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ABSTRACT

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According to the classical human capital theory general training is entirely financed by workers. This prediction is at odds with the empirical evidence. This observation inspired new theoretical models of training in frictional labour market. These frictions create incentives for firms to invest in general training. This paper tries to identify the sources of frictions in the Swiss labour market. The results indicate that internal wage floors may play an important role, especially for training in large firms. Overall, the empirical results support the predictions of the new training literature.

JEL Classification: I2, J31, C33

Keywords: training, wages, market imperfections, mobility

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1. Introduction

According to the classical human capital theory general training is entirely financed by workers who in turn reap all the returns as well (Becker, 1964). This prediction, however, is at odds with the empirical evidence. Many studies show that firms often fully finance training of their workers that is general in nature. Not surprisingly, there is also evidence of small returns of general training to workers and relatively large returns to firms (e.g. Barron, Berger, and Black, 1999, and Goux and Maurin, 2000). These observations inspired new theoretical models aiming at explaining the empirical evidence. Acemoglu and Pischke (1999a,b), among others, developed a model with frictional labour markets. These frictions create incentives for firms to invest in general training. Most important from a policy point of view is that the amount of training in this frictional world is below the optimal first-best solution achieved in the classical Becker model. Given the importance of training for productivity and growth it is natural to ask whether the amount of investment can be improved. Since we are in a world of second-best policy interventions may improve welfare. Which instrument is most effective in increasing training investments may depend on the nature of the friction predominant in the labour market. If information asymmetries play an important part a more regulated training system with credentials providing more information might be helpful. If training costs are too high relative to the returns training subsidies might be useful in increasing training investment. However, at the moment neither the theoretical nor the empirical knowledge is sufficient for clear policy recommendations.

The aim of this paper is to provide further empirical evidence by trying to identify the kind of frictions that are important in the Swiss labour market. The empirical strategy relies on possibly differential returns to training for workers staying with or quitting the training firm. The classical human capital theory predicts that these returns should be equal if training is purely general, and higher for the stayers if training has a firm-specific component. Most of the frictional models predict smaller returns for movers. Larger returns for movers are predicted by models where firms face an internal minimum wage, either for contractual reasons (a wage “guarantee”) or due to moral hazard (e.g. efficiency wages). The empirical evidence for full-time workers indicates higher returns at new firms which supports the models with wage guarantees. In order to gain more insight the analysis is also carried out by population subgroups. The results indicate that the differential return is increasing with the training level which is a necessary condition in the

Acemoglu-Pischke model. Secondly, the differential return only occurs for workers working in large firms. Again, this is an expected result because the internal wage floor explanation should be more relevant in large firms. Overall, these results appear to draw a consistent picture.

The paper is organised as follows: section 2 sketches the main aspects of the new training literature and its implications for empirical research. The econometric approach is outlined in section 3, and section 4 discussed the data used in this paper. Section 5 presents the estimation results, section 6 concludes.

2. The "new" training literature

To set out the main principles of the new training literature (Acemoglu and Pischke, 1998, 1999) consider a simple two period model. The focus is on general training, i.e. human capital that can be transferred across firms. The classical human capital model (Becker, 1964) can be summarised as follows:

- At time $t = 0$ there is an initial production of y_0, and the firm decides on the level of training τ, with $\tau \in (0,\infty)$. Training costs are $c(\tau)$ with $c(0) = 0;\ c(\cdot)' > 0;\ c(\cdot)'' > 0$. The second assumption assures that it is always socially beneficial to have some amount of positive training.
- At time $t = ½$ the firm makes a wage offer w to the worker, and other firms compete for the worker. The worker decides whether to quit and work for another firm. Assume there are many identical firms who can use the general skills of the worker, and the worker does not incur any costs in the process of changing firms. This assumption makes the labour market essentially competitive.
- At time $t = 1$ there is a second and final period of production, where output is equal to $y_1 + f(\tau),$ with $f(0) = 0,\ f'(\cdot) > 0,$ and $f''(\cdot) < 0$. Discounting is ignored for simplicity.

The socially optimal level of training is given by the condition $c'(\tau^*) = f'(\tau^*)$. Becker has shown that the equilibrium is achieved when the second period wage $w_1 = y_1 + f(\tau^*)$ and the first period wage $w_0 = y_0 - c(\tau^*)$. Therefore, in this economy the efficient level of training will be achieved with firms bearing none of the cost of training, and workers financing training by taking a wage cut in the first period of employment. If workers face credit constraints or binding

contracts are not possible training investment will be below the social optimum. The general conclusion that firms will not bear any costs still holds in these cases.

Empirically, there is a lot of evidence against this prediction of the classical human capital model. Table 1 summarises some of this evidence. According to the subjective evaluation of workers 70 – 85% of all training courses are viewed as being general training. The majority of these courses are at least partially financed by the firms (see e.g. Loewenstein and Spletzer, 1998, for the USA, Booth and Bryan, 2002, for the UK, and Backes-Gellner und Schmidtke, 2000, for Germany). The German apprenticeship system is also mentioned as an example against the predictions of the classical model. The same can be argued for the Swiss apprenticeship system which is very similar to the German system.

The "new training literature" attempts to explain these observed facts. The central deviation from the classical model concerns frictions in the labour market. Consider the following simple two period model: in the first period the worker or the firm decide how much to invest in the worker's general human capital, τ. For simplicity normalise output in the first period to zero. In the second period the worker either stays with the firm and produces output $y = f(\tau)$. The worker will be paid a wage rate $w(\tau)$ as a function of his skill levels τ. If he quits he will receive an outside wage $v(\tau)$. Costs of training are again given by $c(\tau)$. Training is assumed to be technologically general, i.e. $f(\tau)$ is the same for all firms. Now assume that there are frictions in the labour market such that $v(\tau) < f(\tau)$, i.e. if the worker quits he will get an outside wage below his marginal product .This creates a surplus $f(\tau) - v(\tau)$ that can be shared between the current firm and the worker. Assuming Nash bargaining the wage of the worker is

$$(1) \qquad w(\tau) = v(\tau) + \beta\left[f(\tau) - v(\tau)\right],$$

where $\beta \in [0,1]$ is the bargaining power of the worker. Note that training costs do not affect the equilibrium wage.

Under the assumption that τ is determined by the investments of the firm and the worker, who independently choose their contributions to costs, c_f and c_w, i.e. τ is given by $c(\tau) = c_f + c_w$. Now firm and worker bargain over the second period wage $w(\tau)$, where the threat point for the worker is the outside wage $v(\tau)$, and the threat point of the firm is not to produce. Acemoglu and

Pischke (1999a) show that if there is training either the firm or the worker will bear all costs. Since we are interested in firm financed general training we focus on this case.

The firm maximises profits by choosing τ, where profits are given by

$$(2) \qquad \pi(\tau) = \left[f(\tau) - w(\tau) \right] - c(\tau) = (1-\beta)\left[f(\tau) - v(\tau) \right] - c(\tau) .$$

First order conditions are

$$(3) \qquad (1-\beta)\left[f'(\tau) - v'(\tau) \right] - c'(\tau) = 0 \quad .$$

If $f'(\tau) - v'(\tau) = 0$ the firm will not invest in training and the worker will bear all training costs. This is the case of perfectly competitive labour markets. Firms will only invest in training if $f'(\tau) - v'(\tau) > 0$. Hence it is not sufficient that outside wages are below the worker's productivity in order to generate firm financed training. It is necessary that productivity increases more than outside wages with increasing human capital. In other words, the surplus $f(\tau) - v(\tau)$ must increase with training. Acemoglu and Pischke call this situation a compressed wage structure. The external compressed wage structure will translate into an internal wage structure implying that $f'(\tau) - w'(\tau) > 0$ as well.[1] One of the most important implications of this model is that investment in training will be less than in the frictionless world, i.e. $\tau < \tau^*$.

Acemoglu and Pischke show that a variety of labour market frictions can lead to wage compression. These include search costs, asymmetric information, complementarity of general and firm-specific skills, efficiency wages, and minimum wages. While the first three directly compress the external wage structure (and the internal wage structure only indirectly) the latter two directly compress the internal wage structure. Loewenstein and Spletzer (1998) develop a contractual model which has the same implications as the efficiency wage model. The main idea of this model is that firms set an internal minimum wage (a wage guarantee) below which wages cannot fall. The reason for this wage guarantee is a signal to employers that firms will not extract excessive returns to training from workers. In other words these are mechanisms to address the moral hazard problems that concern both firms (incentives for effort) and workers (excessive rent extraction by employers). This wage guarantee is binding for workers whose productivity is

[1] This follows from the derivative of $w(\tau) = v(\tau) + \beta\left[f(\tau) - v(\tau) \right]$, which is $w' = v' + \beta\left[f' - v' \right] = \beta f' + (1-\beta)v'$, as long as $\beta < 1$.

below the wage guarantee. If firms invest in training of these workers they can increase their productivity without having to increase the wage as long as productivity remains lower than the wage guarantee. This mechanism creates the compressed internal wage structure. Note that in this case it is not necessary that the external wage structure is compressed in order to induce firms to finance general training. The important implication for the following empirical analysis is that this model implies that workers may be able to increase their wages by changing firms because the wage guarantee may not be binding at an outside firm. In other words, by changing firms workers may be able to capture the returns to previous training. This will be especially the case when there are long-term labour contracts, as modelled by Loewenstein and Spletzer (1998). Hence the central question of the empirical analysis is whether workers who received training in the past year and changed jobs after training have higher returns to training than those workers who stayed with the training firm. The classical human capital model and the other sources of labour market frictions are not compatible with this prediction.

3. Econometrics

In order to analyse the predictions from the previous section I specify the following wage equations (similar specifications are used by Loewenstein and Spletzer, 1998, and Booth and Bryan, 2002). Given the data at hand (see the next section for details) all I can estimate is a two period model. The wage equations for the two periods are given as

$$
\begin{aligned}
& w_{ij0} = x_{ij0}\beta + \mu_i + \nu_{ij} + \varepsilon_{ij0} \\
& w_{ij1} = x_{ij1}\beta + T_i\alpha_1 + \mu_i + \nu_{ij} + \varepsilon_{ij0} \text{ if same firm} \quad , \\
& w_{ik1} = x_{ik1}\beta + T_i\alpha_2 + \mu_i + \nu_{ik} + \varepsilon_{ik0} \text{ if job change}
\end{aligned} \tag{4}
$$

where

w_{ijt} : log of monthly earnings of worker *i* in firm *j* in period *t*

x_{ijt} : vector of worker and firm characteristics (age (cubic), tenure (cubic), education, job position, sex, nationality, indicators for sectors, regions, and time)

T_i: training indicator, training of worker *i* in between period 0 and period 1.

μ_i: permanent worker-specific effect (unobserved)

$\nu_{ij:}$: match-specific component (unobserved)

ε_{ijt}: transitory random effect

The wage equation in period 0 does not contain any training indicator. Previous training is contained in μ_i. There is evidence in the data that training participation is strongly correlated over time, so μ_i is correlated with T_i. Estimating the model by fixed effects removes this and possible further correlations between training participation and unobserved ability or motivation contained in μ_i.

The employer-match effect ν_{ij} is also likely correlated with T_{it} because the probability of training will be higher if the match is good. However, this correlation cannot be removed by fixed effects estimation because first differencing will not eliminate the term $(\nu_{ik} - \nu_{ij})$ for movers. Nevertheless, it is possible to derive the direction of the possible bias due to this correlation.

Loewenstein and Spletzer derive the condition for a job change:

(5) $$T_i(\alpha_2 - \alpha_1) + (\nu_{ik} - \nu_{ij}) + (R_{ikt} - R_{ijt}) > 0$$

where R_{ijt} is the present value of expected future returns at firm *j*.

Now if $(\alpha_2 - \alpha_1) < 0$ then the improvement in the value of the match must be higher for higher values of T_i, hence $corr\left[(\nu_{ik} - \nu_{ij}), T_i\right] > 0$. On the other hand, if $(\alpha_2 - \alpha_1) > 0$ then the value of the job match becomes less important when T_i increases, thus $corr\left[(\nu_{ik} - \nu_{ij}), T_i\right] < 0$. This implies that the estimate of $(\alpha_2 - \alpha_1)$ will be biased upwards if $(\alpha_2 - \alpha_1) < 0$, or the estimate of $(\alpha_2 - \alpha_1)$ will be biased downwards if $(\alpha_2 - \alpha_1) > 0$.[2] In any case the absolute value of the differential return will be underestimated.

Finally, $\nu_{ij} - \nu_{ik}$ does not have an expected value of zero. To take account of this following Loewenstein and Spletzer (1998) the employer-specific effect ν_{ij} is approximated by a dummy variable taking the value of one in case of a job change. The base case is the job in the first observation period.

[2] Assuming that $(\nu_{ik} - \nu_{ij})$ and $(R_{ikt} - R_{ijt})$ are not highly negatively correlated.

4. Data

I employ data from the Swiss Labour Force Survey (SLFS). The SLFS is conducted by the Swiss Federal Statistical Office on a yearly basis. Each year about 18'000 households are interviewed. The SLFS is designed as a rotating panel, i.e. individuals are interviewed at most in 5 consecutive years. In the years 1996 and 1999 there were special questionnaires relating to vocational training. The questions determine who had any training in the past twelve months, who had work-related training, whether this training was financed by the firm or took place during work time, whether training ended with a certificate, and duration of training. From these questions I constructed indicator variables for firm sponsored work-related training and self financed work-related training. In addition, all waves of the SLFS contain information on work-related training in the past twelve months.

Unfortunately, there was a significant change in the questionnaire regarding income between 1995 and 1996.[3] Since the estimation method is based on the incomes before and after training it is impossible to use the 1995/1996 waves for the analysis. Hence I focus on the 1999 wave. I constructed a balanced 2-years panel covering the years 1998/1999.

Only full-time male workers are included in the sample. Work-related training is defined as training in the past 12 months that is either firm-sponsored or self-financed. Training is considered as firm-sponsored if it either was financed by the firm or if it took place during work hours (both inside and outside the firm). Training duration must be at least a week, and only completed training spells are considered. There is no way to identify general and firm-specific training in the data. Hence I assume that the training measured by these indicators is at least partially general in nature. Table 2 provides some support for this assumption. One third of all firm-sponsored training events are computer courses, and one third are language and management courses. Movers and stayers are identified by an indicator variable "job change". Furthermore, it is possible to split the movers into quits and lay-offs. The descriptive statistics of these variables can be found in Table 4 in the next section.

Table 3 breaks down training and job change frequency by socio-demographic characteristics. Almost half of all full-time workers participated in some work-related training. Roughly two third are firm financed. Incidence of firm-sponsored training is above average for better qualified

[3] Until 1995 respondents were asked to state their full labour income, including income from jobs other than their main job. Since 1996 the questionnaire differentiated between main and additional jobs.

workers and workers in large firms. On the other hand, the variation with age or tenure is relatively low. Only for workers with more than ten years of tenure there is a somewhat larger probability of firm-sponsored training. These descriptive results are confirmed by estimating a probit of training participation. The results of the training probit are displayed in the appendix. The most important determinant of participation in firm-sponsored training is previous training.[4] This corresponds to the findings in Gerfin (2003). Based on the training variable contained in all waves ("did you receive work-related training in the past twelve months?") it turns out that 32% did not participate in any training between 1997 and 1999 (recall that training is measured retrospectively, so the 1998 wave contains training information for the year 1997). On the other hand, 22% received training in all three years. Of the remaining 46% 21% had least one training spell and 25% had two training spells. In other words almost 50% of the sample had at least 2 training spells in the three years 1997-1999.

The final row of Table 3 displays descriptive statistics of the job change indicator. Overall, 8% of the workers changed the employer between the two observation periods. There is no difference by previous training status. The likelihood of a job change clearly diminishes with age and tenure. The probit estimates for the probability to change jobs are displayed in the Appendix (Table A.1). It turns out that the most important determinant of the probability of a job change is an indicator for "looking for a job". Other important determinants are firm size and job position. Interestingly, both workers without supervisory position and workers in the management have higher job change probabilities than the reference group (workers with supervisory position).

5. Results

Table 4 shows the fixed effects estimation results of the central parameters.[5] The dependent variable is the log of monthly earnings. I trimmed the sample by excluding the top and bottom percentile of the earnings distribution in order to avoid that results are driven by outliers.

All coefficients are multiplied by 100, hence the figures represent the effect in %. In column (1) the returns to training are restricted to be equal for movers and stayers. Column (2) shows the results when returns to firm-sponsored training are allowed to differ between movers and stayers.

[4] Because the detailed questions regarding training are only available in the 1999 wave it is not possible to separate the indicator for previous training into firm-sponsored and self-financed training.

[5] The full set of estimation results is available on request

Finally, in column (3) the movers are split into quits and lay-offs. Returns to self-financed training are not differentiated between movers and stayers.

Column (1) of Table 4 indicates that for men there is a significant return to training of roughly 1.5% - 2%. The returns do not differ significantly between firm-sponsored and self-financed training (not shown). The effect of a job change is about 2.6%. These results conform to those in Gerfin et al. (2003). Separating the returns to firm-sponsored training for stayers and movers clearly indicates that the returns are larger for movers by a factor of 3. This is what would be expected according to the models with wage guarantees. However, this differential is not significant (the corresponding F-test has a p-value of 0.19). Further differentiating job changes into quits and lay-offs (column 3) yields the expected result that only quitters benefit from a job change, both in terms of the match component and of the returns to training. Interestingly, now the differential return between stayers and quitters is significant at the 10% level (p-value of 0.08). Hence this result indicates that quitters are able to reap at least part of the return to training while in the case of stayers the training firm is able to extract a large fraction of this return. Note however that the fraction of workers who quit and especially who are laid off after training is very small. Overall, the results in Table 4 support the theoretical model with internal wage guarantees. Similar results have been found by Loewenstein and Spletzer (1998) for the USA and by Booth and Bryan (2002) for the UK.

An interesting question is whether these results vary with subgroups, especially with respect to the level of acquired human capital. The theoretical model shows that the rent of the training investment for the firm must increase with training in order to create the incentive to invest. Hence I estimated the model for several subgroups, differentiated by job position, skill level, and previous training participation. In most cases no significant effects are estimated. One very interesting exception is the case of splitting the sample by previous training participation. Given that training participation is highly correlated over time (see Table A.1 and the evidence in Gerfin, 2003) training in the past twelve months is probably a good indicator of accumulated human capital through training. Table 5 displays the estimation results for these two subgroups. For the subgroup of workers who received training in the previous year there are rather small and insignificant returns to firm-sponsored training for stayers. Movers, however, realize large and significant returns to training at their previous employer. The returns are larger than those estimated for the subgroup of non-participants in previous training. This finding is consistent

with the theoretical condition that the surplus $f(\tau)-w(\tau)$ must increase with training. Once workers quit they are able to reap part of this larger surplus. The match specific component, on the other hand, does not appear to be important.

Workers without training in the previous year have no significant effect of current training on their wages, independent on their mobility status. Interestingly, for these workers the match specific component improves significantly when they change jobs. This finding is consistent with the model and the discussion of equation (5). Since these workers do not profit from higher returns to training when they change jobs their decision to change jobs should be dominated by an improved job match. However, despite fitting theoretical predictions very nicely these subgroup results have to be taken with some caution because some of the effects are estimated with small cell sizes.

Finally, I analyse the question whether firm size matters for the results presented above. The contracting and efficiency wage explanations should be more relevant in large firms because the moral hazard problems (monitoring individual effort and productivity) discussed in Section 2 are more pronounced in large firms. Therefore, I estimated the model separately for workers in large firms (more than 100 employees) and in small firms. Table 6 displays the results. In the left part of Table 6 are the results for large firms. They correspond to those from the full sample, but the effects are more pronounced. According to the estimates workers in large firms do not get any return to general training as long as they stay with the training firm, but get large returns when they change employers. Hence the results corroborate the wage floor explanation for frictional labour markets in large firms. In small firms, on the other hand, stayers get at least a part of the return, and more importantly, movers get at most the same return when they change employer. This might be explained by the fact that long term contracts with wage guarantees are more difficult to make in small firms. Possibly small firms who do finance general training may do so because the complementarity between general and specific training is more pronounced in small firms. This result may partly explain why training incidence is much smaller in smaller firms.My results correspond to those in Wolter et al. (2003) who analyse why some firms offer apprenticeship programmes and others do not. One of their result is that large firms offer apprenticeship programmes despite positive net costs of the programme. One possible reason for this finding is that large firms retain at least part of their apprentices and are able to get rents from their productivity after the apprenticeship by paying wages below productivity. Again long term

contracts which determine the wage profile may play an important role. More work is necessary to achieve a better understanding of the mechanisms that lead to the observed behaviour.

6. Conclusions

This paper addressed the empirical question whether there are differential returns to general training at the firm providing the training and at outside firms. The evidence indicates that for male workers returns are larger at outside firms, at least for voluntary quitters. This evidence is consistent with recent theoretical models of training in frictional markets where the frictions are introduced through internal minimal wage floors, due to wage guarantees in labour contracts or efficiency wages. These contracts allow firms to extract a significant part of the return to general training, thus providing the incentive to finance this training in the first place. By changing employers workers are able to get at least part of the returns to previous general training.

Analysing subgroup heterogeneity of the returns to training indicates some further evidence in favour of the frictional labour market model. As required by this model in order to generate firm-sponsored general training there is some evidence that the difference between productivity and inside wages is increasing with training. Secondly, the differential return only occurs for workers working in large firms. Again, this is an expected result because the internal wage floor explanation should be more relevant in large firms. Overall, the empirical results obtained in this paper appear to draw a consistent picture.

Given that the models with labour market frictions imply training investments below the social optimum achieved in the classical human capital model the question arises whether there are policy instruments to improve training investments. In the case of internal wage guarantees theory indicates that training costs are too high to achieve higher investment. This suggests that training subsidies might be a useful instrument. This conclusion, however, is still very tentative given that the empirical evidence is not clear-cut. Further work, both theoretical and empirical, is necessary in order to provide more reliable answers to this very important problem.

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Tables

Table 1: International Comparisons

Country	Proportion of workers receiving training (in %)	of these financed by firm (completely or partially) (in %)	Proportion of general training (subjective view of workers)
USA (1993)	18	60-80	70-85
UK (1998)	31	62	85
Germany I(1986-88)	28	62	-
Germany II(1990-92)	24	66	70

Sources: Loewenstein und Spletzer (1998a,b) for USA; Booth and Bryan (2002) for UK, Pischke (2001) for Germany I, Backes-Gellner und Schmidtke (2000) for Germany II, Gerfin et al (2003) for Switzerland

Table 2: Type of Work-Related Training in Switzerland

Type of Training	Men (% receiving)	Women (% receiving)
Firm-Sponsored	33	29
of these:		
Language	8	13
Computer	33	28
Management	28	14
Other	31	45

Sources: Swiss Labour Force Survey 1999, own calculations

Table 3: Incidence of training and job change (men), in %

		Training in 1997		Educational Level		Age			Tenure				Firm size	No supervi-sory position
	Total	yes	no	low	high	25-35	35-45	45-55	0-2	2-5	5-10	10+	> 100	
Training														
firm-sponsored	37	55	22	13	46	33	40	41	37	32	38	40	47	31
self-financed	16	21	11	8	20	17	17	11	16	20	18	12	15	15
Job change	8	8	8	6	8	12	7	2	15	10	6	3	6	9

Own calculations' SLFS 1999. Sample consists of full-time male workers, excluding self-employed. Sample size 1905

Table 4: Estimation Results (all coefficients multiplied by 100), 1998-1999

Variable	Mean	(1)	(2)	(3)
Training stayers	0.349	**1.27**	**1.11**	**1.11**
Training movers				
All,	0.025	**1.27**	*3.45*	-
Quits	0.018		-	**4.89***
Lay-offs	0.007		-	0.07
Match-component				
job change	0.077	**2.57**	**1.83**	-
Quit	0.056		-	*2.27*
Lay-off	0.021		-	0.84
Number of obs		3810	3810	3810
Number of persons		1905	1905	1905
R-squared – within		0.08	0.08	0.08
R-squared– between		0.11	0.11	0.11
R-squared – overall		0.11	0.11	0.10

Notes: Own calculations, SLFS 1998/1999. Fixed Effects estimation. Coefficients in **bold** are significant on the 5% level, coefficients in *italic* are significant on the 10% level. * denotes significant difference between return for stayers and return for movers. Sample is male full-time workers, not self-employed

Additional control variables: cubic in age and tenure, years of education, marital status, number of children, ISCO skill levels, job position, temporary contract, overtime, firm size, nationality, industry dummies, regional dummies.

Table 5: Subgroup Estimation Results by previous training participation (all coefficients multiplied by 100), 1998-1999

	Training in previous year				*No Training in previous year*			
	Mean	(1)	(2)	(3)	Mean	(1)	(2)	(3)
Training stayers	0.523	0.99	0.68	0.68	0.199	0.65	0.44	0.44
Training movers								
All,	0.028	0.99	**5.50***		0.022	0.65	2.81	
Quits	0.019			**7.53***	0.016			3.97
Lay-offs	0.009			1.11	0.006			-0.54
Match-component								
job change	0.076	0.26	-1.68		0.078	**3.82**	*3.31*	
quit	0.057			-1.13	0.055			*3.78*
lay-off	0.019			-2.96	0.023			2.13
Number of obs		1766	1766	1766		2044	2044	2044
Number of persons		883	883	883		1022	1022	1022
R-squared – within		0.06	0.06	0.07		0.05	0.05	0.05
R-squared– between		0.03	0.04	0.04		0.01	0.02	0.02
R-squared – overall		0.02	0.03	0.03		0.01	0.02	0.02

Notes: Own calculations, SLFS 1998/1999. Fixed Effects estimation. Coefficients in **bold** are significant on the 5% level, coefficients in *italic* are significant on the 10% level. * denotes significant difference between return for stayers and return for movers. Sample is male full-time workers, not self-employed

Additional control variables: cubic in age and tenure, years of education, marital status, number of children, ISCO skill levels, job position, temporary contract, overtime, firm size, nationality, industry dummies, regional dummies.

Table 6: Subgroup Estimation Results by firm size (all coefficients multiplied by 100), 1998-1999

	Large Firms (more than 100 employees)				*Small Firms (less than 100 employees)*			
	Mean	(1)	(2)	(3)	Mean	(1)	(2)	(3)
Training stayers	0.437	0.58	0.09	0.09	0.287	1.80	1.96	1.96
Training movers								
All,	0.021	0.58	9.12*		0.027	1.80	-0.06	
Quits	0.018			8.28*	0.017			1.89
Lay-offs	0.004			1.10	0.010			-3.05
Match-component								
job change	0.056	6.21	2.46		0.092	1.56	2.05	
quit	0.041			3.12	0.067			2.32
lay-off	0.015			1.12	0.026			1.37
Number of obs		1574	1574	1574		2236	2236	2236
Number of persons		787	787	787		1118	1118	1118
R-squared – within		0.08	0.09	0.09		0.05	0.05	0.05
R-squared– between		0.01	0.02	0.01		0.02	0.02	0.02
R-squared – overall		0.02	0.02	0.02		0.02	0.02	0.02

Notes: Own calculations, SLFS 1998/1999. Fixed Effects estimation. Coefficients in **bold** are significant on the 5% level, coefficients in *italic* are significant on the 10% level. * denotes significant difference between return for stayers and return for movers. Sample is male full-time workers, not self-employed

Additional control variables: cubic in age and tenure, years of education, marital status, number of children, ISCO skill levels, job position, temporary contract, overtime, nationality, industry dummies, regional dummies.

TableA.1: Probit, Firm-Sponsored Work Related Training and Job Change

		Training		Job Change	
		Coefficient	Standard Error	Coefficient	Standard Error
	Age	-0.018	0.039	0.034	0.066
	Age squared	0.031	0.050	-0.081	0.088
	Tenure	0.000	0.009	**-0.051**	0.012
	Tenure Squared	0.004	0.026	**0.067**	0.026
Educational Level:	Upper Secondary	**0.293**	0.111	-0.079	0.160
	Tertiary	**0.280**	0.123	-0.047	0.179
	Academic	*0.241*	0.144	-0.136	0.223
ISCO Skill level:	Unskilled	**-0.594**	0.219	*-0.632*	0.398
	Skilled manual	-0.097	0.107	-0.113	0.158
	Semi-Professional	0.142	0.105	-0.215	0.164
	Professional	*0.199*	0.107	-0.013	0.161
Job Position:	No Supervisory Position	**-0.225**	0.077	**0.332**	0.124
	Management	-0.038	0.086	**0.288**	0.142
	Temporary Work Contract	0.006	0.215	0.061	0.272
	Looking for new job	0.017	0.115	**1.003**	0.128
Firm Size:	< 10	*-0.183*	0.095	-0.105	0.133
	> 100	**0.271**	0.074	**-0.242**	0.116
Foreigner		*-0.178*	0.101	0.102	0.135
Sector:	Manufacture of Machinery	**-0.162**	0.130	0.053	0.191
	Other Manufacturing	**-0.264**	0.136	0.012	0.196
	Chemicals	0.131	0.176	-0.791	0.526
	Construction	-0.225	0.143	0.189	0.195
	Trade	0.062	0.120	0.214	0.168
	Hotels and restaurants	-0.124	0.289	-0.123	0.438
	Transport	-0.002	0.130	-0.340	0.232
	Banking, Insurance	0.131	0.142	0.136	0.212
	Public Administration	**0.537**	0.134	-0.210	0.234
	Education	-0.099	0.180	-0.173	0.319
	Health and Social Work	-0.278	0.177	0.318	0.239
Region of Residence:	North-West	0.075	0.098	-0.170	0.152
	South-West (French and Italian part)	-0.161	0.099	**-0.337**	0.157
	East	-0.064	0.103	0.027	0.153
	Central	-0.011	0.089	0.013	0.129
	Training Participation Previous Year	**0.698**	0.066	0.057	0.102
	Number of observations	1905		1905	

Source: Swiss Labour Force Survey, own calculations. All estimations included a constant term. Coefficients in *italic* are significant on the 10% level, coefficients in **bold** on the 5% level.

Training is firm-sponsored training in 1998