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THE DETERMINANTS
OF NURSES'
TRANSITIONS
INTO AND OUT OF
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Abstract

The nurses' pay and choice of industry in Finland during the time period 1987–2001 are examined. Some support is found for the industry specificity of the human capital of the nurses. More experience of other industries increases the probability of work outside the care industry. More experience of the care industry raises the probability of employment in it. Lower pay increases the probability of a change of industry. The pay in other industries has on average grown faster than in the health care sector.

1 Introduction

The highly specialised nursing education means that nurses have much human capital that is specific to the health care sector. Since education of nurses is expensive, a socially efficient use of the nursing labour would require that they are employed in health care. However, research indicates that a fairly large share of the Finnish nurses have been employed in other industries [Snellman, 2005, 2006]. In consequence, the question arises under what circumstances nurses transit to other industries. Also it is of interest whether it is possible to attract nurses back to the health care industry or whether nurses employed in other industries are lost forever for the health care. The aim of this study is to give more information that might enable a development towards a more efficient allocation of the registered nurses in the future.

The deep recession in the 1990s in Finland forms a rather special environment with an exogenous shock in demand for nurses in health care. In an earlier paper Snellman [2006] it was shown that the labour market situation at the graduation of the cohorts strongly influenced the labour market outcomes for the nurses on the Finnish labour market. However, studies on cohort data does not show which nurses are more prone to change industries. A more thorough examination of the employment industry of nurses using data on the individual level can therefore be expected to be useful.

In recent years there has been a debate among researchers about to the specificity of human capital. For example Parent [2000] and Neal [1995] have argued that industry-specific human capital is more relevant than occupation-specific or firm-specific human capital. For nurses occupation- and industry-specific human capital are likely to largely overlap, since the nurses usually are working in the health care industry and the nursing jobs are what the employers in the industry offer them. Because the data list industry rather than occupation, I will in this study use the term industry-specific human capital. Harper [1995] presented a model that can be used for analyzing decisions concerning transitions between industries. However, his model did not take into account the occurrence of spells of unemployment, which was a significant feature of the nursing labour market in Finland in the 1990s.

There has been earlier studies of the labour market behaviour of nurses. However, these have usually concentrated on nurses working within the nursing profession and studies concerning transitions mainly focus on factors influential for keeping nurses at their current work places. For example Holmås [2002] examined the exits of nurses from the work at hospitals in Norway. He found that both pay and working conditions affect the decision whether to stay or not. Frijters et al. [2003] found very modest positive effects of pay on the probability of staying in the British National Health Service.

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In the following section a simple theoretical model of human capital acquisition and industry mobility is presented. In the third section the data used in the study is presented and in the fourth the labour market for nurses during the examined period is described. The fifth section presents the development of income for persons with nursing exams within and outside the health care sector. In the sixth section I estimate what has affected the transitions of the nurses between different labour market statuses. Finally follows a concluding section.

2 A simple model of industry mobility

In this section a simple model for choice of industry taken from Harper [1995] is presented. Harper made the model for analysing occupational choice but if one changes the word occupation to industry, the same model can also be used for analysing the choice of in which industry to work, since the trade-offs of the individuals are the same.

If we assume that the human capital is industry specific and that the individuals acquire it while working in the industry or studying for working in the industry, a person's acquired amount of human capital specific for industry i in the current period T will be given by

$$K_T^i = \sum_{t=t_i}^T H_t^i, \quad (1)$$

in which t_i is the period in the beginning of which the person entered industry i and H_t^i is the human capital specific to industry i acquired in period t . Here we assume that there are only two kinds of industry-specific human capital, that pertaining to the health care industry for which the index i is used and that pertaining to other industries for which the index j is used. A part a_{ji} of the human capital pertaining to other industries is transferable to the health care industry. A part a_{ij} of the human capital pertaining to the health care industry is transferable to other industries. If we assume no depreciation of human capital, the total amount of human capital in the health care industry in period T for a person who entered the labour market in period t_i by becoming employed in the health care industry and has been employed in other industries since time period t_j will thus be

$$K_T^i = a_{ji} \sum_{t=t_j}^{t=T} H_t^j + \sum_{t=t_i}^{t=t_j-1} H_t^i, \quad (2)$$

in which t_j is the period in the beginning of which the person exited the health care industry and began to work outside it. Similarly the human capital for the person relevant for the work in other industries is

$$K_T^j = \sum_{t=t_j}^{t=T} H_t^j + a_{ij} \sum_{t=t_i}^{t=t_j-1} H_t^i. \quad (3)$$

Income from work is a function of the amount of human capital relevant in the industry. Disregarding variations in matching quality the income in the health care industry in period T can be written

$$Y_T^i = r^i K_T^i - C_T^i, \quad (4)$$

in which r^i is the yield on human capital in industry i and C_T^i is the foregone income due to investments in human capital (on the job) in period T . Similarly the income in other industries can be written

$$Y_T^j = r^j K_T^j - C_T^j. \quad (5)$$

A nurse considering a change of industry considers the present value of staying in the same industry versus changing industries. In period T the value for a nurse of staying in the health care industry relative to entering other industries is

$$PV_T^i - PV_T^j = \sum_{t=T}^{t=R} \{(r^i K_T^i - C_T^i) - (r^j K_T^j - C_T^j)\} d_t - V_{ij}, \quad (6)$$

in which R is the time period for retirement, d_t is the discount factor for period t and V_{ij} is the cost of changing jobs from industry i to j . The value of a transition in the opposite direction is received by changing the places of the indexes i and j . If the nurse has transited between the industries several times, the expressions for the human capital available for use in the respective industries are simply the sum of the acquired human capital during all periods with adjustment for the shares transferable between the industries.

Thus far it has been assumed that there are no random variations. However, to understand the functioning of the labour market it is inevitable to include some random variations in the opportunities offered. In this model this could be done by introducing random variations in the factor r determining the yield on human capital in the industries. This factor could vary randomly reflecting the opportunities offered in the industries. During the deep recession in Finland the offers from the other industries to the unemployed nurses were bad but the offers from the health care industry may have been even worse; short periods of work or no job at all. In such circumstances many may have opted for a low-paying job in other industries or jobs that have required large investments in human capital in the beginning. In the economic upturn in the end of the period those who had low-paying jobs in other industries may have received better offers from the employers in the health care industry, which is likely to have induced them to return to the health care, although they had acquired some human capital specific to other industries and possibly had lost some of the health care human capital.

From equation (6) one can see that in addition to the return to human capital offered in the different industries (possibly reflecting employment opportunities and the quality of the match for the job offers), there are a number of factors that influences the gain of transiting to the other industry. In the model no characteristics of the jobs except pay are taken into account but anything that affects the utility of a job positively is likely to have the same effect as pay. A lower cost of changing industries and a longer time horizon (higher R) makes any difference in pay (or other characteristics) in the industries more likely to lead to a transition. This means that younger nurses are more likely to make a transition. Younger and less experienced nurses are also likely to have less human capital specific to an industry making transitions more likely. The accumulation of human capital is likely to lead to that the probability of changing industries declines with experience in the industry. These are the main issues that are tested in the empirical section of this study.

3 A short presentation of the data

The original data set used in the study is a part of a sample from the employment statistics from Statistics Finland. Half of the persons who in some year in the period 1987–2001 were living in Finland and had an educational code whose second number was 7, meaning that they had an education for working with health care or social services, were sampled. This means that also approximately every second registered nurse is included in the sample and that the sample is representative with respect to the characteristics of the nurses except for random variations. In this study we include all registered nurses from this sample who had an registered nurse educational code or corresponding and were younger than 58 years in some year during the period 1987–2001. This implies that the study comprise all persons in the data meeting the other qualifications, who in some year in the period 1987–2001 had one of the educational codes 571101 or 671101 (Bachelor of Nursing), 571103 or 671103 (Bachelor of Public Health), and 571106 or 671106 (Bachelor of Midwifery).

For years 1993–2001 the industry classification of year 1995 is used. For these years the health care industry is in this study defined as the industry 85 on the two digit level, which implies that social services also are included. For 1987–1992 the classification system of year 1988 was used and in this the health care industry as defined in this study includes industries 87 (health care) and 88 (social services). Social services are included in the health care industry, because rather many nurses work within the social services in jobs rather similar to those in what is defined as the real health care industry. The data also includes information on the type of employer, which in this study is used for separating those working in private and public health care. Entrepreneurs are excluded from the estimations, since these form a small and rather different category on the labour market.

To characterise the labour market facing the nurses it is also useful to use a geographical division of the labour market. The regions used in the presentation below are formed from the hospital districts. The Hospital

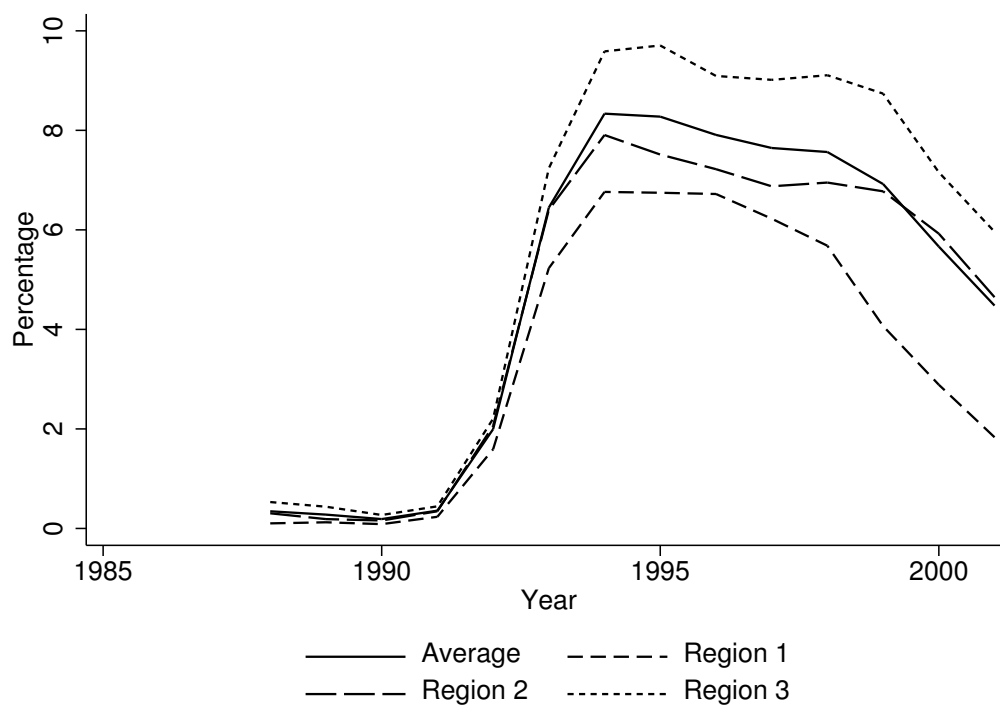


Figure 1: Development of the percentage of the nurses that have been unemployed of those having the exam in nursing as their highest exam in the current and the preceding year. Note that nurses both inside and outside the labour force have been included in the calculations.

District of Helsinki and Uusimaa forms Region 1. The hospital districts in which the other university hospitals are located forms Region 2. This region thus includes the Hospital Districts of Varsinais-Suomi, Pirkanmaa, Pohjois-Savo and Pohjois-Pohjanmaa. Region 3 includes all the other hospital districts; that is the Hospital Districts of Satakunta, Kanta-Häme, Päijät-Häme, Vasa, Etelä-Pohjanmaa, Kymenlaakso, Etelä-Karjala, Etelä-Savo, Itä-Savo, Pohjois-Karjala, Keski-Suomi, Keski-Pohjanmaa, Kainuu, Länsi-Pohja and Lapland.¹

4 The labour market for nurses during the examined period

The examined period is characterised by large swings in demand for labour. The unemployment among nurses was very low in the end of the 1980s, but in the beginning of the 1990s Finland was hit by a deep recession and the unemployment rose fast. Towards the end of the 1990s the unemployment began to slowly decrease but still remained at a level of several percentage points at the end of the examined period. This development can be seen in Figure 1.^{2,3}

In Figure 2 one can see that the development of the employment outside health care has been the opposite

¹Observations of nurses living on the Åland islands are excluded from the analysis. This part of the country is different from the rest of the country and therefore the behaviour of these nurses is likely to differ from that of other nurses.

²The calculations are based on monthly data and the unemployment is the average for the years. A nurse who has been unemployed 6 months in a year are therefore given the value 50 percentage points in the calculation of the average unemployment rate. In the calculations also nurses of working age outside the labour force are included.

³In the figures only nurses who still had a nursing exam as their highest exam are included, but the results did not alter much if those included were extended to all who had had an nursing exam as their highest exam in some preceding year during the period for which there is data. However, those who had acquired an exam that was higher than a nursing exam tended to have higher income.

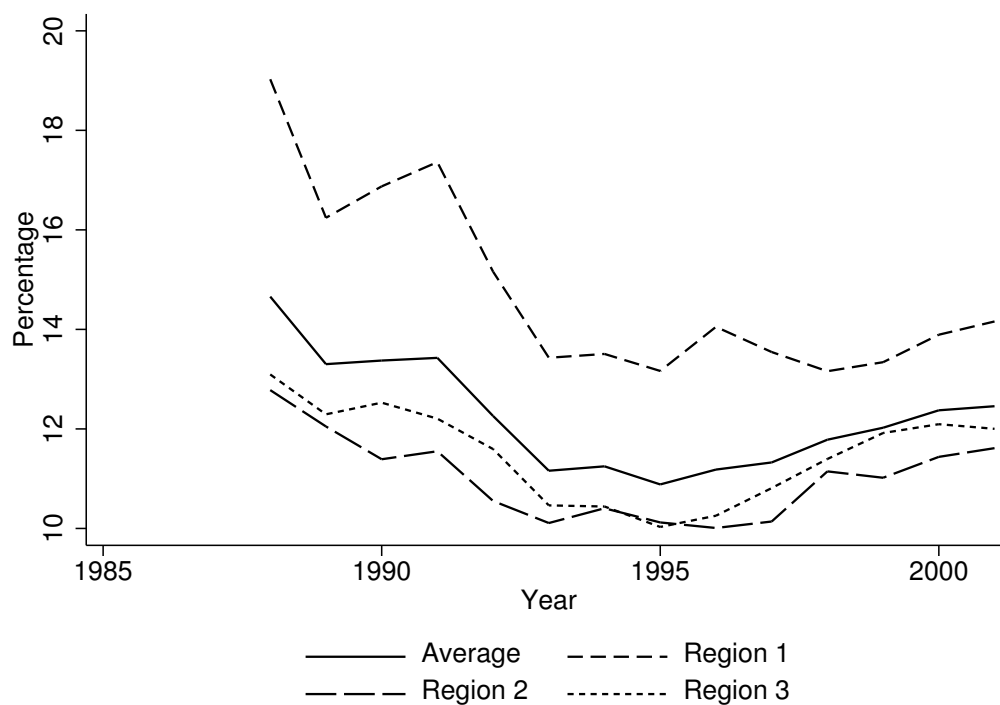


Figure 2: Development of the percentage of the nurses that have been working outside the health care sector of those still having the exam in nursing as their highest exam in the current and the preceding year.

of that of the unemployment.⁴ After a decline during the depression there was a slight gain towards the end of the period, especially in Regions 2 and 3. However, the level of employment outside the health care was still somewhat higher in Region 1 in the end of the period.

In Figures 3 and 4 one can see that the development of the employment in the health care sector also have been the opposite to the one of the unemployment rate.⁵ One can also note that the employment gain in the last few years of the period to a large part took place in the private health care. The expanding economy towards the end of the period raised the demand for private health care and this can also be seen in the employment of nurses. The level of employment in the public health care was lower and the level of employment in the private health care correspondingly higher in Region 1.

An issue related to the one illustrated by the graphs of the level of unemployment and the share of nurses working in different industries and sectors is that of the transitions between the employment categories. Figures 5, 6 and 7 provide an overview of these transitions. As the figures display there have been transitions in both directions all the time but considerable variations in the share of nurses making transitions in different directions. The higher employment in other industries in Region 1 corresponds to a higher transition rates between the health care industry and other industries. The transitions from the health care industry to other industries were less

⁴The calculations are weighted for months of employment during the year and calculated on the basis of the industry of the longest employment relation during the year.

⁵The employment rate is calculated in the same way as the unemployment rate. However, whether a nurse works in the health care industry and in the private or the public sector is only based on the information concerning the longest employment relation during the year. All months of employment during the year for nurses who worked in the health care industry in their longest employment are regarded as months of employment in health care industry. Similarly, none of the employment months for nurses who did not work in the health care industry in their most long-lasting employment during the year are regarded as months of employment in the health care industry. The same method is used to classify months of employment in the private and the public sectors. Entrepreneurs are not included among those employed in the private sector.

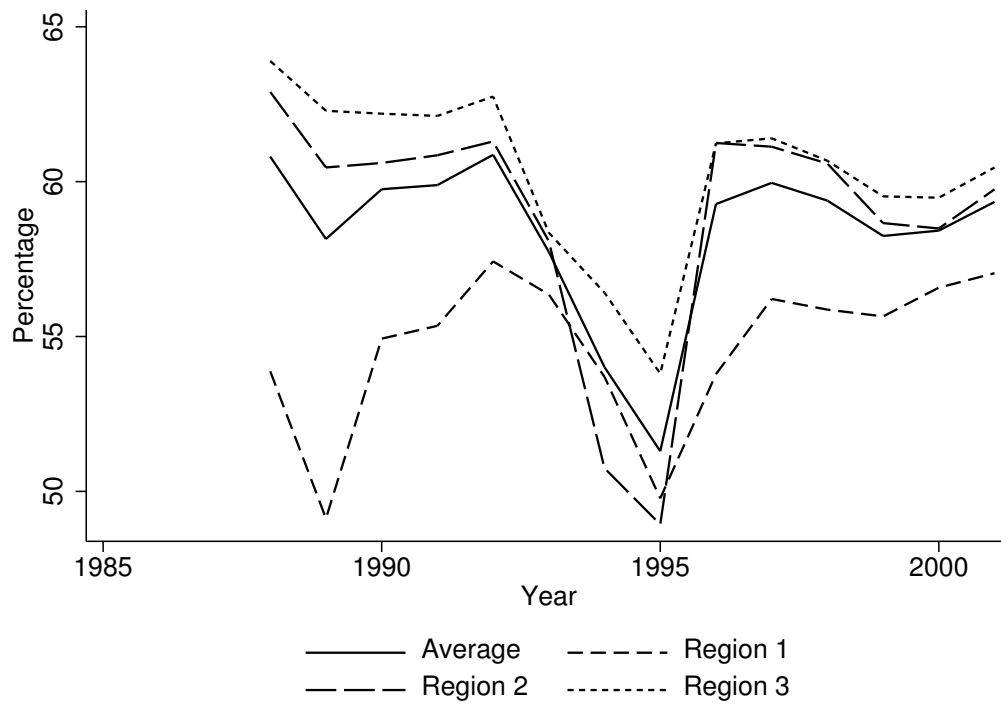


Figure 3: Development of the percentage of the nurses that have been working in the public health care industry of those still having the exam in nursing as their highest exam in this and the previous year.

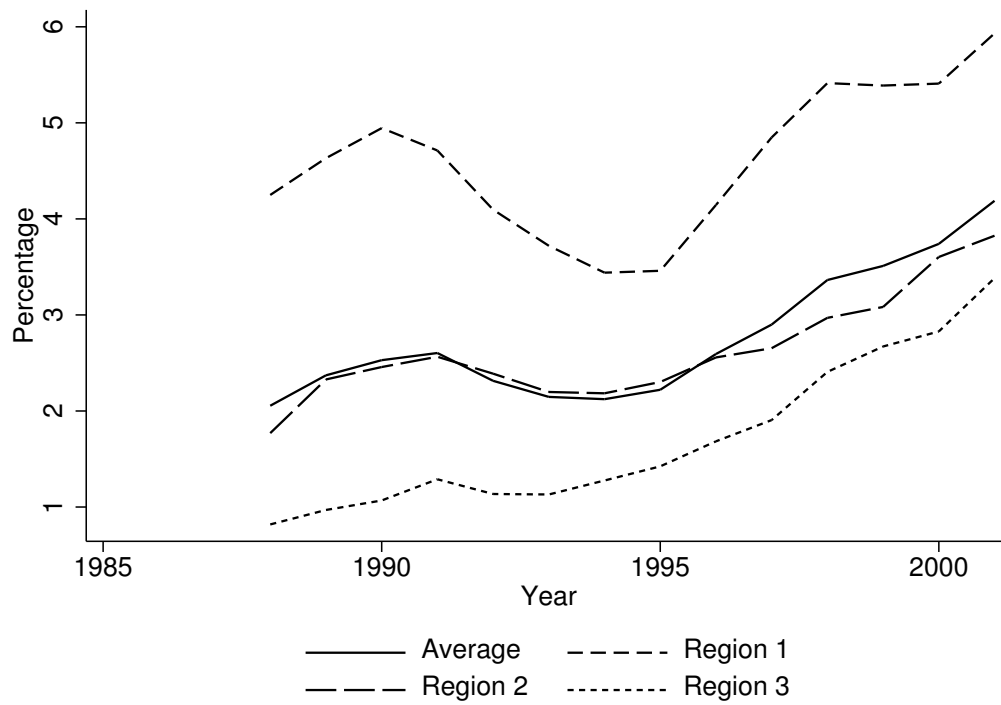


Figure 4: Development of the percentage of the nurses that have been working in the private health care industry of those still having the exam in nursing as their highest exam in this and the previous year.

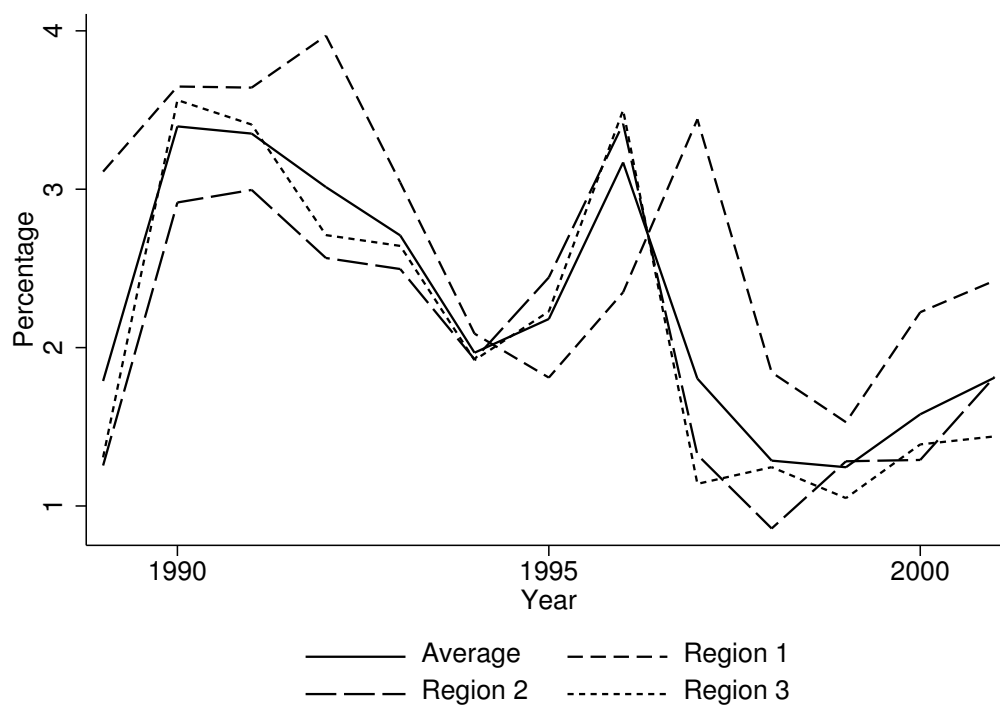


Figure 5: The shares of all nurses that transit from other industries to the health care industry from the end of last year to the end of the current year.

frequent during the years when the unemployment was at its highest and the employment in other industries was relatively low.

Figure 7 shows that nurses entering employment from unemployment have mainly become employed in the public health care. Figures 5–7 seem to indicate that there is no severe problem with entering into health care. However, the transitions might have been made by nurses who had been outside the health care sector only for a short time. Figures 8 and 9 show there have still been considerable persistence of the employment categories.

5 The income of nurses in different industries and regions

The transitions of nurses may have been induced by differences in pay. To explore to what extent differences in pay exist the income for nurses in and outside health care and in different regions are graphed in Figures 10–14. The income levels for nurses working in public health care and outside the health care industry are plotted in Figure 10. Included are only nurses who in the end of the year were working in the same industry category as in the end of preceding year and who worked 12 months of the current year. The income variable is total earned income during the year. In consequence, a part of the income may also come from extra jobs about which there are no information.

The most obvious fact to be observed in Figure 10 is that the income dispersion has been much smaller in the public health care than among those working in other industries. The dispersion in pay and development of the level of pay have stayed rather unchanged during the examined period, although there have been considerable fluctuations in employment.

The dispersion of income in public health care has also been smaller across regions than for those working in other industries, whose income in Region 1 on average was clearly higher than for those working in the public health care, as can be seen in Figure 11. In Region 1 the income for those in other industries also tended to

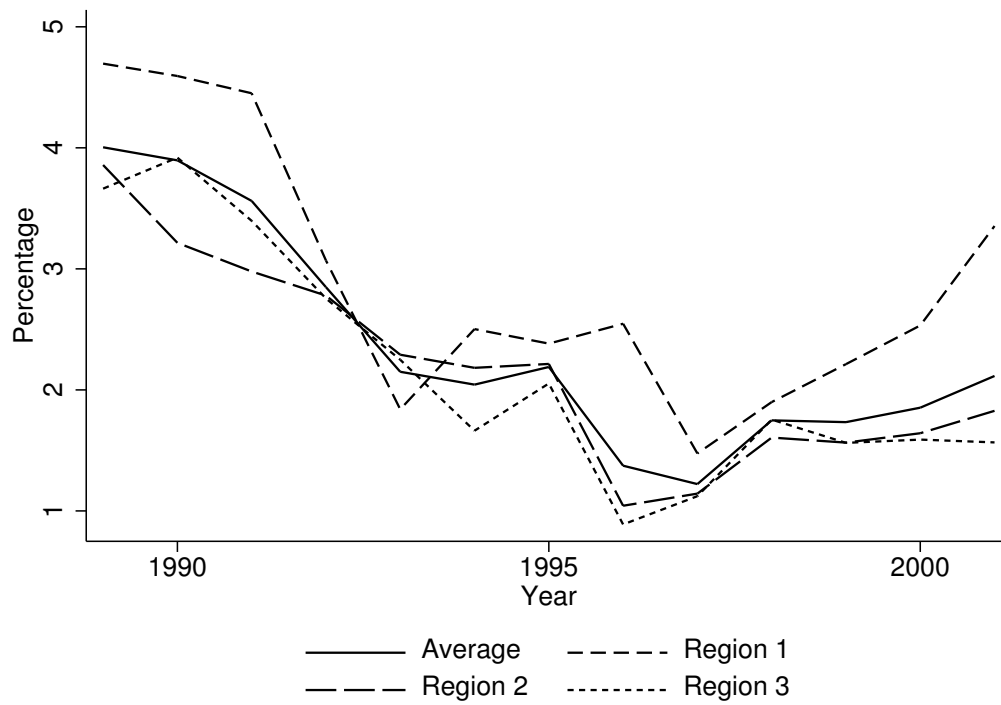


Figure 6: The shares of all nurses that transit from the health care industry to other industries from the end of last year to the end of the current year.

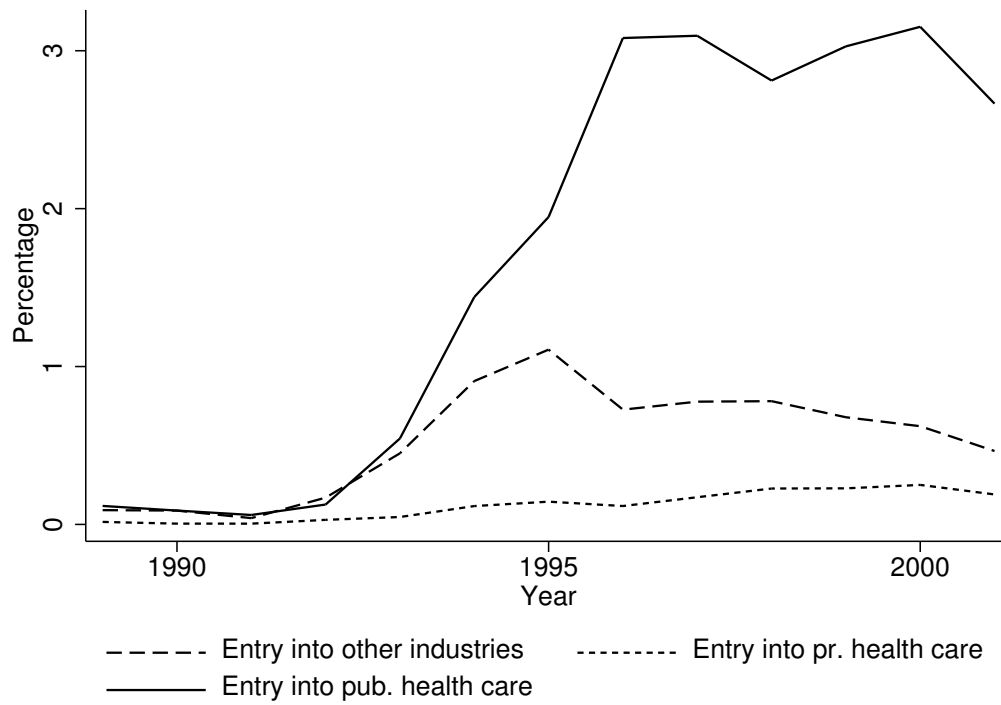


Figure 7: The shares of all nurses that transit from unemployment to the private and public health care as well as to other industries from the end of last year to the end of the current year.

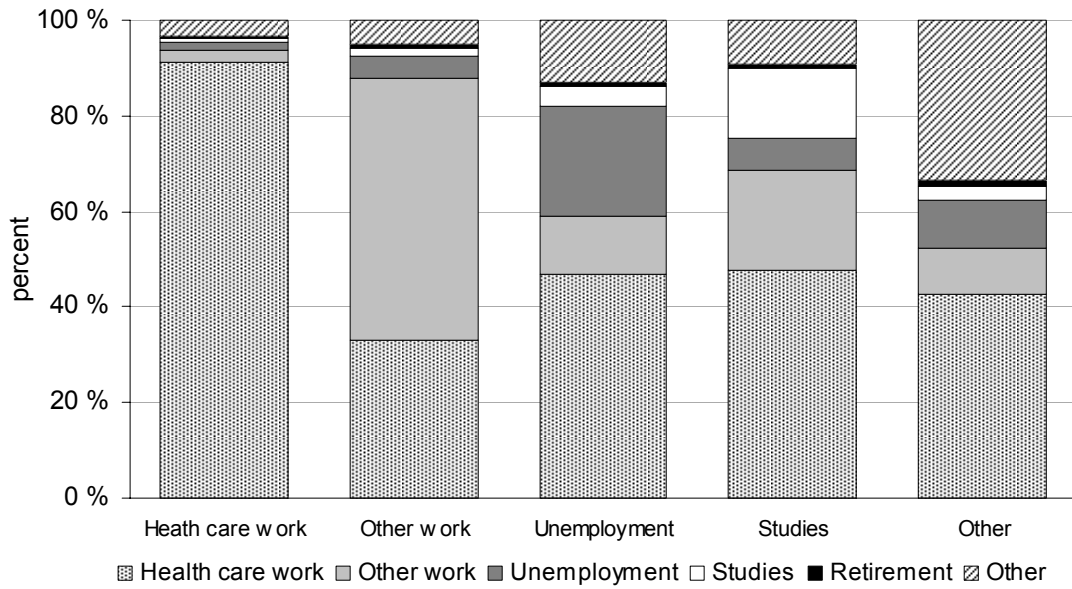


Figure 8: The shares of nurses in different main activities in the end of 1998 (y-axes) by their main activity in the end of 1995 (x-axes).

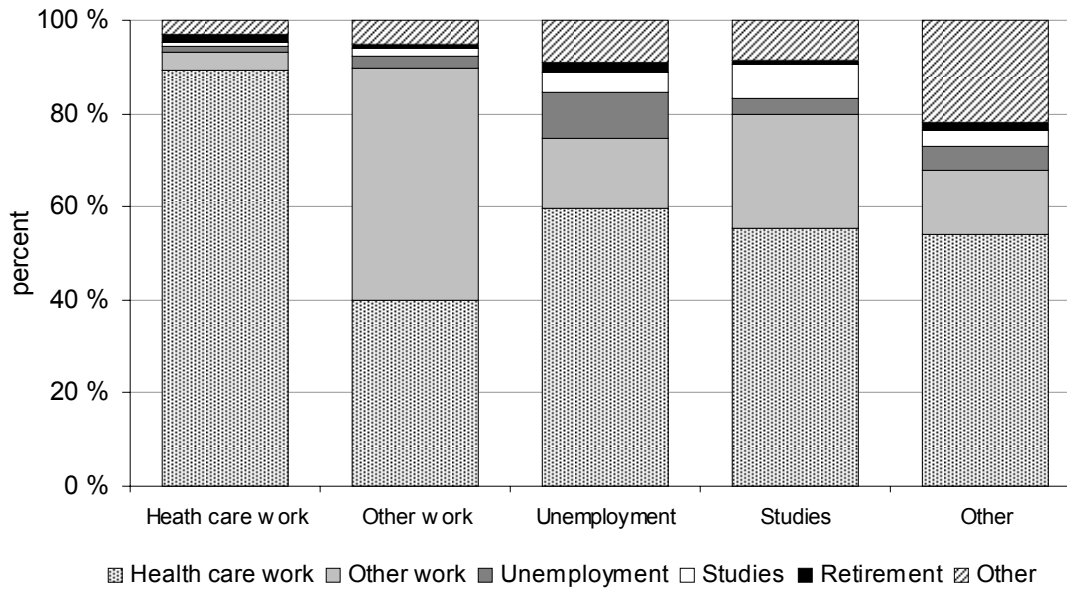


Figure 9: The shares of nurses in different main activities in the end of 2001 (y-axes) by their main activity in the end of 1995 (x-axes).

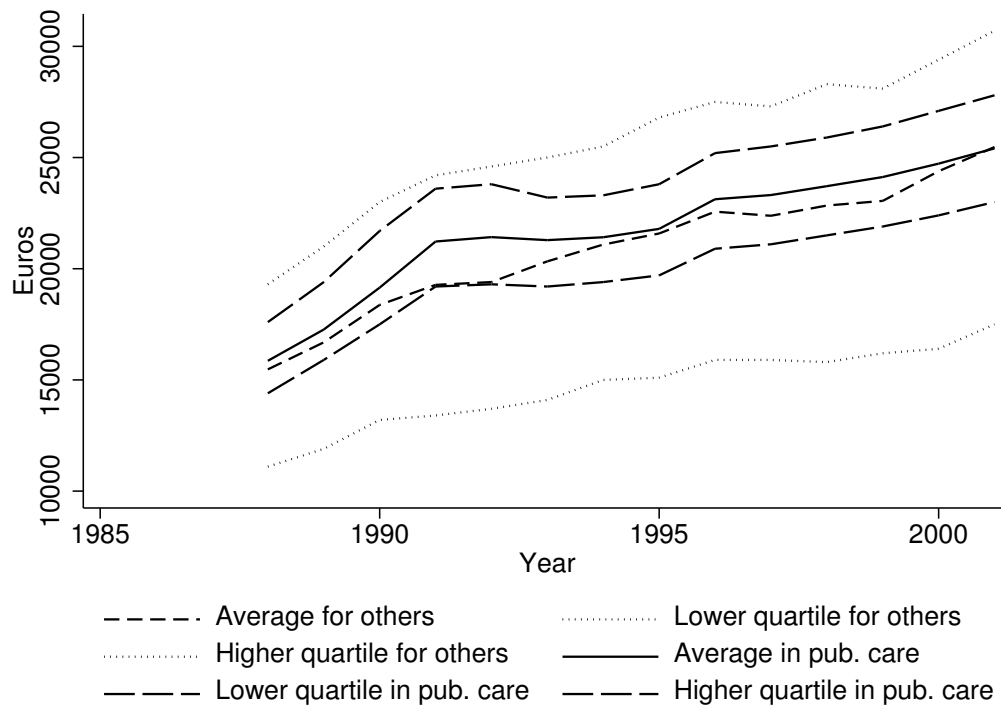


Figure 10: The yearly income of nurses in public health care and in other industries for those whose highest exam in the preceding and current year was still in nursing.

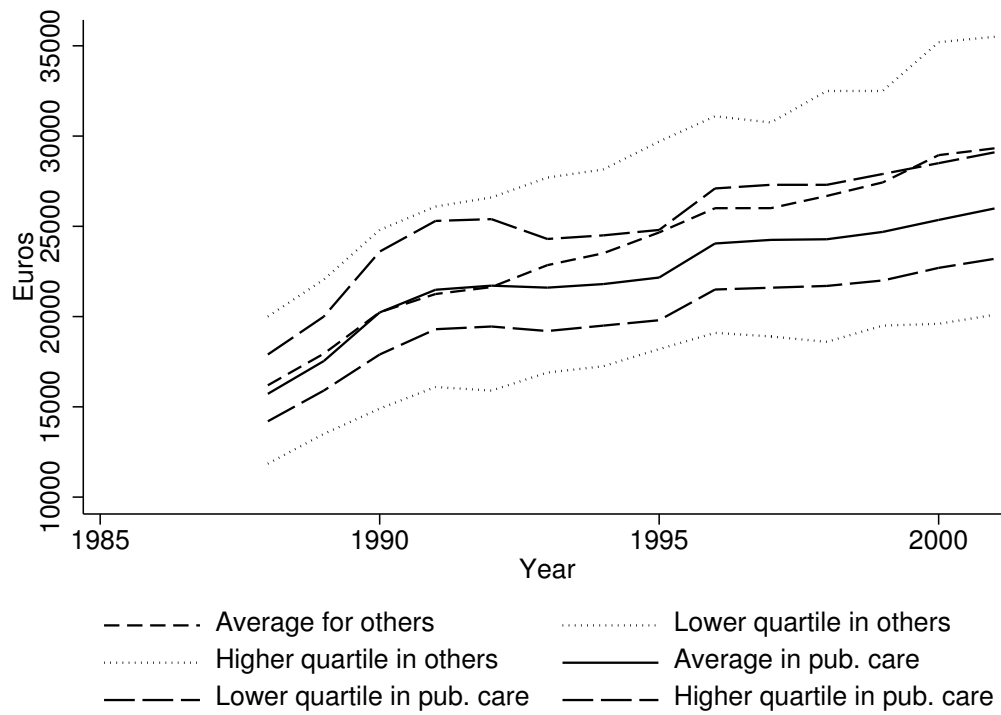


Figure 11: The yearly income of nurses in public health care and in other industries for Region 1 for those whose highest exam in the preceding and current year was still in nursing.

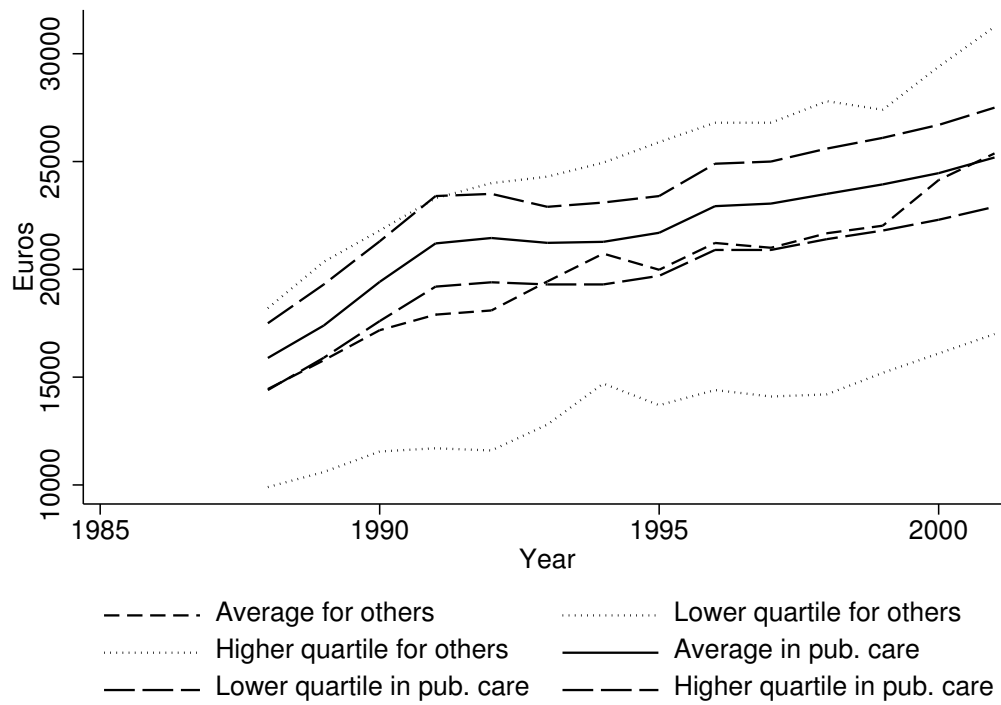


Figure 12: The yearly income of nurses in public health care and in other industries for Region 2 for those whose highest exam in the preceding and current year was still in nursing.

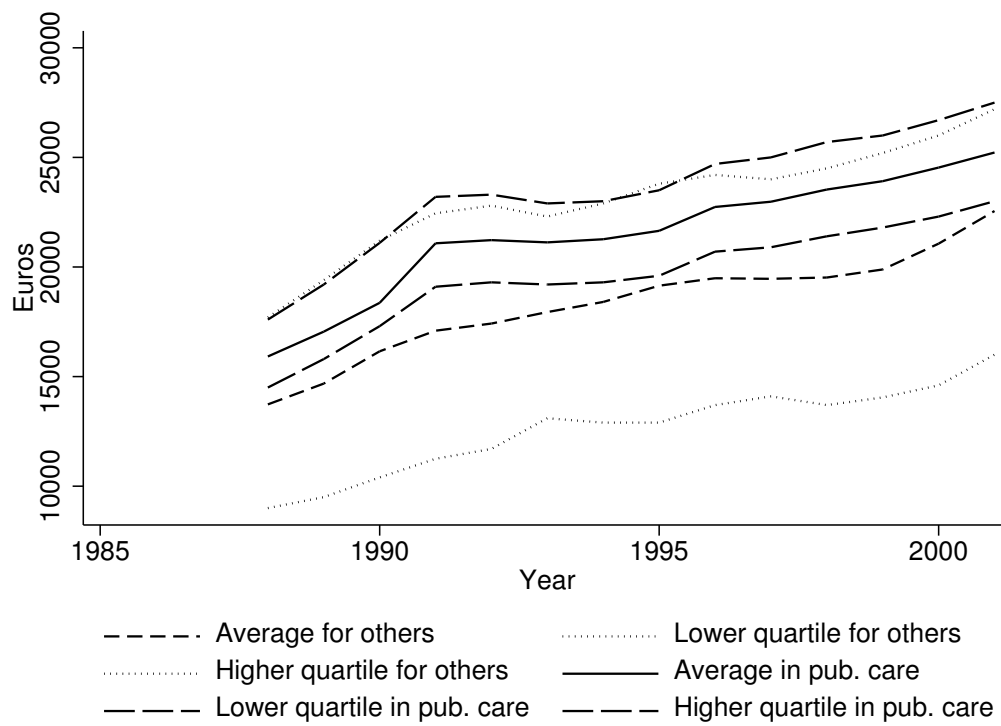


Figure 13: The yearly income of nurses in public health care and in other industries for Region 3 for those whose highest exam in the preceding and current year was still in nursing.

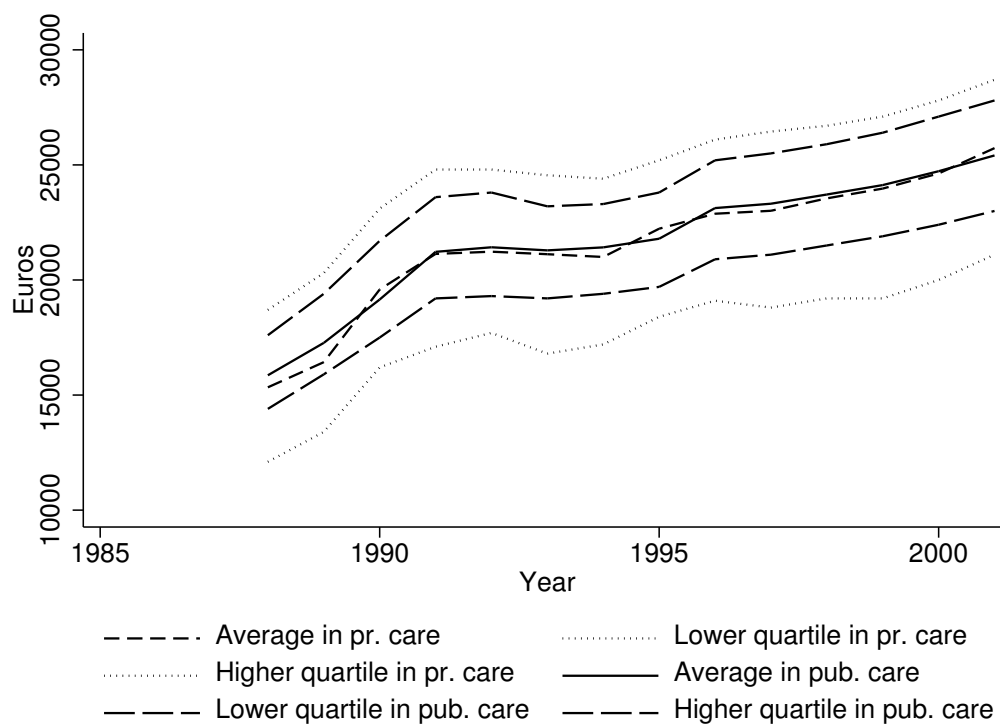


Figure 14: The yearly income of nurses in public health care and in private health care for those whose highest exam in the preceding and current year was still in nursing.

increase faster than for those in public health care, particularly the income of those with the highest earnings. As Figure 12 shows the trends have been in the same direction for those in Region 2 but in this region there were also a considerable amount of nurses employed in other industries with very low earnings even in the end of the period. In Region 3 the pay of nurses outside the health care industry have been considerable worse than in public health care and for the same category in other regions, as is shown in Figure 13. Good jobs outside the care industry thus seem to have been concentrated mainly to the larger cities.

Figure 14 provides a comparison of the development of the pay in public and private health care. An examination also shows that there are surprisingly small variations between them for all regions, the only difference being that the dispersion is somewhat larger in the private sector. In consequence, it is unlikely that the nurses have been attracted by higher pay to leave the public health care for the private health care. However, the rising average pay in other industries may indicate that pay differences have induced transitions into them from public health care. A problem for those transiting might be that the high pay is not immediately available for everyone exiting the health care. Rather working outside health care may first require some investments in human capital. In the next section the factors influencing transitions into and out of the health care industry are examined.

6 Estimations of the factors influencing labour market status

The graphs in the previous section explored the mobility of nurses between different labour market categories. The results also showed that there have been large differences in the pay structure between the health care sector and the category "Other industries". In this section the factors influencing the transitions between different categories are examined. Especially the factors affecting transitions between health care and other industries are studied.

Because there are no information on the relevant variables for the time before 1987, it is only possible to include work history since then in the explanatory variables. The nurses are categorised in the estimations according to their main working industry in the base year (1989, 1992, 1995 and 1998). For each period different estimations are made for the two different categories. Only nurses who have graduated before 1987 are included in the estimations in Tables 1–4. They were also required to be at most 57 years in the end of the examined periods.

Years since health care job is defined as the number of years since the nurse worked in the health care industry at all. Years since other job is defined as the number of years since the nurse worked in other industries both in the longest employment relation during the year and in the end of the year. Years since unemployment means years since the nurse was unemployed at least one month. Years of different kinds of work is based on data from 1987 to the base year and the categorisation of the work is made on the basis of the industry of the main job during the respective year.

Table 1: Estimates using a probit model for industry of employment in 2001 (health care = 1 and other industries = 0) when the registered nurses are separated on the basis of unemployment or industry of employment in 1998. Included in the calculations are those nurses that were at most 57 years in 2001 and had a nursing exam as their highest exam in 1997 and 1998.

Explanatory variables	In other industry 1998		In health care 1998		Unemployed 1998	
	Coefficient	St. error	Coefficient	St. error	Coefficient	St. error
Age 1998	0.45	0.24	0.01	0.16	-0.22	0.51
Age 1998 squared	-0.00492	0.00268	0.00014	0.00179	0.00014	0.00179
Years of health care work	0.05	0.04	-0.02	0.03	0.08	0.08
Years of other work	-0.05	0.03	-0.12	0.03	-0.03	0.08
Years of unemployment	0.07	0.12	-0.15	0.12	0.11	0.13
Share of 1998 employed	-0.46	0.34	0.88	0.36	0.60	0.73
Share of 1998 unemployed	-0.81	1.03	0.64	0.91	-1.71	0.90
Years since health care job	-0.11	0.03	.	.	-0.03	0.08
No health care job after 86	-0.56	0.31	.	.	-1.66	0.78
Years since other job	.	.	0.05	0.03	0.04	0.07
No other job after 86	.	.	0.36	0.21	0.08	0.53
Years since unemployed	-0.07	0.06	-0.01	0.04	.	.
Not unemployed after 86	-0.54	0.30	0.04	0.28	.	.
Log income 1998	-0.24	0.08	0.29	0.13	0.27	0.39
Resident in Region 1 in 1998	0.12	0.14	-0.35	0.11	-0.41	0.36
Resident in Region 2 in 1998	0.20	0.15	-0.16	0.12	0.08	0.43
Number of observations	855		5425		98	
Model degrees of freedom	14		14		14	
χ^2	143.99094		103.91439		29.736582	
Pseudo R^2	0.1948		0.1114		0.2402	

An examination of Tables 1–4 makes clear that the estimated coefficients vary from period to period, probably reflecting the labour demand variations associated with the business cycle, which were visible as employment fluctuations in the graphs shown earlier in this study. Experience of work in other industries generally seems to have had a negative effect on the probability of working in the health care sector in the end of the periods. A higher current income has consistently had the expected effects; negative on the probability for work in the health care sector for those working in other industries and positive effect for those already working in the health care sector. These coefficients show that earning possibilities has an influence on the choices of nurses.

Both the coefficient estimates concerning income and work experience are likely to reflect the accumulation of specific human capital. A lack of specific capital for work outside health care reduces the value of the alternative to work in health care, but work in other industries and the associated accumulation of specific capital for it

Table 2: Estimates using a probit model for industry of employment in 1998 (health care = 1 and other industries = 0) when the registered nurses are separated on the basis of unemployment or industry of employment in 1995. Included in the calculations are those nurses that were at most 57 years in 1998 and had a nursing exam as their highest exam in 1994 and 1995.

Explanatory variables	In other industry 1995		In health care 1995		Unemployed 1995	
	Coefficient	St. error	Coefficient	St. error	Coefficient	St. error
Age 1995	-0.07	0.16	-0.02	0.12	0.06	0.30
Age 1995 squared	0.00080	0.00184	0.00039	0.00142	-0.00090	0.00361
Years of health care work	0.07	0.05	-0.01	0.03	-0.21	0.08
Years of other work	0.11	0.05	-0.07	0.05	-0.21	0.08
Years of unemployment	0.35	0.21	0.19	0.24	-0.36	0.18
Share of 1995 employed	-1.65	0.28	-0.03	0.25	-0.59	1.10
Share of 1995 unemployed	0.54	1.03	-0.35	1.09	0.51	0.80
Years since health care job	-0.31	0.03	.	.	-0.05	0.08
No health care job after 86	-2.43	0.26	.	.	-1.24	0.49
Years since other job	.	.	0.01	0.04	-0.07	0.08
No other job after 86	.	.	0.13	0.27	-0.38	0.35
Years since unemployed	-0.04	0.08	0.35	0.17	.	.
Not unemployed after 86	0.16	0.29	0.98	0.32	.	.
Log income 1995	-0.19	0.08	0.35	0.16	-0.16	0.30
Resident in Region 1 in 1995	-0.10	0.13	-0.17	0.09	-0.47	0.27
Resident in Region 2 in 1995	-0.20	0.14	0.21	0.12	-0.09	0.31
Number of observations	1038		5689		175	
Model degrees of freedom	14		14		14	
χ^2	434.01574		76.386232		32.208358	
Pseudo R^2	0.4028		0.0741		0.1712	

Table 3: Estimates using a probit model for industry of employment in 1995 (health care = 1 and other industries = 0) when the registered nurses are separated on the basis of industry of employment in 1992. Included in the calculations are those nurses that were at most 57 years in 1995 and had a nursing exam as their highest exam in 1991 and 1992.

Explanatory variables	In other industry 1992		In health care 1992	
	Coefficient	St. error	Coefficient	St. error
Age 1992	-0.09	0.09	0.17	0.06
Age 1992 squared	0.00123	0.00118	-0.00179	0.00078
Years of health care work	-0.03	0.05	0.04	0.03
Years of other work	0.05	0.05	-0.12	0.05
Years of unemployment	-0.68	1.19	-0.25	0.40
Share of 1992 employed	-1.39	0.20	0.19	0.19
Share of 1992 unemployed	0.51	1.73	-1.26	1.26
Years since health care job	-0.41	0.04	.	.
No health care job after 86	-2.06	0.19	.	.
Years since other job	.	.	0.03	0.05
No other job after 86	.	.	0.39	0.20
Years since unemployed	0.03	0.12	0.03	0.08
Not unemployed after 86	0.30	0.38	0.19	0.31
Log income 1992	-0.16	0.06	0.04	0.08
Resident in Region 1 in 1992	-0.18	0.10	-0.13	0.08
Resident in Region 2 in 1992	-0.15	0.11	-0.06	0.08
Number of observations	1355		6131	
Model degrees of freedom	14		14	
χ^2	472.30614		140.27092	
Pseudo R^2	0.2904		0.0710	

Table 4: Estimates using a probit model for industry of employment in 1992 (health care = 1 and other industries = 0) when the registered nurses are separated on the basis of industry of employment in 1989. Included in the calculations are those nurses that were at most 57 years in 1992 and had a nursing exam as their highest exam in 1988 and 1989.

Explanatory variables	In other industry 1989		In health care 1989	
	Coefficient	St. error	Coefficient	St. error
Age 1989	-0.07	0.06	-0.03	0.04
Age 1989 squared	0.00095	0.00084	0.00075	0.00050
Years of health care work	-0.03	0.09	-0.11	0.05
Years of other work	-0.07	0.08	-0.42	0.09
Years of unemployment	0.21	0.71	0.88	0.90
Share of 1989 employed	-1.19	0.17	0.17	0.12
Share of 1989 unemployed	-3.26	2.01	-3.00	2.27
Years since health care job	-0.58	0.09	.	.
No health care job after 86	-1.47	0.16	.	.
Years since other job	.	.	-0.08	0.17
No other job after 86	.	.	-0.04	0.25
Years since unemployed	-0.71	0.32	-0.27	0.27
Not unemployed after 86	-0.93	0.49	-0.27	0.49
Log income 1989	-0.10	0.04	0.18	0.06
Resident in Region 1 in 1989	0.11	0.09	-0.08	0.05
Resident in Region 2 in 1989	-0.07	0.09	0.03	0.05
Number of observations	1601		7087	
Model degrees of freedom	14		14	
χ^2	561.46487		116.20129	
Pseudo R^2	0.2745		0.0290	

raises the pay in other industries. Because of the larger income dispersion in the category other industries, high earnings are especially likely to keep some with nursing education in other industries from transitioning to the health care sector. On the other hand the estimates indicate that low-income earners in other industries are likely to enter the health care sector again, at least if they have not been working in other industries very long. However, the estimated influence of income is rather small. According to the estimates a 10 per cent increase in income typically has reduced the probability of a transition with below 1 percentage point. One can also note that the estimates for the coefficients of the income variable are somewhat smaller in the end of the period when there is a longer working history and accumulation of specific human capital is better controlled for. The dummies for the region of residence in the beginning of the period did not have completely consistent effects over time but nurses in Region 1 seem to have been more likely to exit from the health care industry, especially towards the end of the 1990s.

7 Conclusion

The results in this study support the hypothesis that specific human capital is an important determinant of the labour market transitions of registered nurses. The results also give some support to the claim that higher pay attracts nurses and keep them working in the health care sector. Better paid nurses with more experience of the industry (health care / other industries) are less likely to transit to the other category. However, the effect of pay is rather small and there are possibly factors not included in this study that affect transitions even more strongly. This is also supported by the fact that a considerable amount of nurses were working for very low pay in other industries even in the end of the period. Such factors may include working conditions, possibilities for part-time work, and lack of continuous employments in the health care sector. The results have also shown that the outside options for nurses vary considerably across regions with the opportunities offered by other industries being best in the big cities and especially in the Helsinki-Uusimaa region. Because the outside options are better there, the need for higher pay to keep the nurses within the care sector is there higher. This could attract nurses from regions in which the unemployment is higher. The considerable share of nurses working in other industries point towards that attracting back to nursing can be a considerable help in remedying the shortage of nurses that arose especially in the years after the examined period.

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