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FIRST EXPLORATION OF THE BELGIAN HRST DATA

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1. Introduction

Highly skilled human resources have become an important condition for the further development of western economies. The diffusion of knowledge is considered als 'a crucial link between technological progress and economic growth, social development and environmental well-being'. To that purpose, the OECD and the European Commission encourage researchers to collect information concerning the mobility of highly skilled people.

As a result of this request to monitor the labour market position of this specific group, a specific dataset with information about the (labour market) career of highly educated people has been created in Belgium. To obtain this information, the results of the decennial Census have been connected to information from the rich administrative databases of the Belgian Social Security System, with technical assistance of the Crossroadsbank of Social Security. At the end of 1999, the creation of this dataset was finished. This paper presents the first exploration of these data.

In paragraph 2, we focus on the dataset itself. We indicate to what extent we could meet the recommendations of the 'Canberra Manual' in the process of the creation of the Belgian dataset about Human Resources devoted to Science and Technology (HRST). This Canberra Manual provides guidelines, specifically for the measurement of HRST and the analysis of such data.

Paragraph 3 presents the first tables of this Belgian HRST-study. The first series of tables and figures focus on the difference between mobility of persons over a short period (of one year) and mobility over a longer period (of four years). For this longer period, 1993-1997, mobility patterns of groups with different characteristics are explored. We consider differences in terms of gender, age, qualification, occupation and region.
A second series of tables documents the flow of highly qualified personnel between industries. These tables only regard the people who changed firms between 1996 and 1997. We compare the results of this analysis with the Nås study (1998) about the labour market mobility of highly qualified personnel in three Scandinavian countries.

2. The Belgian HRST sample

2.1 The contents of the Belgian HRST-sample

In the decennial Belgian Census (with 1991 as its most recent edition), we have information about all Belgian residents. This is also the only source to provide information about the occupation (encoded with ISCO) and the qualification (encoded with ISCED) of people. The Census served to select people for the HRST-sample. A first filter, based on the highest qualification and the occupation of the Belgian residents, limited the number of people in the sample to all highly educated persons. A second, age specific filter, reduced the sample to all men between 20 and 63 years old (in 1991) and all women between 20 and 58 years old (in 1991).[1]

This group of 270 000 persons (or some 3% of the total population) was retraced in the data bases of the four most important institutions of the Belgian social security (RSZ, RSZPPO, RSVZ, RVA[2]) on the dates of December 31th of 1993, December 31th of 1994, December 31th of 1995, December 31th of 1996, and March 31th of 1997. For each of these five observations, this process of data-linking provides information about e.g. the presence / absence of information about individuals in those social security databases, working time schedule (part time or full time employees), the number of jobs a person has, the sector and size of the company one is working for, if someone has changed between firms since the preceding observation, if the respondent is self-employed or receiving unemployment benefits because of early retirement. With this information, the socio-economic position of the 'stock' can be documented for the five moments of observation. It is also possible to reconstruct the career of every single person in the HRST-survey, and to draw mobility patterns for all highly educated Belgians.

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1 Those sampling restructions and some other 'filters' have been used to reduce the costs of the data-linking.

2 RSZ, 'Rijksdienst voor Sociale Zekerheid' has the information about nearly all employees that work in Belgium.
RSZPPO, 'Rijksdienst voor Sociale Zekerheid van de Plaatselijke en Provinciale Overheden', has the supplementary information about employees in the local governments.
RSVZ, 'Rijksinstituut voor de Sociale Verzekering der Zelfstandigen' documents the self-employed living in Belgium.
RVA, 'Rijksdienst voor Arbeidsvoorziening', has information about every benefit that is paid via the unemployment system.

Before we present the latter analyses, we check if the Belgian HRST-population meets the recommendations that were elaborated in the 'Canberra Manual'.

2.2 The Belgian HRST-sample versus the 'Canberra Manual'-recommendations: the coverage

The Canberra Manual is intended tot provide guidelines for both the measurement of Human Resources devoted to Science and Technology (HRST) and the analysis of such data.

The definition of HRST in this Canberra Manual applies to both supply and demand for HRST. The demand for HRST, i.e. the number of people who are actually required in Science&Technology (or S&T) activities at a certain level, is covered when we consider all people working in a 'HRST-occupation'. The supply of HRST is estimated when taking all persons with a 'HRST-qualification'. *The Canberra Manual proposes to define HRST as the people who fulfil one or other of the following conditions: (a) successfully completed education at the third level in a S&T field of study, or (b) not formally qualified as above, but employed in a S&T occupation where the above qualifications are normally required.*

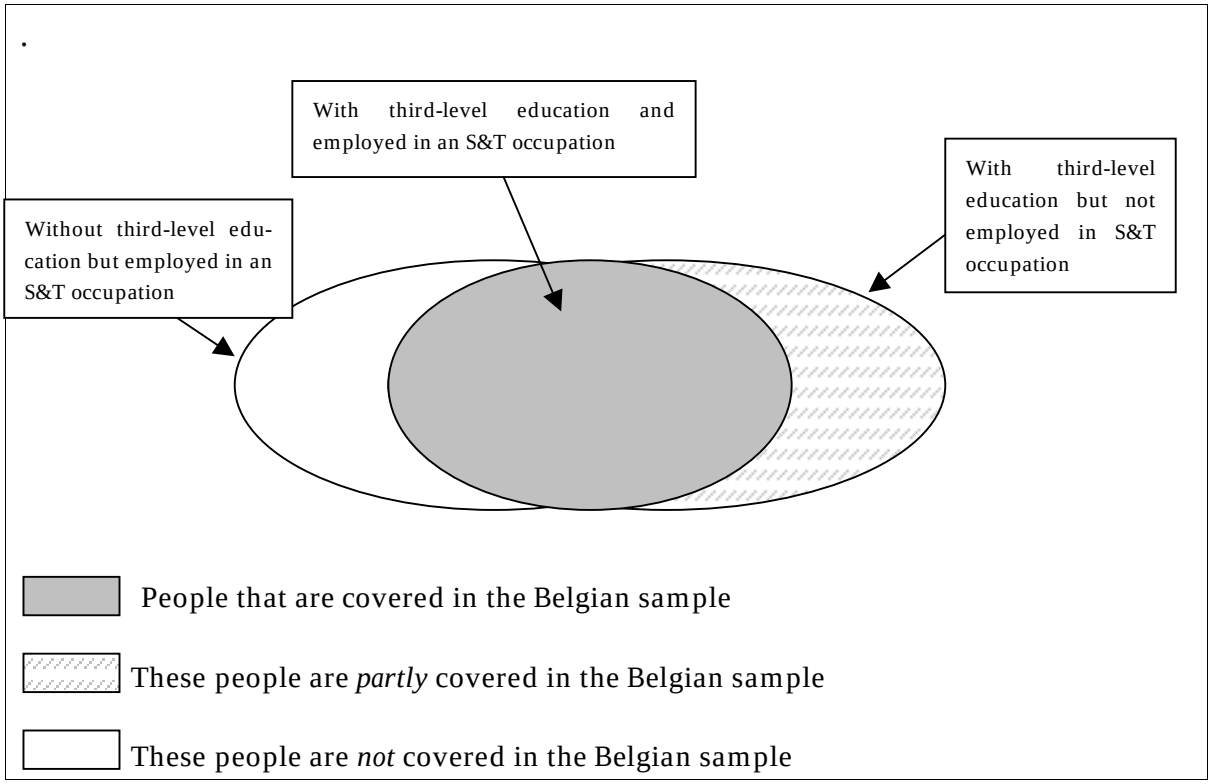
The Belgian HRST definition matches this definition to a large extent, albeit not perfectly. We can specify this with three remarks.

Firstly, the Belgian HRST-sample was not created following this or-or-definition, but following an and-and-definition: the Belgian HRST-sample restrained everybody who (a) is qualified cf. the high HRST-standards, and (b) worked at that moment in a specific occupation. As such the people with a HRST-qualification that work in other occupations are not covered. Low qualified people that nevertheless work at the higher HRST-level, e.g. as a IT professional, are neither in the sample. We present the coverage of this Belgian HRST-sample in figure 1 (a figure that is taken out of the Canberra Manual).

The Belgian HRST-sample covers what is called the core coverage of the HRST definition, i.e. people that are both qualified and working as HRST. In figure 1, we find this group in the dark-coloured area. The oval on the left contains individuals who only meet the occupation condition. They are not qualified in ISCED level 5 or higher, and thus are not taken in our sample. The oval on the right contains

individuals who only meet the qualification condition. They are not employed as HRST and are thus only partly[3] covered in our sample.

Figure 1. Principal categories of HRST



Source: Canberra Manual, Steunpunt WAV.

A second remark concerns the breakdown of the sample in terms of *qualification*. We can make a distinction between a university-level (or ISCED 6 or 7) and a technician-level (or ISCED 5). A more detailed statistical breakdown of the Belgian HRST can not be obtained. This means that *we can only divide into the broad classes* the Canberra Manual suggests. Two more detailed breakdowns are not possible, firstly the suggestion to give information about people qualified lower than ISCED 5, and secondly to make a distinction within the university between an upper part of ISCED 7, a lower part of ISCED 7 and ISCED 6.

Thirdly, the possibilities for research are limited by the occupation breakdown. Specifically, in the sample we have every person that responded in the Census

3 The selection of the sample not only picked out persons who worked in a specific number of (HRST-)occupations, but also the ones that were not working. Only the people active in an occupation that is not in the HRST-shortlist were eliminated. Cf. infra.

1991 to have an occupation with the ISCO-code 211, 212, 213, 214, 221, 222, 244, 311 or 312. We also cover the people who answered in 1991 to be inactive or unemployed, and the people with an unknown labour market status. That is, we only miss information about the people who answered to work in an occupation that is not listed above.

As it was the case with the qualification breakdown, we *can detail the suggested minimum minimorum* concerning the occupation breakdown, the core coverage proposed in the Canberra Manual. This core coverage concerns the ISCO-groups of occupation 21 (Physical, Mathematical and Engineering Science Professionals) and 22 (Life Science and Health Professionals). Regarding the proposed extended coverage, we only have a fraction of the suggested occupations.

Table 1. Comparison between the Belgian HRST sample and the recommendations in the Canberra Manual

Occupation	Qualification		
	ISCED level 6+7	ISCED level 5	Less than ISCED level 5
ISCO 21 + 22	100%	100%	0%
ISCO 122+123+131 + 23 + 24 + 31 + 32 + 33 +34	Only 244, 311, 312	Only 244, 311, 312	0%
All other occupations	0%	0%	0%
Unemployed	100%	100%	0%
Out of the labour force	100%	100%	0%

Legende: Recommended core coverage
Extended coverage

Source: Steunpunt WAV

Table 1 summarises the comparison between the recommendations in the Canberra Manual and the Belgian HRST sample. The sample answers the most essential descriptions in the Manual: the persons that are in the center of the HRST definition are entirely documented by our data. When the Canberra Manual suggests extensions, the sample usually falls short of expectations. On the other hand, all of the non-active persons are picked out.

2.3 The Belgian HRST-sample versus the 'Canberra Manual'-recommendations: possible breakdowns

The Canberra Manual not only proposes to cover a specific part of the population when defining a group of persons for the HRST-analysis, it also suggests to use a specific set of statistical breakdowns. In this part, we verify if we can meet these breakdowns in terms of qualification, occupation, labour market status, economi-

cal sector of employment, type of activity, gender, age, national origin and ethnicity.

We already mentioned that we can easily devide HRST by *qualification* in two categories, ISCED 6+7 and ISCED 5. A more detailed classification (PhD's, other ISCED 7, ISCED 6, ISCED 5, lower than ISCED 5) can not be analysed with our dataset.

Concerning *occupation*, HRST 'core coverage' is excellent. With the Belgian data set, we can even detail this group with ISCO 21 and 22 into more detailed groups of occupations, particularly into ISCO 211 (physicists, chemists and related professionals), 212 (mathematicians, statisticians and related professionals), 213 (computing professionals), 214 (architects, engineers and related professionals), 221 (life science professionals, e.g. biologists and pharmacologists), 222 (health professionals, e.g. medical doctors and veterinarians).
A broader list of other occupations is difficult to produce. Only a limited number of occupations in the 'extended coverage' - ISCO 244 (social science and related professionals), 311 (physical and engineering science technicians), and 312 (computer associale professionals) - have been picked out in the Belgian list.

One final remark about these two variables has to be added. The information about the level of qualification and the occupation are derived from the 1991 Census. All other data - both about the *stock* as well as the *flows* - originate from other sources, and refer to another period, 1993-1997. This implies that the dataset registers someone who changed his occupation between 1991 and 1993 still in the occupation anno 1991, and ignores whoever qualified at a HRST-level after 1991.

HRST can be devided by *labour force status* using he administrative social security data. Whoever is recognised in the data base of RSZ, 'the Public Service for Social Security', is considered as an employee. The persons known by RSZPPO, a similar but smaller institution for the social security of the personnel of local governments, are also considered to be an employee. People registered by RSVZ, 'the Public Service for the Insurance of the Self-Employed', are labelled as self-employed. Finally, the RVA, an institution responsible for the payment of unemployment benefits, defines the number of unemployed. The labour market status becomes less clearly when someone is not recognised by one of these social security institutions. The most obvious conclusion is to consider this person as inactive. On the other hand, he or she can also have emigrated or deceased. The group

with an unknown labour market status in the five consecutive observations, spans 70 000 out of the 270 000 persons in the Belgian HRST sample.

We can only detail HRST by *sector of employment* for the people known by RSZ, the (almost entire group of) employees. The classification used by RSZ is the NACE nomenclature, and the detail is a 2-digit specification. This implies that most of the suggested sectoral breakdowns become possible.

All breakdowns of HRST by *type of activity* is impossible. In Belgium, we lack information about the functions (or activities) of people.

In the Belgian HRST dataset, we have information about the most important characteristics of HRST, *gender* and *age*. However, since we selected people in 1991 that were over 20 years old and under 58/63 years old, the small group of older people that are still active on the age of retirement can't be distinguished. Probably, the exclusion of the youngest group on the labour market poses a more important problem. The youngest person in our sample has 26 years of age in 1997. The reason for this is that we had to use 1991 data (using the decennial Census) to select people to meet the HRST-standards in the Canberra Manual, and 1993-1997 data (using administrative data) to get information about the labour market mobility of this population.

Nationality and *ethnicity* of the sample is unknown.

3. First results concerning mobility analysis of Belgian HRST

The survey contains information about 272 930 persons. In the social security files that were included in this research, there is no information on any of the five observations on 70 290 of these persons. The socio-economic position of this group is vague. The majority of these persons are older persons, and women have a greater share in this group than men. So, it sounds plausible that many of them left the labour market to do the housekeeping. On the other hand, they might also be emigrated or deceased. Because this 'unknown' group has never been part of the officially active population, we leave them out of the analysis. This implies that, in this first step, we narrow the scope to all highly educated persons in HRST-occupations who have been active on the Belgian labour market between 1993 and 1997, a group of 202 640 persons.

3.1 Definition of mobility

In defining labour market mobility, we determine two aspects.

First of all, the *period of time*. The HRST database contains information on five consecutive observations, (almost) each time with a one year interval. Consequently, we can analyse labour market mobility both for a short period (of one year) and for a medium long period (of four years). Both approaches will be considered in this paper.

Secondly, the *definition of mobility itself*. To get the best view on the labour market transitions of the HRST group, we distinct *four different types* of mobility.

I *Mobility of people between various employers or firms.* This is a definition in the narrow sense of mobility. Only movements between various employers are included. The people in this group have been an employee at two consecutive observations, but they have changed firms in between.

II *Other mobility of people at work.* People in this group have been in employment at two consecutive observations, but they changed their labour market status in one way or another. Possible transitions are full time - part time, or employee - self employed

III *Mobility in / out of the labour force.* These transitions include the movements to and from unemployment or inactivity to employment and in the other direction.

IV *Other transitions.* These transitions include all changes in the administrative databases out of the working force. This could refer to a non-active person who decides to register himself in the unemployment files.

Rest *No mobility.* All persons who are registered the same way in two consecutive observations.

Table 2 illustrates both approaches.

It is clear that the number of mobile persons is increasing when we enlarge the period from one to four years. The number of persons in mobility (types I to IV) more than doubles when looking at the situation 1993-1997 instead of looking at one year. The ‘consistent’ part of the survey declines from about 80% to 56%.

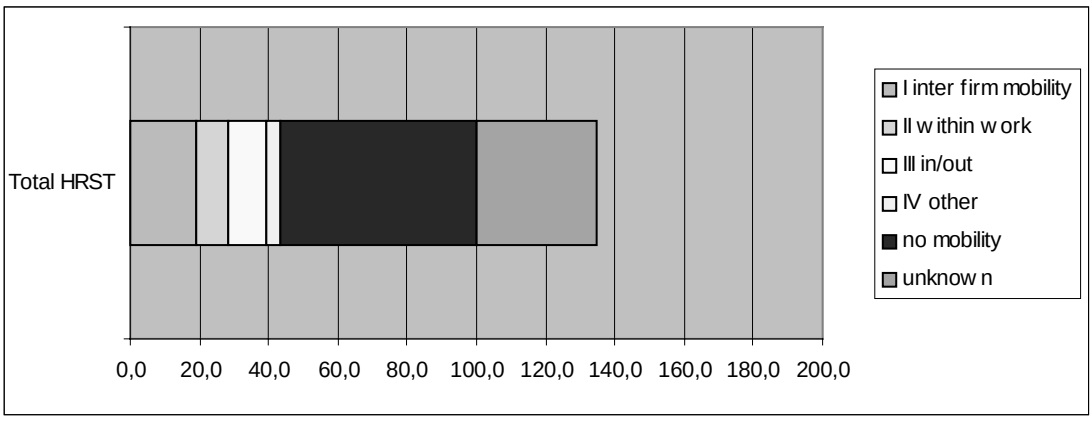
Table 2. HRST-persons that were on the labour market in the period 1993-1997, their position regarding different types of mobility

	I inter firm mobility	II within workforce	III in / out of work	IV other transitions	Stability	Total
Number (n)						
Period 1993-1997	38 615	18 539	23 008	8 198	114 280	202 640
Dec '93 – Dec '94	15 062	8 505	12 090	5 147	161 836	202 640
Dec '94 – Dec '95	16 805	8 154	11 203	4 523	161 955	202 640
Dec '95 – Dec '96	13 148	8 406	9 616	4 330	167 140	202 640
Dec '96 – Mrt '97	6 500	5 106	5 472	2 267	183 295	202 640
Percent (%)						
Period 1993-1997	19,1	9,1	11,4	4,0	56,4	100,0
Dec '93 – Dec '94	7,4	4,2	6,0	2,5	79,9	100,0
Dec '94 – Dec '95	8,3	4,0	5,5	2,2	79,9	100,0
Dec '95 – Dec '96	6,5	4,1	4,7	2,1	82,5	100,0
Dec '96 – Mrt '97	3,2	2,5	2,7	1,1	90,5	100,0

Source: KSZ, HRST-dataset (Steunpunt WAV)

Out of the 200 000 persons on the labour market, 38 600 or 19% has been mobile between 1993 and 1997 in the narrowest sense of the definition (I). They have at least once changed between firms. When we broaden the definition to all transitions that have been made by working people (II), mobility rises to 28% of the population of HRST. When we add the movements to and from work in our mobility definition (III), we consider almost 40% of all active HRST as mobile. Figure 2 resumes these findings.

Figure 2. HRST-persons and four types of mobility, 1993-1997



Comment: 100% = all persons that were registered at least once between 1993 and 1997.
Source: KSZ, HRST-dataset (Steunpunt WAV)

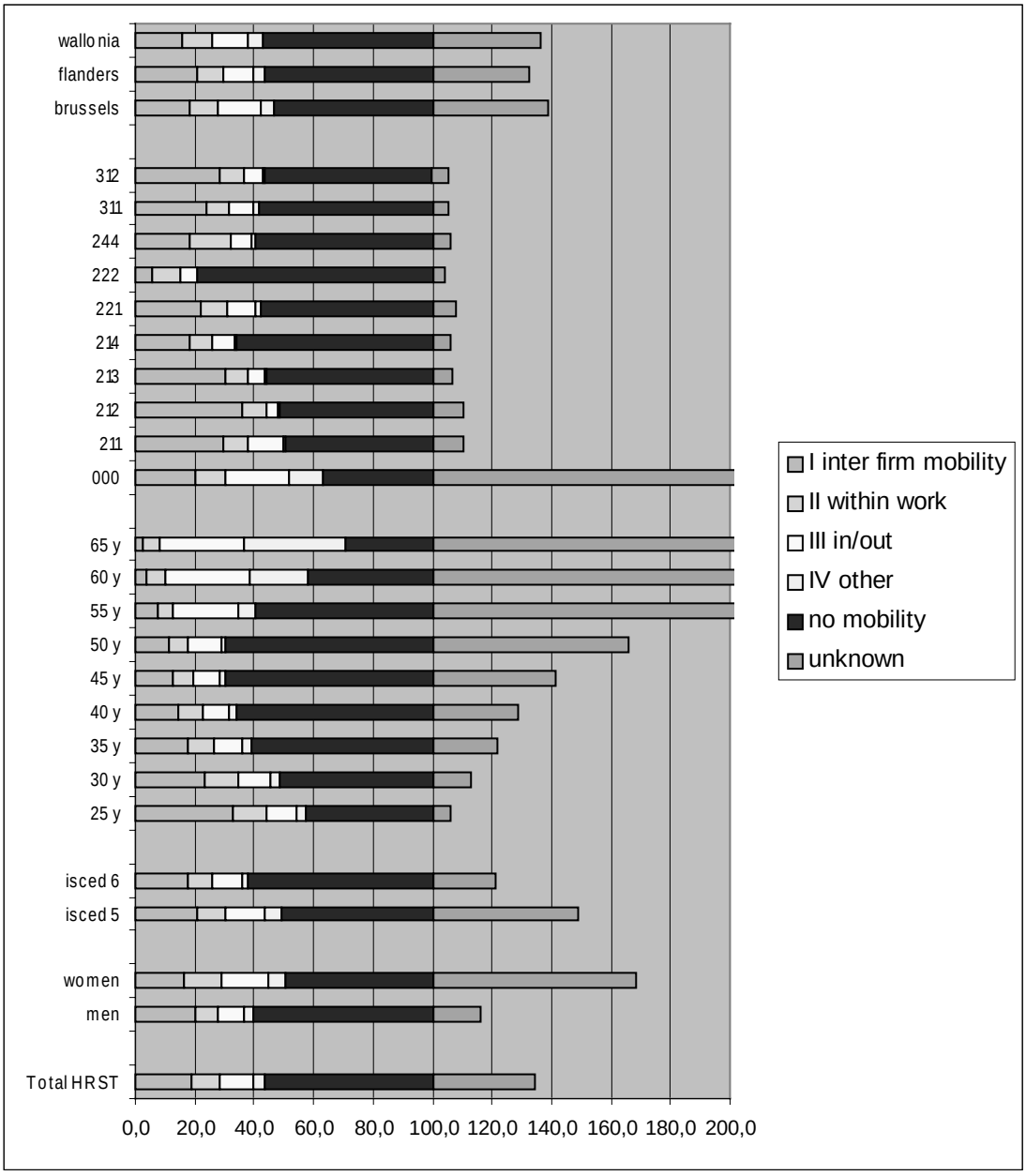
3.2 Mobility patterns and major characteristics

This global view of the mobility of this group between 1993 and 1997 is detailed by different characteristics, region, ISCO-occupation, age, qualification and sexe. Every time, the population that was registered in the social security files at least once between 1993 and 1997 equals to 100. This group is divided into those that ever changed between various employers (I), changed his working status (II), moved into or out of the working population (III), those that have had another transition (IV), and finally into the part of the population that has never changed the labour market status, in other words, has had a stable labour market position.

Differences between Belgian *regions* and *qualification* level are small. Technician level HRST seem to undergo more transitions than university level HRST, but differences between the mobility level of these two groups are limited.

Patterns of mobility show more differences by *gender*. In the narrow sense of the word, HRST men are more mobile on the labour market than women. When we count only the changes between various firms (I) as transitions on the labour market, mobility looks like a men's affair. The jobhopper has a male profile. When we broaden our mobility definition with other transition within the group at work (II) and/or in/out work (III), this profile becomes more and more female. This is explained by the high number of women that shorten the working time and/or interrupt the career to facilitate the family-and-work-combination.

Figure 3. HRST-persons and four types of mobility, period 1993-1997, by region, ISCO-code, age, qualification level and gender



Comment: 100% = all persons that were registered at least once between 1993 and 1997.
Source: KSZ, HRST-dataset (Steunpunt WAV)

There is also an important difference in the mobility patterns of the HRST by *age*. In the most rigid sense of mobility (I), the young undergo more transitions than the old. When we enlarge the definition of mobility to the mobility type II, mobility is still a phenomenon of young people. One seems to change the career more easily on a younger stage, especially by changing between different employers, but also by e.g. starting a business on ones own. At an older stage in the career, this seldom happens. The transitions of the older group have a different

character. People of over 50 years of age register more outflow movements (III) and 'other' mobility (IV). At the end of the career, it is more convenient to take the step to an early retirement (an example of mobility type III) and in a second fase to leave the labour market definitely by swapping the early retirement with (regular) pension (an example of mobility type IV).

There's also a big difference in mobility patterns of HRST by *ISCO-occupations*. We rarely observe mobility of 'health professionals' (ISCO 222): medical doctors hardly changed their job in the period of analysis. In contrast with these medical scientists, we find a lot of mobility when we look at the group of natural scientists. Between 1993 and 1997, one third of all computing professionals (213), computer associate professionals (313), physicists (211) or statisticians (212) has changed between various employers at least once.

3.3 Number of transitions (mobility type I), and major characteristics

In this paragraph we focus on the mobility type I. Differences in the occurrence of this mobility type are analysed. Is there a difference in the number of changes between various employers by gender or age? Who is changing four times in a row? In this analysis, we regard only the 38 615 persons from table 2, who have changed between various employers at least once between 1993 and 1997.

Table 3 describes the number of transitions (type I) by major characteristics. The maximum number of changes is four. This is the case when someone has another employer at every observation.
The right column, the 'total group', is not the group of 200 000 persons we earlier mentioned. Here, we only take the persons that were at least once registered as an employee, 134 000 persons, because this is the only group who *could* possibly change between various employers.

The differences in the mobility pattern become even more clear when we not only look at the simple fact if somebody has been mobile, but also look at the number of transitions in the period 1993-1997. It is the men, the young, statististians and IT professionals that go through several transitions more often than other groups.

Table 3. HRST persons that were registered at least once as employee between 1993-1997, by the number of years a transition of mobility type I occurred, and by region, ISCO-code, age, qualification level and gender

	No Transition (%)	1 transition (%)	2 transitions (%)	3 transitions (%)	4 transitions (%)	All employees (n)
Total	71,2	21,0	6,1	1,5	0,2	134 229
Man	69,8	22,2	6,2	1,6	0,2	88 306
Woman	73,9	18,7	5,8	1,4	0,2	45 923
Isced 5	72,2	20,3	5,8	1,5	0,2	73 288
Isced 6	70,1	21,9	6,4	1,5	0,1	60 941
25 years	61,9	26,3	9,3	2,2	0,3	31 850
30 years	68,4	22,9	6,6	1,9	0,2	33 611
35 years	72,5	20,3	5,6	1,4	0,2	22 899
40 years	75,3	18,9	4,6	1,1	0,1	17 231
45 years	79,6	15,9	3,7	0,8	0,1	13 347
50 years	80,3	15,9	3,0	0,7	0,0	7 237
55 years	83,8	13,4	2,4	0,2	0,1	4 987
60 years	88,4	9,9	1,3	0,3	0,1	2 655
65 years	88,8	10,2	0,7	0,2	0,0	412
000	67,6	22,1	7,9	2,0	0,3	37 048
211	67,9	25,1	5,1	1,6	0,3	686
212	61,5	22,4	14,6	1,5	0,0	205
213	67,4	23,9	6,3	2,4	0,1	20 397
214	73,8	20,4	4,7	1,0	0,1	20 341
221	70,3	24,1	5,2	0,4	0,0	809
222	76,2	17,0	5,5	1,1	0,2	8 523
244	76,1	17,5	5,1	1,2	0,2	14 682
311	73,0	20,8	5,1	1,0	0,1	30 681
312	69,9	23,5	5,6	0,9	0,1	857
Brussels	71,0	20,9	6,1	1,7	0,3	15 388
Flanders	69,7	21,9	6,6	1,6	0,2	79 895
Wallonia	74,4	19,2	4,9	1,3	0,1	38 946

Source: KSZ, HRST-dataset (Steunpunt WAV)

3.4 Mobility by delivering and receiving sectors, 1996-1997

In this paragraph we try to illustrate the shift of mobile persons between different industries. Before we present the results of this analysis, we briefly quote some decisions that have been made to get these tables. First, we only look at the period between 1995 and 1996. The sectoral shifts in other periods give similar results. Secondly, we only take the information about *persons who changed between various employers between 1995 and 1996* (or the 13 148 persons in mobility type I in table 2), *added with the persons that entered or left the group of employees in this period*. Third, we only consider that part of the population with a university degree (ISCO 6+7).

In limiting the survey to the university HRST, we have an analogous sample to the sample Nås et al. used to construct similar tables about sectoral shifts in Norway, Sweden and Finland.
So, first we present the sectoral shifts on the Belgian labour market, and afterwards, we finish with an international comparison between mobility on the Belgian and the Scandinavian labour market.

Table 4 indicates how the transitions of university level HRST have changed the sectoral distribution of this highly qualified group.

- There is a remarkable *high percentage of mobile persons that leave the wage earning population*. Of all people that have left their job in 1995, 31,2% is not working for another employer in 1996. Of course, this does not mean that they have all become unemployed. Only 17% out of these 2 923 are registered as unemployed in 1996 (not in the table!). The share of them that has started their own business and are now self employed (30%) is much bigger. There's also an even bigger - female - group that has drawn back to inactivity, either in retirement or to do the housekeeping.
  There are considerable differences between the mobility patterns by economic sectors. The size of the group that leaves the labour market is important (i.e. 40% of all 'moving' persons) in public services as education, public administration or health services. On the other hand, when R&D people resign or loose their job, they have an alternative job with another employer: one year later, only 15% of this group is no part of the wage earning population.

- *Intersectoral shifts* are quite important. We can deduct this from the shares in the table that are printed in italic, the share of mobile persons who still work in the same sector as one year before. It happens frequently that highly qualified HRST persons not only change between employers, but also between sectors. Between 1995 and 1996, the *degree of closeness* was biggest in the 'utilities and construction' and in the 'R&D institutes'. In those two sectors, almost half of the 'moving' persons still worked in the same sector.
  These intersectoral shifts complete the existing picture of a sector. For example, this table declares that two booming sectors as 'business services' and 'R&D' differ in this field. As we already mentioned, 'R&D job hoppers' stay often in the same sector. If they do change, we often find them working in 'education institutes'. People who leave their 'business services' job, move over to 'manufacturing', 'trade' and, to a lesser degree, 'transport' and 'financial services'.

Table 4. Mobility (i.e. the change of employer) of university level HRST-persons, 1995-1996

Delivering sector (1995) / Receiving sectors (1996)	1	2	3	4	5	6	7	8	9	10	11	12	**Total work - Force**	13	Total	Persons moving	Persons employed	Mobility rate in
1. primary sectors / mining	*20,4*	0,0	0,6	0,1	0,0	0,0	0,2	0,0	0,1	0,1	0,0	0,0	**0,2**	0,7	0,3	30	177	16,9
2. manufacturing	2,0	*41,8*	6,5	9,8	5,8	3,5	12,8	5,6	2,6	0,9	2,3	0,0	**11,8**	9,0	11,4	1259	12306	10,2
3. utilities and construction	2,0	2,0	*48,1*	0,8	0,5	0,5	1,5	0,0	0,2	0,1	0,5	0,0	**2,4**	2,3	2,4	265	1999	13,3
4. trade, hotels, restaurants	4,1	8,9	2,3	*41,0*	2,6	4,9	9,5	3,8	0,9	0,7	3,8	0,0	**9,3**	11,1	9,6	1063	6211	17,1
5. transport, storage, comm.	4,1	2,2	0,6	2,8	*35,3*	3,0	3,3	1,0	0,4	0,4	2,0	0,0	**2,5**	3,6	2,6	292	2174	13,4
6. financial services, real estate	0,0	0,9	1,6	1,6	2,1	*35,3*	4,1	1,0	0,6	0,9	0,9	0,0	**2,9**	4,1	3,1	343	2892	11,9
7. business services	6,1	13,9	6,5	12,0	12,6	16,6	*37,6*	5,6	4,1	2,5	9,7	0,0	**13,8**	21,2	14,9	1652	7346	22,5
8. r&d institutes	0,0	0,7	0,0	0,4	0,0	0,5	0,6	*47,6*	2,1	0,5	1,1	0,0	**2,3**	1,6	2,2	242	951	25,4
9. education institutions	2,0	1,4	1,3	0,8	3,2	1,4	2,0	14,3	*38,1*	6,0	5,0	21,6	**10,1**	18,4	11,4	1257	5907	21,3
10. public adm., health, social	8,2	0,8	1,3	1,2	2,6	3,8	2,6	5,6	9,6	*42,0*	8,4	16,2	**9,7**	20,0	11,2	1244	10105	12,3
11. other public services	2,0	0,9	1,3	1,3	2,1	0,8	2,0	0,0	1,7	6,7	*26,9*	2,7	**3,4**	7,8	4,1	449	2183	20,6
12. unknown sector	0,0	0,0	0,0	0,5	0,0	0,0	0,1	0,0	0,6	0,3	0,2	*40,5*	**0,4**	0,3	0,4	44	351	12,5
Total workforce	**51,0**	**73,3**	**70,0**	**72,3**	**66,8**	**70,4**	**76,3**	**84,6**	**60,9**	**61,2**	**60,7**	**81,1**	**68,8**	**100,0**	**73,6**	**8140**	**52602**	**15,5**
13. out of workforce (non employee)	49,0	26,7	30,0	27,7	33,2	29,6	23,7	15,4	39,1	38,8	39,3	18,9	**31,2**	0,0	26,4	2923	2923	100,0
Total	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	**100,0**	100,0	100,0	11063		
Total number of persons moving	49	1522	310	1188	190	368	1762	286	1871	1354	443	37	**9380**	1683	11063			
Total number of persons employed	196	12561	2043	6343	2079	2915	7464	993	6581	10195	2174	298	**53842**	1683				
Mobility rate out	25,0	12,1	15,2	18,7	9,1	12,6	23,6	28,8	28,4	13,3	20,4	12,4	**17,4**	100				

Source: KSZ, HRST-dataset (Steunpunt WAV)

Remark:

1. primary sectors / mining	Nace 1 - 14
2. manufacturing	Nace 15 - 37
3. utilities and construction	Nace 40 - 45
4. trade, hotels, restaurants	Nace 50 - 55
5. transport, storage, comm.	Nace 60 - 64
6. financial services, real estate	Nace 65 - 71
7. business services	Nace 72, 74
8. r&d institutes	Nace 73
9. education institutions	Nace 80
10. public adm., health, social	Nace 75, 85
11. other non-public services	Nace 90 – 95, 99
12. unknown sector	Nace 98

- In the column on the extreme right of the table and in the bottom row you can find '*mobility rates*'. They indicate the proportion of inflow and outflow in the total number of employees. Remarkably, the total outflow mobility rate of highly educated HRST (17,4%) exceeds the inflow mobility rate (15,5%). This contrasts with the knowledge that, in the nineties, highly qualified personnel is enlarging their proportion in the total (Belgian) workforce year after year. We can explain this contradiction by referring to the way the data were gathered. The methodology we used could not integrate the young people who graduated between 1991 and 1996, and consequently entered the labour market. Labour Force Survey data show that it concerns a couple of thousand youngsters a year, which will heighten the inflow mobility rate by some extent. We also know that this young group (after entering the labour market in their first job) undergoes more labour market transitions than other groups. So, withdrawing them from the survey will affect not only the inflow mobility rate, but will also underestimate the outflow mobility rate.
  We see that high inflow mobility rates are often combined with high outflow mobility rates. Sectors with a high mobility profile are the 'business services', 'R&D' and the 'education institutes'. In Belgium, a low profile regarding mobility is kept by 'manufacturing', 'utilities and construction', 'transport', 'financial services' and 'public administration'.

Nås et al. (1998) have published comparable data - since here also administrative data are used in the analysis - on the delivering and receiving sectors of highly educated personnel in three Scandinavian countries, Norway, Sweden and Finland. We try to extend this international comparison on intersectoral flows with the Belgian data.

Still, we need to point some differences between Belgian and Scandinavian data: (1) the Belgian definition of mobility is based on the change of employer, while the Scandinavian definition depends on the change of establishment, (2) the Belgian sample is limited to highly educated employees working in a specific number of HRST occupations, while Scandinavian data reflect the situation about all highly educated employees, (3) the definition of the sectors '(higher) education institutes' and 'public administration' is different, because we could not distinct the higher education institutes from the other education institutes, and (4) the period of analysis differs slightly: Belgian and Norvegian data refer to 1995-1996, while Finnish and Swedish data refer to 1994-1995.

Nevertheless, we compare the sectoral 'mobility rates' of these four countries. Table 5 summarises this international comparison.

Table 5. Inflow and outflow mobility rates, by sector and country

	Mobility rate IN				Mobility rate OUT			
	Belgium	Sweden	Norway	Finland	Belgium	Sweden	Norway	Finland
1. primary sectors / mining	16,9	19,7	16,1	17,1	25,0	20,8	19,9	13,1
2. manufacturing	10,2	19,5	22,3	34,2	12,1	17,0	20,7	24,4
3. utilities and construction	13,3	15,2	20,3	30,4	15,2	16,5	18,8	22,5
4. trade, hotels, restaurants	17,1	23,1	27,8	28,0	18,7	23,7	26,5	21,9
5. transport, storage, comm.	13,4	17,0	25,2	27,1	9,1	16,1	22,7	21,0
6. financial services, real estate	11,9	14,3	15,4	31,6	12,6	15,2	16,0	34,5
7. business services	22,5	21,9	26,8	27,8	23,6	19,3	23,2	21,2
8. r&d institutes	25,4	41,7	13,9	21,9	28,8	23,0	19,1	20,3
9. education institutions	21,3	17,5	19,7	41,6	28,4	21,8	18,5	33,0
10. public adm., health, social	12,3	14,6	15,7	28,4	13,3	15,0	16,7	25,6
11. other public services	20,6	31,4	20,8	10,1	20,4	27,1	20,3	18,9
Total workforce	**15,5**	**17,0**	**18,4**	**28,5**	**17,4**	**16,7**	**18,5**	**24,7**

Bron: KSZ, HRST-dataset (Steunpunt WAV), Nås et al. (1998).

At first sight, there are a lot of differences in the mobility of highly educated HRST by country and by sector. The country most comparable to Belgium in terms of labour market mobility is Sweden. Roughly, both countries report the lowest mobility figures in 'construction', 'transport', 'manufacturing', 'financial services' and 'public administration'. Mobility seems to peak in 'trade', 'R&D', 'business services', 'education institutes' and 'other public services'.

The comparison between Belgium on the one hand and Norway and Finland on the other doesn't hold. In Norway, we have a similar total mobility rate, but the sectoral dispersion is totally different. For instance, 'manufacturing' and 'transport' are rather mobile sectors in Norway.
In Finland, there is not only a totally different sectoral dispersion in the mobility rates of highly educated HRST, but also a much higher total share of employees changing establishment than in Belgium (but also Sweden and Norway).

4. Conclusion

At first sight, the international comparison - an important goal in building up this data base about Belgian HRST - is not evident. The share of university level HRST employees that change to another employer seems to swing around 20% when we compare the data of Belgium, Sweden, Norway and Finland. However, the sectoral dispersion of these mobility rates is that different that we automatically have

doubts about the reliability of these results. Still, efforts to improve these results are useful. One, this is only a first exercise on the Belgian database. Second, fine-tuning between the Belgian methodology on the one hand and the Scandinavian expertise on the analysis of mobility with administrative data bases on the other can ameliorate these results.

This first exploration of Belgian data already shows that the quality of the HRST database permit a variety of interesting analysis. We have information on the core target group as described in the Canberra Manual. On top of this, every single person out of this group (with the exception of the youngest generation) is covered by this database. And further, we dispose of a large amount of information on the labour market position on five subsequent observations for all these individuals.

We conclude with some results of these first tables. Mobility quickly rises as we enlarge the scope of analysis from an interval of one year to a period of four years. Between 1993 and 1997, 20% of the HRST people that were at least once on the Belgian labour market, changed between two employers. If we broaden the definition of mobility with (1) every person that has changed his position within the working population and (2) the people that entered or left the working population, the mobility over a period of four years rises up to 40% of this group.

The mobility pattern of the population differs especially by gender, age and occupation. If we limit our mobility definition to the change of employer, mobility is a phenomenon of men, youngsters and employees with an occupation in natural sciences. When we also consider inflow and outflow around the working population as a part of the definition of mobility, a higher number of transitions occurs in the female and older group.

Finally, the information about intersectoral shifts of HRST produced some interesting results. It is clear that intersectoral shifts are quite important within the group of highly educated HRST: whoever changes between employers, has a big chance to change between sectors. In Belgium, ‘business services’, ‘R&D’ and ‘educational institutions’ were recognised as mobile sectors. But we already remarked that it seems there is no international pattern in this finding.