 Policy context of the report

According to a recent Commission Action Plan, fostering growth in the European economy calls for better matching between the skills demanded in the growth sectors and regions and those available in the workforce. This requires more mobility of capital and of labour, in pursuit of the twin objectives of a successful and dynamic European economy and a balanced geographical and social distribution of the rewards of faster economic growth.[1]

Such a policy development is to a large extent linked to the ambitious and overriding goal that the European Union set itself at the Lisbon European Council meeting held in March 2000. This goal was 'to become the most competitive and dynamic knowledge-based economy in the world capable of sustainable economic growth with more and better jobs and greater social cohesion'.[2]

When the *Action Plan for Skills and Mobility* was subsequently adopted at the Barcelona summit in 2002, the Commission also called upon government, business and workers themselves to do more to equip workers for occupational mobility and better jobs and to accelerate efforts to ensure geographical mobility and a high-performance labour market.[3]

At the same time, this *Action Plan for Skills and Mobility* also called for greater occupational mobility in order to adapt to structural change, driving such change in a competitive world (and) contributing to a better functioning of labour markets and higher productivity, employment, growth and competitiveness.

But *Mobility in the eEconomy* is not only relevant to the Lisbon and Barcelona processes of interest to analysts, policymakers and the business community alike. It is also inextricably

1 Communication from the Commission to the Council, the European Parliament, the Economic and Social Committee and the Committee of the Regions, *Commission's Action Plan for Skills and Mobility*, Brussels, 13 February 2002, p. 6.

2 European Council (2000), *Lisbon European Council, Presidency Conclusions*, 23-24 March 2000.

3 Http://Europa.Eu.Int/Comm/Employment_Social/News/2002/Feb/034_En.Html

linked to the growth and characteristics of employment in the Information, Communication and Technology sector and, as such, key European Union policy developments such as the *eEurope Action Plan.*[4]

A better understanding of the growth and flows in the ICT branch is therefore important. Demographic factors, business cycles and rapid technological change increasingly results in quantitative and qualitative imbalances in the supply of skilled labour.[5] Looking at the flows of ICT workers - where are they coming from and where are they going to - should help to highlight the skills mismatch in the demand for, and supply of, ICT workers. Furthermore, do new workers in ICT sectors have the appropriate skills base. Before younger workers have spent a significant period of time in the workforce, their education will be their principle form of training. If ICT branches are attracting an increasing amount of new and younger workers, do these new recruits tend to have a high level of education or are they attracted to the ICT sector from a variety of educational backgrounds?

But these are just a few of many aspects. An appreciation of the mobility of personnel between ICT and other economic branches is important when developing indicators concerning the potential knowledge about the Information Society. For it is not only the people working in the ICT sector that have knowledge about the sector, but also people who have formerly worked in the ICT sector. It is therefore important to gain an idea of the level of this 'knowledge transfer' and the degree to which it differs between countries.

Providing information and recommendations to the European Commission on the better measurement of mobility in the *e*Economy is therefore important. But it is also of interest to provide data on key related socio-economic reference indicators. After all, social inclusion and equal opportunities in a knowledge-based society are explicit objectives of the *eEurope Action Plan*.

For example, the proliferation of ICT technologies and the growth of the ICT sector has led to changing patterns in how work is organised. ICT technologies carry the prospect to no longer work in the office or another main place of work, opening up the possibilities for carrying out a whole number of job functions that previously would not have been possible. But is this so-called increased flexibility particularly evident in the ICT sector and, furthermore, does it translate new working methods and organisation to create a different environment for those people working in the ICT sector?

## 1.2 Objectives

Taking into consideration these areas of interest surrounding the ICT sector, one objective of this report has been to see to what extent the inflows and outflows of ICT workers as well as their destination sectors can be detailed using the register data of the Belgian Datawarehouse. The aim being a better understanding of the knowledge flows in and around the ICT sector as well as of the distribution of Information Society knowledge.

However, information on ICT workers, their mobility and other socio-economic factors is only telling when it is evaluated in contrast with something else. In other words, the information needs to be analysed and compared with other suitable references i.e. the economy as a whole, other manufacturing or service sectors, various age groups, etc. Another objective of this report has therefore been to look at the effect gender and age have on the mobility op ICT personnel, comparing this to other sectors of importance and the economy as a whole.

In short, this report explores the possibilities to use the Belgian DWH for:

- describing the ICT sector in Belgium in terms of its personnel;
- determining flows within the ICT sector and between ICT and other branches by regrouping the economic destination sectors of ICT personnel into broad categories.

The data used to build up the indicators follows established nomenclature and internationally standardised definitions. Quite apart from nomenclature, there are a number of other meth-

4 Communication from the Commission to the Council, the European Parliament, the Economic and Social Committee and the Committee of the Regions, *eEurope 2005: An information society for all*, Brussels, 28 May 2002.

5 Career Space (2001), *Generic ICT skills profiles*.

odological factors that need to be taken into consideration for assessing the degree to which the Belgian DWH is a suitable source for measuring ICT sector mobility. Apart from some general issues, the main criteria need to be first its accuracy in measuring ICT and second its suitability for measuring the dynamics of employment change. This report therefore also provides an in-depth insight into the methodological questions surrounding the measurement of ICT mobility using the Belgian DWH.

## 1.3 Synergies and clustering

This report has benefited from the research carried out in various other STILE workpackages. Notably, the interrelated work on WP2, which looked at extending the coding used in current national LFS surveys, the research carried out for WP3 on NACE and ISCO classifications of *e*Business and *e*Workers and also that of WP5, which created and tested an ad hoc module to measure telework.

As well as drawing from the experiences gained through other workpackages in the STILE project, and also feeding into others, efforts have already been made to cluster with another project funded by the European Commission under its Information Society Technologies programme. Agreements between the STILE and NESIS (New Economy Statistical Information System) projects have been reached on consistent methodological approaches to ensure that comparison of results between the two can be more easily achieved.

Chapter
2

# Datawarehouse and ICT

## 2.1 Methodological considerations

The Datawarehouse Labour Market is a database in which a series of social data from a number of social security institutions are permanently linked. The data files of these institutions are related to one another via the (coded) personal identification number, which every person has for their social security (INSZ). The individuals are therefore the most important statistical unit. Each participating social security institution offers an extensive list of variables in the Datawarehouse, such as the NACE code. For persons in employment, the characteristics of the employment regime, the employer and the number of hours worked are also integrated in the Datawarehouse, a fact which makes statistics about jobs, employers and employment volume possible.

The population of the Datawarehouse consists of all persons who during one quarter were known to one of the institutions involved. Added to these are the individuals' family members (in as far as these are not known themselves by one of the participating institutions). Of the latter group we merely know the sex, the age and the home address.

In terms of the labour force, the Datawarehouse therefore comprises the majority of working inhabitants of Belgium and a large part of the unemployed. Missing from the group of employed are especially the employees who are working for an employer who is not required to contribute to the Belgian social security, such as frontier workers employed abroad. Of the total population of unemployed, the individuals who are not - be it directly or indirectly - entitled to unemployment benefit remain beyond the scope of the Datawarehouse.

On the basis of the information from the participating social security institutions, a detailed division of the population by labour status is drawn up in the Datawarehouse. Thereby the situation on the last day of the quarter is systematically taken into consideration.

The nomenclature of these socio-economic positions is built up hierarchically and can be broken down to a five digit level. This allows for a far-reaching division within the four major categories. The new possibilities of the Datawarehouse are exploited to the full by mapping positions for which different social security institutions provide the information (e.g. persons who are both employees and self-employed). As an illustration this is shown in Table 2.1 at the three digit level.

**Table 2.1** Datawarehouse Labour Market: overview of the socio-economic nomenclature

| Code and description of the socio-economic position |
|---|
| 1. Employed |
| 1.1. Employee |
| 1.1.1. In a single employment |
| 1.1.2. In several jobs |
| 1.2. Self-employed |
| 1.2.1. Main occupation |
| 1.2.2. Secondary occupation |
| 1.2.3. Self-employed after retirement age |
| 1.3. Helping an employer who is self-employed |
| 1.3.1. Employed as helper as main occupation |
| 1.3.2. Employed as helper as secondary occupation |
| 1.3.3. Employed as helper after retirement age |
| 1.4. Employee and self-employed |
| 1.4.1. Mainly employee |
| 1.4.2. Mainly self-employed |
| 2. Unemployed with RVA benefits |
| 2.0.1. Unemployed after full-time employment |
| 2.0.2. Unemployed after studies, qualifying for 'waiting benefit' |
| 2.0.3. Unemployed after a voluntary part-time job |
| 2.0.4. Unemployed after graduation, entitled to a 'bridging benefit' |
| 2.0.5. Unemployed without benefit (new status) |
| 3. Inactive (with RVA benefits) |
| 3.0.1. Full-time early retirement |
| 3.0.2. Full-time career break |
| 3.0.3. Exemption from registration as unemployed |
| 4. Unknown |
| 4.0.1. Suspended unemployed |
| 4.0.2. Other |

*Source:* KSZ-DWH Labour market data (Processing Steunpunt WAV)

Information and Communication Technology, or ICT, provides the basis for measuring the *e*Economy. Though there are a number of different definitions around for ICT, *Mobility in the eEconomy* broadly follows that agreed by the OECD Working Party on Indicators for the Information Society. In its subsequent publication, *Measuring the ICT sector,*[6] the OECD details the definition of ICT as described in Table 2.2, where some ICT subsectors at the class level (four digit)[7] are included:

This classification is based on the principle that products in the manufacturing sector:
- 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 and communication by electronic means;

and that products in the service sector:
- must be intended to enable the function of information processing and communications by electronic means.

The definition in Table 2.2 requires information at the three digit and sometimes four digit level of NACE. At project start, however, Labour Force Survey (LFS) data was available at the broader two digit (i.e. NACE 32), and for a minority of countries, three digit level of NACE (i.e.

6 *Measuring the ICT sector*, OECD, 2000.

7 NACE Rev. 1.1 is organised hierarchically into five levels. From the broadest to the most detailed, they are (i) Sections; (ii) Subsections; (iii) Divisions; (iv) Groups; (v) classes. In this report, we are most concerned with Division (two digit level) and Groups (three digit level).

NACE 32.1). To ensure comparable data for a maximum number of countries, the starting point of workpackage 6 has to be NACE at the two digit level. But this entails choices being made concerning the inclusion of NACE sectors at the two digit level on the basis of the existence of ICT in some of its subsectors. If ICT indicators are to be compared across all countries for which LFS data were, at project start, available at Eurostat, then LFS data will not be able to provide an exact measurement of ICT according to the OECD definition. In adapting the definition slightly, care must be taken not to inflate the definition of ICT, while on the other hand ensuring that the size of the population in the approximation does not increase sampling variation to the extent that it loses the representativeness of the population in question.

**Table 2.2** OECD Definition of ICT by sector of activity (NACE/ISIC)

| Description | ISIC Rev. 3 | NACE Rev. 1.1 |
|---|---|---|
| Office, accounting and computing machinery | 3000 | 30 |
| Insulated wire and cable | 3130 | 31.3 |
| Electronic valves and tubes and other electronic components | 3210 | 32.1 |
| Television and radio transmitters and apparatus for line telephony and line telegraphy | 3220 | 32.2 |
| Television and radio receivers, sound or video recording or reproducing apparatus, and associated goods | 3230 | 32.3 |
| Instruments and appliances for measuring, checking, testing, navigating and other purposes, except industrial process equipment | 3312 | 33.2 |
| Industrial process control equipment | 3313 | 33.3 |
| Wholesaling of machinery, equipment and supplies* | 5150 | 51.6 |
| Telecommunications | 6420 | 64.2 |
| Renting of office machinery and equipment (including computers) | 7123 | 71.33 |
| Computer and related activities | 72 | 72 |

* Where possible, this should be limited to the wholesaling of ICT goods, *Measuring the ICT sector*, OECD, 2000.

*Source:* Measuring the ICT sector, OECD, 2000

For this reason, certain subsectors have been excluded from ICT compared to the OECD definition due to the expected difficulty in accurately measuring total ICT employment. To judge on whether a NACE sector should subsequently be included or excluded, an extraction of data was made from Eurostat's Structural Business Statistics (SBS) database, which has data at the three and four digit level of NACE. The share of employed people in the three digit sector (or group of three digit sectors) was then calculated against the two digit level to see to what extent overrepresentation of individuals would result from the inclusion of the two digit level sector i.e. employment in NACE 33.2 and NACE 33.3 as a share of NACE 33.

On this basis, *manufacture of electrical machinery and apparatus n.e.c.* (NACE 31) has been excluded from the definition of ICT since *manufacture of insulated wire and cable* (NACE 31.3) accounted for under 20% of employment in NACE 31 for the majority of reporting countries between 1996 and 2000. Similarly, *wholesale of machinery, equipment and supplies* (NACE 51.6) only accounted for under 30% of employment in *wholesale trade and commission trade, except motor vehicles and motorcycles* (NACE 51). To meet the OECD definition, *renting of office machinery and equipment (including computers)* is required at the NACE four digit level (NACE 71.33). This level of detail for NACE 71 is infrequently reported in the SBS, but what evidence there is suggests that it accounts for a negligible employment share, and for this reason it has also been excluded.

But while the inclusion of these NACE two digit sectors would have incorporated non-ICT workers into the ICT cohort, at the same time their omission means that certain individuals have been excluded from what, following the OECD definition, would be workers in the ICT sector.

To a certain extent, this is 'corrected' by the inclusion of NACE 33 and NACE 64 at the two digit level. In the first of these, NACE 33, though only m*anufacture of television and radio transmitters and apparatus for line telephony and line telegraphy* (NACE 33.2) and m*anufacture of television and radio receivers, sound or video recording or reproducing apparatus and*

*associated goods* (NACE 33.3) are in the ICT definition, according to the SBS data, their employment share generally represents between 40 and 60%. *Telecommunications* (NACE 64.2), meanwhile, is very often the most important ICT subsector in the economy and its omission would not only mean excluding a large number of workers, but would also mean that any subsequent analysis would neglect this very significant facet of the ICT cohort.

As a result, the starting point for workpackage 6 is the following definition of ICT:

**Table 2.3** Definition of ICT used in workpackage 6

| NACE code | Description |
|---|---|
| **30** | **Manufacture of office machinery and computers** |
| 30.0 | Manufacture of office machinery and computers |
| 30.010 | Manufacture of office machinery |
| 30.020 | Manufacture of computers and other information processing |
| **32** | **Manufacture of radio, television and communication equipment and apparatus** |
| 32.1 | Manufacture of electronic valves and tubes and other electronic components |
| 32.2 | Manufacture of television and radio transmitters and apparatus for line telephony and line telegraphy |
| 32.201 | Manufacture of TV and radio transmitters |
| 32.202 | Manufacture of apparatus for line telephony and line telegraphy |
| 32.3 | Manufacture of television and radio receivers, sound or video recording or reproducing apparatus and associated goods |
| **33** | **Manufacture of medical, precision and optical instruments, watches and clocks** |
| *33.1* | *Manufacture of medical and surgical equipment and orthopaedic appliances* |
| *33.101* | *Manufacture of electrical apparatus for medicine, dentistry and veterinary medicine* |
| *33.102* | *Manufacture of non-electrical apparatus and instruments for medicine, dentistry and veterinary medicine* |
| *33.103* | *Manufacture of orthopaedic appliance* |
| 33.2 | Manufacture of instruments and appliances for measuring, checking, testing, navigating and other purposes, except industrial process control equipment |
| 33.201 | Manufacture of electrical instruments and appliances for measuring, checking, testing, navigating and other purposes |
| 33.202 | Manufacture of non-electrical instruments and appliances for measuring, checking, testing, navigating and other purposes |
| 33.3 | Manufacture of industrial process control equipment |
| *33.4* | *Manufacture of optical instruments, photographic equipment* |
| *33.401* | *Manufacture of spectacles* |
| *33.402* | *Manufacture of optical instruments, photographic equipment* |
| *33.5* | *Manufacture of watches and clocks* |
| **64** | **Post and telecommunications** |
| *64.1* | *Post and courier activities* |
| *64.110* | *National post activities* |
| *64.120* | *Courier activities other than national post activities* |
| 64.2 | Telecommunications |
| **72** | **Computer and related activities** |
| 72.1 | Hardware consultancy |
| 72.2 | Software consultancy and supply |
| 72.3 | Data processing |
| 72.4 | Data base activities |
| 72.5 | Maintenance and repair of office, accounting and computing machinery |
| 72.6 | Other computer related activities |

Note: NACE 2 digit level in bold text, ICT sectors in plain text, non-ICT but included in ICT based on 2 digit NACE codes in italic text.
*Source:* Camire, Steunpunt WAV, 2004

Since the Datawarehouse has data at a five digit level of the NACE code, in this deliverable we are able to make a distinction between a two digit ICT definition and a three digit ICT definition based on the starting classification in Table 2.3. When speaking of the two digit ICT sector we take all subsectors in Table 2.3 into consideration, while when analysing the three digit ICT sector the subsectors in italics (33.1, 33.4, 33.5 and 64.1) are excluded.

In order to enable comparisons with other activity sectors, we make the following distribution on the basis of the three digit NACE code:[8]

**Table 2.4** Classification of activity sectors based on NACE code

| STILE sector | Description | NACE code |
|---|---|---|
| | **ICT** | |
| 1.1 | Office accounting and computing machinery and electronic equipment | 30, 32, 33.2, 33.3 |
| 1.2 | Telecommunications | 64.2 |
| 1.3 | Computer and related activities | 72 |
| | **Agriculture, mining, manufacturing, utilities, construction** | |
| 2.1 | Agriculture, forestry, fishing | 01, 02, 05 |
| 2.2 | Mining, quarrying | 10, 11, 12, 13, 14 |
| 2.3 | Consumer goods | 15, 16, 17, 18, 19 |
| 2.4 | Wood, pulp and paper, printing, oil refining, chemical industry, rubber, plastics | 20, 21, 22, 23, 24, 25 |
| 2.5 | Metals, machinery (not ICT) | 27, 28, 29, 31, 33.1, 33.4, 33.5, 34, 35 |
| 2.6 | Other manufacturing | 26, 36, 37 |
| 2.7 | Energy and water | 40, 41 |
| 2.8 | Construction | 45 |
| | **Trade, hotels, restaurants, transport, communication, financial intermediation, other services (excl ICT, educational and research institutes)** | |
| 3.1 | Wholesale and retail trade, hotels, restaurants | 50, 51, 52, 55 |
| 3.2 | Transport, storage, post, communications | 60, 61, 62, 63, 64.1 |
| 3.3 | Financial intermediation | 65, 66, 67 |
| 3.4 | Other services | 70, 71, 74 |
| | **Educational and research institutes** | |
| 4.1 | Universities, educational institutions | 80 |
| 4.2 | Research institutes | 73 |
| | **Other community services** | |
| 5.1 | Health activities | 85 |
| 5.2 | Other community services | 75 to 95 excl 80 and 85 |
| 990 | Extraterritorial organisations | 99 |

*Source:* Camire, Steunpunt WAV, 2004

In section 2.5, we make a comparison between LFS and Datawarehouse. Since the LFS only disposes of the NACE codes down to two digits, we will also make the sectoral distribution of the Datawarehouse in that part on the basis of two digits. In practical terms, it means that the entire NACE sector 33 will be incorporated into STILE sector 1.1 and that the whole of NACE sector 64 will be incorporated into STILE sector 1.2.

8 Adapted from Åkerblom and Virtaharju, 2001.

## 2.2 The ICT workforce in Belgium

On the basis of the Datawarehouse, it is possible to demarcate the ICT sector to within three digits of the NACE Belcode.[9] Below, we will describe the ICT sector in the light of a number of characteristics of employees working in NACE sectors 30, 32, 33.2, 33.3, 64.2 and 72.

### 2.2.1 Employees in the ICT sector and the evolution

The ICT sector in Belgium employs approximately 89,300 people (Table 2.5). This is almost 2.8% of the total number of employees. *Telecommunications* account for a third of those (34.5%, NACE 64.2). Other large subsectors are *Software consultancy and supply* (19.7%, NACE 72.2) and *Hardware consultancy* (14.8%, NACE 72.1). These three sectors therefore have a large bearing on the characteristics of the total ICT sector. Next in size are the subsectors *Manufacturing of radio, television and communication equipment and apparatus* (NACE 32; together they account for 21.5%).

**Table 2.5** Distribution of the employees in ICT by subsector (Belgium; average quarter 2000)

| NACE code | Description | (n) | (%) |
|---|---|---|---|
| **30** | **Manufacture of office machinery and computers** | **456** | **0.5** |
| 30.0 | Manufacture of office machinery and computers | 456 | 0.5 |
| 30.010 | Manufacture of office machinery | 32 | 0.0 |
| 30.020 | Manufacture of computers and other information processing | 424 | 0.5 |
| **32** | **Manufacture of radio, television and communication equipment and apparatus** | **19,248** | **21.5** |
| 32.1 | Manufacture of electronic valves and tubes and other electronic components | 5,077 | 5.7 |
| 32.2 | Manufacture of television and radio transmitters and apparatus for line telephony and line telegraphy | 7,953 | 8.9 |
| 32.201 | Manufacture of TV and radio transmitters | 465 | 0.5 |
| 32.202 | Manufacture of apparatus for line telephony and line telegraphy | 7,488 | 8.4 |
| 32.3 | Manufacture of television and radio receivers, sound or video recording or reproducing apparatus and associated goods | 6,217 | 7.0 |
| **33** | **Manufacture of medical, precision and optical instruments, watches and clocks** | **2,626** | **2.9** |
| *33.1* | *Manufacture of medical and surgical equipment and orthopaedic appliances* | *2,836* | *:* |
| *33.101* | *Manufacture of electrical apparatus for medicine, dentistry and veterinary medicine* | *288* | *:* |
| *33.102* | *Manufacture of non-electrical apparatus and instruments for medicine, dentistry and veterinary medicine* | *722* | *:* |
| *33.103* | *Manufacture of orthopaedic appliance* | *1,827* | *:* |
| 33.2 | Manufacture of instruments and appliances for measuring, checking, testing, navigating and other purposes, except industrial process control equipment | 1,524 | 1.7 |
| 33.201 | Manufacture of electrical instruments and appliances for measuring, checking, testing, navigating and other purposes | 610 | 0.7 |
| 33.202 | Manufacture of non-electrical instruments and appliances for measuring, checking, testing, navigating and other purposes | 914 | 1.0 |

9 NACE Belcode is the official national Belgian version of the NACE classification. The data contained by Datawarehouse on employers is centralised, which means there is no specific information for the local establishment the employee works at, but that the employer is used as a general reference point. If an employer has several establishments and various activities, the geographic location of the head office and/or main activity are given.

**Table 2.5** Distribution of the employees in ICT by subsector (Belgium; average quarter 2000). Continued

| NACE code | Description | (n) | (%) |
|---|---|---|---|
| 33.3 | Manufacture of industrial process control equipment | 1,103 | 1.2 |
| *33.4* | *Manufacture of optical instruments, photographic equipment* | *623* | *:* |
| *33.401* | *Manufacture of spectacles* | 349 | : |
| *33.402* | *Manufacture of optical instruments, photographic equipment* | 274 | : |
| *33.5* | *Manufacture of watches and clocks* | *340* | *:* |
| **64** | **Post and telecommunications** | **30,811** | **34.5** |
| *64.1* | *Post and courier activities* | *49,368* | *:* |
| *64.110* | *National post activities* | 44,320 | : |
| *64.120* | *Courier activities other than national post activities* | 5,048 | : |
| 64.2 | Telecommunications | 30,811 | 34.5 |
| **72** | **Computer and related activities** | **36,205** | **40.5** |
| 72.1 | Hardware consultancy | 13,229 | 14.8 |
| 72.2 | Software consultancy and supply | 17,607 | 19.7 |
| 72.3 | Data processing | 2,196 | 2.5 |
| 72.4 | Data base activities | 1,102 | 1.2 |
| 72.5 | Maintenance and repair of office, accounting and computing machinery | 1,877 | 2.1 |
| 72.6 | Other computer related activities | 193 | 0.2 |
| *ICT* | *2 digits* | *142,512* | *:* |
| **ICT** | **3 digits** | **89,345** | **100.0** |
| STILE 1.1 | Office accounting and computing machinery (NACE 30, 32, 33.2 and 33.3) | 22,330 | 25.0 |
| STILE 1.2 | Telecommunications (NACE 64.2) | 30,811 | 34.5 |
| STILE 1.3 | Computer and related activities (NACE 72) | 36,205 | 40.5 |
| **Total Economy** | | **3,235,914** | **2.8** |

Note: % share is calculated as a proportion of ICT at the 3 digit level (89,345 employees).
*Source:* KSZ-DWH Labour Market (Processing Steunpunt WAV)

Demarcating the ICT sector on the basis of two digits, we find 142,500 employees (4.4% of the total number of employees). The main advantage of using the three digit level is that, within NACE 33, it is possible to distinguish between, on the one hand 33.2 and 33.3 as ICT, and on the other hand 33.1, 33.4 and 33.5 as non-ICT. Similarly one can distinguish within NACE 64 between, 64.2 as ICT and 64.1 as non-ICT. With data available at the three digit level we can exclude 33.1, 33.4, 33.5 and 64.1 which will give us a more accurate classification of the ICT sector. Doing this the total number of employees in ICT in Belgium drops from 142,500 people to 89,300 people. The main cause is NACE 64.1 (postal sector) with almost 50,000 employees.

*Recent growth in the ICT sector*

The Datawarehouse does not enable us to draft the long-term evolutionary process. On the basis of the RSZ (National Institute for the Social Insurance of the Employed) data we can nevertheless draft the evolution of the number of jobs (not the number of employees, but the number of jobs) in the ICT sector demarcated on the basis of three digit NACE codes. In each case, the data relate to the last day of the second quarter. We must be careful with these figures because administrative shifts (for instance due to changes in NACE codes, fusions and take-overs) were not corrected. The figures only allow us to highlight global trends.

**Table 2.6** Evolution of the number of jobs in ICT and the proportion of ICT in the total number of jobs in the Belgian economy (Belgium; 30 June 1997-2002)

| STILE sector | NACE sector | 1997 (n) | 2002 (n) | 1997-2002 (n) | 1997 (%) | 2002 (%) |
|---|---|---|---|---|---|---|
| 1.1 | 30, 32, 33.2, 33.3 | 22,800 | 21,100 | -1,700 | 0.7 | 0.6 |
| 1.2 | 64.2 | 30,100 | 33,500 | +3,300 | 0.9 | 1.0 |
| 1.3 | 72 | 22,100 | 41,600 | +19,500 | 0.7 | 1.2 |
| ICT 3 digits | | 75,000 | 96,100 | +21,100 | 2.3 | 2.8 |

*Source:* RSZ (Processed by Steunpunt WAV)

Both the *industrial branch of ICT* (STILE 1.1) and *Telecommunications* (STILE 1.2) have noticeably undergone a rather stable development since 1997. *Computer sciences and related activities* (STILE 1.3) have seen a significant increase in the number of jobs. The number of jobs in this sector almost doubled between 1997 and 2002. As a consequence, the proportion of the ICT sector as part of the entire economy has also increased. Remarkable is that the number of jobs in all sectors, including ICT, declined between 2001 and 2002 (not in Table 2.6). The ICT sector does not vary greatly in this respect from most other commercial and industrial sectors.

The number of self-employed people working in the ICT sector cannot be determined by means of the Datawarehouse or the register data of the RSVZ (National Institute for the Social Insurance of the Self-Employed) because of the latter's occupational coding system. The coding system is not based on the NACE Belcode classification but rather follows the specific logic of the RSVZ, which forms an authentic source of information on the self-employed. It is impossible to demarcate the ICT sector on the basis of these occupational codes.

To get some idea, nevertheless, of the number of self-employed people in ICT, we can carry out an estimate on the basis of the proportion of self-employed people/employees in ICT (within two digits of the NACE Belcode) according to the Belgian LFS. On applying this proportion to the number of employees in the ICT sector according to the Datawarehouse, we estimate that approximately 10,000 self-employed (including helpers) work in ICT (two digits), approximately 6,200 of which are working in NACE 72.

*Employees according to gender, age and educational attainment*

According to the Datawarehouse, 56.6% of employees in Belgium are male (Table 2.7). It is interesting to note that the ICT sector is even more male dominated: only three out of ten employees in ICT are women. Only the industrial sectors (for example, the *metal* sector and the *construction industry*) are even more male-dominated. A second observation is that not all sectors within ICT display the same distribution between men and women. The global distribution is particularly influenced by *Telecommunications* (NACE 64.2*)* and (*hardware and software*) *Consultancy* (NACE 72.1 and 72.2*),* both of which show a strong overrepresentation of men.

With regard to the age distribution, we note that youngsters occupy an average proportion of the ICT jobs but that older people are underrepresented: barely 21% of the employees in ICT are older than 45 compared to approximately 29% for the total economy (Table 2.7). Even the 35 to 44 years old are slightly under-represented. This means that the group of 25 to 34 years old is strongly overrepresented. Here again, we can establish important differences between various sectors within ICT. The proportion of older people in the *Consultancy* (NACE 72.1 and 72.2) subsector is notably lower while it is higher in *Manufacturing* (STILE 1.1) and *Telecommunications* (STILE 1.2). The predominance of the 35 to 34 years old is especially high in the *Computer and related activities* (STILE 1.3).

**Table 2.7** Distribution of employees according to gender, age and sector (Belgium; average quarter 2000)

| NACE code | Total | | Men | Women | 15-24 years | 25-34 years | 35-44 years | 45-64 years |
|---|---|---|---|---|---|---|---|---|
| | (n) | (%) | (%) | (%) | (%) | (%) | (%) | (%) |
| 30.0 | 456 | 0.5 | 56.5 | 43.5 | 9.2 | 45.8 | 34.2 | 10.8 |
| 32.1 | 5,077 | 5.7 | 65.5 | 34.5 | 14.8 | 32.1 | 27.5 | 25.6 |
| 32.2 | 7,953 | 8.9 | 73.9 | 26.1 | 9.0 | 29.0 | 27.4 | 34.6 |
| 32.3 | 6,217 | 7.0 | 57.2 | 42.8 | 12.4 | 34.8 | 30.1 | 22.8 |
| *33.1* | 2,836 | : | 59.8 | 40.2 | 14.4 | 32.9 | 29.7 | 23.0 |
| 33.2 | 1,524 | 1.7 | 65.8 | 34.2 | 12.0 | 34.2 | 31.9 | 21.9 |
| 33.3 | 1,103 | 1.2 | 82.3 | 17.7 | 12.8 | 38.7 | 29.5 | 19.0 |
| *33.4* | 623 | : | 49.8 | 50.2 | 14.0 | 33.0 | 33.4 | 19.7 |
| *33.5* | 340 | : | 73.0 | 27.0 | 8.8 | 45.4 | 29.1 | 16.7 |
| *64.1* | *49,368* | *:* | *68.8* | *31.2* | *5.4* | *21.9* | *26.5* | *46.3* |
| 64.2 | 30,811 | 34.5 | 70.0 | 30.0 | 10.2 | 31.8 | 28.6 | 29.4 |
| 72.1 | 13,229 | 14.8 | 73.1 | 26.9 | 11.8 | 54.0 | 24.8 | 9.4 |
| 72.2 | 17,607 | 19.7 | 75.5 | 24.5 | 14.1 | 51.9 | 24.5 | 9.4 |
| 72.3 | 2,196 | 2.5 | 67.8 | 32.2 | 7.1 | 35.4 | 34.6 | 22.9 |
| 72.4 | 1,102 | 1.2 | 56.1 | 43.9 | 12.8 | 57.0 | 22.0 | 8.1 |
| 72.5 | 1,877 | 2.1 | 77.9 | 22.1 | 22.5 | 43.3 | 24.4 | 9.8 |
| 72.6 | 193 | 0.2 | 71.0 | 29.0 | 20.6 | 57.7 | 19.1 | 2.6 |
| *ICT 2 digits* | *142,512* | *:* | *69.7* | *30.3* | *9.6* | *33.5* | *27.0* | *29.8* |
| **ICT 3 digits** | **89,345** | **100.0** | **70.7** | **29.3** | **11.8** | **39.9** | **27.2** | **21.1** |
| STILE 1.1 | 22,330 | 25.0 | 66.9 | 33.1 | 11.7 | 32.5 | 28.7 | 27.1 |
| STILE 1.2 | 30,811 | 34.5 | 70.0 | 30.0 | 10.2 | 31.8 | 28.6 | 29.4 |
| STILE 1.3 | 36,205 | 40.5 | 73.7 | 26.3 | 13.2 | 51.4 | 25.1 | 10.2 |
| **Total Economy** | **3,235,914** | **:** | **56.7** | **43.4** | **11.6** | **29.3** | **30.5** | **28.6** |

Note: NACE 2 digit level in bold text, ICT sectors in plain text, non-ICT but included in ICT based on 2 digit NACE codes in italic text.
*Source:* KSZ-DWH Labour Market (Processing Steunpunt WAV)

If we distribute all employees in ICT in Belgium according to gender, age and sector, the following picture emerges.

Approximately 47% of employees in the Belgian ICT sector are men aged between 25 and 45 (Table 2.8). It is a strong overrepresentation compared to the total number of employees in the same age group (33%). Hardly 20% are women between 25 and 45 years old, which in turn is a strong underrepresentation. In fact, women are underrepresented in the ICT sector in every age group, while men are overrepresented especially in the age group of 25 to 45 years old.

The largest group of ICT employees are men aged between 25 and 45 working in *Telecommunications* (NACE 64.1) and *Consultancy* (NACE 72.1 and 72.2). Together, they constitute approximately one third of the ICT employees in Belgium. Also the male 45 to 64 years old working in *Telecommunications* are a significant group (8.2%). Other important employee groups are the men aged between 25 and 64 working in *Manufacturing of radio, television and communication equipment and apparatus* (NACE 32) and women aged between 25 and 45 working in *Telecommunications* and *Consultancy* and male youngsters working in *Consultancy* and *Telecommunications*. Together, all these groups constitute almost 75% of all employees in the ICT sector.

**Table 2.8** Distribution of employees according to gender, age and sector (Belgium; average quarter 2000), in %

| NACE code | Men | | | | Women | | | | Total |
|---|---|---|---|---|---|---|---|---|---|
| | 15-24 years | 25-34 years | 35-44 years | 45-64 years | 15-24 years | 25-34 years | 35-44 years | 45-64 years | 15-64 years |
| 30.0 | 0.0 | 0.1 | 0.1 | 0.0 | 0.0 | 0.1 | 0.1 | 0.0 | 0.5 |
| 32.1 | 0.6 | 1.2 | 1.0 | 0.9 | 0.2 | 0.6 | 0.5 | 0.6 | 5.7 |
| 32.2 | 0.5 | 1.9 | 1.8 | 2.4 | 0.3 | 0.7 | 0.7 | 0.6 | 8.9 |
| 32.3 | 0.5 | 1.4 | 1.1 | 0.9 | 0.3 | 1.0 | 1.0 | 0.7 | 7.0 |
| 33.2 | 0.1 | 0.4 | 0.3 | 0.3 | 0.1 | 0.2 | 0.2 | 0.1 | 1.7 |
| 33.3 | 0.1 | 0.4 | 0.3 | 0.2 | 0.0 | 0.1 | 0.1 | 0.1 | 1.2 |
| 64.2 | 1.9 | 6.8 | 7.3 | 8.2 | 1.6 | 4.2 | 2.6 | 2.0 | 34.5 |
| 72.1 | 1.3 | 5.8 | 2.7 | 1.1 | 0.5 | 2.2 | 1.0 | 0.3 | 14.8 |
| 72.2 | 2.2 | 7.6 | 3.7 | 1.5 | 0.6 | 2.7 | 1.2 | 0.3 | 19.7 |
| 72.3 | 0.1 | 0.6 | 0.6 | 0.4 | 0.1 | 0.3 | 0.3 | 0.2 | 2.5 |
| 72.4 | 0.1 | 0.4 | 0.2 | 0.1 | 0.1 | 0.3 | 0.1 | 0.0 | 1.2 |
| 72.5 | 0.4 | 0.7 | 0.4 | 0.2 | 0.1 | 0.2 | 0.1 | 0.0 | 2.1 |
| 72.6 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 |
| **ICT 3 digits** | **7.9** | **27.4** | **19.3** | **16.1** | **3.9** | **12.5** | **7.9** | **4.9** | **100.0** |
| STILE 1.1 | 2.0 | 5.4 | 4.6 | 4.7 | 1.0 | 2.7 | 2.6 | 2.0 | 25.0 |
| STILE 1.2 | 1.9 | 6.8 | 7.3 | 8.2 | 1.6 | 4.2 | 2.6 | 2.0 | 34.5 |
| STILE 1.3 | 4.0 | 15.2 | 7.5 | 3.2 | 1.4 | 5.6 | 2.7 | 0.9 | 40.5 |
| **Total Economy** | **6.4** | **15.8** | **16.9** | **17.6** | **5.2** | **13.5** | **13.6** | **11.0** | **100.0** |

*Source:* KSZ-DWH Labour Market (Processing Steunpunt WAV)

On the basis of the Datawarehouse, we cannot come to any conclusions regarding the educational attainment of employees in the ICT sector. The LFS, on the other hand, enables us to do so, as long as we define the ICT sector on the basis of two digits of the NACE Belcode.

**Table 2.9** Distribution of employees in ICT by educational attainment (Belgium; 2002)

| STILE sector | NACE sector | Total (n) | Up to lower secondary education (%) | Higher secondary education (%) | Tertiary education (%) |
|---|---|---|---|---|---|
| 1.1 | 30, 32, 33 | 33,800 | 18.1 | 33.5 | 48.4 |
| 1.2 | 64 | 82,100 | 35.4 | 38.3 | 26.3 |
| 1.3 | 72 | 50,400 | : | 21.2 | 75.0 |
| ICT 2 digits | | 166,300 | 22.3 | 32.1 | 45.5 |
| **Total Economy** | | **3,352,000** | **27.9** | **37.6** | **34.4** |

*Source:* NIS LFS (Processing Steunpunt WAV)

Approximately 34% of employees in Belgium in 2002 are highly qualified, while 28% of them are educated at the lower secondary level.[10] In the ICT sector, the proportion of highly qualified employees is significantly higher. Almost 46% of employees in the ICT sector are highly qualified. Within the ICT sector, important differences are evident. It is not very surprising that NACE sector 72 (*Computer and related activities*, including *consultancy*) contains the largest proportion of highly qualified employees. No less than three out of four employees in that

10 'Highly qualified' includes people who completed third level education ISCED 5 or 6. 'Lower secondary education' includes people with incomplete education or education ISCED 0 to 2.

sector are highly qualified. This contrasts sharply with NACE sector 64 *(Postal services* and *Telecommunications)* in which only one out of four employees is highly qualified. Presumably, the postal services particularly reduce the proportion of highly qualified, since only a small ratio of the employees aged between 45 and 64 are highly qualified and since we also know that not many people aged 45 or over work in telecommunications. The *Manufacturing* (STILE 1.1) sector with 48% also contains an above average proportion of highly qualified employees. With regard to age, there are few differences. The 15 to 34 years old in the ICT sector are slightly more likely to be highly qualified than the 35 to 44 years old. In the age group of 45 and over, the proportion of highly qualified employees is the lowest, particularly in the *Postal services* and *Telecommunications* as stated previously. But every age group in the ICT sector contains a larger proportion of highly qualified employees than the average sector in Belgium.

### 2.2.2 Employment regime

The ICT sector has remarkably few part-time employees compared to other sectors. Only 6.4% of ICT employees work part-time, compared to the average ratio of 22.1% (see Table 2.10). Only in NACE 32.3, 33.2, 72.3 and 72.4, does more part-time work take place compared to the other ICT sectors.

Part-time work is generally carried out by women: globally, 42.3% of women work part-time compared to 6.9% of men. The situation does not differ in ICT: 17.8% of the women work part-time, compared to 1.7% of the men. Women in the ICT sector are nevertheless much less likely to work part-time than their colleagues in other sectors (17.8% compared to 42.3%). The lowest proportion of part-time employment among women can be found in the largest ICT subsector, i.e. *Telecommunication* (NACE 64.2).

**Table 2.10** Proportion of part-time employees according to gender, age and sector (Belgium; average quarter 2000)

| NACE code | Total number of employees | | Men | Women | 15-24 years | 25-34 years | 35-44 years | 45-64 years |
|---|---|---|---|---|---|---|---|---|
| | (n) | (%) | (%) | (%) | (%) | (%) | (%) | (%) |
| 30.0 | 456 | 8.1 | 1.7 | 16.6 | 1.2 | 6.5 | 11.1 | 11.7 |
| 32.1 | 5,077 | 6.1 | 1.0 | 15.9 | 1.4 | 3.8 | 6.6 | 11.2 |
| 32.2 | 7,953 | 4.4 | 0.6 | 15.2 | 0.4 | 3.6 | 6.8 | 4.1 |
| 32.3 | 6,217 | 15.6 | 2.4 | 33.5 | 11.5 | 13.1 | 20.8 | 14.8 |
| 33.1 | 2,836 | 15.5 | 7.3 | 27.9 | 6.0 | 15.8 | 18.2 | 17.7 |
| 33.2 | 1,524 | 11.9 | 2.5 | 30.6 | 0.1 | 12.0 | 18.1 | 9.2 |
| 33.3 | 1,103 | 6.5 | 1.1 | 31.8 | 4.3 | 3.9 | 9.0 | 9.4 |
| 33.4 | 623 | 8.0 | 1.0 | 15.2 | 1.4 | 6.3 | 11.6 | 9.6 |
| 33.5 | 340 | 6.7 | 2.1 | 19.2 | 0.0 | 1.8 | 16.8 | 6.2 |
| 64.1 | 49,368 | 17.8 | 8.6 | 38.2 | 28.8 | 19.1 | 18.9 | 15.3 |
| 64.2 | 30,811 | 4.3 | 1.5 | 10.8 | 5.5 | 3.5 | 4.8 | 4.4 |
| 72.1 | 13,229 | 6.4 | 1.9 | 18.6 | 1.9 | 4.3 | 11.5 | 10.4 |
| 72.2 | 17,607 | 6.5 | 1.9 | 20.6 | 2.2 | 4.9 | 11.0 | 9.6 |
| 72.3 | 2,196 | 11.7 | 2.8 | 30.7 | 1.3 | 6.0 | 17.8 | 14.8 |
| 72.4 | 1,102 | 9.9 | 5.0 | 16.2 | 6.7 | 6.6 | 18.7 | 14.6 |
| 72.5 | 1,877 | 4.5 | 1.3 | 15.8 | 1.4 | 3.0 | 5.8 | 14.7 |
| 72.6 | 193 | 7.6 | 5.5 | 12.9 | 11.3 | 7.4 | 2.7 | 20.0 |
| *ICT 2 digits* | *142,512* | *10.5* | *4.1* | *25.3* | *8.6* | *8.3* | *12.7* | *11.6* |
| **ICT 3 digits** | **89,345** | **6.4** | **1.7** | **17.8** | **3.7** | **4.9** | **9.2** | **7.0** |
| STILE 1.1 | 22,330 | 8.6 | 1.3 | 23.5 | 4.1 | 7.2 | 11.9 | 8.6 |
| STILE 1.2 | 30,811 | 4.3 | 1.5 | 10.8 | 5.5 | 3.5 | 4.8 | 4.4 |
| STILE 1.3 | 36,205 | 6.8 | 2.0 | 20.1 | 2.2 | 4.7 | 11.7 | 10.9 |
| **Total Economy** | **3,235,914** | **22.1** | **6.9** | **42.3** | **26.0** | **20.1** | **24.4** | **20.4** |

Note: NACE 2 digit level in bold text, ICT sectors in plain text, non-ICT but included in ICT based on 2 digit NACE codes in italic text.

*Source*: KSZ-DWH Labour Market (Processing Steunpunt WAV)

As a general rule, the proportion of part-time work increases with age up to the 35 to 44 years old and it decreases for the age group 45 and over. The telecommunication sector is an exception as the proportion of 15 to 24 years old is actually the highest there. A possible explanation for the latter is students working part-time.

### 2.2.3 Company size

The Datawarehouse also contains information on the size of the company the employee works at. The information is centralised, which means that no data are available about the local establishment the employee is based at but that the employer is used as a general reference point. If an employer has several establishments and various activities, the geographic location of the head office and/or main activity are given.

**Table 2.11** Distribution of employees in ICT by subsector and company size (Belgium; average quarter 2000)

| NACE code | Total number of employees | | <10 | 10-49 | 50-99 | 100-499 | 500-999 | ≥1,000 |
|---|---|---|---|---|---|---|---|---|
| | (n) | (%) | (%) | (%) | (%) | (%) | (%) | (%) |
| 30.0 | 456 | 100 | 7.0 | 43.4 | 17.8 | 31.8 | 0.0 | 0.0 |
| 32.1 | 5,077 | 100 | 0.9 | 8.5 | 10.5 | 22.1 | 37.3 | 20.7 |
| 32.2 | 7,953 | 100 | 0.1 | 2.2 | 3.2 | 2.2 | 8.0 | 84.3 |
| 32.3 | 6,217 | 100 | 0.4 | 3.8 | 1.6 | 5.5 | 0.0 | 88.6 |
| *33.1* | 2,836 | 100 | 32.7 | 27.2 | 15.0 | 25.1 | 0.0 | 0.0 |
| 33.2 | 1,524 | 100 | 5.8 | 30.8 | 26.5 | 36.9 | 0.0 | 0.0 |
| 33.3 | 1,103 | 100 | 10.6 | 39.3 | 18.6 | 31.5 | 0.0 | 0.0 |
| *33.4* | 623 | 100 | 3.8 | 34.7 | 29.8 | 31.7 | 0.0 | 0.0 |
| *33.5* | 340 | 100 | 2.7 | 40.5 | 21.1 | 35.7 | 0.0 | 0.0 |
| *64.1* | 49,368 | 100 | 1.9 | 1.5 | 0.3 | 2.3 | 3.3 | 90.7 |
| 64.2 | 30,811 | 100 | 2.5 | 5.4 | 2.4 | 10.4 | 9.7 | 69.6 |
| 72.1 | 13,229 | 100 | 22.4 | 30.2 | 16.6 | 17.3 | 4.1 | 9.3 |
| 72.2 | 17,607 | 100 | 17.2 | 28.0 | 15.1 | 35.4 | 4.3 | 0.0 |
| 72.3 | 2,196 | 100 | 8.3 | 25.2 | 13.6 | 14.8 | 38.1 | 0.0 |
| 72.4 | 1,102 | 100 | 20.0 | 28.3 | 16.8 | 34.8 | 0.0 | 0.0 |
| 72.5 | 1,877 | 100 | 8.9 | 9.7 | 3.3 | 78.2 | 0.0 | 0.0 |
| 72.6 | 193 | 100 | 74.9 | 25.1 | 0.0 | 0.0 | 0.0 | 0.0 |
| *ICT 2 digits* | 142,512 | 100 | 6.8 | 10.9 | 6.0 | 13.2 | 6.5 | 56.6 |
| **ICT 3 digits** | **89,345** | **100** | **8.7** | **15.3** | **8.6** | **18.6** | **8.6** | **40.2** |
| STILE 1.1 | 22,330 | 100 | 1.4 | 8.7 | 7.1 | 12.1 | 11.3 | 59.4 |
| STILE 1.2 | 30,811 | 100 | 2.5 | 5.4 | 2.4 | 10.4 | 9.7 | 69.6 |
| STILE 1.3 | 36,205 | 100 | 18.5 | 27.7 | 14.9 | 29.6 | 5.9 | 3.4 |
| **Total Economy** | **3,235,911** | **100** | **14.1** | **17.2** | **6.7** | **16.8** | **7.0** | **38.1** |

Note: NACE 2 digit level in bold text, ICT sectors in plain text, non-ICT but included in ICT based on 2 digit NACE codes in italic text.
*Source:* KSZ-DWH Labour Market (Processing Steunpunt WAV)

Overall, approximately 45% of employees in Belgium work in a company employing over 500 people; 38% work in a company with 1000 or more employees. Approximately 21% are employed in a company with fewer than 50 employees. The ICT sector is only marginally different in this respect: slightly more employees work in a company with over 500 employees (8.6% + 40.2%) and slightly fewer in a company with less than 50 employees (8.7% + 15.3%).

However, there are important differences between the various subsectors within ICT. For instance, in the main *industrial branch* of the ICT sector (NACE 32), a much larger proportion of employees are working in very big companies (with over 500 employees). In NACE 32.2 and 32.3, the proportion even lies in the region of 90%. Employees in the *Telecommunication*

sector (NACE 64.2), too, often work in companies with over 500 employees (nearly 80%). In both cases, the companies often even employ more than 1,000 employees. However, the sector of *Computers and related activities* (NACE 72) shows a different picture. Let's focus on the consultancy sectors. In *Hardware consultancy* (NACE 72.1), barely 14% work in a company with more than 500 employees. More than half of all employees work in a company with fewer than 50 employees; for 22%, their company has even less than 10 employees. Few *Software consultants* (NACE 72.2) work in large companies. Nearly half work in a company with fewer than 50 employees. The proportion of employees working in a medium-sized company (50 to 500 employees) is slightly larger here.

The picture for men and women working in the ICT sector is barely different. Small disparities emerge between the different age groups. The proportion of employees working in a company with more than 500 employees increases with age. Accordingly, the proportion of employees in *Telecommunications* (NACE 64.2) working in companies with more than 500 employees is higher among the 35 to 44 years old and the 45 to 64 years old. The younger age groups are slightly more likely to work in a smaller company. The same can be observed in *Software consultancy* (NACE 72.2). Younger age groups more often work in smaller companies while older groups more often work in companies with between 50 and 500 employees.

## 2.3 Inflow and outflow of ICT workers

The workforce of companies or sectors is evidently not static. Every day, new employees start work whereas others leave their job or even the activity sector. Apart from people flowing into a sector (or company) from another wage-earning job, some people naturally flow in from self-employment, unemployment or from being professionally inactive. The same applies to people leaving companies or sectors: some move to another sector or to self-employment, while others leave the gainfully employed segment of the labour market.

A sector's 'workforce' is, quantitatively speaking, the net-result of the inflow and outflow of employees and in terms of quality therefore not stable: even an activity sector with an invariable number of employees for years on end is nevertheless influenced by the in- and outflow of employees. Employees with their knowledge and skills are after all an important base material of the company. When an employee leaves the company, part of that base material is lost. On the other hand, new knowledge and skills enter the company when it takes on new employees.

If we wish to gain a better insight into the diffusion of Information Society knowledge, we must be able to define the transfer of an employee as the transfer of knowledge and skills. This knowledge and skills contain various components, including formal education, work experience, but also personality traits like creativity, analytic thinking etc. The big challenge is to measure this knowledge and skills through administrative databases. For instance, the Datawarehouse contains no information about the educational attainment or additional training courses followed, nor about the respective positional level or the years of service of the employee in the company. We will therefore base our analysis below on the assumption that every person carries relevant general knowledge with them and every transition therefore results in some knowledge flow.

Since the analysis in this section primarily relates to flows into and from the working segment instead of purely flows within the working segment, we do not apply the detailed distribution of ICT sectors, but we start from the more general distribution into STILE sectors. In this way, the situation of ICT sectors can be compared to other sectors.

### 2.3.1 Inflow into ICT

We distinguish four inflow channels: inflow from another job (the job-to-job mobile),[11] from self-employment, from unemployment and from the inactive (for example people fulfilling domestic tasks or students).

**Table 2.12** Inflow rates (into a wage-earning job) by activity sector (Belgium; average quarter 2000)

| STILE sector | Employees (n) | Total quarterly inflow into job (n) | From other job (%) | Of which in other sector (%) | Self-employed (%) | Unem-ployment (%) | Inactivity (%) | Total inflow into sector (%) | Total inflow into job (%) |
|---|---|---|---|---|---|---|---|---|---|
| 1.1 | 22,330 | 877 | 1.7 | 1.5 | 0.1 | 0.2 | 1.9 | 3.8 | 3.9 |
| 1.2 | 30,811 | 1,488 | 2.6 | 2.2 | 0.1 | 0.4 | 1.7 | 4.4 | 4.8 |
| 1.3 | 36,205 | 3,471 | 5.4 | 3.6 | 0.3 | 0.5 | 3.4 | 7.8 | 9.6 |
| 2.1 | 22,328 | 4,757 | 2.9 | 1.5 | 0.5 | 2.5 | 15.4 | 19.8 | 21.3 |
| 2.2 | 4,003 | 112 | 1.2 | 0.9 | 0.1 | 0.5 | 1.0 | 2.5 | 2.8 |
| 2.3 | 136,074 | 6,415 | 1.9 | 1.1 | 0.1 | 0.7 | 2.1 | 3.9 | 4.7 |
| 2.4 | 156,781 | 6,289 | 1.6 | 1.2 | 0.1 | 0.3 | 1.9 | 3.5 | 4.0 |
| 2.5 | 233,253 | 8,131 | 1.5 | 1.0 | 0.1 | 0.4 | 1.6 | 3.0 | 3.5 |
| 2.6 | 57,640 | 2,311 | 2.0 | 1.5 | 0.1 | 0.5 | 1.4 | 3.5 | 4.0 |
| 2.7 | 26,595 | 562 | 0.7 | 0.6 | 0.0 | 0.4 | 1.0 | 2.1 | 2.1 |
| 2.8 | 179,667 | 14,079 | 4.1 | 1.4 | 0.2 | 1.0 | 2.5 | 5.1 | 7.8 |
| 3.1 | 509,646 | 47,433 | 3.4 | 1.3 | 0.2 | 1.2 | 4.5 | 7.2 | 9.3 |
| 3.2 | 219,968 | 11,987 | 2.8 | 1.2 | 0.2 | 0.7 | 1.8 | 3.9 | 5.4 |
| 3.3 | 128,274 | 4,834 | 1.7 | 0.9 | 0.1 | 0.2 | 1.7 | 2.9 | 3.8 |
| 3.4 | 276,635 | 46,736 | 3.0 | 1.8 | 0.3 | 3.8 | 9.8 | 15.7 | 16.9 |
| 4.1 | 313,199 | 14,535 | 1.2 | 0.8 | 0.1 | 0.7 | 2.6 | 4.2 | 4.6 |
| 4.2 | 10,413 | 612 | 2.5 | 2.2 | 0.1 | 0.7 | 2.6 | 5.6 | 5.9 |
| 5.1 | 321,466 | 18,892 | 2.0 | 0.8 | 0.1 | 0.9 | 2.9 | 4.7 | 5.9 |
| 5.2 | 529,452 | 25,361 | 1.4 | 0.9 | 0.1 | 0.8 | 2.4 | 4.2 | 4.8 |
| 990 | 3,141 | 233 | 1.7 | 1.3 | 0.3 | 1.3 | 4.1 | 7.0 | 7.4 |
| Total Economy | 3,235,914 | 225,507 | 2.3 | 1.1 | 0.2 | 1.1 | 3.4 | 5.8 | 7.0 |

*Source:* KSZ-DWH Labour Market (Processing Steunpunt WAV)

Of the 3,235,900 employees (on the last day of a quarter in 2000), 225,507 did not yet hold their job during the previous quarter. Seven percent of employees therefore newly flowed into their *job* during the previous quarter. Approximately 3.4% flowed in from inactivity and 1.1% from unemployment, adding up to a total of 4.5% from a position of not being in work. Another 0.2% came from self-employment and approximately 2.3% from another paid job. Of the latter group, some even worked in another sector (1.1%). If we want to gain an insight into the proportion of employees who are 'new' to the *sector*, we must disregard employees changing

11 Job-to-job mobility is commonly conceived as a change of employer. In the Datawarehouse only data about the individual's legal employer (enterprise) is included and not about the establishment. We measure mobility as a change of the relation between an individual's unique ID-number and his/her employer's unique ID-number. We will examine this in greater detail when focussing on job-to-job mobility further on.

jobs within the same sector (2.3%-1.1%), which leaves 5.8% of employees who flowed into their current sector of employment in the course of the previous quarter.[12]

The 'new employees' can therefore be looked at from two different angles: from a job perspective or from a sectoral perspective. For example, for STILE sector 1.3 *(Computer and related activities)*, we can say that on the one hand, 9.6% of employees are new to their job and on the other hand, 7.8% of employees are new to the sector. Because our research object is the mobility of employees in ICT, we will focus on the first angle, namely on the employees who are new to their job, regardless of whether their previous job was in the same sector or not. In most of the STILE sectors, the proportion of 'new' employees is somewhat lower than the average of 7%, but a small number stand out: STILE sectors 3.1 (*Wholesale and retail trade, hotels, restaurants*), 3.4 (*Other services*), 2.8 (*Construction*), 1.3 (*Computer and related activities*) and 2.1 (*Agriculture, forestry, fishing*) all have a higher than average proportion of newcomers. The inflow into a job in these sectors from inactivity is particularly significant (with the exception of STILE sector 1.3 where the largest inflow channel comes from another job). Striking are the inflow percentages from inactivity into *Agriculture, forestry and fishing* (STILE 2.1) and the *Other services* (STILE 3.4). The large inflow into STILE 2.1 is explained by seasonal labour (for instance, fruit picking), the inflow into STILE 3.4 is explained by the presence of NACE sector 74.5 *Labour recruitment and provision of personnel* (interim work); both types of work are characterised by short-term contracts which means that these employees are very mobile in and around the labour market.

If we specifically look at the ICT sectors, we note that the inflow from unemployment and inactivity lies lower there than the average for all sectors. The inflow from another job is above average in the *Computer and related activities* (STILE 1.3) and in the *Telecommunications* (STILE 1.2). In the assumption that people who flow in from another job bring more up-to-date knowledge with them than unemployed and inactive people, we can say that these ICT sectors 'import' more than an average amount of knowledge.

Remarkable is that most of the people flowing in from another job also flow in from another activity sector. We will return to this issue in the section about flows between sectors.

Overall, we see that the total inflow into *Office accounting and computing machinery* (STILE 1.1) and *Telecommunications* (STILE 1.2) is always below (respectively 3.9% and 4.8%) average (7.0%) and that the total inflow into *Computer and related activities* (STILE 1.3) is higher (9.6%) than average, due to the high inflow from another job and the average inflow from professional inactivity. The inflow pattern for *Computer and related activities* (STILE 1.3) consequently deviates from other ICT sectors: both the inflow from inactivity and from other gainful employment is significantly higher.

Since age is an important explanatory factor of mobility behaviour in and around the labour market, we will examine the various age groups in greater detail. We note that the number of employees flowing in decreases with age: for the youngsters, it is 22.3% of the total number of employees; for the 25 to 34 years old only 7.8% and the rate decreases to as little as 2.7% for the highest age group. The high proportion of youngsters flowing in is primarily due to a high inflow from inactivity, which in this case is mainly from the education system. But the proportion flowing in from unemployment and from other jobs is also highest among youngsters, falling as the age increases. These observations also apply to the ICT sectors. Youngsters who flow in from the education system bring relatively up-to-date knowledge with them, but they

12 Methodological observation: the inflow from self-employment, unemployment and inactivity is in fact an inflow into socio-economic positions 1.1 (gainful employment) + 1.4.2 (gainful employment combined with self-employment - main job in employment) + 1.4.2 (gainful employment and self-employment - main job is in self-employment) while the inflow from another job as well as the total number of employees are based on the socio-economic positions 1.1 (gainful employment) + 1.4.1 (gainful employment combined with self-employment - main job in employment). This leads to an overestimation of the flows from self-employment, unemployment and inactivity to gainful employment: namely the flow from self-employment, unemployment and inactivity to socio-economic position 1.4.2. The figures nevertheless indicate that this overestimation is fairly minimal. For example, between the second and third quarter of 2000, 1761 people moved from self-employment to 1.4.2; two people from unemployment to 1.4.2 and 53 people from inactivity to 1.4.2. The discrepancy lies mainly with the self-employed: of the 7122 self-employed who moved to gainful employment (0.2% in the table), approximately 1760 in fact go to socio-economic position 1.4.2 while the number of people in 1.4.2 is not contained in the total number of employees. Relative to the total number of people flowing in (225,507), it is only a limited overestimation.

don't usually have much experience and know-how. An important proportion of the newly imported knowledge in companies therefore tends to consist of 'textbook knowledge'.

**Table 2.13** Inflow rates (into a wage-earning job) in the ICT sector by age (Belgium; average quarter 2000)

| STILE sector | Employees (n) | Total quarterly inflow into job (n) | From other job (%) | Of which in other sector (%) | Self-employed (%) | Unemployment (%) | Inactivity (%) | Total inflow into sector (%) | Total inflow into job (%) |
|---|---|---|---|---|---|---|---|---|---|
| 15-24 years old | | | | | | | | | |
| 1.1 | 2,606 | 327 | 3.2 | 2.9 | 0.0 | 0.6 | 8.7 | 12.2 | 12.5 |
| 1.2 | 3,133 | 541 | 6.2 | 5.4 | 0.2 | 1.2 | 9.6 | 16.4 | 17.3 |
| 1.3 | 4,793 | 1,025 | 7.5 | 5.3 | 0.3 | 0.7 | 12.9 | 19.2 | 21.4 |
| Total Economy | 375,379 | 83,704 | 4.9 | 2.6 | 0.2 | 2.4 | 14.8 | 20.0 | 22.3 |
| 25-34 years old | | | | | | | | | |
| 1.1 | 7,254 | 355 | 2.7 | 2.5 | 0.1 | 0.3 | 1.8 | 4.7 | 4.9 |
| 1.2 | 9,807 | 699 | 4.7 | 3.9 | 0.2 | 0.6 | 1.7 | 6.3 | 7.1 |
| 1.3 | 18,618 | 1,706 | 6.2 | 4.1 | 0.2 | 0.5 | 2.3 | 7.1 | 9.2 |
| Total Economy | 948,186 | 73,599 | 3.2 | 1.7 | 0.3 | 1.5 | 2.8 | 6.2 | 7.8 |
| 35-44 years old | | | | | | | | | |
| 1.1 | 6,413 | 135 | 1.1 | 0.9 | 0.1 | 0.2 | 0.7 | 2.0 | 2.1 |
| 1.2 | 8,806 | 195 | 1.3 | 1.1 | 0.1 | 0.2 | 0.5 | 1.9 | 2.2 |
| 1.3 | 9,104 | 567 | 4.0 | 2.6 | 0.3 | 0.5 | 1.4 | 4.8 | 6.2 |
| Total Economy | 986,896 | 43,443 | 1.7 | 0.8 | 0.2 | 0.9 | 1.6 | 3.5 | 4.4 |
| 45-64 years old | | | | | | | | | |
| 1.1 | 6,057 | 60 | 0.4 | 0.3 | 0.0 | 0.1 | 0.5 | 0.9 | 1.0 |
| 1.2 | 9,066 | 52 | 0.3 | 0.3 | 0.1 | 0.0 | 0.2 | 0.5 | 0.6 |
| 1.3 | 3,690 | 174 | 2.5 | 1.7 | 0.4 | 0.4 | 1.4 | 3.9 | 4.7 |
| Total Economy | 925,453 | 24,762 | 0.8 | 0.3 | 0.2 | 0.4 | 1.2 | 2.2 | 2.7 |

*Source:* KSZ-DWH Labour Market (Processing Steunpunt WAV)

The differences noted earlier between the ICT sectors hold true for all the age groups: the inflow into new jobs is lower in STILE sectors 1.1 and 1.2 and higher in STILE sector 1.3 within each age group.

**Table 2.14** Inflow rates (into a wage-earning job) in the ICT sector by gender (Belgium; average quarter 2000)

| STILE sector | Employees (n) | Quarterly inflow in job (n) | From other job (%) | Of which in other sector (%) | Self-employed (%) | Unemployment (%) | Inactivity (%) | Total inflow into sector (%) | Total inflow into job (%) |
|---|---|---|---|---|---|---|---|---|---|
| Men | | | | | | | | | |
| 1.1 | 14,932 | 579 | 1.8 | 1.6 | 0.1 | 0.1 | 1.8 | 3.7 | 3.9 |
| 1.2 | 21,561 | 904 | 2.4 | 2.0 | 0.1 | 0.2 | 1.4 | 3.8 | 4.2 |
| 1.3 | 26,683 | 2,576 | 5.5 | 3.5 | 0.3 | 0.4 | 3.4 | 7.6 | 9.7 |
| Total | 1,834,642 | 116,127 | 2.3 | 1.1 | 0.3 | 0.9 | 2.9 | 5.2 | 6.3 |
| Women | | | | | | | | | |
| 1.1 | 7,399 | 298 | 1.4 | 1.3 | 0.0 | 0.4 | 2.2 | 3.9 | 4.0 |
| 1.2 | 9,250 | 583 | 3.1 | 2.6 | 0.1 | 0.7 | 2.4 | 5.8 | 6.3 |
| 1.3 | 9,522 | 896 | 5.2 | 3.9 | 0.2 | 0.6 | 3.4 | 8.2 | 9.4 |
| Total | 1,401,270 | 109,379 | 2.2 | 1.1 | 0.2 | 1.4 | 4.0 | 6.7 | 7.8 |

*Source:* KSZ-DWH Labour Market (Processing Steunpunt WAV)

The differences between men and women remain limited in this respect. In general, the inflow of women (7.8%) is slightly higher than the inflow of men (6.3%). The difference lies mainly in the inflow from inactivity and to a lesser extent from unemployment. These differences between men and women can also be observed in the ICT sectors. Only in *Computer and related activities* (STILE 1.3) is the inflow from inactivity is equal for men and women.

### 2.3.2 Outflow from ICT

Whereas we distinguished four channels in the inflow into ICT (inflow from another job, from self-employment, unemployment and inactivity), we will only distinguish two channels in the outflow out of a job: 'outflow to another job' and 'outflow out of the employed segment of the labour market'. The latter is a combination of the outflow to self-employment, unemployment and inactivity. The reasoning behind this lies in administrative delays. From the first mobility analyses based on the Datawarehouse we learned that certain social security institutes supplying data to the Datawarehouse have inherent delays with their registration.[13]

By way of illustration, we give the example of employees who leave their job to become self-employed. The registration of their self-employment may be delayed, causing them to show up in the statistics as 'inactive' during one quarter and as 'self-employed' only in the following quarter, despite the fact that they actually started their self-employment immediately after leaving their wage-earning job. Analyses of the inflow into self-employment (on a quarterly basis: e.g. between the first and second quarter of 2000) based on the Datawarehouse showed that an unexpectedly high proportion of the self-employed flowed in from inactivity. If the inflow was studied on a yearly basis (for example, between the first quarter of 1999 and the first quarter of 2000), the proportion fell considerably. A significant number of people flowing from another status (employment, unemployment, ...) were consequently inactive for a period of up to three quarters before becoming self-employed. Registering self-employment therefore presumably entails administrative delays. Another reason is the fact that starting self-employment often requires a preparation period spanning a few quarters. The analyses showed that people flowing into unemployment are also often inactive for one or several quarters, according to the statistics. But the problem does not exist with the inflow into employment and it was therefore not mentioned in the relevant section.

A partial solution for the problem is to analyse the outflow on an annual rather than on a quarterly basis. But that poses the opposite problem that someone showing as employed in the first quarter of 1999 and as self-employed in the first quarter of 2000 will be assumed to have a straight transition from employment to self-employment, while he may in fact have been unemployed for a period of two quarters, followed by a decision to become self-employed. For the time being, no fitting solution seems available for the problem of administrative delays, although analyses on an annual basis have already overcome a large part of the problem. We will still analyse the outflow from employment on a quarterly basis, in analogy with the analysis of the inflow, because we do not have the required mobility data on an annual basis at our disposal. The problem amounts to not being able to determine with absolute certainty what the actual situation is of people flowing out of employment in the following quarter. We have therefore combined the outflow to self-employment, to unemployment and inactivity under the heading 'outflow out of the employed segment'. On the basis of the available data, therefore, it is not possible to gain a clear insight into the 'entrepreneurship' of employees.

Of 3,235,900 employees (on the last day of a quarter in 2000), 207,406 (6.4%) no longer worked in that job during the following quarter. A proportion of 4.1% even flowed away from the employed segment of the labour market, while 2.3% changed jobs (and 1.1% both changed jobs and to a different sector).

13 Booghmans & Van Gils, 2004.

**Table 2.15** Outflow rates (out of a wage-earning job) by activity sector (Belgium; average quarter 2000)

| STILE sector | Employees (n) | Quarterly outflow from job (n) | To other job (%) | Of which in other sector (%) | Out of employment (%) | Total outflow from sector (%) | Total outflow from job (%) |
|---|---|---|---|---|---|---|---|
| 1.1 | 22,330 | 797 | 1.4 | 1.3 | 2.2 | 3.4 | 3.6 |
| 1.2 | 30,811 | 1,047 | 1.8 | 1.3 | 1.6 | 3.0 | 3.4 |
| 1.3 | 36,205 | 2,509 | 4.4 | 2.6 | 2.5 | 5.1 | 6.9 |
| 2.1 | 22,328 | 4,677 | 3.7 | 2.3 | 17.2 | 19.5 | 20.9 |
| 2.2 | 4,003 | 131 | 1.4 | 1.1 | 1.8 | 3.0 | 3.3 |
| 2.3 | 136,074 | 7,759 | 2.3 | 1.5 | 3.4 | 4.9 | 5.7 |
| 2.4 | 156,781 | 6,448 | 1.6 | 1.1 | 2.5 | 3.6 | 4.1 |
| 2.5 | 233,253 | 8,013 | 1.5 | 1.0 | 1.9 | 2.9 | 3.4 |
| 2.6 | 57,640 | 2,586 | 2.1 | 1.6 | 2.4 | 4.0 | 4.5 |
| 2.7 | 26,595 | 659 | 0.7 | 0.6 | 1.8 | 2.4 | 2.5 |
| 2.8 | 179,667 | 13,306 | 3.9 | 1.2 | 3.5 | 4.7 | 7.4 |
| 3.1 | 509,646 | 45,915 | 3.7 | 1.6 | 5.3 | 6.9 | 9.0 |
| 3.2 | 219,968 | 10,988 | 2.5 | 1.0 | 2.5 | 3.5 | 5.0 |
| 3.3 | 128,274 | 4,693 | 1.6 | 0.8 | 2.0 | 2.8 | 3.7 |
| 3.4 | 276,635 | 39,599 | 3.0 | 1.8 | 11.4 | 13.1 | 14.3 |
| 4.1 | 313,199 | 13,245 | 1.1 | 0.7 | 3.1 | 3.8 | 4.2 |
| 4.2 | 10,413 | 486 | 2.6 | 2.3 | 2.1 | 4.4 | 4.7 |
| 5.1 | 321,466 | 15,978 | 2.0 | 0.8 | 3.0 | 3.8 | 5.0 |
| 5.2 | 529,452 | 22,329 | 1.4 | 0.8 | 2.8 | 3.6 | 4.2 |
| 990 | 3,141 | 304 | 2.0 | 1.5 | 7.7 | 9.2 | 9.7 |
| Total | 3,235,914 | 207,406 | 2.3 | 1.1 | 4.1 | 5.3 | 6.4 |

*Source:* KSZ-DWH Labour Market (Processing Steunpunt WAV)

Just as with the analysis of the inflow, we see that in most STILE sectors the outflow is slightly below average (6.4%) and that some sectors sharply exceed the average, namely *Wholesale and retail trade, hotels, restaurants* (STILE 3.1), *Other services* (STILE 3.4), *Construction* (STILE 2.8), *Agriculture, forestry, fishing* (STILE 2.1) and *Computer and related activities* (STILE 1.3). These are precisely the sectors with a higher than average inflow rate. The extremely high outflow rates of 2.1 and 3.4 can be explained by seasonal work (STILE 2.1) and the presence of interim sector NACE 74.5 (STILE 3.4), characterised by a higher proportion of short-term work contracts and consequently very mobile employees.

Overall, the total outflow from a wage-earning job in the *industrial branch of ICT* (3.6%) and in *Telecommunications* (3.4%) lies below the average for all sectors (6.4%), while it is higher in the *Computer and related activities* (6.9%) due to the high proportion of employees changing jobs. The outflow of knowledge and skills is higher in the *Computer and related activities* than in other sectors. More than half of all the job-to-job mobile in the ICT sectors also moves to another sector.

**Table 2.16** Outflow rates (out of a wage-earning job) in the ICT sector by gender (Belgium; average quarter 2000)

| STILE sector | Employees (n) | Quarterly outflow from job (n) | To other job (%) | Of which in other sector (%) | Out of employment (%) | Total outflow from sector (%) | Total outflow from job (%) |
|---|---|---|---|---|---|---|---|
| 15-24 years old | | | | | | | |
| 1.1 | 2,606 | 153 | 2.7 | 2.3 | 3.2 | 5.5 | 5.9 |
| 1.2 | 3,133 | 254 | 4.1 | 3.2 | 4.0 | 7.2 | 8.1 |
| 1.3 | 4,793 | 412 | 5.4 | 3.2 | 3.2 | 6.4 | 8.6 |
| Total Economy | 375,379 | 59,927 | 4.9 | 2.6 | 11.1 | 13.7 | 16.0 |
| 25-34 years old | | | | | | | |
| 1.1 | 7,254 | 295 | 2.2 | 2.0 | 1.8 | 3.8 | 4.1 |
| 1.2 | 9,807 | 515 | 3.1 | 2.3 | 2.2 | 4.4 | 5.2 |
| 1.3 | 18,618 | 1,427 | 5.1 | 3.0 | 2.6 | 5.6 | 7.7 |
| Total Economy | 948,186 | 70,462 | 3.2 | 1.7 | 4.2 | 5.9 | 7.4 |
| 35-44 years old | | | | | | | |
| 1.1 | 6,413 | 131 | 0.9 | 0.7 | 1.1 | 1.9 | 2.0 |
| 1.2 | 8,806 | 162 | 1.0 | 0.7 | 0.9 | 1.6 | 1.8 |
| 1.3 | 9,104 | 492 | 3.3 | 1.9 | 2.1 | 4.0 | 5.4 |
| Total Economy | 986,896 | 41,915 | 1.7 | 0.8 | 2.6 | 3.4 | 4.2 |
| 45-64 years old | | | | | | | |
| 1.1 | 6,057 | 220 | 0.4 | 0.4 | 3.2 | 3.6 | 3.6 |
| 1.2 | 9,066 | 117 | 0.3 | 0.2 | 1.0 | 1.2 | 1.3 |
| 1.3 | 3,690 | 177 | 2.2 | 1.4 | 2.6 | 4.0 | 4.8 |
| Total Economy | 925,453 | 35,101 | 0.8 | 0.3 | 3.0 | 3.3 | 3.8 |

*Source:* KSZ-DWH Labour Market (Processing Steunpunt WAV)

By age, we can immediately see that the total outflow from a job falls as the age increases. The high outflow percentage among youngsters (16.0%) is largely a result of the high outflow from the wage-earning segment (11.1%). Noteworthy is that, in the ICT sectors, the outflow by youngsters lies a great deal below the average for all youngsters. Work experience in the ICT sector seems to give younger people a great advantage in the labour market. Among the other age groups, the outflow is lower in ICT sectors 1.1 and 1.2 (but the difference is not as pronounced as for the youngsters), and higher in STILE 1.3. In the older age groups, the *Computer and related activities* consequently lose a larger than average amount of knowledge.

The differences between men and women are more limited here. Women are slightly more likely than men to flow out from their job (7.0%), particularly out of the wage-earning segment (4.8%). In *Telecommunications* (STILE 1.2) and to a lesser extent in the *industrial branch* (STILE 1.1) of ICT, this general pattern is also visible. But the differences between men and women are smaller in *Computer and related activities* (STILE 1.3).

The outflow to other jobs is on average the same for men and women. However, differences occur between the ICT sectors. In the *industrial branch* and in *Computer and related activities*, the outflow to other jobs is higher among men, while it is higher among women in *Telecommunications*.

**Table 2.17** Outflow rates (out of a wage-earning job) in the ICT sector by gender (Belgium; average quarter 2000)

| STILE sector | Employees (n) | Quarterly outflow from job (n) | To other job (%) | Of which in other sector (%) | Out of employ-ment (%) | Total out-flow from sector (%) | Total outflow from job (%) |
|---|---|---|---|---|---|---|---|
| Men | | | | | | | |
| 1.1 | 14,932 | 518 | 1.7 | 1.5 | 1.8 | 3.3 | 3.5 |
| 1.2 | 21,561 | 638 | 1.6 | 1.2 | 1.3 | 2.5 | 3.0 |
| 1.3 | 26,683 | 1,835 | 4.5 | 2.5 | 2.4 | 4.9 | 6.9 |
| Total Economy | 1,834,642 | 109,392 | 2.3 | 1.1 | 3.7 | 4.8 | 6.0 |
| Women | | | | | | | |
| 1.1 | 7,399 | 279 | 0.9 | 0.7 | 2.9 | 3.7 | 3.8 |
| 1.2 | 9,250 | 409 | 2.1 | 1.6 | 2.3 | 4.0 | 4.4 |
| 1.3 | 9,522 | 674 | 4.2 | 2.9 | 2.9 | 5.8 | 7.1 |
| Total Economy | 1,401,270 | 98,014 | 2.2 | 1.1 | 4.8 | 5.9 | 7.0 |

*Source:* KSZ-DWH Labour Market (Processing Steunpunt WAV)

### 2.3.3 Inflow - outflow: the result

Based on the analysis of the inflow and outflow movements, it became clear that wage earners in some activity sectors tend to be more mobile than those in others. The table below gives a general mobility rate on the basis of the total inflow and outflow rates, showing around which activity sectors most mobility takes place.

**Table 2.18** Inflow rate, outflow rate, total mobility rate by sector (Belgium; average quarter 2000)

| STILE sector | Number of employees (n) | Quarterly inflow rate (%) | Quarterly outflow rate (%) | Total quarterly mobility rate (%) |
|---|---|---|---|---|
| 1.1 | 22,330 | 3.9 | 3.6 | 7.5 |
| 1.2 | 30,811 | 4.8 | 3.4 | 8.2 |
| 1.3 | 36,205 | 9.6 | 6.9 | 16.5 |
| 2.1 | 22,328 | 21.3 | 20.9 | 42.3 |
| 2.2 | 4,003 | 2.8 | 3.3 | 6.1 |
| 2.3 | 136,074 | 4.7 | 5.7 | 10.4 |
| 2.4 | 156,781 | 4.0 | 4.1 | 8.1 |
| 2.5 | 233,253 | 3.5 | 3.4 | 6.9 |
| 2.6 | 57,640 | 4.0 | 4.5 | 8.5 |
| 2.7 | 26,595 | 2.1 | 2.5 | 4.6 |
| 2.8 | 179,667 | 7.8 | 7.4 | 15.2 |
| 3.1 | 509,646 | 9.3 | 9.0 | 18.3 |
| 3.2 | 219,968 | 5.4 | 5.0 | 10.4 |
| 3.3 | 128,274 | 3.8 | 3.7 | 7.4 |
| 3.4 | 276,635 | 16.9 | 14.3 | 31.2 |
| 4.1 | 313,199 | 4.6 | 4.2 | 8.9 |
| 4.2 | 10,413 | 5.9 | 4.7 | 10.5 |
| 5.1 | 321,466 | 5.9 | 5.0 | 10.8 |
| 5.2 | 529,452 | 4.8 | 4.2 | 9.0 |
| 990 | 3,141 | 7.4 | 9.7 | 17.1 |
| **Total Economy** | **3,235,914** | **7.0** | **6.4** | **13.4** |

*Source:* KSZ-DWH Labour Market (Processing Steunpunt WAV)

Of the total database of 3,235,914 employees (in an average quarter in 2000) in Belgium, 225,507 were mobile between two quarters (inflow into or outflow from a wage-earning job). This gives a mobility rate of 13.4%.

Five STILE sectors stand out above the average. Their workforce has a high level of mobility into and from wage-earning jobs. The two highest mobility rates are recorded in *Agriculture, forestry and fishing* (STILE 2.1) and *Other services* (STILE 3.4). As stated above, the high mobility rate is due to the prevalence of short-term contracts, for example for seasonal work and interim work. The other three sectors are *Wholesale and retail trade, hotels, restaurants* (STILE 3.1), *Construction* (STILE 2.8) and *Computer and related activities* (STILE 1.3). From the high mobility in the Computer and related activities, we can deduce that the Information Society knowledge is very mobile: there is a high flow rate of knowledge and skills.

Notably, the mobility is highest among youngsters: 38.3% of 15 to 24 years old and 15.2% of the 25 to 34 years old. As stated earlier, the mobility in STILE sectors 1.1 and 1.2 is consistently below average, whereas it is above average in STILE sector 1.3. Remarkably, the mobility rate of the 15 to 24 years old in STILE sector 1.3 lies below the average (30.0%). The fact that STILE sector 1.3 has an above average mobility is therefore due to the above average mobility of the other age groups, which means that it not only has a high level of knowledge, but also of experience.

By gender, we already established that women have a higher mobility than men do. This also applies to the ICT sector, except for *Computer and related activities* (STILE 1.3) where men and women have the same mobility rate.

When we offset the inflow and outflow, we also obtain a picture of the sector's appeal. For that purpose, we look at the inflow and outflow at sectoral level, not at job level. It will show us how many people flow into and from the activity sector on a quarterly basis.

**Table 2.19** Inflow, outflow and growth rate by activity sector (Belgium; average quarter 2000)

| STILE sector | Number of employees (n) | Quarterly inflow into sector (n) | Quarterly outflow from sector (n) | Net result (n) | Quarterly growth rate (%) |
|---|---|---|---|---|---|
| 1.1 | 22,330 | 841 | 761 | 80 | 0.4 |
| 1.2 | 30,811 | 1,352 | 911 | 440 | 1.4 |
| 1.3 | 36,205 | 2,815 | 1,853 | 963 | 2.7 |
| 2.1 | 22,328 | 4,432 | 4,352 | 80 | 0.4 |
| 2.2 | 4,003 | 100 | 119 | -19 | -0.5 |
| 2.3 | 136,074 | 5,362 | 6,706 | -1,344 | -1.0 |
| 2.4 | 156,781 | 5,541 | 5,700 | -159 | -0.1 |
| 2.5 | 233,253 | 6,941 | 6,823 | 118 | 0.1 |
| 2.6 | 57,640 | 2,015 | 2,290 | -275 | -0.5 |
| 2.7 | 26,595 | 546 | 642 | -96 | -0.4 |
| 2.8 | 179,667 | 9,204 | 8,431 | 774 | 0.4 |
| 3.1 | 509,646 | 36,472 | 34,954 | 1,518 | 0.3 |
| 3.2 | 219,968 | 8,659 | 7,660 | 999 | 0.5 |
| 3.3 | 128,274 | 3,710 | 3,569 | 141 | 0.1 |
| 3.4 | 276,635 | 43,413 | 36,277 | 7,137 | 2.6 |
| 4.1 | 313,199 | 13,170 | 11,879 | 1,291 | 0.4 |
| 4.2 | 10,413 | 583 | 457 | 126 | 1.2 |
| 5.1 | 321,466 | 14,994 | 12,080 | 2,915 | 0.9 |
| 5.2 | 529,452 | 22,262 | 19,230 | 3,032 | 0.6 |
| 990 | 3,141 | 219 | 290 | -72 | -2.3 |
| **Total Economy** | **3,235,914** | **189,021** | **170,920** | **18,101** | **0.6** |

*Source:* KSZ-DWH Labour Market (Processing Steunpunt WAV)

The figures clearly show that only a few sectors come out with a strongly positive balance on a quarterly basis in 2000: particularly *Computer and related activities* (STILE 1.3), *Telecommunications* (STILE 1.2), *Other services* (STILE 3.4) and to a lesser degree the *Research institutes* (STILE 4.2) welcome more new wage earners than they let go. A few other sectors have a narrowly positive balance. The largest losers are a number of industrial sectors, such as *Consumer goods* (STILE 2.3) and *Other manufacturing* (STILE 2.6). The *industrial branch of the ICT sector* manages to achieve a positive net result.

Mobility is highest among young people. It is not surprising that, particularly of these youngsters, more people flow into wage-earning jobs than flow out of them while the reverse is true for the highest age group. This is logical, since after completing their education, youngsters are in the entry phase in the labour market compared to older people being in their exit phase through retirement. The ICT sectors are no different. This means that they are the recipients of much 'textbook knowledge', but that they also lose a lot of experience and know-how.

Fewer differences exist between men and women. In *Telecommunications* (STILE 1.2), the net result is more positive for women than for men and in *Computer and related activities* (STILE 1.3) it is more positive for men.

We can also focus on the inflow from and the outflow to other paid work, which means we only look at the job-to-job mobile.

**Table 2.20** Inflow from, outflow to another job and growth rate by sector (Belgium; average quarter 2000)

| STILE sector | Number of employees (n) | Quarterly inflow from other sector (n) | Quarterly outflow to other sector (n) | Net result (n) | Quarterly growth rate (%) |
|---|---|---|---|---|---|
| 1.1 | 22,330 | 339 | 279 | 60 | 0.3 |
| 1.2 | 30,811 | 664 | 408 | 257 | 0.8 |
| 1.3 | 36,205 | 1,309 | 931 | 377 | 1.0 |
| 2.1 | 22,328 | 327 | 506 | -180 | -0.8 |
| 2.2 | 4,003 | 37 | 45 | -8 | -0.2 |
| 2.3 | 136,074 | 1,489 | 2,039 | -550 | -0.4 |
| 2.4 | 156,781 | 1,812 | 1,784 | 28 | 0.0 |
| 2.5 | 233,253 | 2,273 | 2,302 | -29 | 0.0 |
| 2.6 | 57,640 | 845 | 902 | -58 | -0.1 |
| 2.7 | 26,595 | 172 | 169 | 3 | 0.0 |
| 2.8 | 179,667 | 2,522 | 2,085 | 437 | 0.2 |
| 3.1 | 509,646 | 6,474 | 7,916 | -1,443 | -0.3 |
| 3.2 | 219,968 | 2,724 | 2,240 | 484 | 0.2 |
| 3.3 | 128,274 | 1,109 | 972 | 137 | 0.1 |
| 3.4 | 276,635 | 4,877 | 4,860 | 17 | 0.0 |
| 4.1 | 313,199 | 2,422 | 2,172 | 250 | 0.1 |
| 4.2 | 10,413 | 231 | 243 | -12 | -0.1 |
| 5.1 | 321,466 | 2,470 | 2,424 | 46 | 0.0 |
| 5.2 | 529,452 | 4,547 | 4,177 | 371 | 0.1 |
| 990 | 3,141 | 40 | 48 | -9 | -0.3 |
| **Total Economy** | **3,235,914** | **36,928** | **36,928** | **0** | **0.0** |

*Source:* KSZ-DWH Labour Market (Processing Steunpunt WAV)

Striking is that the enterprises in the ICT sectors and to a lesser extent in *Construction* (STILE 2.8) and *Transport, storage, post, communication* (STILE 3.2) are the only ones to sign up significantly more employees from other enterprises than they lose to them. Here, too, the enterprises in the industrial sectors are the ones that most often show a negative balance. Somewhat remarkable is that in *Wholesale and retail trade, hotels, restaurants* (STILE 3.1) the enterprises let more people go to other enterprises than it receives in return. We never-

theless notice that the general inflow into this STILE sector is greater than the outflow. This means that the enterprises in this sector have a large inflow from the inactive segment and from unemployment.

The positive result in the ICT sectors is greatest among the 15 to 24 years old and it decreases as age goes up. Men and women hardly differ in this respect.

## 2.4 Job-to-job mobility in ICT

During the analyses of the inflow and outflow movements, we already turned our attention a few times to employed people who change jobs. In this section, we will examine this specific group in greater detail.

Job-to-job mobility is commonly conceived as a change of employer. In the Datawarehouse only data about the individual's legal employer (enterprise) is included and not about the establishment. We measure mobility as a change of the relation between an individual's unique ID-number and his/her employer's unique ID-number. A shortcoming of this method is that we miss the job-to-job mobility within one enterprise: a clerk becoming head of his department is not regarded as job-to-job mobile. Nor is a change of establishment within the enterprise regarded as job-to-job mobility.

When analysing job-to-job mobility we come to another specific problem. An important cause of mobility is entry and exit of enterprises: a significant share of mobility is the result of enterprises going out of business or being restructured in such a way that they change their identification number in the registers upon which the definition of mobility is based.[14] The identification number of enterprises can change due to administrative and economic reasons (e.g. take-over, split-off, etc.) resulting in 'false' mobility.

To a certain degree, this 'false' mobility is corrected for in the Datawarehouse. We developed an algorithm in order to make a distinction between 'individual' (I), 'collective' (C) and 'no' (Q) mobility and people in a special (S) employment regime. This algorithm has been applied to all wage earners who then receive a mobility code I, C, Q. Only people with a 'special' regime were excluded and receive no mobility code (S).[15] The idea is that if a certain transition from employer X to employer Y between two quarters is being made by 20 employees or more, this change of employer identification number is considered to be a statistical artefact. The employee making this transition gets a code 'C' and is not considered to have been mobile.

These tables only contain people who were employed during the entire period, from the second quarter of 1999 to the second quarter of 2000. Accordingly, people who were unemployed between two jobs are not considered as job-to-job mobile and do not feature. This explains why the number of employees distributed by sector in these tables deviates from figures given in previous analyses.

### 2.4.1 Differences in job-to-job mobility according to sector

The job-to-job mobility rate reflects the proportion of employees who are working for a different employer one year later. Globally speaking, 7.2% of all employees in Belgium moved jobs between 1999 and 2000.

14 Nås et al., 2001.

15 There are 4 types of regime: full-time, part-time, special and undefined. The special regime refers to seasonal work and temporary work (literally 'at short intervals'). These workers are believed to be mobile by definition and they would distort the mobility rates of the total population.

**Table 2.21** Job-to-job mobility rate of employees (15-64 years old) in the ICT sector (Belgium; 2nd quarter 1999-2000)

| NACE code | Description | Total number of employees 2nd quarter 1999 (n) | Job mobility rate (%) |
|---|---|---|---|
| 30.0 | Manufacture of office machinery and computers | 432 | 5.1 |
| 32.1 | Manufacture of electronic valves and tubes and other electronic components | 7,194 | 3.7 |
| 32.2 | Manufacture of television and radio transmitters and apparatus for line telephony and line telegraphy | 8,767 | 4.6 |
| 32.3 | Manufacture of television and radio receivers, sound or video recording or reproducing apparatus and associated goods | 3,131 | 5.9 |
| *33.1* | *Manufacture of medical and surgical equipment and orthopaedic appliances* | 2,478 | *7.9* |
| 33.2 | Manufacture of instruments and appliances for measuring, checking, testing, navigating and other purposes, except industrial process control equipment | 1,207 | 4.9 |
| 33.3 | Manufacture of industrial process control equipment | 2,047 | 8.5 |
| *33.4* | *Manufacture of optical instruments, photographic equipment* | 532 | *8.6* |
| *33.5* | *Manufacture of watches and clocks* | 343 | *9.0* |
| *64.1* | *Post and courier activities* | 46,483 | *2.5* |
| 64.2 | Telecommunications | 26,429 | 5.7 |
| 72.1 | Hardware consultancy | 11,008 | 17.0 |
| 72.2 | Software consultancy and supply | 12,600 | 15.0 |
| 72.3 | Data processing | 1,815 | 10.6 |
| 72.4 | Data base activities | 818 | 12.7 |
| 72.5 | Maintenance and repair of office, accounting and computing machinery | 1,432 | 12.6 |
| 72.6 | Other computer related activities | 81 | 29.6 |
| *ICT 2 digits* | | 126,797 | *6.6* |
| **ICT 3 digits** | | **76,961** | **8.9** |
| STILE 1.1 | Office accounting and computing machinery (NACE 30, 32, 33.2 and 33.3) | 22,778 | 4.9 |
| STILE 1.2 | Telecommunications (NACE 64.2) | 26,429 | 5.7 |
| STILE 1.3 | Computer and related activities (NACE 72) | 27,754 | 15.3 |
| **Total Economy** | | **2,778,338** | **7.2** |

Note: NACE 2 digit level in bold text, ICT sectors in plain text, non-ICT but included in ICT based on 2 digit NACE codes in italic text.
*Source:* KSZ-DWH Labour Market (Processing Steunpunt WAV)

Generally speaking, employees in the commercial service sectors (for example *Hotels and restaurants*, *wholesale and retail*) experience greater job-to-job mobility and those in the non-profit making sectors (for example, *the Public sector*) are less mobile. In the ICT sector, the proportion of job-to-job mobile employees is significantly higher than average: 8.9% of employees in the ICT sector worked for a different employer/company in 2000 compared to 1999. Also within the ICT sector, notable differences come to the fore and remarkably the commercial provision of services (*Consultancy*, NACE 72.1 and 72.2) is much more mobile than, for example, the industrial branch of ICT. Within the *Hardware* and *Software consultancy*, respectively 17% and 15% of employees are job-to-job mobile, which makes consultants one of the most job mobile employees. But other employees within NACE sector 72 also have a higher than average job-to-job mobility.

We cannot draw conclusions on whether their job-to-job mobility is voluntary or not. Some people are forced to change jobs following redundancy or bankruptcy. Others change jobs at their own initiative. Analyses on the basis of the LFS have demonstrated that the proportion of

involuntary mobility is significantly lower in the non-profit making sector than in the commercial service sector. These non-profit making sectors are, among other things, less sensitive to cyclical fluctuations and consequently less liable to bankruptcies and redundancies, forcing fewer people to look for other jobs.

From the perspective of the mobility of know-how, this distinction is nevertheless not particularly relevant. The result is the same: the employee with their knowledge and skills is gone.

*Evolution in ICT job-to-job mobility*

The proportion of employees changing jobs varies over time. On the basis of the Labour Force Survey, we can calculate the job-to-job mobility rate from 1993 until 2002.

Mobility is influenced by the economic environment. In the Scandinavian countries, where a lot of research has already been carried out into mobility, it was established that job-to-job mobility seems to keep pace with the economic cycle: the better the economy (measured on the basis of unemployment levels and the growth rate of the Gross National Product), the higher the job-to-job mobility.[16] In economically prosperous times, people make use of the larger number of jobs on offer to change jobs. On the other hand, people are forced in economically less favourable times with numerous redundancies and bankruptcies to look for other work. Taking both effects into consideration, we don't expect a strong correlation between job-to-job mobility (voluntary and forced mobility together) and the economic cycle.

As far as Belgium is concerned, there seems to be a slightly positive correlation between job-to-job mobility and the economic cycle. If we use the ILO's figure for the level of unemployment as an indicator for the economic climate (high unemployment pointing towards an unfavourable climate), we can assume that the economic decline culminated in the years 1994 to 1996. From 1997, unemployment started to recede somewhat, with a steeper decline in 2000 and 2001 and a new increase in 2002. It should be noted that the studied period (1993-2002 with an interruption between 1998 and 1999) is too short to show up clear trends over time. This analysis should consequently be interpreted as a tentative exercise.

**Table 2.22** Job-to-job mobility rate of employed people between 15 and 64 years old (Belgium; 1993-2002), in %

| | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 |
|---|---|---|---|---|---|---|---|---|---|---|
| NACE 30, 32, 33 | : | : | : | : | : | : | 7.4 | 6.4 | 5.2 | 5,8 |
| NACE 64 | : | : | : | : | : | : | 4.9 | 5.5 | 5.0 | 5.9 |
| NACE 72 | : | : | : | : | : | : | 14.2 | 15.2 | 10.8 | 13.1 |
| ICT 2 digits | 2.1 | 2.0 | 3.3 | 3.2 | 2.5 | 2.6 | 7.3 | 8.2 | 6.6 | 8.1 |
| **Total Economy** | **3.4** | **3.1** | **3.5** | **3.5** | **3.3** | **3.6** | **6.7** | **7.7** | **7.8** | **6.6** |

Notes: NACE 2 digit level in bold text, ICT sectors in plain text, non-ICT but included in ICT based on 2 digit NACE codes in italic text.
Gap in time sequence between 1998 and 1999.
Source: NIS EAK (Processing Steunpunt WAV)

We see that the job-to-job mobility rate between 1993 and 1998 fluctuated between 3.1% and 3.6%. It is hard to assess whether this level is low or normal, considering we do not yet have access to sufficiently long time sequences. In view of the methodological change in the LFS between 1998 and 1999, we do not know what happened to the job-to-job mobility in that period. In the period from 1999 to 2001, when the economy started to grow, job-to-job mobility increased. In 2002, when the economy slowed down, job-to-job mobility receded to 6.6%. We consequently find a slight variation in the job-to-job mobility rate, but it remains fairly level on

16 Graversen et al., 2001.

the whole. In the Scandinavian countries, the job-to-job mobility rate undergoes much stronger fluctuations.[17]

In the ICT sector, we find that job-to-job mobility fluctuates even more than average, making the correlation with the economic cycle even less evident. Whereas the job-to-job mobility rate on average remained constant between 2000 and 2001, it showed a strong decline in ICT. In 2002, it rose again sharply in ICT, compared to a pronounced decline in the average rate. These strong fluctuations are manifesting themselves particularly in NACE sector 72: between 2000 and 2001 a decrease from 15% to 11% and in 2002 an increase to 13%. On the whole, no firm conclusions can be drawn from the long-term analysis of job-to-job mobility on the basis of the LFS.

*Job-to-job mobility by gender and age*

The differences between men and women with relation to job-to-job mobility are fairly limited. Men are marginally less mobile than women. The differences also remain limited within the ICT sector: 9.3% of male employees are job-to-job mobile compared to 8.1% of women. Only within *Telecommunications* (NACE 64.2) is the proportion reversed with women slightly more job-to-job mobile than their male colleagues.

**Table 2.23** Job-to-job mobility rate of employees in the ICT sector by gender and age (Belgium; 2nd quarter 1999-2000)

| NACE code | Total number of employees 2nd quarter 1999 (n) | Total (%) | Men (%) | Women (%) | 15-24 years (%) | 25-34 years (%) | 35-44 years (%) | 45-64 years (%) |
|---|---|---|---|---|---|---|---|---|
| 30.0 | 432 | 5.1 | 4.5 | 6.0 | 8.6 | 5.3 | 4.5 | 4.2 |
| 32.1 | 7,194 | 3.7 | 4.6 | 2.1 | 8.0 | 5.5 | 2.2 | 1.2 |
| 32.2 | 8,767 | 4.6 | 5.0 | 3.3 | 13.7 | 8.9 | 2.6 | 1.2 |
| 32.3 | 3,131 | 5.9 | 8.3 | 2.4 | 10.3 | 9.0 | 3.3 | 2.3 |
| *33.1* | 2,478 | *7.9* | 9.3 | 5.8 | 18.9 | 8.7 | 4.8 | 3.6 |
| 33.2 | 1,207 | 4.9 | 6.3 | 2.2 | 11.3 | 6.1 | 2.4 | 4.0 |
| 33.3 | 2,047 | 8.5 | 8.8 | 6.8 | 16.9 | 10.4 | 6.4 | 3.3 |
| *33.4* | 532 | *8.6* | 8.2 | 9.1 | 19.0 | 12.2 | 5.1 | 1.1 |
| *33.5* | 343 | *9.0* | 9.9 | 6.6 | 10.3 | 13.0 | 5.2 | 2.1 |
| *64.1* | 46,483 | *2.5* | 2.4 | 2.6 | 12.9 | 5.8 | 1.5 | 0.5 |
| 64.2 | 26,429 | 5.7 | 5.2 | 7.1 | 17.9 | 10.9 | 2.7 | 0.9 |
| 72.1 | 11,008 | 17.0 | 17.7 | 15.0 | 22.2 | 18.7 | 13.7 | 8.8 |
| 72.2 | 12,600 | 15.0 | 15.1 | 14.5 | 19.0 | 17.1 | 11.6 | 6.9 |
| 72.3 | 1,815 | 10.6 | 11.7 | 8.2 | 24.2 | 14.0 | 9.7 | 2.5 |
| 72.4 | 818 | 12.7 | 11.6 | 14.3 | 14.4 | 15.8 | 5.6 | 1.9 |
| 72.5 | 1,432 | 12.6 | 13.3 | 9.8 | 15.9 | 15.8 | 7.5 | 4.7 |
| 72.6 | 81 | 29.6 | 32.7 | 23.1 | 57.1 | 27.3 | 23.5 | 50.0 |
| *ICT 2 digits* | *126,797* | *6.6* | *6.8* | *5.9* | *16.2* | *11.3* | *4.1* | *1.3* |
| **ICT 3 digits** | **76,961** | **8.9** | **9.3** | **8.1** | **16.9** | **13.3** | **5.6** | **2.1** |
| STILE 1.1 | 22,778 | 4.9 | 5.8 | 2.8 | 11.0 | 7.7 | 2.9 | 1.6 |
| STILE 1.2 | 26,429 | 5.7 | 5.2 | 7.1 | 17.9 | 10.9 | 2.7 | 0.9 |
| STILE 1.3 | 27,754 | 15.3 | 15.8 | 14.0 | 20.1 | 17.6 | 11.9 | 6.8 |
| **Total Economy** | **2,778,338** | **7.2** | **7.4** | **6.8** | **17.4** | **10.4** | **5.2** | **2.7** |

Note: NACE 2 digit level in bold text, ICT sectors in plain text, non-ICT but included in ICT based on 2 digit NACE codes in italic text.
Source: KSZ-DWH Labour Market (Processing Steunpunt WAV)

17 Graversen et al., 2001.

Job-to-job mobility is strongly age-related (Table 2.23). Youngsters, in particular, often change jobs. As age increases, job-to-job mobility declines. The turbulent period when youngsters start their career is not surprising: young people are still on the look-out for the ideal job and are furthermore often employed on a temporary contract. The ICT sector does not differ in this respect: of the 15 to 24 years old, approximately 17% are job-to-job mobile; with the 25 to 34 years old, this is still 13.3% and it then strongly decreases in the two higher age groups. Particularly among the 45 plus group, the proportion of job-to-job mobile employees is very low. In the light of the observation that particularly the subsectors of *Computer and related activities* (NACE 72) are very job-to-job mobile, it results in a very high proportion of job-to-job mobile youngsters between 15 and 34 in these sectors, more specifically in *Consultancy* and *Data processing*. Just as with the previous analyses, we can conclude that the mobility of knowledge in the ICT sector is high in comparison with other sectors.

The Datawarehouse does not contain any data on the employees' educational attainment. That data is contained in the LFS, but the information on job-to-job mobility divided up by sector and educational attainment is unreliable in view of the small values. What we can conclude is that, on the whole, employees educated at the lower secondary level are less mobile than medium qualified and highly qualified employees. This is unlikely to be different in the ICT sector.

### 2.4.2 Flows between sectors

An interesting question is where all those job changing employees with their knowledge and skills go to. Do they remain within the same sector or do they move to a related rather than completely different sector. Inversely, we can also ask where all the 'new' employees in a sector come from. In order to find an answer to these questions, we look at all the employees who moved to a different employer[18] between two quarters in 2000 and we examine between which sectors the movement took place.[19]

Overall in Belgium, 293,700 employees moved to a different employer between two quarters over the specified period.[20] Of those, 50% remained employed within their own STILE sector. The proportion of 'stayers' is higher in the commercial and non-commercial service sectors (STILE sectors 3.1 to 3.4 and 5.1 to 5.2) and lower in the industrial sectors, with the exception of the construction sector (2.1 to 2.7) (Table 2.24). An important observation is that the proportion of 'stayers' in the ICT sectors remains far below the average. Employees in ICT who move to a different employer leave their own (STILE) sector more often than average.

18 Sum of the people who were job-to-job mobile between the fourth quarter of 1999 and the first quarter of 2000; between the first and second quarter of 2000; between the second and third quarter of 2000; between the third and fourth quarter of 2000; each time the data refer to the last day of the quarter.

19 Only the inflow and outflow from other sectors are considered, not from other labour market segments like unemployment, for instance.

20 Employees who changed jobs twice (or more) during the year are counted twice (or more), except if the changes took place within one quarter.

**Table 2.24** Outflow from STILE sectors to sector of destination (Belgium; average 2000)

| (%) Quarter 1 | Quarter 2 | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1.1 | 1.2 | 1.3 | 2.1 | 2.2 | 2.3 | 2.4 | 2.5 | 2.6 | 2.7 | 2.8 | 3.1 | 3.2 | 3.3 | 3.4 | 4.1 | 4.2 | 5.1 | 5.2 | 990 | Un-known | Total |
| 1.1 | **11.4** | 7.9 | 12.0 | 0.0 | 0.0 | 2.5 | 4.6 | 13.7 | 1.0 | 0.2 | 4.8 | 15.7 | 2.1 | 1.4 | 13.8 | 2.9 | 0.6 | 2.1 | 3.1 | 0.0 | 0.0 | 100.0 |
| 1.2 | 1.5 | **25.0** | 13.8 | 0.0 | 0.0 | 0.7 | 2.1 | 1.3 | 0.2 | 0.3 | 1.5 | 17.8 | 3.1 | 4.3 | 18.9 | 1.5 | 0.2 | 1.4 | 6.0 | 0.2 | 0.0 | 100.0 |
| 1.3 | 1.8 | 5.7 | **41.3** | 0.1 | 0.0 | 1.1 | 2.4 | 2.1 | 0.4 | 0.3 | 0.9 | 16.5 | 1.9 | 4.6 | 13.6 | 2.5 | 0.4 | 1.1 | 3.3 | 0.1 | 0.0 | 100.0 |
| 2.1 | 0.1 | 0.1 | 0.2 | **39.1** | 0.2 | 3.5 | 2.0 | 4.1 | 1.5 | 0.1 | 11.2 | 13.1 | 7.4 | 0.3 | 5.4 | 1.3 | 0.5 | 2.9 | 7.0 | 0.0 | 0.2 | 100.0 |
| 2.2 | 0.0 | 0.0 | 1.3 | 2.2 | **21.1** | 1.8 | 2.2 | 5.3 | 5.3 | 1.8 | 14.9 | 13.6 | 7.0 | 3.1 | 10.1 | 1.3 | 0.0 | 1.3 | 7.5 | 0.0 | 0.4 | 100.0 |
| 2.3 | 0.7 | 0.3 | 0.9 | 0.8 | 0.0 | **34.1** | 5.4 | 6.2 | 2.2 | 0.2 | 5.1 | 21.9 | 5.5 | 1.1 | 6.9 | 1.4 | 0.2 | 3.0 | 4.1 | 0.0 | 0.1 | 100.0 |
| 2.4 | 0.8 | 0.9 | 2.5 | 0.5 | 0.1 | 4.2 | **29.5** | 7.6 | 2.5 | 0.4 | 6.0 | 17.4 | 4.4 | 1.3 | 12.2 | 1.7 | 0.7 | 2.2 | 4.9 | 0.0 | 0.0 | 100.0 |
| 2.5 | 1.7 | 0.5 | 1.4 | 0.6 | 0.1 | 2.7 | 5.4 | **34.1** | 3.3 | 0.5 | 12.8 | 15.1 | 6.1 | 0.9 | 8.5 | 1.2 | 0.2 | 1.3 | 3.5 | 0.0 | 0.0 | 100.0 |
| 2.6 | 0.6 | 0.3 | 0.5 | 0.7 | 0.4 | 3.7 | 5.7 | 9.8 | **24.7** | 0.3 | 17.2 | 15.3 | 7.6 | 0.6 | 5.7 | 0.9 | 0.1 | 1.4 | 4.3 | 0.0 | 0.0 | 100.0 |
| 2.7 | 0.9 | 4.3 | 1.8 | 0.5 | 0.0 | 1.9 | 4.2 | 9.6 | 1.3 | **8.9** | 6.6 | 10.0 | 6.3 | 5.0 | 17.7 | 2.8 | 0.4 | 5.1 | 12.6 | 0.0 | 0.0 | 100.0 |
| 2.8 | 0.2 | 0.2 | 0.2 | 0.6 | 0.1 | 1.2 | 1.7 | 5.4 | 2.2 | 0.3 | **70.0** | 6.5 | 3.7 | 0.3 | 3.7 | 0.5 | 0.0 | 0.8 | 2.4 | 0.0 | 0.0 | 100.0 |
| 3.1 | 0.4 | 0.9 | 2.0 | 0.4 | 0.0 | 3.1 | 2.6 | 3.1 | 1.0 | 0.2 | 3.2 | **58.1** | 5.0 | 1.5 | 8.0 | 1.9 | 0.1 | 3.1 | 5.2 | 0.0 | 0.1 | 100.0 |
| 3.2 | 0.2 | 0.5 | 0.8 | 0.6 | 0.0 | 1.6 | 1.7 | 2.9 | 1.4 | 0.1 | 4.6 | 11.4 | **59.8** | 1.3 | 6.6 | 0.9 | 0.0 | 1.0 | 4.4 | 0.0 | 0.1 | 100.0 |
| 3.3 | 0.2 | 1.8 | 4.8 | 0.2 | 0.0 | 0.9 | 1.4 | 1.4 | 0.3 | 0.2 | 0.8 | 8.1 | 2.1 | **53.6** | 14.0 | 2.3 | 0.1 | 1.6 | 5.9 | 0.0 | 0.0 | 100.0 |
| 3.4 | 0.7 | 2.0 | 3.9 | 0.4 | 0.0 | 2.5 | 3.9 | 3.5 | 0.9 | 0.4 | 3.5 | 16.4 | 4.2 | 3.6 | **40.6** | 2.3 | 0.3 | 3.3 | 7.4 | 0.1 | 0.1 | 100.0 |
| 4.1 | 0.4 | 0.4 | 2.0 | 0.3 | 0.0 | 1.0 | 1.8 | 0.8 | 0.3 | 0.1 | 0.8 | 6.8 | 1.6 | 1.7 | 6.2 | **38.6** | 2.1 | 9.0 | 25.3 | 0.1 | 0.8 | 100.0 |
| 4.2 | 1.7 | 1.3 | 2.9 | 0.7 | 0.0 | 1.8 | 8.6 | 1.7 | 0.5 | 0.2 | 0.9 | 8.0 | 0.9 | 1.2 | 11.8 | 25.2 | **10.8** | 6.5 | 14.6 | 0.1 | 0.6 | 100.0 |
| 5.1 | 0.1 | 0.1 | 0.4 | 0.2 | 0.0 | 0.9 | 0.8 | 0.7 | 0.2 | 0.1 | 0.9 | 6.8 | 1.2 | 0.5 | 4.1 | 7.2 | 0.4 | **61.7** | 12.1 | 0.0 | 1.7 | 100.0 |
| 5.2 | 0.2 | 0.6 | 1.2 | 0.4 | 0.0 | 1.3 | 1.5 | 1.5 | 0.6 | 0.3 | 2.0 | 10.6 | 3.7 | 1.6 | 7.6 | 13.2 | 0.4 | 9.6 | **42.6** | 0.1 | 0.9 | 100.0 |
| 990 | 0.4 | 1.2 | 5.6 | 0.0 | 0.0 | 0.0 | 0.8 | 1.6 | 0.0 | 0.0 | 0.0 | 9.2 | 3.6 | 5.2 | 26.1 | 4.8 | 0.0 | 1.2 | 17.7 | **22.5** | 0.0 | 100.0 |
| Unknown | 0.0 | 0.2 | 0.2 | 0.2 | 0.1 | 1.5 | 1.3 | 0.6 | 0.1 | 0.2 | 1.4 | 8.5 | 2.7 | 0.9 | 6.2 | 9.2 | 0.8 | 39.2 | 26.2 | 0.0 | 0.5 | 100.0 |

Source: KSZ-DWH Labour Market (Processing Steunpunt WAV)

The same picture can be drawn on the basis of the 'inflow': which sectors are new employees flowing in from? Of all employees who changed employer, 50% came from within the same STILE sector. Again, the service sectors stand out (STILE 3.1 to 3.4 and 5.1 and 5.2) with an above average proportion of 'stayers' whereas the ICT sector has a lower than average proportion.

The **industrial branch of the ICT sector** (STILE sector 1.1 or NACE sectors 30, 32, 33.2 and 33.3) has an annual job-to-job mobility rate of 4.9%, which is rather limited. Of all the employees in the ICT sector who changed employer, an average of only 11% remains in the sector. Approximately 8% moved to the *Telecommunications sector* (STILE 1.2) and 12% to *Computer and related activities* (STILE 1.3), primarily to *Software consultancy* (NACE 72.2) and *Hardware consultancy* (NACE 72.1). But the majority leaves the ICT sector. The main destinations are firstly the wholesale and retail trade and the hotel and catering industry (STILE 3.1), particularly the *Wholesale of machinery, equipment and supplies* (NACE 51.6); secondly the *Other commercial service sectors* (STILE 3.4), more in particular *Business and management consultancy activities* (NACE 74.1) and *Architectural and engineering activities and related technical consultancy* (NACE 74.2); and lastly the *Metal sector* (STILE 2.5), where particularly the *Manufacture of machinery and equipment* (NACE 29) and the *Manufacture of electrical machinery and apparatus* (NACE 31) are at the receiving end of a significant proportion of the job-to-job mobile.

As far as the direction of the inflow is concerned, we note that the main 'recipients' are also the main 'suppliers' of employees: the *Wholesale and retail trade* (mainly NACE 51.6), the *Other commercial services* (mainly NACE 74.1 and 74.2) and the *Metal sector* (particularly NACE 28, 29 and 31). This indicates that the industrial ICT sectors give and take to and from certain other sectors. The balance is slightly positive: they 'receive' slightly more employees from the aforementioned sectors than they 'supplied' to them in 2000.

The **telecommunications sector** (STILE 1.2 or NACE 64.2) has with 5.7% a marginally higher proportion of job-to-job mobile, but still below the average in Belgium. Of all the job-to-job mobile employees, 25% remain within *Telecommunications*. Approximately 14% try their luck in the *Computer and related services sector* (STILE 1.3), particularly in *Software* and *Hardware consultancy* (NACE 72.2 and 72.1). The rest leave the ICT sector altogether. Roughly 19% move to *Other services* (STILE 3.4) and in particular to *Business and management consultancy activities* (NACE 74.1), *Architectural and engineering activities and related technical consultancy* (NACE 74.2) and *Miscellaneous business activities* (NACE 74.8). Approximately 18% end up in the *Wholesale and retail trade and the hotel and catering industry* (STILE 3.1), mainly in the *Wholesale of machinery, equipment and supplies* (NACE 51.6). The *Non-profit making services* (STILE 5.2) also absorb a significant proportion of the movers, mainly the *Administration of the State and the economic and social policy of the community* (NACE 75.1).

Again, we note that the main 'recipients' are also the main 'suppliers' of employees. Furthermore, the balance in 2000 is positive: the *Telecommunications* industry receives more employees from other sectors than it lets go.

The **computer and related activities sector** (STILE 1.3 or NACE 72) has the highest proportion of employees changing employer (15.3%). The *Computer and related activities sector* is mainly determined by *Hardware* and *Software consultancy* (NACE 72.1 and 72.2) with mobility rates of 17% and 15% respectively.

Of all employees in the *computer and related activities* industry who change employer, 41% remain within the sector. However, the various subsectors of the computer and related activities industry differ: particularly the *Consultants* (NACE 72.1 and 72.2) remain within the consultancy, while the other information scientists (NACE 72.3 to 72.6) are more likely to seek out another sector.

If we look specifically at the *Hardware* and *Software consultants*, we note that most of the movers go on to the *Wholesale trade* (respectively 17% and 15% to STILE 3.1), particularly to the *Wholesale of machinery, equipment and supplies* (NACE 51.6). Furthermore, a significant proportion end up in *Other services* (14% and 13% to STILE 3.4), more specifically in *Business and management consultancy activities* (NACE 74.1) and in *Architectural and engineering activities and related technical consultancy* (NACE 74.2). Another significant proportion tries its luck in *Telecommunications* (hence remaining within ICT, STILE 1.2) or in the *Financial sector* (STILE 3.3).

For the other subsectors in the *Computer and related activities industry*, the same scenario applies, with the difference that the proportion of 'movers' is larger. Most of them end up in *Wholesale of machinery, equipment and supplies* (NACE 51.6), in *Business and management consultancy activities* (NACE 74.1) and in *Telecommunications* (NACE 64.2).

The inflow into the *computer and related activities* industry originates mainly from *Wholesale trade* (more specifically from NACE 51.6) and *Other services* (particularly NACE 74.1). In 2000, the balance for the *computer and related activities* industry is clearly positive. Particularly the 'trade-off' with *Wholesale and retail trade* and with *Other services* is positive for the *computer and related activities* industry.

Previously, we observed that the job-to-job mobility in the ICT sector was above average, particularly in the *Computer and related activities sector*. The analysis of the flows between sectors shows that the proportion of job-to-job mobile employees remaining within the ICT sector is below average. Furthermore, we established that the general trend of the proportion of 'stayers' being greater in the (commercial and non-profit making) services than in the industrial sectors also holds true within ICT: the *Industrial branch of the ICT* sector (STILE 1.1) has 11% 'stayers', compared to 25% in the *Telecommunications industry* (STILE 1.2) and 41% in the *Computer and related activities sector* (STILE 1.3).

With regard to the flow between sectors, we can conclude that sectors give and take. The ICT sector particularly has a 'trade-off' relationship with the *Wholesale of machinery, equipment and supplies* (NACE 51.6), with *Business and management consultancy activities* (74.1) and *Architectural and engineering activities and related technical consultancy* (NACE 74.2). Furthermore, the industrial branch of the ICT (STILE 1.1) also finds 'receivers' and 'suppliers' in the *Manufacture of machinery and equipment* (NACE 29) and the *Manufacture of electrical machinery and apparatus* (NACE 31). For *Telecommunications* (STILE 1.2), it is the *Miscellaneous business activities* (NACE 74.8) and the *Administration of the State and the economic and social policy of the community* (NACE 75.1).

There are no differences between the age groups with regard to this general pattern. However, small differences exist between men and women. Male employees in the ICT sector who change employers more often remain within their own sector than women. If they change to a different sector after all, it is more likely to be another ICT sector compared to women. Women move more often than men to *Other services* (STILE 3.4), as well as to *Health care and welfare services* (STILE 5.1 and 5.2).

### 2.4.3 Conclusions on mobility in the ICT

The analysis of the inflow into a new wage-earning job taught us that the proportion of wage earners which are new to their job in *Office accounting and computing machinery* (STILE 1.1) and in *Telecommunications* (STILE 1.2) lies below that of the average sector, and above average in the *Computer and related activities* (STILE 1.3). For STILE 1.1 and 1.2, it is primarily due to the lower inflow from unemployment and the inactive; for STILE 1.3, the higher inflow from another wage-earning job plays a definite role. Just as in other sectors, the inflow into ICT is very high among youngsters. The inflow from inactivity, in this case from the education system, is particularly significant here.

With regard to the outflow from a wage-earning job, we can more or less draw the same conclusion: the outflow in STILE sectors 1.1 and 1.2 lies below that of the average sector, whereas the outflow in STILE sector 1.3 exceeds it. For STILE 1.3, the high outflow to another job again plays an important role.

The outflow is particularly high among youngsters, more specifically the outflow from the wage-earning segment is high. However, we see that in ICT the outflow among youngsters is still far below the average, also in STILE sector 1.3 which overall has a higher outflow. Work experience in ICT seems to give youngsters an important advantage in the labour market. For STILE 1.3, we therefore see that the outflow from a wage-earning job in the older age groups (particularly for those aged 35 and over) lies above the average of other sectors, primarily due to the high outflow towards another wage-earning job.

If we juxtapose the inflow and the outflow, it is immediately obvious that the wage earners in *Office accounting and computing machinery* (STILE 1.1) and *Telecommunications* (STILE 1.2) have a lower level of mobility, resulting in a more limited mobility of knowledge and skills

around those sectors, while the wage earners in *Computer and related activities* (STILE 1.3) register a high level of mobility leading to knowledge and skills being extremely mobile in the sector.

Furthermore, we note that STILE 1.2 and 1.3 are among the few sectors where more new wage earners flow in than out. This positive balance nevertheless only applies to youngsters and to the 25 to 34 years old. Among the 35 to 44 years old and the 45 to 64 years old, the balance is negative all round. It signifies that ICT sectors may well have a large inflow of 'text-book knowledge' but they also have a significant outflow of experience and know-how.

The analysis of job-to-job mobility took an in-depth look at the group of wage earners changing to a different employer. Again, it clearly transpired that *Computer and related activities* (STILE 1.3) has a deviating mobility pattern. Where this sector registers a job-to-job mobility rate that is well above the average for all sectors - particularly its subsectors *Hardware* (NACE 72.1) and *Software consultancy* (NACE 72.2) - *Office accounting and computing machinery* (STILE 1.1) and *Telecommunications* (STILE 1.2) have a lower job-to-job mobility rate. Here, too, we establish that the youngsters and the 25 to 34 years old have particularly high mobility rates.

In all ICT sectors, the proportion of job-to-job mobile wage earners remaining within their own STILE sector furthermore remains below the average. Particularly in STILE 1.1 and 1.2, the proportion is very small. A large proportion of job-to-job mobile in ICT consequently not only changes jobs, but also moves to another STILE sector.

With regard to the flows between sectors, we can conclude that sectors give and take. The ICT sector particularly has a 'trade-off' relationship with the *Wholesale of machinery, equipment and supplies* (NACE 51.6), with *Business and management consultancy activities* (74.1) and *Architectural and engineering activities and related technical consultancy* (NACE 74.2). Furthermore, the industrial branch of the ICT (STILE 1.1) also finds 'receivers' and 'suppliers' in the *Manufacture of machinery and equipment* (NACE 29) and the *Manufacture of electrical machinery and apparatus* (NACE 31). For *Telecommunications* (STILE 1.2), it is the *Miscellaneous business activities* (NACE 74.8) and the *Administration of the State and the economic and social policy of the community* (NACE 75.1).

## 2.5 Datawarehouse versus Labour Force Survey: quality issues

When analysing data about labour market phenomena, it is important to obtain some indication of the quality and reliability of the data used. In workpackage 6, we make use of two sources: firstly, the LFS, which allows the construction of internationally comparable indicators (see Deliverable D6.1) and secondly, the Belgian Datawarehouse Labour Market which enables the construction of relevant indicators on the basis of register data. By confronting both sources, we can learn something about the reliability and quality of each source. Firstly, we will examine the strengths and weaknesses of both sources before checking the Belgian LFS data against the administrative data of the Datawarehouse.

### 2.5.1 Advantages and disadvantages of surveys and register data

The *advantages* of surveys like LFS are many. The LFS is addressed to anyone, regardless of their professional status. Self-employed as well as wage earners, those in jobs as well as unemployed, children as well as those on bridging pensions schemes are all included. This means that the resulting statistics are comprehensive. Because the survey is co-ordinated by Eurostat, comparisons can be drawn within Europe, and homogeneous time sequences can be developed because the LFS is repeated on an annual basis. Furthermore, the information is relatively up-to-date, and biographical variables like age and level of education are also included. Surveys may also be useful for obtaining more qualitative information. For instance, we may be able to learn more about the voluntary or compulsory nature of the mobility from the LFS information. Are people moving of their own free or were they dismissed. Did someone choose to step out of the labour market or were they forced to. This sort of information is not available from the administrative databases.

Surveys obviously also have *disadvantages*. Firstly, the results need to be interpreted within a certain confidence interval because only a small proportion of the total population is

used to formulate general statements about the population as a whole. Apart from these 'sampling errors', other errors disconnected from the same are made, for instance because questions were misunderstood, the interviewer wrongly coded or misunderstood the response, etc. A specific problem for the LFS is that it works with proxy-respondents, which may affect the reliability of the data: in order to reduce the non-response, a member of the household is allowed to answer questions on behalf of the absent respondent. In Belgium the replies of approximately one in four respondents are obtained by proxy (for youngsters six out of ten). The proxy-respondents may have replied differently to certain questions than the actual respondent would have done. It is assumed that members of the same household are well informed about the most important characteristics and activities of the intended respondent. Statistics Canada has stated in a paper on the quality of LFS data that the information on the labour market situation (whether someone is employed, unemployed or not professionally active) and about personal characteristics tends to be good quality. Other, more specific information on the family member, on the other hand, may be less accurate, e.g. the usual number of hours worked or the description of the activity sector.[21] Research in the United States showed that replies from the respondents themselves and from proxy-respondents resulted in the same labour market classification in 83% of all cases (employed, unemployed, not professionally active). On more specific points (e.g. the number of hours worked, salary, etc), the answers only coincided in 70% of the replies.[22]

**Table 2.25** SWOT analysis on measuring mobility using the (EU) LFS

| STRENGTHS | WEAKNESSES |
|---|---|
| • Eurostat co-ordinated → internationally comparable<br>• Covered by legislation<br>• History of organisation/ working practices<br>• The largest data source in many countries<br>• Qualitative info available (e.g. Purpose of education or training)<br>• Addressed to anyone (e.g. children, pensioners)<br>• Relatively up-to-date | • Estimated data based on samples of individuals<br>• Sampling errors<br>• Other errors: misunderstanding question/answer; miscoding<br>• Confidence interval → no detailed breakdown of some variables possible due to availability or reliability (e.g. NACE)<br>• NACE sector information not detailed enough to get a precise definition of ICT<br>• Proxy-respondents: questions can be answered for other individuals in the same household<br>• Memory distortion and non-response (on questions related to 'situation one year before') → underestimation of mobility<br>• Coding of NACE sector of economic activity based upon description by employee and not by firm |
| • LFS is increasingly being used for various research purposes: it is the largest data source in almost every country<br>• Emphasis on qualitative information | • More and more information is being registered |
| **OPPORTUNITIES** | **THREATS** |

Source: Camire, Steunpunt WAV, 2004

21 Statistics Canada, 2003.
22 Boehm E.L., 1989.

Using LFS-data carries certain disadvantages, specific to the way in which mobility is measured. Surveys like the LFS tend to underestimate the number of transitions for at least two reasons. Firstly, because some retrospection is required to map out the changes. Research by the CBS (the Netherlands) has shown that retrospective data about the labour market situation of a year ago in a survey of the working population in the Netherlands was less reliable. Asking information about the situation one year ago produces some memory distortion.[23] The effect of memory distortion is mainly one-way, according to Allaart, namely in the direction of an underestimate of trends. The problem of memory distortion is exacerbated by the use of proxy-respondents, who are probably even less reliable about the situation in the labour market one year ago. A second reason for underestimating the actual number of transitions follows from the fact that people may be changing to and from two divisions throughout the year. For instance, an unemployed person may have worked for a number of months in the course of a year, but find himself unemployed again by the end of the year. Judged by the definition used above, this person is not considered as mobile. Other examples are people working for agencies. It is doubtful whether an agency worker placed with various employers interprets his/her activities as mobility between different employers. However, a previous analysis conducted by the Steunpunt WAV has indicated that the volume of this 'interim' mobility tends to be minimal. The analysis covered the period January to December 1994, and it was based on the monthly reports of the labour market situation of 1,806 Flemish respondents between 20 and 59 years old in the PSBH-sample group. Of the group of respondents that remained in the same division after one year, only 2.4% had disappeared from the division in the course of the year and had been mobile during the year.

A number of disadvantages described earlier can be dealt with by means of an administrative database like the Datawarehouse Labour Market. The exhaustive character of this database prevents the need for the results to be extrapolated, and no interval needs to be observed for the sake of reliability. Overall, this source can be recommended, particularly for relatively small populations. This makes it suitable for the analysis of mobility between various sectors of activity, for instance.

Furthermore, this sort of database is not affected by memory distortion or by the problem of proxy-respondents and more variables can be taken into account (e.g. work regime). On the other hand, a number of factors cause administrative databases to overestimate trends (unless a few careful corrections are made). Firstly, register data are inevitably contaminated, because variations are not incorporated on time or are corrected at a later date. This administrative delay affects the analysis of socio-economic mobility on a quarterly basis. Secondly, they contain many inaccurate transitions. For instance, apparent transitions from one employer to another only because the employer's registration number in the database has changed. Mergers, workers becoming self-employed or departments that become detached from mother firms, as well as purely judicial changes such as the status of the enterprise or a different company name, - they all lead to transitions which the employees themselves do not experience as job changes, and they will not be reported as such (Allaart, 2000). To a certain degree, this 'false' mobility is corrected for in the Datawarehouse. We developed an algorithm in order to make a distinction between 'individual' (I), 'collective' (C) and 'no' (Q) mobility and people in a special (S) employment regime. This algorithm has been applied to all wage earners who then receive a mobility code I, C, Q. Only people with an 'special' regime were excluded and receive no mobility code (S).[24] The idea is that if a certain transition from employer X to employer Y between two quarters is being made by 20 employees or more, this change of employer identification number is considered to be a statistical artefact. The employee making this transition gets a code 'C' and is not considered to have been mobile.

23 Allaart, 2000.

24 There are 4 types of regime: full-time, part-time, special and undefined. The special regime refers to seasonal work and temporary work (literally 'at short intervals'). These workers are believed to be mobile by definition and they would distort the mobility rates of the total population.

**Table 2.26** SWOT analysis on measuring mobility using the Datawarehouse

| STRENGTHS | WEAKNESSES |
|---|---|
| • Exhaustive → detailed breakdown of variables (e.g. NACE sector of activity), no sampling errors, no proxy respondents; no memory distortion<br>• Measuring combination of activities possible<br>• Quarterly data on individual level: career-path analysis possible<br>• Relatively up-to-date | • Not internationally comparable<br>• Coverage is around 90% of inhabitants (e.g. no pensioners); the missing 10% are mostly non-active people<br>• No qualitative data - data are gathered for administrative purposes, not for research<br>• Delays in registration can affect the data quality<br>• Mobility of job = mobility of enterprise (there is no information on establishments)<br>• Administrative change of ID-number of enterprises (mergers, split-offs, take-overs) leads to re-coding and can therefore overestimate mobility ('false' mobility)<br>• No information on educational attainment is available |
| • Importance of register data is set to increase (due to software/hardware penetration)<br>• 'false' mobility will be resolved through use of unique ID-number allocated to establishments<br>• The use of this unique ID-number will result in the collection of data at establishment level<br>• Coverage will increase since more databases will be linked to the Datawarehouse (e.g. for pensioners) | • Changes in public opinion/legislation on privacy could affect use of data in Belgium |
| **OPPORTUNITIES** | **THREATS** |

Source: Camire, Steunpunt WAV, 2004

Another problem of register data is that people may be included in several divisions. A frequent combination is of work and benefits. It is fairly important for the size of the trends whether someone who is partially disabled, but who continues to work for the same employer, is counted as still at work or making an exit from the labour market.[25] In the Datawarehouse, the problem does not occur, due to the coupling of various administrative databases by means of a unique identification number, resulting in an extensive and detailed socio-economic nomenclature.

Another important problem is that a change of jobs is in fact counted as a change of legal employer. It means that no information is available on the level of the local establishment, but only on the level of the legal employer, i.e. the enterprise. A change of establishment within the enterprise is therefore not rated as mobility. Furthermore, the internal mobility (for example, through promotion) within an establishment or enterprise is hence not measured as mobility. The (Belgian) LFS, on the other hand, measures on the level of the local establishment. Question 65 enquires into the situation one year before the survey, giving employees the choice between 'the same job' and 'another job', among other options. The instructions for the interviewers state that 'job' should be narrowly interpreted as 'same statute, same post, and same local establishment'. By implication, mobility within the company is also measured, for instance due to upward mobility within the local establishment. Nevertheless, it is hard to determine whether these instructions are implicated the same way in each interview.

25 Allaart, 2000.

Information about mobility within the enterprise is in fact a less relevant problem in the context of studies on the mobility of knowledge and know-how, since the knowledge remains in the possession of the enterprise in those cases. However, the intrafirm mobility plays an important role in studies about the efficient allocation of knowledge and know-how within the company.

### 2.5.2 Confronting LFS and DWH

Below, we will compare both sources on a number of different levels. Firstly, we want to compare a few 'stocks': the total population, the number of people in work and finally the number of (wage-earning) employees distributed by age, gender and activity sector. Subsequently, we use both sources to calculate a few 'flows', namely the flows into and from the working segment.

*Comparison of stock*

In the first instance, we compare the total population aged between 15 and 64 of both sources. This immediately shows that some people (6.3%) are missing in the Datawarehouse (the LFS is an extrapolation for the entire population). As mentioned above, the population of the Datawarehouse consists of all people who were known to one of the social security institutions involved in the Datawarehouse during one quarter. Added to these are the individuals' family members (in so far as they are not already known by one of the participating institutions). Part of the total population is therefore missing from the Datawarehouse. Presumably, most of them are inactive (like pensioners and/or people fulfilling domestic tasks), but also employees like outbound frontier workers and unpaid helpers (of the self-employed) are absent. Of the group of unemployed, only those receiving benefits are represented in the Datawarehouse (constituting the vast majority, however).

The fact that retired people make up an important part of the missing numbers can be deduced from a strong deviation between both sources with respect to the age group of the 45 to 64 years old, especially women (17.9%). For women, the official retirement age in 2000 was 62 (for men, it was 65). It explains why many women over 62 'disappear' from the Datawarehouse. Furthermore, the highest age group contains many women who have never or rarely entered the labour market. These women do not feature in the Datawarehouse unless they are known through their husbands.

**Table 2.27** Total population between 15 an 64 years old according to LFS and DWH (Belgium; 2000)

| | LFS (annual average) | | | DWH (2nd quarter) | | | Difference | | |
|---|---|---|---|---|---|---|---|---|---|
| | Total (n) | Men (n) | Women (n) | Total (n) | Men (n) | Women (n) | Total (%) | Men (%) | Women (%) |
| 15-24 years | 1,243,900 | 631,700 | 612,300 | 1,220,600 | 619,500 | 601,100 | 1.9 | 2.0 | 1.9 |
| 25-34 years | 1,459,000 | 740,000 | 719,200 | 1,397,500 | 707,300 | 690,200 | 4.4 | 4.6 | 4.2 |
| 35-44 years | 1,588,600 | 803,100 | 785,400 | 1,541,800 | 778,300 | 763,500 | 3.0 | 3.2 | 2.9 |
| 45-64 years | 2,427,600 | 1,208,800 | 1,218,800 | 2,161,400 | 1,127,900 | 1,033,600 | 12.3 | 7.2 | 17.9 |
| Total | 6,719,200 | 3,383,600 | 3,335,600 | 6,321,400 | 3,233,000 | 3,088,300 | 6.3 | 4.7 | 8.0 |

Source: NIS LFS, KSZ-DWH Labour Market (Processing Steunpunt WAV)

Deviations also exist with regard to the working segment. On the basis of the LFS, two methods can be used to demarcate the number of people in work: either according to the ILO-definition (having worked for more than one hour during the reference week) and according to subjective questioning (for Belgium, question 81).

**Table 2.28** Number of people in work according to LFS and DWH (Belgium; 2000)

| Working segment | LFS (average 2000) (n) | DWH (2nd quarter 2000) (n) | Difference (n) | (%) |
|---|---|---|---|---|
| q81 | 3,947,800 | 3,830,700 | 117,100 | 3.4 |
| ILO | 4,067,100 | 3,830,700 | 236,400 | 6.2 |

Source: NIS LFS, KSZ-DWH Labour Market (Processing Steunpunt WAV)

The LFS gives a higher number of people in work than the Datawarehouse. Remarkably, the difference is nearly twice as big compared to the ILO-definition in the LFS. This definition is very broad in the sense that any person working just one hour during the reference week (paid or unpaid as a volunteer) is considered to be in work. For example, if students who worked for at least one hour are asked in question 81 to specify their socio-professional status, they will presumably define themselves as students rather than employees.

The differences between the LFS and the DWH can be attributed to several causes. In the first place, the measuring methods are obviously entirely different: a comprehensive administrative registration (of a large part of the total population) compared to an extrapolated verbal questioning (for one in four respondents even via proxy-respondents). The strengths and weaknesses of both measuring methods have been discussed previously.

Furthermore, in the Datawarehouse, people are only considered to be in work when they are officially reported to the social security as such, which does not include unpaid volunteers or moonlighters. Besides, some employees are not registered with the Belgian social security system, particularly cross-border workers (living in Belgium, but working abroad).

Furthermore, the data for Table 2.28 for the Datawarehouse relates to the last day of the second quarter of 2000, while those of the LFS are annual averages. The number of employees according to administrative sources always lies slightly below the annual average in the second quarter.

Below, we make the comparison between the Datawarehouse and the LFS on the basis of the ILO-definition in the LFS, because it is the most usual way to determine the socio-economic position of the respondent.

In Table 2.29, we focus on the wage earners. These data in the Datawarehouse are also calculated as annual averages (i.e. the average of four quarters), which makes the comparison more clear-cut.

**Table 2.29** Number of employed people by age and gender according to LFS and DWH (Belgium; 2000)

| Employees | LFS (annual average) | | | DWH (annual average) | | | Difference | | |
|---|---|---|---|---|---|---|---|---|---|
| | Total (n) | Men (n) | Women (n) | Total (n) | Men (n) | Women (n) | Total (%) | Men (%) | Women (%) |
| 15-24 years | 341,400 | 192,800 | 148,600 | 375,400 | 206,500 | 168,900 | -9,1 | -6,6 | -12,0 |
| 25-34 years | 1,047,100 | 563,700 | 483,400 | 948,200 | 512,000 | 436,200 | 10,4 | 10,1 | 10,8 |
| 35-44 years | 1,079,500 | 592,900 | 486,500 | 986,900 | 546,900 | 440,000 | 9,4 | 8,4 | 10,6 |
| 45-64 years | 972,400 | 601,100 | 371,300 | 925,500 | 569,200 | 356,200 | 5,1 | 5,6 | 4,2 |
| Total | 3,440,400 | 1,950,600 | 1,489,800 | 3,235,900 | 1,834,600 | 1,401,300 | 6,3 | 6,3 | 6,3 |

Source: NIS LFS, KSZ-DWH Labour Market (Processing Steunpunt WAV)

As expected, the LFS contains more wage earners than the Datawarehouse (+6.3%). However, important differences emerge relating to age. For example, among the 15 to 24 years old, we note that the LFS contains fewer wage earners than the Datawarehouse. No suitable explanation is available for this. Possible explanations are the fact that proxy-respondents are more common among young people and they are less accurate in reporting minor jobs carried out by youngsters. This may result in fewer youngsters being considered as employed in the LFS. On the other hand, the administrative databases suffer from some 'contamination' from people with a temporary contract (including interim work): often, the date of the end of the contract is given incorrectly for these people resulting in the number of temporary wage earners being overestimated at the end of the quarter. Since young people are employed on temporary contracts more often than other age groups, their group is more affected by the problem, causing wage-earning youngsters to be overreported in the administrative databases.

Next, we look at the distribution of the wage earners by the activity sector in which they are deployed. We will use the same sector classification as before.

**Table 2.30** Number of employed people by activity sector according to LFS and DWH (Belgium; 2000)

| STILE sector | Description | LFS (n) | DWH (n) | Difference (n) | Difference (%) |
|---|---|---|---|---|---|
| | **ICT** | **169,645** | **142,512** | **27,133** | **19.0** |
| 1.1 | Office accounting and computing machinery and electronic equipment | 33,459 | 26,129 | 7,330 | 28.1 |
| 1.2 | Telecommunications | 88,935 | 80,179 | 8,757 | 10.9 |
| 1.3 | Computer and related activities | 47,251 | 36,205 | 11,046 | 30.5 |
| | **Agriculture, mining, manufacturing, utilities, construction** | **952,316** | **812,541** | **139,775** | **17.2** |
| 2.1 | Agriculture, forestry, fishing | 16,987 | 22,328 | -5,341 | -23.9 |
| 2.2 | Mining, quarrying | 7,451 | 4,003 | 3,448 | 86.2 |
| 2.3 | Consumer goods | 152,259 | 136,074 | 16,185 | 11.9 |
| 2.4 | Wood, pulp and paper, printing, oil refining, chemical industry, rubber, plastics | 197,822 | 156,781 | 41,041 | 26.2 |
| 2.5 | Metals, machinery (not ICT) | 277,831 | 229,454 | 48,377 | 21.1 |
| 2.6 | Other manufacturing | 69,150 | 57,640 | 11,510 | 20.0 |
| 2.7 | Energy and water | 34,214 | 26,595 | 7,619 | 28.6 |
| 2.8 | Construction | 196,603 | 179,667 | 16,936 | 9.4 |
| | **Trade, hotels, restaurants, transport, communication, financial intermediation, other services (excl ICT, educational and research institutes)** | **1,018,457** | **1,085,155** | **-66,698** | **-6.1** |
| 3.1 | Wholesale and retail trade, hotels, restaurants | 453,143 | 509,646 | -56,502 | -11.1 |
| 3.2 | Transport, storage, post, communications | 211,865 | 170,600 | 41,265 | 24.2 |
| 3.3 | Financial intermediation | 147,430 | 128,274 | 19,156 | 14.9 |
| 3.4 | Other services | 206,018 | 276,635 | -70,617 | -25.5 |
| | **Educational and research institutes** | **355,487** | **323,612** | **31,875** | **9.8** |
| 4.1 | Universities, educational institutions | 344,702 | 313,199 | 31,503 | 10.1 |
| 4.2 | Research institutes | 10,786 | 10,413 | 373 | 3.6 |
| | **Other community services** | **920,085** | **850,919** | **69,166** | **8.1** |
| 5.1 | Health activities | 404,657 | 321,466 | 83,191 | 25.9 |
| 5.2 | Other community services | 515,428 | 529,452 | -14,024 | -2.6 |
| 99 | Extraterritorial | 24,302 | 3,141 | 21,161 | 673.6 |
| | Unknown | 104 | 18,035 | -17,931 | -99.4 |
| | **Total Economy** | **3,440,395** | **3,235,914** | **204,481** | **6.3** |

Source: NIS LFS, KSZ-DWH Labour Market (Processing Steunpunt WAV)

The deviations between the LFS and the DWH by sector are extremely large. Globally speaking, as we saw earlier, the LFS contains 6.3% more wage earners than the DWH. But that by no means applies to all sectors: only a few sectors have a deviation of 6.3% or less. Even if we only look at the large sector aggregates (indicated in bold in the table), we see that the differences are significant. On a more detailed level, the differences are even more striking. The only thing we can conclude from this is that both sources draft a very different picture of

the distribution of wage earners and that we are actually talking about two different 'realities': the administrative reality and the subjective reality.

In the administrative source, the NACE code is allocated by the employer and it reflects the economic, judicial reality. In the LFS, the respondents (or proxy-respondents) themselves indicate the sector they work in, reflecting a subjective reality of which it is hard to determine on what (subjective) grounds it is based. Additionally, we saw that the quality of the reply by proxy-respondents deteriorates as the questions become more detailed. It would be safe to assume that information given by proxy-respondents on activity sectors is questionable.

*The comparison of flows*

The differences between the 'stock' irrefutably lead to differences relating to the 'flows' in the labour market. Firstly, we look at the flow from one job to another (in other words, flows within the working segment) and secondly we focus on flows into and out of the working segment. Contrary to the comparative analysis of the stock, we make use of the subjective questioning in the LFS (question 81) in order to determine the socio-economic position of the respondent at the moment of the survey. The reasoning behind this is that, in order to measure the socio-economic position of the respondent one year before the survey, we also have to make use of subjective questioning (questions 59 and 65) and those questions are drafted identically to the question into the socio-economic position at the moment of questioning (question 81). For the flows within the working segment, the Datawarehouse provides data of the four quarters of 2000, allowing us to calculate an annual average. For the flows into and from the working segment, we only dispose of the second quarter of 2000.

The differences between both sources with regard to the flows between jobs (16.1%) exceed those with regard to the stock (6.3%), but overall, these differences are not particularly dramatic. According to the LFS, approximately 235,800 people changed jobs over the past year in 2000, compared to a total of around 203,100 according to the Datawarehouse (Table 2.31). In any case, both sources indicate a same order of magnitude, both for stock and for flows. As far as the age distribution is concerned, there are important differences: with the 25 to 34 years old, the difference with respect to the flows runs up to 25%, whereas it amounts to 17% for the 35 to 44 years old. A possible explanation is the fact that the Datawarehouse does not measure internal mobility within the enterprise whereas the LFS, following the approach taken in this report, measures a change of function/position as mobility. It may well be that this internal mobility is more prevalent in the age groups 25-34 and 35-44, for example by the promotion or by people still looking out for the right job within the company.

When we carry out the distribution by sector of activity (distribution into STILE sectors on the basis of the two digit NACE code, the differences nevertheless become substantial, identical to the large differences observed with regard to the stocks. For example, it is striking that the LFS contains approximately 70% more job-to-job mobile people in the telecommunication sector (STILE sector 1.2) than the Datawarehouse, whereas large differences can also be found in the industrial sectors.

Since the differences in flows partly emanate from the differences between the stock, it is useful to express job-to-job mobility as a relative measure, namely as a job-to-job mobility rate (flow/stock * 100). Doing so reduces the differences between both sources. The LFS gives an inflow rate of 6.9% compared to the DWH's rate of 6.3%, which is a difference of 9.2% - this is (6.9-6.3)/6.3*100 - whereas the difference between both absolute numbers was 16.1%. The difference for the 25 to 34 years old also becomes significantly smaller (13.3% compared to 25.2%). The distribution by activity sector teaches us the same thing: the differences decrease. The deviation with respect to the mobility rate in the telecommunication sector is approximately 50%, while the deviation with respect to the absolute number of job-to-job mobiles was still 70%. In spite of this, the differences with regard to the mobility rate in the distribution by sector still remain very large.

**Table 2.31** Job-to-job mobile employees and job mobility rate by gender, age and activity sector according to LFS and DWH (Belgium; annual average 2000)

| | Job-to-job mobile employees | | | | Job-to-job mobility rate | | |
|---|---|---|---|---|---|---|---|
| | LFS 2000 | DWH 2000 | Difference | | LFS 2000 | DWH 2000 | Difference |
| | (n) | (n) | (n) | (%) | (n) | (n) | (%) |
| **Total** | **235,800** | **203,089** | **32,700** | **16.1** | **6.9** | **6.3** | **9.2** |
| Men | 140,500 | 121,049 | 19,400 | 16.0 | 7.2 | 6.6 | 9.1 |
| Women | 95,300 | 82,040 | 13,300 | 16.2 | 6.4 | 5.9 | 9.3 |
| 15-24 years | 47,100 | 46,474 | 600 | 1.4 | 13.8 | 12.4 | 11.5 |
| 25-34 years | 110,500 | 88,289 | 22,200 | 25.2 | 10.6 | 9.3 | 13.3 |
| 35-44 years | 54,700 | 47,165 | 7,600 | 16.0 | 5.1 | 4.8 | 6.1 |
| 45-64 years | 23,400 | 21,161 | 2,300 | 10.7 | 2.4 | 2.3 | 5.3 |
| **STILE sector** | | | | | | | |
| 1.1 | :u | 1,314 | :u | :u | :u | 5.0 | :u |
| 1.2 | 6,400 | 3,809 | 2,600 | 67.8 | 7.2 | 4.8 | 51.3 |
| 1.3 | 7,800 | 6,007 | 1,800 | 29.2 | 16.4 | 16.6 | -1.0 |
| 2.1 | :u | 1,444 | :u | :u | :u | 6.5 | :u |
| 2.2 | :u | 173 | :u | :u | :u | 4.3 | :u |
| 2.3 | 10,300 | 7,351 | 3,000 | 40.6 | 6.8 | 5.4 | 25.6 |
| 2.4 | 15,700 | 7,706 | 8,000 | 104.0 | 7.9 | 4.9 | 61.7 |
| 2.5 | 19,300 | 10,152 | 9,200 | 90.3 | 7.0 | 4.4 | 57.2 |
| 2.6 | :u | 3,423 | :u | :u | :u | 5.9 | :u |
| 2.7 | :u | 588 | :u | :u | :u | 2.2 | :u |
| 2.8 | 21,500 | 20,751 | 800 | 3.7 | 10.9 | 11.5 | -5.2 |
| 3.1 | 42,200 | 45,565 | -3,400 | -7.4 | 9.3 | 8.9 | 4.1 |
| 3.2 | 18,200 | 15,336 | 2,800 | 18.6 | 8.6 | 9.0 | -4.5 |
| 3.3 | 8,900 | 7,329 | 1,500 | 20.9 | 6.0 | 5.7 | 5.1 |
| 3.4 | 23,000 | 24,481 | -1,500 | -6.1 | 11.2 | 8.8 | 26.1 |
| 4.1 | 12,300 | 9,652 | 2,600 | 26.9 | 3.6 | 3.1 | 15.3 |
| 4.2 | :u | 795 | :u | :u | :u | 7.6 | :u |
| 5.1 | 16,400 | 16,531 | -100 | -0.5 | 4.1 | 5.1 | -21.0 |
| 5.2 | 21,500 | 19,960 | 1,500 | 7.7 | 4.2 | 3.8 | 10.6 |
| 99 | 1,100 | 128 | 1,000 | 793.6 | 4.7 | 4.1 | 15.5 |

:u data unreliable.
Source: NIS LFS, KSZ-DWH Labour Market (Processing Steunpunt WAV)

However, not only the mobility within the working segment is important when researching mobility and the diffusion of knowledge and know-how. The flows into and from the working segment also play an important role. It is therefore interesting to see what both sources teach us about these flows into and from the working segment. We try to keep the analysis simple and transparent by a not too detailed distribution of the various socio-economic positions, making use of the global division between being in work or not.

We start from the previous observation that the populations of both databases differ: the LFS contains 6,719,000 people aged between 15 and 64, compared to the Datawarehouse counting 6,297,000; a difference of 422,000 people or 6.7% more in the LFS than in the Datawarehouse.[26] The difference lies with the number of people not in work (+10.9%) rather than with the total number of people in work (+4.0%): the Datawarehouse incorporates only part of the unemployed, namely those receiving benefits, whereas many retired people are also missing from it.

Due to the larger population, we also expect the LFS to contain more mobile people. However, it is immediately obvious that the LFS contains precisely fewer mobile people. The Datawarehouse counts 556,000 mobile people (into and from the working segment), compared to the LFS with 467,000 people, which is 89,000 people less (-15.9%) than in the Datawarehouse. Especially the flow from no work to work has been recorded as much smaller in the

26 The difference with Table 2.28 stems from the fact that the totals in Table 2.31 are dated at the end of the second quarter of 1999 and the totals of Table 1 date from 2000. The database on which this exercise about flows into and from the working segment is based starts from the population at the end of the second quarter of 1999 and it follows the population until the second quarter of 2000.

LFS (-20.1%). The number of mobile people around the working segment is estimated indisputably lower in the LFS than in the administrative databases of the Datawarehouse. Possibly, the memory effect may play a role here in the LFS, resulting in (relatively short) periods of unemployment or inactivity one year before the survey not being remembered. The effect will be even stronger with proxy-respondents.

**Table 2.32** Mobility between work and no work according to LFS and DWH (Belgium; 1999-2000)

| LFS annual average (nx1,000) Status 2000 / Status 1999 | Work | No work | DWH 2nd quarter (nx1,000) Status 2000 / Status 1999 | Work | No work |
|---|---|---|---|---|---|
| Work | 3,731 | 218 | Work | 3,516 | 244 |
| No work | 249 | 2,521 | No work | 311 | 2,225 |
| Total | 3,980 | 2,739 | Total | 3,827 | 2,470 |
| Total population | 6,719 | | Total population | 6,297 | |
| Total mobile people | 467 | | Total mobile people | 556 | |
| Mobility rate | 7.0 | | Mobility rate | 8.8 | |
| **Difference (LFS-DWH) (nx1000) Status 2000 / Status 1999** | **Work** | **No work** | **Difference (LFS-DWH) (%) Status 2000 / Status 1999** | **Work** | **No work** |
| Work | 215 | -26 | Work | 6.1 | -10.6 |
| No work | -63 | 296 | No work | -20.1 | 13.3 |
| Total | 152 | 270 | Total | 4.0 | 10.9 |
| Total population | 422 | | Total population | 6.7 | |
| Total mobile people | -89 | | Total mobile people | -15.9 | |
| Mobility rate | | | Mobility rate | -21.2 | |

Source: NIS LFS, KSZ-DWH Labour Market (Processing Steunpunt WAV)

Even if we account for a difference in the population by calculating a relative mobility rate (number of mobile in proportion to the entire population), the difference in mobility measured remains large: 8.8% in the Datawarehouse and 7.0% in the LFS. It is a difference of -21% - this is (7.0-8.8)/8.8*100 - which is even bigger than the difference between the absolute numbers (-15.9%).

Even without making a distribution by age, gender or activity sector, we still get a very different picture from both sources. We can assume that, when we look at these flows into and from work for various activity sectors, the differences increase further still. The LFS is consequently not the most suitable instrument for that sort of analysis.

*Conclusion*

From these analyses, we can conclude that the differences between the LFS and the DWH with relation to the *stocks* and *job-to-job mobility flows* generally remain fairly limited. But when we make a distribution by activity sector, the differences mount up. It seems as if the variable ‘activity sector’ reflects a different reality in both sources and furthermore that the quality of this variable in the LFS is dubious, particularly for certain groups like the youngsters where many proxy-respondents are used.

With relation to the *flows into and from the working segment*, the differences are greater, even on a very general level (global difference between work and no work; no distribution by age, gender or sector). For analyses regarding the inflow into and outflow from the working segment for various activity sectors, the LFS is not the most suitable instrument in the light of the substantial deviations from the administrative data.

Chapter
3

# Recommendations on the use of register data and LFS

The importance of research into mobility in the labour market has sharply increased over the last few years and many researchers have homed in on the issue. The most important resource for studying mobility in the labour market was (and still is) the Labour Force Survey which gauged the labour market situation of respondents one year before the time of the survey. Soon, major pitfalls of the survey came to light, as discussed above.

In Belgium also, mobility research has been based mainly on the information available in the LFS. Recently, the Datawarehouse Labour market has become an important new source at the disposal of researchers. Experiences in the Scandinavian countries demonstrated that administrative databases have considerably widened the scope for labour market research. More and more countries, including Belgium and Germany, have opened up their administrative databases for research. There is an increasing awareness that they provide significant opportunities for labour market research.

With the analyses in the context of STILE, we wanted to explore the possibilities of this new database to assess the current and future value of the LFS and of administrative data for research into mobility in the labour market. More specifically, we tried to gauge the value of both sources for research into the mobility of employees in the ICT sector in order to gain a better insight into the knowledge flows into and around the ICT sector as well as of the distribution of Information Society knowledge. This was done by an in-depth analysis of the level of interaction between the ICT sector and other branches of the economy on the basis of the Datawarehouse on the one hand, and a global comparison of both sources with regard to stocks and flows in and around the labour market on the other hand.

The conclusions concerning the content about the mobility of employees in the ICT sector and the diffusion of Information Society knowledge have been dealt with above. Here, we will examine the strengths and weaknesses of both sources, firstly in the light of the required research and secondly, in terms of opportunities for the future.

The first analyses of mobility in and around the labour market on the basis of the Datawarehouse have clearly illustrated the possibilities but also the limitations of administrative data for mobility research in general and more specifically for research into knowledge flows into and around the ICT sector.

The main advantages are: their exhaustive character which requires no extrapolation, enabling a far-reaching breakdown of variables, which is particularly crucial for a detailed demarcation of the ICT sectors; the non-occurrence of quality loss due to data affected by memory distortion and proxy-respondents; clear objective definitions of socio-economic positions and the activity sectors; and the possibility to assemble long-term data on a quarterly basis.

The main disadvantage is the absence of a variable giving insight into the knowledge and skills of the population, for example the educational attainment. This makes it impossible to define the transfer of an employee in terms of high or low knowledge flow and it forces us to assume that any employee transfer involves a certain transfer of knowledge. Another disadvantage is the existence of ‘administrative contamination’, for example by purely administrative changes like employers’ codes or administrative delays. This shortfall is nevertheless partly remedied and will be solved in the future by the use of a unique ID-number for establishments. Lastly, a proportion of the population is missing from the Datawarehouse. But since

it largely concerns inactive people, for example pensioners, this drawback is less dramatic for research into knowledge flows in the ICT sector.

In general, we can safely say that the strengths of the Datawarehouse correspond to the weaknesses of the LFS and inversely that the weaknesses of the Datawarehouse correspond to the strengths of the LFS. An important advantage of the LFS, apart from the opportunity it creates to make international comparisons, is the information it contains about the educational attainment of respondents; an important drawback is the lack of a reliable meticulous detailing of the NACE code because of its sample character, the use of proxy-respondents and the subjective definition of activity sectors.

There are no ready-made solutions to turn the LFS into a more suitable instrument for measuring the mobility of Information Society knowledge. But a few avenues are available to improve the quality of the data.

In the first instance, the problem relating to the memory effect may be resolved by extending the panel character of the LFS: through a targeted second round of surveys to (a proportion of) respondents after one year, the respondents would report twice on their current situation, making it possible for changes to be recorded.

Furthermore, the use of proxy-respondents could be restricted. After all, research has indicated that the quality of replies given by proxy respondents falls sharply with regard to the finer details.

Thirdly, the coding of the activity sectors should become a much more objective procedure. It is necessary to broaden the questioning on the sector of activity by asking for more details on the activity of the establishment/enterprise the respondent works for, in order to enable a more objective sector classification. Workpackage 3 of the STILE project goes into more detail on this subject.

The most comprehensive solution for many of the drawbacks discussed is nevertheless for both sources to underpin each other with their respective strengths. The advantages of both sources are clearly complementary. By linking the LFS data to administrative sources, for example like the Datawarehouse, we could effectively kill two birds with one stone. The Datawarehouse could be complemented with data on educational attainment and the LFS data enriched with panel data regarding the labour market situation, and an objective definition of the activity sector the respondent is working in.

In future, the significance of administrative data can only grow by the steady growth of ICT applications by public authorities and because an increasing amount of information is recorded with regard to the labour market and education. It is abundantly clear that the possibilities of administrative databases for quantitative analysis are unsurpassable. Then again, the strength of surveys like the LFS resides in the fact that they can obtain more qualitative information that can complement the quantitative information contained within administrative databases. These qualitative data form the indispensable motor of explanatory labour market research. The future of surveys like the LFS therefore lies in the collection of qualitative information, ideally linked to the administrative databases to make for a comprehensive research instrument.

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