The Role of Specific and General Human Capital after Displacement

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ABSTRACT *Displaced workers experience significant and long-lasting wage losses. However, the average wage losses hide the tremendous differences among workers. So far, the differences are explained by differences in accumulated on-the-job experience, education level, age, and so on, but a large variation among similar workers remain. In this paper we investigate the effect of general and specific human capital on the unemployment duration and wage losses during the first three years following displacement. Information on the specificity of a job or function allows us to quantify the impact on the wage losses. We are able to rank positions in terms of the specificity of accumulated human capital.*

KEY WORDS: Displacement; unemployment duration; sorting; heterogeneity

Introduction

The displacement literature has long recognised the role of heterogeneity among workers in understanding observed post-displacement search time and pre-displacement and post-displacement earnings differences among workers. Compared with regular lay-offs, displaced workers should be able to distinguish themselves as they are not specifically selected into unemployment but part of a firm that closed down. This should, according to Gibbons and Katz (1991), lead to better labour market prospects compared with the average unemployed worker. In the United States, wage losses of 10–30% for displaced workers are reported (see for example, Ruhm, 1991; Kletzer, 1998).

Displacement wage losses have been used to examine the transferability of human capital. Losses of firm-specific skills are estimated as the returns to tenure at the displacing firm. The tenure variable is used as a proxy for the (specific) human capital that a worker has accumulated while working at that firm (Becker, 1962; Parsons, 1972). Addison and Portugal (1989) criticise earlier specifications of displacement wage losses that try to estimate loss of specific human capital through pre-displacement tenure in the firm. They show that the previous tenure is also 'productive' in new jobs, implying a partial transferability of human capital.

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Topel (1990) examines the losses associated with changing employment after displacement. He finds that more senior workers suffer from greater reductions in earnings compared with their junior counterparts. This suggests that some human capital is built up during the career that is (partly) destroyed upon displacement. Farber (1997) interprets this as economic redundancy of skills. In a later paper, Farber (1999) finds that 30% of the return to tenure can be explained by heterogeneity while the other 70% should be seen as returns to specific investments. Neal (1995) examines the transferability of specific investments in human capital by examining industry-specific returns to tenure. He finds that some returns to tenure are industry specific.

In this paper we will use data on displaced workers of a single firm—the Dutch aircraft manufacturer Fokker—to investigate the impact of general and specific human capital on the wage losses after displacement and the duration of unemployment in the period following the lay-off. By running regressions with the traditional human capital variables and then extending them with firm-specific information, we show that the variables generally used for the approximation of general human capital—education level—and specific human capital—tenure—can be improved upon if information on the hierarchical position specificity of a pre-displacement function can be obtained.

The paper is organised as follows. In the next section we describe the data, including the development of the post-displacement survey. In the third section we discuss the impact of general and specific human capital on the labour market experience after displacement. The following section describes and reports our empirical results. The final section concludes.

The Displaced Worker Survey and Personnel Data

The year 1996 marked the end of more than 75 years of aircraft production by the Dutch company Fokker. Founded by one of the pioneers of aviation and aircraft design, Anthony Fokker, the company first blossomed in the 1920s when it became the world leader in aircraft construction, producing in both The Netherlands and the United States. After the destruction of the production facilities during the Second World War, Fokker remained one of the smaller players in the world aircraft industry, producing predominantly civilian mid-range airplanes of 50–100 seats. In March 1996 it filed for bankruptcy and 5644 workers lost their tenured jobs. The bankruptcy trustees created a new company, called Fokker Aviation, which contained the viable remains of the old firm. A total of 953 workers were simultaneously made redundant from the bankrupt firm and hired by Fokker Aviation. Another group of 700 workers was offered a contract to continue working for the trustees to finish building aircafts already sold to airline companies; 3991 workers were permanently displaced.[1] We use data from two sources. Fokker's electronic personnel data system provided information about workers' pre-displacement careers inside the firm.

Fokker Survey

In 1999 post-displacement information was gathered through a mail survey among all workers who were laid off after the firm's bankruptcy. Current addresses of the respondents were obtained from the bankruptcy trustees. Information from the Fokker Pension Fund was used to check upon deceased employees. The addresses

of deceased former employees were omitted from the address files used for the survey. The 'Fokker Survey' collected data on the labour market experience for the three years following the workers' displacement for all 5506 former employees of Fokker. Of the workers that received a survey 41.4% (2279) returned completed questionnaires.[2] The survey results are of high quality for a self-administered mail survey and non-response seems to be random over the relevant variables.[3]

The subsample that is used in this study consists of all workers that were actually displaced; that is, that were neither offered a job in the bankruptcy spin-off nor a temporary contract to complete unfinished aircrafts. In the regression analysis those workers with item non-response on relevant variables were also excluded. This gives us a sample of 1464 workers for the wage loss and the unemployment duration estimation.

The Personnel Data

From Fokker's personnel files we obtained information on each employee's type of job, compensation, and demographics. Demographic characteristics include date of birth, gender, education, marital status, and the hiring date of each employee. The average tenure at the time of bankruptcy was 15 years. The firm's hierarchy distinguishes eight different levels below top management. The highest observable step, the eighth level, is just below the top management and the Board of Directors. For reasons of possible identification, the two upper levels (9 and 10) were left out of the dataset.

The hierarchical structure roughly reflects the division of unskilled versus skilled workers as well as the organisation of supervision. Production workers are located in levels 1–3. Managers, engineers, and aircraft designers belong to levels 4–8.[4] Every position is 'allocated' to a job activity. These activities are Administration, Sales, Management, Human Resources, R&D as well as Production Preparation, Production Planning, Support, Production and Quality Control. There are three regionally distinct plants. We also have information on age, tenure, marital status, and gender, for which we will correct.

Specific Human Capital versus General Human Capital

Following Becker (1964) and Acemoglu and Pischke (1999), we will distinguish between specific human capital, which can be used within the context of a specific job or a specific firm, and general human capital, which can be used across jobs, firms and industries. Education levels are good indicators of some form of general human capital, be it that some degrees are more specific towards an occupation than others. Working in a job can by itself lead to the accumulation of specific human capital; however, in not every job will human capital that is accumulated be necessarily specific to the industry, firm or even job. Within the framework of the displacing firm, however, there are positions that are more likely to accumulate and require specific human capital than others. It is therefore unlikely that the positions in the areas of administration, human resources and certain fields of management are using specific human capital that cannot at least be partially transferred to other companies of at least the same size or structure. On the other hand, the transferability of human capital for workers in quality control of the production process, in development of aircraft or parts thereof, or even in production (preparation) are more likely to be at least industry specific.

In addition to tenure, which commonly identifies specific learning on the job, we will use the differences in work fields within the displacing company to identify differences in the accumulated specificity of human capital.[5]

Education levels are usually used to identify a part of the general human capital. In addition we propose in our context to use the hierarchical position within the displacing firm. This is a variable that is not commonly observed, which captures both the effect of general human capital as it is embodied in a worker's education level and their subsequent career. This will be elaborated upon below.

Education Levels and Hierarchical Position

Education levels are commonly associated with human capital, and should be associated with different levels of wage losses and search times. In the Dutch

Table 1. Workfields within Fokker

Job activity	Most common jobs
Sales	1 Engineering support 2 Area sales manager 3 Maintenance engineer
R&D	1 Specialist structures 2 Constructor 3 Senior employee materials and processes
Production Preparation	1 Technical writer 2 Production preparation 3 Compiler
Production Planning	1 Order planner 2 Materials acquisition 3 Employee acquisition
Production	1 Builder 2 Aircraft welder 3 Aircraft mechanic
Support and Supplies	1 Warehouse worker 2 Transport worker 3 Worker receipt spares
Human Resources	1 Catering employee 2 Security guard 3 Manager P&O
Finances & Administration	1 Secretary 2 Employee technical administration 3 Employee administration
Quality Control	1 Quality controler production line 2 Quality controler final 3 Quality controler electrics
Management & Information Processing	1 Consultant business unit 2 Systems analyst 3 Employee administration business unit

Notes: The table presents the three most common functions within a work field, based on function codes one day before the bankruptcy.

system there are several different levels of both vocational and general school degrees. In our case, we use as the baseline education level MBO, which is intermediate vocational training and represents the largest group in our dataset. Below this level there are workers that have no formal education beyond elementary school ('Basisschool'), workers in lower, intermediate ('HAVO') and higher ('VWO') general schooling degrees, and lower vocational degrees ('LBO / LTS'). Beyond the baseline case with intermediate vocational degrees are those with higher vocational degrees ('HBO') and university degrees, where we make the distinction between general universities ('WO') and technical universities ('TU'). Given a specific degree a worker can pursue various careers within a company.

Within Fokker there was a clear distinction between the lower production level and the higher management and engineering level. The education level thus allows entrance in certain ranges of the hierarchy (cf. Dohmen *et al.*, 2004). Having reached a certain level of the hierarchy then approximates the human capital in two ways: first of all it requires a certain education level and, second, it is a result of the sorting process in which more able workers are allocated to a higher position. Furthermore, workers in higher hierarchical positions gain experience in the management of teams and subordinates — a general skill that could be transferable.

There are thus two reasons to believe that the hierarchical level can measure general human capital. First, the education level commonly employed serves firms as a way to sort workers into different career paths. Higher educated workers get employed in different starting levels than those with lower education degrees. Thus the education level captures from the start of a career of a worker the effect of education, but to then go further as it observes subsequent sorting through career progression. Second, higher hierarchical positions routinely involve some managerial tasks within any job and activity. This is a general competence that a worker learns by working in higher hierarchical positions.

Tenure and Specific Human Capital

Specific human capital is usually measured through the tenure at the displacing firm. It is assumed that at least part of the learning on the job cannot be transferred across firms or industries. This part of the learning by working on the certain job is designated as the specific human capital. We will use the distinction in work fields or job activities that a certain function is associated with in the firm to distinguish between different levels of specificity of the accumulated human capital; that is, the more specific a job is to the firm, the higher the expected wage loss that a worker will face after displacement. More specific human capital usually implies thinner labour markets: workers will have to search longer for positions in which at least part of the human capital is being used.

Empirical Estimation

The displaced workers in our firm were part of an internal labour market. They will be faced with the situation on the external labour market in which their specific combination of general and specific human capital have to be re-evaluated. Depending on the general or specific character of their human capital, they will be faced with different offers and possibilities. The more specific a skill, the thinner the labour market is likely to be.[6]

In the subsequent regression analyses we will first estimate a regression with education levels, to which we will subsequently add the hierarchical position and the job activity. In this way we can look at the impact of education on the post-displacement labour market experience as most analysis would have to do, to then add the additional information.

Duration of Unemployment

In order to examine the effect of general and specific human capital on the duration of unemployment we estimate a proportional hazard duration model.

$$\lambda_i(t) = \lambda(t) \exp(\beta_0 + X_i \beta_x) \tag{1}$$

where

$$\lambda(t) = \upsilon \cdot \alpha t^{\alpha - 1}$$

is the hazard specified with a Weibull model, with the Weibull coefficient of α. The model can be extended with a frailty correction for heterogeneity (υ following a gamma distribution, with a mean of 1 and a variance of σ). Including the frailty parameter υ allows one to test for unobserved heterogeneity that affects duration after we have corrected for individual characteristics X_i.

Wage Losses

The wage difference between the pre-displacement and post-displacement earnings is defined as:

$$\Delta W_i \equiv W_i^{\mathrm{a}} - W_i^{\mathrm{F}} \tag{2}$$

where W_i^{a} is the log of the monthly wage earned at the new job by worker i and W_i is the log of the last monthly wage earned before displacement. The wage difference can be explained by observable characteristics Z_i as follows.

$$\Delta W_i = Z_i \beta + u_{1i} \tag{3}$$

where β is a constant vector and u_{1i} is the residual unexplained by Z_i. We observe ΔW_i only for workers who found employment. For those workers the offered wage W^a was above the reservation wage when the offer arrived. We thus only observe ΔW_i if

$$\Delta W_i^* \equiv W_i^a - W_i^R \geq 0 \tag{4}$$

and write

$$\Delta W_i^* = \Omega_i \gamma + u_{2i} \tag{5}$$

where Ω_i is a vector of characteristics determining the reservation wage of worker i, and u_{2i} is a residual. We do not observe the reservation wage, but we do observe

whether or not the worker found work as well as the starting salary W_i^a at the new job. We also know W_i. We assume that:

$u_{1i} \sim N(0,\sigma)$

$u_{2i} \sim N(0,1)$

$corr\,(u_{1i},u_{2i}) = \rho$

Then, the set of selection equations (4) and (5) can be written as the probability of having found an acceptable match as a linear function of characteristics Ω_i (Heckman 1979). To account for possible selection bias caused by non-random-ness in finding new work, we need to identify differences between Z_i and Ω_i. Ω_i includes variables unobserved by the outside employers but known by both the worker and the former employer. The identifying variables should affect the worker's reservation wage but not the outside wage offer W_i^a. Two variables are used. One variable records short spells of temporary inability to work (WAO) while being employed at Fokker during the period 1987–1996. We assume that asymmetric information on individual well-being lowers the reservation wage but not the outside offer. The other variable included records of the last job performance evaluation score at Fokker in 1996. Performance scores, unobserved by potential employers, are positively correlated with reservation wages as they are associated with the quality of work and possibly with the quality of search. But they are assumed to be unrelated to the distribution of outside offers.

Estimation Results

In the empirical analysis of the wage losses and the duration of unemployment, all workers who were offered a contract from the bankruptcy trustees are left out as they experience no initial unemployment spell. Additionally, we exclude those employees who do not classify themselves in the survey as unemployed because they have either started their own business[7] (self-employment, 2.5% of sample), are full-time involved in voluntary activities or other types of unpaid work, receive disability pensions, or have retired since bankruptcy (together 2.2% of the sample).

Duration of unemployment Table 2 presents the estimation results of a proportional hazard Weibull model with gamma frailty correction for unobserved heterogene-ity. Regression 1 gives the estimation with age, tenure and education categories. The effect of age on unemployment duration is standard: higher age leads to lower hazard ratios (negative coefficients). In other words, a workers searches longer the older he is. Tenure, reflecting the experience within the displacing firm, is often interpreted as specific human capital. There is some effect of higher tenure on the hazard; it tends to lower the chances of leaving unemployment, hence prolonging the unemployment duration. If we take tenure, and to some extent also age, as an indicator of the accumulated, specific human capital we can conclude that the search duration is increased. This leads towards the idea that thinner labour markets exist for workers with specific knowledge. The more they want to transfer of the built-up human capital, the longer they will have to search, and the longer will be the observed unemployment time.

  Including education levels relative to the intermediate vocational degree shows that lower education leads to lower hazards, hence longer unemployment. Using the general human capital interpretation would suggest that higher general

Table 2.   Survival analysis: duration of unemployment, first three years

	Hazard of leaving unemployment					
	Regression 1		Regression 2		Regression 3	
	Coefficient	SE	Coefficient	SE	Coefficient	SE
Age: <30 years	0.477	0.310	0.505	0.318	0.384	0.328
Age: 30–34 years	0.164	0.228	0.191	0.230	0.148	0.235
Age: 35–39 years			– Baseline –			
Age: 40–44 years	–0.913	0.221	–1.032	0.225	–1.049	0.230
Age: 45–49 years	–1.304	0.248	–1.498	0.256	–1.596	0.263
Age: 50–54 years	–2.975	0.336	–3.183	0.350	–3.208	0.351
Age: > 55 years	–3.131	0.705	–3.532	0.666	–3.603	0.666
Tenure: < 5 years	–0.505	0.409	–0.320	0.411	–0.182	0.417
Tenure: 5–10 years	0.126	0.227	0.181	0.227	0.219	0.230
Tenure: 10–15 years			– Baseline –			
Tenure: 15–20 years	–0.401	0.221	–0.403	0.223	–0.360	0.225
Tenure: 20–25 years	–0.529	0.251	–0.544	0.252	–0.504	0.258
Tenure: 25–30 years	–0.463	0.303	–0.429	0.303	–0.430	0.310
Tenure: > 30 years	–0.596	0.373	–0.515	0.376	–0.578	0.382
Education: Basic	–0.976	0.697	–0.739	0.699	–0.883	0.715
Education: MAVO	–0.327	0.289	–0.202	0.296	–0.259	0.299
Education: HAVO	0.533	0.534	0.529	0.537	0.428	0.550
Education: VWO	–1.241	0.590	–1.795	0.580	–1.826	0.582
Education: LBO/LTS	–0.438	0.191	–0.282	0.209	–0.446	0.214
Education: MBO			– Baseline –			
Education: HBO	0.196	0.186	–0.164	0.218	–0.254	0.221
Education: WO	0.722	0.391	–0.062	0.433	–0.437	0.438
Education: TU	0.461	0.268	–0.264	0.317	–0.350	0.326
Hierarchical level 1			– Baseline –			
Hierarchical level 2			0.245	0.233	0.707	0.263
Hierarchical level 3			0.267	0.253	0.907	0.306
Hierarchical level 4			0.264	0.252	1.028	0.313
Hierarchical level 5			0.799	0.303	1.494	0.363
Hierarchical level 6			1.499	0.358	2.249	0.423
Hierarchical level 7			0.549	0.503	1.307	0.562
Hierarchical level 8			1.973	0.547	2.638	0.602
Job activity: Administration			– Baseline –			
Job activity: Sales					–0.761	0.436
Job activity: R & D					–0.920	0.389
Job activity: Production Preparation					–0.817	0.393
Job activity: Production Planning					–0.686	0.423
Job activity: Production					0.191	0.392
Job activity: Support					0.123	0.500
Job activity: Human Resources					0.687	0.554
Job activity: Quality Control					0.034	0.421
Job activity: Management					–0.021	0.664
	$\sigma = 0.481$				$\alpha = 1.502$	
Observations			917			

Notes: We estimate using a Weibull proportional hazard model, with α as the coefficient of the Weibull distribution, and σ as the (variance) coefficient of the gamma-frailty correction. All workers that had at least one month of unemployment duration were included. Time measured is the duration of unemployment within 3 years. SE, standard error.

human capital will also lead to lower search times. Education is considered general human capital. There is no specific effect that we would expect general human capital to have on the duration of unemployment.[8]

Similar findings have so far been obtained by other studies of displaced workers, and also of unemployed workers in general. Extension of the explanatory variables by the former hierarchical position and the former field of work in the displacing firm changes the hazard ratios.

Including the hierarchical position of the firm (Regression 3), relative to the lowest position, reduces the significance of the education levels in explaining unemployment duration. This is something we expected as the hierarchical position is, as said before, a result of a starting position in the firm based on the education level and the career based on the performance within the company. There is an additional form of sorting of the workers. The hierarchical position of all layers proves to be a significant predictor of shorter unemployment spells relative to the lowest level in the hierarchy. It is striking, however, that the position that is not necessarily easily observable by new employers has such an impact relative to the certified level that a schooling degree gives.

Adding the information on the field of work in the last function of the displacing firm enhances this picture even further. In terms of the specificity of the position a mixed picture emerges. Only the very specific R&D functions and the somewhat specific functions in production preparation lead to longer unemployment duration, whereas none of the other areas differ significantly from the function in administration. This is not necessarily what we expect as some functions within a job activity seem to be rather specific, involving the accumulation of rather specific human capital. However, workers can also choose to search for jobs that do not use the specific human capital, therefore broadening the labour market, and shortening the unemployment duration.

Wage losses Looking at the wage loss regression including age, tenure and education level yields the following picture. The estimation of wage differences three years after displacement yields an average loss of 1.6% (cf. Table 3, Regressions 1–3, which give the marginal effects of the wage loss regression with Heckman correction). It is higher for higher age groups and is increasing with tenure. Levels of education that are higher than the intermediate vocational training diminishes wage losses significantly. This is the expected result, as the higher education allows for the transferability of general knowledge, and the specificity of a workers knowledge is captured by the wage losses of higher tenured workers.

Including now the two variables on hierarchical level and the specificity of the job changes the explanatory power of the education level (cf. Regression 3). The hierarchical position takes over most of the 'insulation' of the education level from workers' wage losses: the higher level a worker worked in the hierarchy, the lower were the wage losses.

Especially interesting are the wage losses by former job activity. These wage losses could be interpreted as a ranking of the specificity of the average job in its field. Going from the lowest wage losses to the highest wage losses reflects the movement towards more specific areas. Relative to *Administration* all but one job activity (*Human Resources*) show significantly higher wage losses, this being the least specific job, where most human capital that is accumulated on the job can be transferred relatively easily to other jobs within other companies. *Management*

Table 3.   Wage differences three years after displacement

	Marginal effects on wage differences					
	Regression 1		Regression 2		Regression 3	
	Mean	SE	Mean	SE	Mean	SE
Age: <30 years	0.029	0.026	0.042	0.027	0.050	0.026
Age: 30–34 years	−0.003	0.019	0.003	0.019	0.007	0.019
Age: 35–39 years			– Baseline –			
Age: 40–44 years	−0.050	0.018	−0.050	0.018	−0.054	0.018
Age: 45–49 years	−0.115	0.020	−0.114	0.020	−0.117	0.020
Age: 50–54 years	−0.103	0.020	−0.107	0.020	−0.107	0.020
Age: > 55 years	−0.064	0.028	−0.066	0.029	−0.065	0.029
Tenure: < 5 years	0.100	0.036	0.09	0.036	0.092	0.036
Tenure: 5–10 years	0.013	0.019	0.014	0.019	0.011	0.019
Tenure: 10–15 years			– Baseline –			
Tenure: 15–20 years	−0.036	0.019	−0.036	0.019	−0.031	0.019
Tenure: 20–25 years	−0.041	0.023	−0.044	0.023	−0.032	0.022
Tenure: 25–30 years	−0.005	0.028	−0.012	0.028	−0.007	0.028
Tenure: > 30 years	−0.015	0.035	−0.024	0.034	−0.020	0.034
Education: Basic	0.093	0.064	0.129	0.069	0.118	0.067
Education: MAVO	−0.028	0.025	−0.013	0.026	−0.029	0.026
Education: HAVO	−0.066	0.041	−0.064	0.042	−0.091	0.042
Education: VWO	0.057	0.050	0.031	0.048	0.003	0.048
Education: LBO/LTS	−0.048	0.018	−0.029	0.019	−0.029	0.019
Education: MBO			– Baseline –			
Education: HBO	0.054	0.017	0.024	0.020	0.008	0.020
Education: WO	0.084	0.029	0.046	0.031	0.013	0.032
Education: TU	0.067	0.023	0.036	0.026	0.032	0.026
Hierarchical level 1			– Baseline –			
Hierarchical level 2			0.026	0.022	0.027	0.023
Hierarchical level 3			0.048	0.026	0.061	0.030
Hierarchical level 4			0.077	0.025	0.091	0.030
Hierarchical level 5			0.083	0.030	0.105	0.034
Hierarchical level 6			0.046	0.035	0.058	0.039
Hierarchical level 7			0.063	0.051	0.073	0.053
Hierarchical level 8			0.135	0.051	0.125	0.057
Job activity: Administration			– Baseline –			
Job activity: Sales					−0.071	0.031
Job activity: R & D					−0.160	0.031
Job activity: Production Preparation					−0.120	0.029
Job activity: Production Planning					−0.111	0.034
Job activity: Production					−0.127	0.031
Job activity: Support					−0.090	0.039
Job activity: Human Resources					−0.059	0.038
Job activity: Quality Control					−0.105	0.032
Job activity: Management					−0.066	0.029
Observations			1464			
Predicted Δlog(W)			−0.016			

Notes: Dependent variable is the difference between the current wage and the wage before displacement. We further control for plant location, gender and marital status.
SE, standard error.

shows an additional 6.6% in wage losses (relative to *Administration*), next are workers in *Sales* with 7.1% and *Support* with 9.0%. *Quality control* (10.5%), *Production Planning* (11.1%), *Production Preparation* (12.0%) and *Production* (12.7%) already show higher wage losses, with finally workers in *Research and Development* showing the highest wage losses with 16.0% higher average wage losses compared with those of administration workers. This is a similar ranking to one that would have been established by examining the function names within the work fields with one exception: *Quality Control* shows lower wage losses than some less specific functions, which is somewhat surprising.

The results confirm our impression that distinguishing between work fields within the company allows us to examine the question on the specificity of accumulated human capital and its transferability to a new employer from a different angle. Holding tenure constant, we see that there are many different functions with differing degrees of specificity. These differences in specificity lead to differing outcomes in search and wage losses. The effect of tenure in itself is diminished, while work fields tend to explain some of the variation observed.

Education levels, on the other hand, seem to have a gatekeeper function in that they open doors to ports-of-entry within a firm. However, the more important variable for post-displacement outcomes is the hierarchical position within a firm. This variable includes both the eduction level, and furthermore the subsequent career within the firm. It is therefore not surprising that hierarchical level strongly affects both the unemployment duration and the post-displacement wage losses.
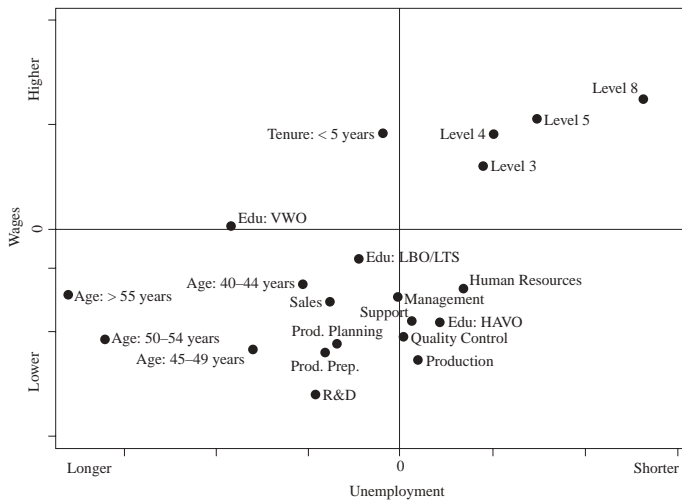
Figure 1 summarizes the impact of the variables on unemployment duration and wage losses. Only significant coefficients were included. Note that the graph is plotted relative to the baseline groups of workers in *Administration*, with an intermediate vocational education (MBO), in the age group of 35–39 years old, having a tenure of 10–15 years, being in the lowest hierarchical level.

All age groups that are older than our baseline are in the lower left quadrant, indicating the combination of longer unemployment duration and higher wage losses. The only significant tenure variable, that of workers with very short tenure, can be found in the expected upper quadrant. Having only little tenure will not lead to huge wage losses, as not much human capital is accumulated.

All job activities are in the lower two quadrants, indicating higher wage losses for all workers in job activities different from *Administration*. However, there are differences in the duration of unemployment. Whereas the more general job activities show shorter unemployment duration and hence are in the lower right quadrant, we can find the workers of the more specific job activities in the lower left quadrant.

The higher hierarchical levels are all in the upper right quadrant, indicating lower average wage losses and shorter unemployment duration. The picture emerging from the hierarchical level is clear: the higher the hierarchical level, the easier it is to escape unemployment and find a job that rewards the former level of employment.

Overall it is striking to see in this figure that the coefficients tend to draw a picture that goes from the lower left quadrant to the upper right one. Coefficients seem to have a joint effect on unemployment duration and wage differences in the sense that they either prolong unemployment and increase wage

Notes: The graph depicts the estimated coefficient of the marginal effects of wage difference and the coefficients of the proportional hazard unemployment duration regressions. Coefficients that are significant in either regression are included. All coefficients are relative to the baseline case of an administrative worker, aged 35-39 years, with 10-14 years of tenure, having an intermediate vocational education, in hierarchical level 1. Unemployment duration is increasing to the left, and wage losses are diminished upwards.

Figure 1. Coefficients of unemployment duration and wage differences.

losses or decrease the chance of unemployment while diminishing the wage losses. There is little evidence pointing to a trade-off in which, for example, shorter unemployment duration is combined with the acceptance of higher wage losses.

Conclusion

We began by addressing the question of the impact of the specific and general human capital on the post-displacement labour market experience. One of the difficulties inherent to human capital is the measurement on the one hand, and its classification as general or specific on the other. So far the displacement literature, has emphasised the effect of tenure as an indicator of the specificity of human capital, and displaced workers were used in order to estimate the returns to it.

In this paper we show that a classification of workers into work fields that are more or less specific is a far better predictor of wage losses than tenure within the displacing firm. It allows us to differentiate between observationally similar workers (in terms of tenure), while pinpointing those with more specific work experience. This allows us to disentangle some of the differences in experienced wage losses following displacement.

General human capital is usually identified by education level and the transferable part of the work experience, measured in pre-displacement tenure. We suggest the use of an additional variable, the hierarchical position of a worker. A higher hierarchical position usually reflects both the entry level based on the educational background of the worker and the subsequent career. Including such a variable in unemployment duration and wage loss regressions shows strong effects. Higher hierarchical positions are associated with significantly lower wage losses and shorter search times.

Notes

1. The bankruptcy trustees sold Fokker Aviation to STORK in 1997. For a complete description see the Trustee report (Deterink *et al.*, 1997).
2. Surveys in The Netherlands have low response rates compared with the rest of Europe. Dutch Statistics report 50% and 60% response for the 'Quality-of-Life' and the 'Labour Force Survey', respectively.
3. We could validate some of the given information by comparing the reported salary earned with Fokker with the information available from the administrative files. Many respondents were able to fill in the exact amount of gross monthly salary that they earned three years prior to the survey. An analysis of non-response was also performed, which did not lead to results that could question the general validity of the data. The survey is described in detail in Kriechel (2003, chapters 5–6).
4. For a detailed description of the company's structure in 1987–1996 see Dohmen *et al.* (2004).
5. See Table 1 for some indication on the specificity of work fields.
6. See Stevens (1994) for a monopsonistic approach to specific human capital, specifically for the case of training. Stevens defines 'specificity' in terms of the size of the labour market for the skill obtained through the training. Lazear (2003) takes a similar approach for his skill-weights. Here the human capital is defined as specific combinations ('weights') of general skills.
7. Self-employment is one route out of unemployment. Given that the self-employment decision is complex and given that self-employment income seems to differ significantly from wage outcomes of comparable employed individuals, we decided to exclude this group of workers. In fact Hamilton (2000) concludes: '[…] self-employment offers significant nonpecuniary benefits, such as "being your own boss." Many entrepreneurs have not only lower initial earnings than employees with the same observed characteristics but also lower earnings growth' (p. 628). In the specific dataset we use, the incidence rate into self-employment is far below the usual numbers. We will thus disregard the small group of self-employed in this paper.
8. It could be argued, however, that higher education levels allow for shorter unemployment spells as they increase the efficiency of searching.

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