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The Puzzle of Non-Participation in Continuing Training – An Empirical Study of Permanent vs. Occasional Non-Participation

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Abstract

Although participation in continuing vocational training is often found to be associated with considerable individual benefits, a puzzlingly large number of people still do not take part in training. We argue that in order to solve the puzzle it is important to take selection effects into account when studying the returns to education. It has already been established that training participants and non-participants differ in unobservable characteristics and therefore self-select into training or not. We show that even non-participants cannot be treated as a homogeneous group: there are individuals who never take part in training (permanent non-participants) and individuals currently not taking part (occasional non-participants). Using a unique data set of non-participants we separate and compare those two groups. We find that, if they participated, permanent non-participants would have higher costs than occasional non-participants and the benefits associated with their current jobs would be lower. However, even permanent non-participants would benefit from participation in terms of improved prospects on the labor market. The results indicate that permanent non-participants either misperceive future developments or suffer from an exceptionally high discount rate, which in turn leads in their view to a negative cost-benefit ratio for training.

Keywords: Further training; Investing in human capital; Costs-benefit ratio.

1. Introduction

Lifelong learning and continuing vocational training are becoming more and more important- a trend driven primarily by demographics and rapid technological change. On the one hand, the decline in birth rates and an aging workforce may cause a shortage of skilled labor, strengthening the importance of continuing vocational training (Bellmann, 2003). On the other, technological change is strongly skill-biased, shifting labor demand toward more educated workers.[1] Employees with low levels of education risk earning lower wages or, even worse, being crowded out of the labor market. Many jobs are disappearing due to technological change, and occupations that are formally identical with those that existed in the past are becoming more and more complex (Spitz, 2004). All this should cause a strong incentive to participate in continuing vocational training. Moreover, a large number of studies have shown that participation in continuing vocational training boosts individual wages.[2] Recent research has also found non monetary benefits, such as a reduced risk of becoming unemployed.[3] However, many individuals still refrain from participating in continuing vocational training. Even individuals who leave school with few or no qualifications, and whose only way to catch up would be to participate in continuing training, often decide not to participate in any continuing training measure (Schröder, Schiel & Aust, 2004). Furthermore, Groot & Maassen van den Brink (2003) point to the existence of different training tracks, where workers not participating in further training in one year are likely to belong to the group of non-participants in the next year as well.

The question we raise in our paper is how the puzzle, i.e. having high returns on training for all participants on the one hand and a large number of people not participating in training on the other , can be solved. We argue that the solution is to be found in unobservable characteristics of two different groups of non-participants in training, namely

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[1] Chennells & Van Reenen (1999) survey the evidence on the correlation between technology and skills and come to the conclusion that the technological change is skill-biased.

[2] See Frazis & Loewenstein (2003) for US; Basssanini, Booth, Brunello, De Paola & Leuven (2005) and Pfeiffer (2000) for Europe.

[3] Büchel & Pannenberg (2003).

occasional and permanent non-participants. This distinction has not been used before and the results are promising.

There is a vast empirical literature devoted to estimating the (positive) impact of training, e.g. on the participants' wage, but only a few empirical papers analyze the rate of return that non-participants would have if they had taken part in continuing vocational training. Vignoles, Galindo-Rueda & Feinstein (2004) analyze the effect of work related training on wage growth, but focus only on middle-aged male workers. They estimate a selection model - taking into account that the training decision could be endogenous - and find substantial selection effects. Those workers who received training measures gain substantial wage benefits, whereas non-participating workers would not have gained higher wages if they had participated. Groot (1995) analyzes the impact of an investment in firm-related training on wages and he finds that participants do have a positive rate of return. But the wage gain a non-participant would have received if he had participated is negative. Moreover, Leuven & Oosterbeek (2002) show that the return to work-related training is overestimated when self-selection is not taken into account. There is also similar evidence in the field of initial vocational training. Wolter, Mühlemann & Schweri (2003) find that most of the apprenticeships in Switzerland generate net benefits for the participating firms. But they also show that if non-participating firms were to start to train apprentices, they would incur significantly higher net costs compared to the participating firms, which follows from the fact that non-participants face much more unfavorable cost-benefit ratios. Thus all these results indicate that due to the absence of sufficient benefits or due to higher costs not participating in training could be a rational decision. But the question still remains as to the characteristics of those individuals for whom it may not pay to take part in training.

Bassanini et al. (2005) studied the determinants driving the probability of receiving training and found that educational attainment and skill-intensity of occupation exert a positive impact. There seem to be complementarities between higher levels of education on the one hand and continuing training on the other. So individuals who are already disadvantaged in schooling and vocational education are more likely not to participate in lifelong learning later in life. Jenkins, Vignoles, Wolf & Galindo-Rueda (2002) found that the more qualified individuals are, the more likely they are to return to learning later in life. Moreover, training probability decreases with age, and part-time as well as

temporary workers are less often found in the group of participants (Bassanini et al., 2005). In sum, training participants and non-participants differ in observable as well as in unobservable characteristics.

In this paper, we argue that non-participants cannot and should not be treated as a homogeneous group. We concentrate on those not taking part in continuing vocational training and, for the first time, distinguish permanent from occasional non-participants, studying their returns separately. We are fortunate in being able to use a unique data set with more than 1200 non-participants.[4] This survey not only allows the distinction between individuals never taking part in training (permanent non-participants) and individuals currently not taking part, i.e. in the year of the survey (occasional non-participants), but also covers a large number of non-participants of both types due to the sampling method. The aim of our paper is to study the differences between these two groups and particularly to find out why some people never take part in continuing vocational training.

The structure of the paper is as follows: the next section covers the theoretical framework, a simple cost-benefit model. Section 3 explains the econometric models and the estimation methods applied. The data set used is described in section 4. The results of the estimation of costs and benefits are presented in section 5, and conclusions are drawn in the last section.

2. Theoretical Framework: the investment decision

Following standard human capital theory an individual's training decision depends on the expenditures as well as on the returns associated with participation in training.[5] Individuals bear costs for continuing training because they expect returns in the future. If the returns exceed the costs, it pays to invest; otherwise it is rational not to invest in

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[4] We thank the Expert Commission on Financing Lifelong Learning for collecting and for allowing us to use the data.

[5] Becker (1975).

training.[6] Or to be more precise, an individual only invests in continuing vocational training if the present value of the benefits exceeds the present value of the costs, i.e. if

$$\sum_{t=1}^{T} \frac{B_{ijt}}{(1+r)^t} \quad > \quad \sum_{t=1}^{t+z} \frac{C_{ijt}}{(1+r)^t} \qquad (1)$$

If inequation (1) does not hold, it would not be rational for individuals to invest in training.

The total costs (*C*) of an employee[7] (*i*) participating in training measure (*j*) in period *(t)* can be separated into direct costs and indirect or opportunity costs. Direct costs include participation fees, expenses for books, transportation costs or expenses for childcare, as well as non-monetary costs like disliking learning and negative feelings attached to training due to bad past learning experience. Opportunity costs include either forgone salary that an individual could have earned if he had not taken part in continuing training (in the case of unpaid leave) or the loss of leisure. Some direct cost components may be alike for everyone (e.g. participation fees), others – especially non-monetary direct costs (like learning stress) - may vary substantially between individuals. Opportunity costs can also be assumed to differ substantially but the overall effect is unclear ex ante. Individuals with higher ability or motivation may learn more quickly and finish the same training measure in a shorter time compared to other individuals, but their forgone income per time unit is higher. On the other hand individuals with lower ability learn more slowly but they also earn less, so the overall effect is unclear. However, for individuals with lower income it might be more difficult to compensate for forgone earnings, so even lower absolute amounts of foregone income would still prevent them from participating.

The benefits (*B*) also have two components: direct benefits like an increase in pay, and indirect benefits like an increase in job security and long term labor market prospects.

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[6] In many cases the company bears some or even most of the costs and therefore gets at least part of the returns. In this paper nevertheless we concentrate on the individual's decision. Even if the company and the individual split costs and benefits, we just look at the individual's part.

[7] Full-time employees, part-time employees, unemployed persons, training participants as well as unemployed persons who would like to start working (again) in the next two years belong in this group.

Furthermore, since the decision depends on the present value of costs and benefits, the remaining time in the labor market (*T*) and the individual discount rate plays a crucial role. Individuals with a high discount rate *r* are more present oriented. As a consequence they are less likely to accept costs today to gain benefits at some time in the future.

Taken together, the decision never to take part can occur either because never-participants cannot afford the associated costs (monetary and/or non-monetary), because of low benefits associated with the training participation, or because of a high discount rate or low remaining time in the labor market. Another potential reason could be that particularly permanent non-participants lack the necessary information and can thus not correctly anticipate future benefits or possible job-offers.

Unfortunately, the data set used does not allow calculation of cost-benefit ratios because they are each measured in different units and we cannot estimate monetary equivalents. Therefore, we have to study costs and benefits separately and expect the following empirical patterns:

1. The costs of participating in training for people who have never taken part are equally high or higher than for occasional non-participants.
2. The returns of participating in training are lower for permanent than for occasional non-participants.

3. Estimation model and methods

In this section we present the estimation model for the costs that result from taking part in continuing vocational training as well as for various benefits that result from participation. In all our estimations we control for potential selection effects.

3.1 Costs

The basic equation we estimate can be written as:

$$\text{Costs} = \beta_0 + \beta_1 \cdot \text{VocTraining} + \beta_2 \cdot \text{ProfStatus} + \beta_3 \cdot \text{EmpCharacteristics}$$
$$+ \beta_4 \cdot \text{IndCharacteristics} + \delta \cdot X + u \qquad (2)$$

Since the dependent variable *costs* cannot be measured directly because our sample consists of non-participants only, we use the individual's *willingness to pay* as an upper bound for the costs that an individual would realistically have to pay given their individual characteristics.[8]

"VocTraining" includes various dummy variables for vocational training measures, such as *apprenticeship*, *full-time vocational school*, *master craftsman* and *university.* Professional status, represented by "ProfStatus", includes variables indicating different categories such as *blue-collar worker*, *white-collar worker* and *self-employed* person.[9] "EmpCharacteristics" consists of the *number of employees* in the company someone is working for and also of different dummy variables describing the job: *full time employed*, *use a computer at work or at home or knowledge and skill needs change*. Further individual control variables ("IndCharacteristics") are n*et income*, *age*, *gender* and having children (*kids).*

In a second step, we add the *marital status* and *interaction terms* between the individual characteristics *gender* and *kids* as well as between *married* and *kids*. Findings from the German Socioeconomic Panel (see Bellmann, 2003) show that married women who live in a household with children are less likely to take part in continuing training whereas men in the same situation are more likely to participate.

In addition, we include a variable representing an individual's *time preference* and estimate the basic and the extended equation again. Controlling for present or future orientedness, it is possible to consider the impact of costs on the participation decision exclusively. For a detailed list of the variables included in the estimation models see Table 1.

A major methodological problem is that the variable *costs* can only be observed for people who have ever taken part in continuing vocational training. This is a form of sample selection called incidental truncation (Wooldridge, 2003 pp. 587–591). Whether we can observe the (dependent) variable depends on the participation decision and it is therefore known for occasional non-participants only. It can be assumed that individuals are

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[8] See section 4.

[9] We do not include civil servants, because they are in a different situation as regards wage and job security.

not randomly selected into further training[10] since occasional non-participants might have different costs than never-participants. Thus, an OLS Regression of equation (2) might produce inconsistent and biased estimates of the coefficients because unobserved individual characteristics (e.g. ability) that affect costs and also have an influence on the training decision are ignored. The approach that we use to solve this problem is as follows[11]:

First we model the probability of an observation being selected (participation equation):

$$y^*_{2i} = z'_i\gamma + u_{2i} \qquad \text{(latent variable } y^*_{2i}\text{)} \qquad (3)$$

where $u_{2i} \sim N(0, 1)$, and we observe $y_{2i}=1$ (an individual occasionally takes part in continuing vocational training) if $y^*_{2i} > 0$. As we always observe the explanatory variables – independently of the participation decision – it is possible to include all observations.

Then we have to examine y_{1i}, but taking into account that y_{1i} is only observed if $y_{2i}=1$ (outcome equation):

$$y_{1i} = x'_i\beta + u_{1i} \qquad (4)$$

where $u_{1i} \sim N(0, \sigma^2_1)$ and y_{1i} is the costs associated with a participation in continuing training. The error terms u_{1i} and u_{2i} are bivariate normal with correlation ρ.

It is strongly recommended that x is a strict subset of z and that there is at least one element of z that is not also in x (Wooldridge, 2003: 589). Therefore, any explanatory variable in the regression equation should also be an explanatory variable in the selection equation. Moreover, we need at least one variable that affects selection but does not have a partial effect on y.

The expected value of y_{1i} can then be written as:

$$E(y_{1i}|z'_i, y_{2i}=1) = x'_i\beta + \rho\lambda(z'_i\gamma) \qquad (5)$$

where $\lambda(z'_i\gamma)$ is the inverse Mills ratio (Wooldridge 2003 p. 588). If there is no correlation between the two equations ($\rho=0$), then the participation and outcome equation are

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[10] Leuven & Oosterbeek (2002).

[11] As the data set used does not have a panel structure, fixed effects estimation (Wooldridge, 2003 pp. 461-467; Wooldridge, 2002 pp. 265-279), which would also be a possible approach to take potential selection effects into account, cannot be used.

independent and the OLS estimates of β will be unbiased. But if there is correlation between the participation decision and the cost determinants, there is an omitted variable problem, $\lambda(z'_i\gamma)$. That is why we first test if there is selection bias. Under the null hypothesis (ρ=0), there is no selection problem. If the hypothesis cannot be rejected, OLS estimation should be sufficient. Otherwise we have to take selection effects into account and use the model explained above. We can either choose the two-step estimation method (Heckman, 1976) or the maximum likelihood estimation (Wooldridge, 2003 p. 591). The latter is asymptotically unbiased, asymptotically normal and more efficient than the two-stage estimator, provided that the appropriate assumptions are met (Breen, 1996 p. 40).[12]

3.2 Benefits

The following equation is used to assess the benefits associated with taking part in continuing training:

$$P(\text{Benefit} = 1|x) = \Phi\,(\beta_0 + \beta_1 \cdot \text{VocTraining} + \beta_2 \cdot \text{ProfStatus} + \beta_3 \cdot \text{EmpCharacteristics} + \beta_4 \cdot \text{IndCharacteristics} + \delta \cdot X) \qquad (6)$$

where *benefit* is a binary response variable. Due to data restrictions and in contrast to the cost analysis, we have to estimate direct and indirect benefits separately. First we use *increase in pay* as a dependent variable, indicating a direct benefit. In order to examine indirect benefits, we use *improving job security* as well as *improving employment outlook* as dependent variables. The independent variables are the same as in the cost equation.

Individuals who have taken part in continuing vocational training may also be more motivated or may have different inherent skills. If more talented individuals take part in continuing training and have higher earnings partly because of their abilities, the effect of participation is overestimated. It is therefore important to use a maximum-likelihood probit estimation with selection instead of a simple probit estimation.

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[12] There are other studies preferring the two-step estimator. Puhani (1997) gives a survey of criticism about the different methods.

The procedure follows the approach used in the case of incidental truncation with a metric dependent variable, shown in chapter 3.1. The major difference is that there is a binary dependent variable. Therefore the outcome equation is as follows:

$$y^*_{1i} = x'_i\beta + u_{1i} \qquad (7)$$

where $u_{1i} \sim N(0, 1)$ and $y_{1i}=1$ if $y^*_{1i}>0$.

4. Data and descriptive statistics

Our empirical estimation is based on a unique data set covering people who did not take part in continuing vocational training over the period from September 2001 to August 2002, commissioned by the German "Expert Commission on Financing Lifelong Learning".[13] The dataset contains information from computer assisted telephone interviews with 1264 employees between 19 and 64 years of age and living in Germany. The sample is a representative sample of non-participants that resulted as a byproduct of a survey of participants. Individuals from a large representative sample were contacted and asked whether they had taken part in continuing training in a given period or not. According to their answer they were either allocated to the participants-survey (further analyzed by Beicht, Krekel & Walden, 2006) or to the non-participants-survey (further analyzed by Schröder et al., 2004). For each sample the telephone interviewers used a questionnaire which was specifically designed for the needs of the respective respondents. We were able to use the data from the non-participants survey.

Since our main interest lies in differences between permanent and occasional non-participants in training, we separate non-participants into individuals who have never participated in training and individuals who have taken part in continuing vocational training at least once in the past, but just not during the survey period in question (occasional non-participants).

Continuing training includes formal training measures (internal and external) as well as informal on-the-job training (e.g. quality circles, job rotation). The *training* variable is a

[13] For details of the survey see Schröder et al. (2004).

dummy variable, taking the value 1 if someone belongs to the occasional non-participants and 0 if someone is a never-participant.[14] About one third of the interviewed persons (419) belong in the latter category.

Regarding our dependent variables, people were asked about the costs and benefits associated with a participation in continuing vocational training. Descriptive statistics indicate that never-participants rate the benefits associated with participation in continuing vocational training considerably lower than occasional non-participants, and it seems reasonable to assume that they also have a lower willingness to pay for continuing vocational training measures. People had to specify the amounts (in €) that they were willing to spend for continuing training each year, choosing one out of five categories. In order to obtain a metric variable, we use the upper limit per category. On average, never-participants have a lower *willingness to pay* than occasional non-participants: the former are willing to invest about € 300 the latter more than € 500 on average. Table 1 gives a detailed list of all variables used and provides their overall means and the means broken down into occasional and permanent non-participants. As already mentioned, the willingness to pay seems to be a good measure of the costs, at least for occasional participants. One can assume that the amount individuals are willing to invest corresponds to the expenses that those individuals would have to pay for training measures suitable to their individual characteristics. Moreover people who happen currently not to be participating in continuing training should be able to make a realistic estimate of the necessary investment. As shown in section 3, we only include cost information of occasional non-participants in the estimations and it therefore seems plausible to take the willingness to pay as a proxy for the typical costs associated with a continuing training participation. This assumption is backed up by the empirical results from the participants-survey presented in Beicht et al. (2006). They show that the expenses of continuing training participants are on average € 502. This is very close to the amount that occasional non-participants are willing to spend for continuing vocational training.

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[14] Budria & Pereira (2004) find that the duration of continuing training has an impact on returns. As we do not have duration data, we cannot make these differences. But for our main objective, analyzing why some people never take part in continuing training, this is not crucial. This is also the reason why we do not include the detailed forms of continuing vocational training measures which the dataset contains.

On the benefits side, almost the same percentage in both groups received an *increase in pay*[15], but there are differences in their considerations of the necessity for continuing vocational training to achieve the following objectives: the probability that an occasional non-participant considers participation in continuing training as a necessary condition to *improve job security* is about 4 %, and to *improve prospects on the labor market* even 10% higher than the never-participant's probability. It is possible that persons who have never taken part in continuing vocational training before underestimate the returns of continuing training. If this has an influence on the willingness to pay, both variables are biased. Using the (selection) models presented in section 3, only the benefits specification of the occasional non-participants is included in the estimations and therefore the risk of biased estimates due to selection into training is avoided and does not have to be taken into account. The expected return can be used as a measure for the real benefit.

Considering our explanatory variables, we find that permanent non-participants are characterized by rather low or even no qualifications. Almost 20 % of permanent non-participants do not have a secondary school certificate and only 5 % of the occasional non-participants belong to this group. Blue-collar workers are found more often among never-participants than white-collar workers or self-employed persons. Such low qualifications seem to be a key characteristic of permanent non-participants. Unsurprisingly, persons who use a computer at work or at home have a higher chance of having participated in training in the past. Furthermore, working in a larger company also raises the probability of (previous) participation. Men are more likely to have already participated in continuing training. Finally, permanent as compared to occasional non-participants earn a lower income on average.

As already explained, not only costs or benefits but also the individual discount rate (the present orientedness) could have an influence on the training decision and must therefore be considered. As a proxy for the discount rate we use the preference of an individual for enjoying life and having enough time for personal interests and leisure.

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[15] Unfortunately we do not know if - for occasional non-participants - the increase in pay is the consequence of the participation in continuing vocational training. But we can compare the probability of receiving a raise in salary between the two groups.

As explained in section 3, it is important to take selection effects into account. The participation equation should contain a variable that is only related to the participation decision. We therefore use a variable specifying the reason for non-participation, namely the answer "taking part causes too much stress due to my job and private obligations" for the selection equation. Slightly under half of the permanent non-participants (46 %), but only a third of the occasional non-participants (35 %) state that this was decisive for their non-participation, so the variable is correlated with the participation decision. To use this variable in our selection equation, we furthermore have to assume that this does not have an effect on the cost or benefit variables which we include in our estimations. This seems reasonable because the stress that a person expects because of their job or family obligations is an individual variable which can be assumed to be unrelated to a training specific variable such as income gains or training costs.

After eliminating observations with missing data, a sample of 527 individuals is left for analysis. Of these, 163 observations are censored and thus are not included when estimating the outcome equation separately.

5. Econometric Results

5.1 Costs

Table 2 (column 1) gives the results of estimating the basic equation. The selection model, using a maximum likelihood estimator, supports the view that there is selection into training based on unobservable characteristics: the hypothesis that there is no sample selection ($\rho=0$) is rejected at the 5 % level. Thus, we find that the costs for training vary across employees, based on observable as well as unobservable characteristics. As can be seen, the selection effect is negative ($\rho=-0.1219$) which means that occasional non-participants have ceteris paribus lower costs than permanent non-participants, which is a highly plausible result. The unobserved characteristics that increase the likelihood of taking part in continuing vocational training are associated with lower actual expenditures.

Turning to the predicted costs, the result shown above is confirmed: on average permanent non-participants pay slightly more than occasional non-participants. The former have a predicted amount of about € 504which is substantially higher than what the permanent non-participants' are willing to pay (cf. section 4). A very important determinant seems to be vocational training: employees with an apprenticeship or a university (of applied science) degree have significantly lower costs associated with training participation than employees without a secondary school certificate. Income does not have a significant impact on willingness to pay, so forgone salary does not seem to play a crucial role. Therefore, the loss of leisure as well as the direct costs must be the major difference. Individuals with the lowest level of schooling (no secondary school certificate) can be assumed to have the greatest difficulty in learning at school and might therefore also have a lower ability and less motivation to keep on learning later in their life because they would need much more time and effort than individuals with a higher qualification level. In addition, they are assumed to be much more averse to learning.

Including a variable representing time preferences (column 2) does not yield a substantial change. The result shown above also holds for the models with additional individual characteristics and interaction terms (column 3 and 4). None of the added variables has an impact on the costs associated with continuing participation in training.

Finally, it can be concluded that the cost component might play a role in the individual participation decision: the costs for permanent non-participants would be higher than the costs for occasional non-participants.

5.2 Benefits

In the following we study different types of benefits associated with a continuing participation in training. First we use *increase in pay* as a dependent variable (Table 3). Estimating the basic equation, we fail to reject the hypothesis that the outcome and participation equation can be estimated separately ($\rho=0$). Therefore, we use a simple probit model to estimate the outcome equation, since the coefficients are not biased due to unobserved characteristics that have an influence on both the participation decision and the probability of a wage increase. The results of the regressions are shown in Table 3, columns 1-3.

The significant variables generally take their expected signs: white-collar workers are more likely to have received an increase in pay than blue-collar workers, which is highly relevant, since the latter are more likely to belong in the group of permanent non-participants. This is also true for employees holding a job characterized by frequent changes in knowledge and skill needs. Moreover, Having children is associated with a lower likelihood of a wage increase. Calculating the marginal effects at the means of the independent variables shows that being a white-collar worker (compared to a blue-collar worker) is associated with a 9.1 percentage point higher likelihood of a pay increase, and the need for a frequent change of knowledge and skills with a 12.8 percentage point higher likelihood, while having children is associated with an 8.5 percentage point lower likelihood of an increase in pay. Moreover, having a master craftsman's diploma enters with a significant negative coefficient. They are less likely (9.1 percentage points) to have received a wage increase than someone without a secondary school-leaving certificate.

The results remain stable when the time preference variable is added (Table 3, columns 4-6). Including the variables representing marital status (*married and single mother/father*) as well as interaction terms between *gender* and *kids* and between *marriage* and *kids* yields almost the same results with exception of the variable *kids*,which no longer has a significant impact (Table 3, last six columns).

Finally, it should be noted that the predicted probability of having received an increase in pay is about 15 percent: occasional non-participants have on average a higher and never-participants a lower likelihood of receiving a pay raise. As a whole, the results are in line with Vignoles et al. (2004), who find that only those workers who actually participate in continuing training are able to realize wage gains. For those workers who did not participate in training, participation would not have been associated with a wage gain.

Secondly, we consider the benefit of training in terms of job prospects. We first look at differences in *job security*. Again, we assume that individuals who occasionally take part in continuing training differ from those who never take part in training, which is supported by the results of the basic equation estimation. There is a positive selection

effect of ρ=0.8448. The hypothesis that there is no sample selection (ρ=0) is rejected at the 5 % level (Table 4, column 1 and 2). Occasional non-participants are less likely to lose their job as a result of their inherent ability or other unobserved characteristics and not necessarily because of their participation in continuing vocational training.

With respect to job security, being a male, using a computer on the job and working in a large company is associated with a lower likelihood of becoming unemployed. In calculating the marginal effects at the means of the independent variables we find that using a computer has a statistically and also an economically significant positive impact of 13.8 percentage points on the likelihood of increased job security. Keeping in mind that employees who use a computer at work are more likely to take part in continuing training than other workers, it can be assumed that it is particularly important for those people to keep on learning later in life in order not to lose their job. Being a male as compared to being a female increases the likelihood by 11.6 percentage points. Finally, firm size affects job security, but the effect is not practically large: if a firm grows by 1000 employees, the likelihood of participation in training increases by only 1.1 percentage points. On average the probability of increased job security is 21.4 %, whereas the predicted probability of permanent non-participants is slightly lower and the probability of occasional non-participants is higher. The difference between the two groups is about 4% and should therefore be accounted for.

Even after adding the variable representing present orientedness, the above mentioned results remain stable. The hypothesis that there is no sample selection can still be rejected, although only at the 10 % level (Table 4, column 3 and 4). The variable does not have a significant impact on job security, but - indirectly indicating a usually unobserved characteristic – reduces the influence of unobserved characteristics which usually make the coefficient of a separately estimated probit model biased. Nevertheless, estimating a selection model seems preferable.

The last four columns in Table 4 differ insofar as some variables indicating the marital status and interaction terms between *gender* and *kids* as well as between *marriage* and *kids* are added. This has an influence on the significance of some of the "Individual Characteristics" variables, which are worth looking at: the likelihood of an increase in job security falls with increasing age but at a diminishing rate. The most notable result

is the significant positive coefficient of having children. The marginal effect is – at 36.5 percentage points (and 39.2 percentage points respectively) – very high. Turning to the added variables, we find that being married has a significant and positive impact on job security (21.8 and 22.7 percentage points respectively). But if a married couple has children, the likelihood of having a secure job is reduced by 30.9 (and accordingly 32.7) percentage points. Keeping in mind that the coefficient of the variable *kids* is also very high, families with children are still less likely to lose their job. As already mentioned above, men have a significantly higher likelihood of having a secure job than women. Comparing mothers and fathers (instead of persons without children) the difference is smaller, as the interaction term between *kids* and *gender* is significantly negative.

Turning to *prospects on the labor market*, we find that a separate estimation of the outcome equation does not yield biased estimates of the coefficients: the hypothesis that there is no sample selection ($\rho=0$) cannot be rejected at the 10 % level, independently of the included explanatory variables. As the regressions of the models including marital status and the interaction terms have a higher significance, we turn to Table 5, columns 7-12 without further comments on the first half of the Table.

In particular, the coefficients of the variables *married* and *married with kids* are highly significant. While being married has a positive effect on the likelihood of increased prospects on the labor market, having children in addition has a significant negative impact; taking into account the coefficient of *kids*, which is positive but not significant, it is no longer clear whether there is really a difference between married couples with and without children. Interestingly, working full time, which has neither an influence on costs nor on the likelihood of an increase in pay or job security, has a significantly positive effect. Working full time instead of part time (or other forms) is associated with a marginal effect of 16.9 percentage points. As with job security, firm size enters with a positive and significant coefficient with an effect that is not practically large.

The predicted probability of continuing training as a necessary condition for increased prospects on the labor market is 48.5 % for occasional non-participants and 47.7 % for permanent non-participants. Almost half of each group benefits from a participation in continuing vocational training as far as increased prospects on the labor market are concerned. Therefore, this seems to be a highly important and non negligible factor.

To summarize, taking part in continuing vocational training does not result in a higher level of job security for permanent than for occasional non-participants. Permanent non-participants are more likely to be found in unskilled jobs. Therefore, they are not the type of worker who is faced with constantly increasing requirements at the workplace due to technological change. They are the type of worker whose job is most likely to disappear. Therefore, considering only the current job, it is even rational for permanent non-participants to refrain from training because they would not gain much. However, since precisely those workers are at risk of losing their job it would be important for them to think in the long term. As we have seen, continuing vocational training would be necessary to improve their employment outlook. Participation in training could provide them with knowledge enabling them to do more complex or even completely different work, which in turn would make it easier to find a new job. Thus, information asymmetries seem to play a crucial role: permanent non-participants would benefit as much as occasional non-participants in terms of employment outlook, but do not seem to realize that in addition to returns associated with their current jobs (where returns are indeed very low) participation in training could also lead to better prospects on the labor market and could therefore help them to find a new job if they are laid off. By contrast, Hill (2001) analyzes the participation of older women in different types of training and shows that female employees in less-skilled occupations are comparatively more likely to seek training on their own than highly qualified women. Highly educated women still take part in training (self- or employer-financed) more often, but this indicates that some less well-educated women seem to realize the importance of further training and act on their own initiative since they do not think that they receive enough training from their employer.

The second hypothesis is therefore only partly confirmed. Permanent non-participants would indeed have lower benefits regarding their current job,[16] but they would still benefit as much as occasional non-participants in terms of long term labor market prospects.

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[16] This result corresponds with Groot's (1995) finding that non-participants would have a negative wage gain in the case of participation.

5.3 Participation decision

Given the above results it seems important to distinguish between permanent and occasion non-participants because they are faced with a significantly different cost-benefit structure of training. Accordingly, the question is what distinguishes the two non-participation groups. Table 6 provides probit regression results concerning the probability of taking part in continuing vocational training. The first two columns of the Table give results for the basic equation (column 1) and for the basic equation with a variable representing time preference added (column 2); the last two columns provide both models with some more individual characteristics.

The following results are similar in all models. The likelihood of taking part in continuing vocational training is significantly higher for a master craftsman, a worker with an apprenticeship or with a university (of applied science) degree than for a worker without a secondary school certificate. The results are consistent with those reported in the literature: Bassanini et al. (2005), for example, find that having a lower level of education exerts a negative impact on the probability of training participation. Surprisingly, there is no significant distinction between different professional statuses. The need for changing knowledge and skill as well as the use of a computer significantly increases the likelihood of being an occasional non-participant rather than a permanent non-participant. As expected, the likelihood of being a permanent non-participant is significantly higher for employees who consider training to be too much stress in addition to their job and private obligations.

The regressions with the variable representing time preferences indicate that present orientedness (high discount rate) is negatively associated with the likelihood of being a participant. Individuals with a high discount rate obviously invest only if they can expect an immediate gain.

Entering variables indicating marital status and interaction terms between different individual characteristics leads to the following: contrary to the results usually found in the literature (see e.g. Bassanini et al., (2005)), persons who are employed full time are significantly less likely to belong to the group of occasional non-participants. Single mothers/fathers as well as persons who are married (no matter whether they have children or

not) are more likely to take part in continuing vocational training. There is no significant difference between mothers and fathers.

6. Conclusions

Although continuing training is becoming increasingly important, a large proportion of the workforce does not participate in training. This seems particularly puzzling since a large number of studies demonstrate that participation in training leads to substantial positive returns. In our paper we show that non-participants are not a homogeneous group and that the distinction between permanent non-participants and occasional non-participants is fundamental to solving the puzzle. We compare permanent non-participants with occasional non-participants (employees who have taken part in continuing training at least once). We assume that the two groups differ in observable as well as unobservable characteristics and use selection models in our empirical analysis in order to account for this problem. We study differences in the costs, benefits and/or discount rates of the two groups of non-participants. We find that individuals who are permanent non-participants would have to bear higher costs if they were to participate. Moreover, the benefits associated with their current job would be lower, i.e. any pay increases or reduction in unemployment risk would be smaller for permanent non-participants than for occasional non-participants. However, the results indicate that in the long-run never-participants would benefit from participation in terms of improved prospects on the labor market, which indicates that the discount rate of never-participants is probably exceptionally high. Although participation in training would not protect those people from losing their job, it would increase their likelihood of finding a new job once they have become unemployed, but this may seem to be too far in the future to be important at the present time. Angrist & Lavy (2005) argue similarly with respect to investments in schooling of low achieving students and suggest using short term financial rewards to reduce the problem of exceptionally high discount rates. Based on a randomized trial, they present evidence that financial incentives do indeed increase high school certification rates. Thus, when thinking about policy implications it seems necessary to increase workers' awareness of returns that are not directly associated with their current job, but which might lie far in the future and which might there-

fore often be neglected. Small financial incentives attached to finishing training measures could be an option with which to overcome the problem of exceptionally high discount rates.

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Appendix

Table 1: List of Variables Used

VARIABLE	NOTES	NON-PARTICIPANTS		
		TOTAL	OCCA-SIONAL	PERMA-NENT
		Mean (Std. Dev.)	Mean (Std. Dev.)	Mean (Std. Dev.)
Participation in continuing vocational training	Dummy = 1 if a person is an occasional non-participant, otherwise 0	0.6647 (0.4723)		
Willingness to pay	Willingness to pay in €	449.2002 (978.3869)	519.3101 (1040.6510)	309.8956 (824.8570)
Increase in pay	Dummy = 1 if a person received an increase in pay, otherwise 0	0.1593 (0.3661)	0.1618 (0.3686)	0.1538 (0.3615)
Job security	Dummy = 1 if continuing vocational training is necessary to improve job security, otherwise 0	0.3608 (0.4804)	0.3753 (0.4845)	0.3316 (0.4714)
Prospect on the labor market	Dummy = 1 if continuing vocational training is necessary to improve prospects on the labor market, otherwise 0	0.4939 (0.5002)	0.5286 (0.4995)	0.4253 (0.4950)
Vocational Training				
Without secondary school certificate	Reference	0.0951 (0.2934)	0.0536 (0.2254)	0.1772 (0.3823)
Apprenticeship	Several years of professional training in school and on the job	0.7207 (0.4488)	0.7407 (0.4385)	0.6810 (0.4667)
Full-Time Vocational School	Several years of professional training in school	0.1621 (0.3687)	0.1686 (0.3746)	0.1494 (0.3569)
Master Craftsman		0.0501 (0.2182)	0.0664 (0.2492)	0.0177 (0.1321)
University of Applied Sciences		0.0280 (0.1651)	0.0370 (0.1890)	0.0101 (0.1002)

University		0.0475 (0.2129)	0.0600 (0.2377)	0.0228 (0.1494)
Professional Status				
Blue-collar worker	Reference	0.3744 (0.4842)	0.3193 (0.4665)	0.4835 (0.5004)
White-collar worker		0.5586 (0.4968)	0.6066 (0.4888)	0.4633 (0.4993)
Self-employed person		0.0671 (0.2502)	0.0741 (0.2621)	0.0532 (0.2246)
Employment characteristics				
Full time employed	Dummy = 1 if a person is employed full time, otherwise 0	0.5509 (0.4976)	0.5581 (0.4969)	0.5367 (0.4993)
Change	Dummy = 1 if knowledge and skill need change, otherwise 0	0.5035 (0.5002)	0.5352 (0.4991)	0.4400 (0.4971)
Meeting the needs	Dummy = 1 if knowledge and skill meet the needs, otherwise 0	0.8239 (0.3810)	0.8346 (0.3718)	0.8026 (0.3986)
Computer private	Dummy = 1 if a person uses the computer privately, otherwise 0	0.6916 (0.4620)	0.7663 (0.4235)	0.5431 (0.4988)
Computer on-the-job	Dummy = 1 if a person uses the computer on-the-job, otherwise 0	0.5899 (0.4921)	0.7048 (0.4565)	0.3631 (0.4816)
Number of employees		1744.6100 (3470.5110)	1936.5700 (3634.3540)	1342.0280 (3064.8140)
Individual Characteristics				
Age		40.7342 (10.1024)	41.0051 (9.7997)	40.1964 (10.6704)
Age squared		1761.2450 (840.6438)	1777.3320 (825.8251)	1729.3190 (869.4981)
Sex	Dummy = 1 if person is male, otherwise 0	0.4440 (0.4971)	0.4674 (0.4993)	0.3975 (0.4900)
Kids	Dummy = 1 if person has at least one child, otherwise 0	0.5686 (0.4955)	0.5755 (0.4947)	0.5552 (0.4977)

Net income	Net income in €	1319.3630 (1151.1690)	1412.6960 (1259.7100)	1140.6910 (882.3360)
Married	Dummy = 1 if person is married, otherwise 0	0.6746 (0.4687)	0.6918 (0.4620)	0.6405 (0.4805)
Single Mother/Father	Dummy = 1 if person is a single mother/father, otherwise 0	0.0850 (0.2789)	0.0793 (0.2704)	0.0962 (0.2952)
Time Preference				
Present oriented	Dummy = 1 if enjoying life and having enough time for personal interests/leisure is a very important aim in life, otherwise 0	0.3422 (0.4746)	0.3252 (0.4687)	0.3756 (0.4849)
Influence on participation decision				
Strain	Dummy = 1 if continuing vocational training is too much strain besides job and private obligations, otherwise 0	0.3888 (0.4877)	0.3514 (0.4777)	0.4639 (0.4993)
Control Variables (Industry)				
Agriculture & Forestry	Reference	0.0514 (0.2210)	0.0489 (0.2158)	0.0570 (0.2324)
Manufacturing & Industry		0.3660 (0.4820)	0.3525 (0.4782)	0.3954 (0.4899)
Service Sector		0.4797 (0.4999)	0.4887 (0.5003)	0.4601 (0.4994)
Health, Education & Social Services		0.0801 (0.2717)	0.0855 (0.2799)	0.0684 (0.2530)
Liberal Professions		0.0227 (0.1491)	0.0244 (0.1545)	0.0190 (0.1368)

Employees who did not choose one of the vocational training categories were excluded because they form a very small and heterogeneous group. Just a few people are family workers, employees subject to social insurance contribution or who have not yet worked. They cannot be included because most of them have missing values in the other variables and with just one or two observations left, it is not possible to provide evidence.

Table 2: Costs

	Basic equation	… & time preference	… & interaction terms	… & time preference, interaction terms
	MLE	MLE	MLE	MLE
Outcome equation: costs				
Vocational Training				
Apprenticeship	-284.9283* (152.7667)	-283.9043* (153.1549)	-283.4516* (153.5701)	-282.5839* (153.9265)
Full-Time Vocational School	45.7697 (153.5818)	48.5427 (153.4299)	63.9263 (155.8915)	66.3883 (155.8606)
Master Craftsman	184.8608 (214.6432)	196.9994 (216.5999)	174.8389 (224.8583)	186.0187 (226.3103)
University of Applied Sciences	-279.7773* (151.5675)	-283.0289* (150.7788)	-292.7146* (155.9092)	-297.5709* (155.7774)
University	-271.0859** (135.8782)	-260.1087* (135.1057)	-283.5607** (140.0331)	-272.3519* (139.2009)
Professional Status				
White-collar worker	64.1820 (106.5599)	64.6401 (106.5510)	52.0351 (106.4128)	52.3419 (106.3334)
Self-employed person	348.3002 (258.4311)	366.4148 (259.1558)	338.2618 (261.7224)	355.9353 (262.0150)
Employment characteristics				
Full time employed	34.3136 (105.8100)	42.8373 (109.9947)	46.0780 (118.6091)	55.3230 (122.6371)
Change	-14.8042 (87.6586)	-22.9363 (89.4323)	-8.9708 (89.1424)	-16.9396 (90.7878)
Meeting the needs	55.0591 (148.1695)	56.1919 (146.7103)	55.3781 (150.0058)	56.8354 (148.4188)
Computer private	34.7630 (92.1616)	27.2637 (93.1956)	42.5436 (94.6205)	35.2355 (95.2035)
Computer on-the-job	129.8048 (82.4911)	133.1337 (83.7198)	126.4736 (82.1286)	129.7036 (83.4052)
Number of employees	-0.0115 (0.0100)	-0.0107 (0.0099)	-0.0106 (0.0102)	-0.0097 (0.0101)
Individual Characteristics				
Age	16.8039 (25.9540)	15.5175 (25.7850)	12.7199 (25.5104)	11.3838 (25.4447)
Age squared	-0.3272 (0.3209)	-0.3125 (0.3180)	-0.2836 (0.3115)	-0.2686 (0.3096)
Sex	-117.8094 (135.9695)	-128.1258 (134.9939)	-130.4606 (154.3147)	-138.2807 (152.8725)
Kids	-110.2118 (101.0877)	-102.8876 (100.8610)	-19.4856 (153.4032)	2.7676 (156.6122)
Net income	0.0130 (0.0279)	0.0135 (0.0278)	0.0128 (0.0291)	0.0134 (0.0291)
Married			119.0190 (148.2023)	121.9026 (148.3600)

Single Mother/Father			-69.3903 (157.4123)	-75.6189 (159.3330)
Male & Kids			5.1082 (178.9591)	-0.4381 (179.0223)
Married & Kids			-98.7678 (149.4645)	-112.1637 (153.2088)
Time preference				
Present oriented		91.4999 (95.8714)		92.5311 (95.9817)
Control Variables				
Manufacturing & Industry	308.0705** (137.0232)	327.1587** (143.7396)	306.5503** (139.5684)	326.3443** (146.1510)
Service Sector	-2.8847 (124.0187)	19.0697 (125.3544)	-3.9832 (125.2291)	18.2295 (126.8389)
Health, Education & Social Services	-247.9344 (158.0024)	-232.4713 (161.1717)	-253.5693 (160.3076)	-237.9120 (163.2831)
Liberal Professions	-156.8382 (151.4443)	-155.7366 (148.0036)	-154.3663 (149.9228)	-153.3828 (147.9948)
_cons	408.5194 (495.6430)	379.9509 (500.2964)	393.0891 (468.9033)	361.4693 (472.7255)
Prob > χ^2	0.0289	0.0382	0.0514	0.0676
N	527	527	527	527
Participation equation: participation in continuing vocational training				
Vocational Training				
Apprenticeship	0.3424* (0.1883)	0.3460* (0.1890)	0.3710** (0.1893)	0.3769** (0.1902)
Full-Time Vocational School	0.0192 (0.2272)	0.0100 (0.2268)	-0.0146 (0.2324)	-0.0221 (0.2327)
Master Craftsman	0.7137** (0.3563)	0.6646* (0.3571)	0.6828* (0.3697)	0.6375* (0.3710)
University of Applied Sciences	0.7372* (0.4218)	0.8151* (0.4181)	0.8562** (0.4176)	0.9445** (0.4136)
University	0.4525 (0.3785)	0.4273 (0.3766)	0.5518 (0.3813)	0.5278 (0.3816)
Professional Status				
White-collar worker	0.0194 (0.1717)	0.0289 (0.1737)	-0.0154 (0.1756)	-0.0062 (0.1772)
Self-employed person	-0.3470 (0.3080)	-0.4068 (0.3119)	-0.4318 (0.2985)	-0.4912 (0.3038)
Employment Characteristics				
Full time employed	-0.2546 (0.1896)	-0.2838 (0.1897)	-0.3265* (0.1942)	-0.3602* (0.1951)
Change	0.2425* (0.1272)	0.2678** (0.1284)	0.2718** (0.1289)	0.2984** (0.1300)
Meeting the needs	-0.2175 (0.1823)	-0.2088 (0.1831)	-0.2046 (0.1845)	-0.1993 (0.1853)
Computer private	0.5084*** (0.1465)	0.5218*** (0.1474)	0.5260*** (0.1461)	0.5395*** (0.1473)

Computer on-the-job	0.6345*** (0.1462)	0.6175*** (0.1472)	0.6435*** (0.1469)	0.6252*** (0.1480)
Number of employees	0.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)
Individual Characteristics				
Age	0.0283 (0.0506)	0.0266 (0.0508)	0.0023 (0.0527)	-0.0005 (0.0527)
Age squared	-0.0002 (0.0006)	-0.0001 (0.0006)	0.0001 (0.0006)	0.0001 (0.0006)
Sex	0.1701 (0.1769)	0.1950 (0.1773)	0.1645 (0.2067)	0.1803 (0.2078)
Kids	-0.0773 (0.1497)	-0.0899 (0.1508)	0.0808 (0.4205)	-0.0120 (0.4251)
Net income	0.0002* (0.0001)	0.0002* (0.0001)	0.0002* (0.0001)	0.0002* (0.0001)
Married			0.6355** (0.2821)	0.6448** (0.2828)
Single Mother/Father			0.7174* (0.3801)	0.7797** (0.3857)
Male & Kids			0.2058 (0.2645)	0.2233 (0.2651)
Married & Kids			-0.4198 (0.4205)	-0.3454 (0.4255)
Time preference				
Present oriented		-0.2724** (0.1282)		-0.2807** (0.1292)
Influence on participation decision				
Strain	-0.4459*** (0.1276)	-0.4376*** (0.1279)	-0.4759*** (0.1296)	-0.4664*** (0.1301)
Control Variables				
Manufacturing & Industry	0.0674 (0.2718)	0.0390 (0.2755)	-0.0265 (0.2656)	-0.0571 (0.2691)
Service Sector	0.1205 (0.2751)	0.0859 (0.2789)	0.0513 (0.2664)	0.0145 (0.2700)
Health, Education & Social Services	0.3735 (0.3530)	0.3456 (0.3551)	0.2842 (0.3453)	0.2491 (0.3473)
Liberal Professions	0.7127 (0.6102)	0.7822 (0.5814)	0.8016 (0.6428)	0.8609 (0.6006)
_cons	-1.4309 (1.0424)	-1.2781 (1.0474)	-1.1775 (1.0495)	-0.9919 (1.0532)
Prob > χ^2	0.0208	0.0249	0.0268	0.0272
ρ	-.1219	-.1148	-.1164	-.1102

Robust std.errors in parentheses; *** (0.01), ** (0.05), * (0.10).

Table 3: Increase in Pay

	Basic equation			… & time preference			… & interaction terms			… & time preference, interaction terms		
	MLE	Probit		MLE	Probit		MLE	Probit		MLE	Probit	
		Coef	Marginal effects		Coef	Marginal effects		Coef	Marginal effects		Coef	Marginal effects
Outcome equation: increase in pay												
Vocational Training												
Apprenticeship	-0.0052	0.0366	0.0086	-0.0134	0.0300	0.0071	0.0091	0.0367	0.0087	-0.0005	0.0304	0.0072
	(0.2504)	(0.2559)	(0.0601)	(0.2474)	(0.2560)	(0.0602)	(0.2698)	(0.2518)	(0.0590)	(0.2642)	(0.2519)	(0.0591)
Full-Time Vocational School	0.0649	0.0241	0.0058	0.0620	0.0152	0.0036	0.0550	0.0335	0.0081	0.0521	0.0248	0.0060
	(0.3387)	(0.3242)	(0.0788)	(0.3368)	(0.3244)	(0.0782)	(0.3462)	(0.3239)	(0.0790)	(0.3479)	(0.3240)	(0.0784)
Master Craftsman	-0.5705	-0.4757	-0.0907*	-0.5788	-0.4879	-0.0923*	-0.5378	-0.4852	-0.0917*	-0.5522	-0.4965	-0.0932**
	(0.3763)	(0.3301)	(0.0482)	(0.3565)	(0.3296)	(0.0474)	(0.4102)	(0.3303)	(0.0475)	(0.3881)	(0.3297)	(0.0467)
University of Applied Sciences	0.0351	0.1530	0.0391	0.0150	0.1501	0.0382	0.0543	0.1250	0.0315	0.0354	0.1230	0.0309
	(0.4285)	(0.3812)	(0.1040)	(0.4224)	(0.3815)	(0.1037)	(0.4915)	(0.3856)	(0.1025)	(0.4896)	(0.3866)	(0.1025)
University	-0.2816	-0.2176	-0.0469	-0.2962	-0.2355	-0.0502	-0.2694	-0.2258	-0.0483	-0.2894	-0.2430	-0.0515
	(0.3816)	(0.3767)	(0.0723)	(0.3765)	(0.3813)	(0.0717)	(0.4133)	(0.3747)	(0.0711)	(0.4034)	(0.3793)	(0.0705)
Professional Status												
White-collar worker	0.3694	0.3951*	0.0906*	0.3631	0.3953*	0.0905*	0.3917*	0.3948*	0.0902*	0.3889*	0.3951*	0.0902*
	(0.2347)	(0.2132)	(0.0472)	(0.2369)	(0.2130)	(0.0471)	(0.2239)	(0.2183)	(0.0480)	(0.2275)	(0.2181)	(0.0479)
Self-employed person	-0.0216	-0.1150	-0.0261	-0.0340	-0.1443	-0.0322	-0.0533	-0.1040	-0.0236	-0.0681	-0.1333	-0.0298
	(0.4756)	(0.4377)	(0.0938)	(0.4752)	(0.4400)	(0.0915)	(0.5077)	(0.4456)	(0.0962)	(0.5146)	(0.4481)	(0.0939)
Employment Characteristics												
Full time employed	0.3105	0.2791	0.0625	0.3036	0.2681	0.0601	0.3590	0.3324	0.0732	0.3529	0.3209	0.0708
	(0.2374)	(0.2493)	(0.0518)	(0.2341)	(0.2473)	(0.0516)	(0.2771)	(0.2676)	(0.0539)	(0.2717)	(0.2654)	(0.0536)
Change	0.4587	0.5490***	0.1278***	0.4552	0.5614***	0.1305***	0.4998*	0.5418***	0.1258***	0.4999	0.5541***	0.1284***
	(0.3124)	(0.1736)	(0.0388)	(0.3141)	(0.1732)	(0.0386)	(0.2899)	(0.1757)	(0.0393)	(0.3051)	(0.1755)	(0.0392)
Meeting the needs	0.0344	0.0021	0.0005	0.0311	-0.0021	-0.0005	0.0066	-0.0066	-0.0016	0.0037	-0.0110	-0.0026
	(0.2499)	(0.2502)	(0.0596)	(0.2469)	(0.2492)	(0.0595)	(0.2561)	(0.2527)	(0.0604)	(0.2545)	(0.2515)	(0.0603)

Computer private	0.0229	0.1802	0.0407	0.0166	0.1887	0.0425	0.0894	0.1677	0.0379	0.0821	0.1757	0.0396
	(0.3882)	(0.2098)	(0.0448)	(0.3665)	(0.2100)	(0.0446)	(0.4103)	(0.2121)	(0.0455)	(0.4005)	(0.2123)	(0.0452)
Computer on-the-job	-0.0013	0.1839	0.0419	-0.0115	0.1839	0.0419	0.0953	0.1853	0.0421	0.0826	0.1859	0.0422
	(0.4743)	(0.2176)	(0.0469)	(0.4350)	(0.2175)	(0.0468)	(0.4832)	(0.2177)	(0.0467)	(0.4582)	(0.2176)	(0.0466)
Number of employees	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Individual Characteristics												
Age	-0.0027	0.0032	0.0008	-0.0010	0.0058	0.0014	0.0098	0.0102	0.0024	0.0125	0.0131	0.0031
	(0.0616)	(0.0635)	(0.0152)	(0.0615)	(0.0640)	(0.0153)	(0.0626)	(0.0631)	(0.0150)	(0.0627)	(0.0635)	(0.0151)
Age squared	-0.0002	-0.0002	0.0000	-0.0002	-0.0002	-0.0001	-0.0003	-0.0003	-0.0001	-0.0003	-0.0003	-0.0001
	(0.0007)	(0.0008)	(0.0002)	(0.0007)	(0.0008)	(0.0002)	(0.0008)	(0.0008)	(0.0002)	(0.0008)	(0.0008)	(0.0002)
Sex	0.0502	0.1183	0.0282	0.0538	0.1320	0.0314	0.1178	0.1416	0.0336	0.1252	0.1551	0.0367
	(0.2733)	(0.2304)	(0.0547)	(0.2708)	(0.2291)	(0.0543)	(0.2811)	(0.2611)	(0.0616)	(0.2845)	(0.2612)	(0.0615)
Kids	-0.3286	-0.3534*	-0.0847*	-0.3340	-0.3634*	-0.0870*	-0.4364	-0.4599	-0.1101	-0.4390	-0.4751	-0.1136
	(0.2069)	(0.1898)	(0.0459)	(0.2042)	(0.1881)	(0.0456)	(0.5959)	(0.5973)	(0.1438)	(0.5991)	(0.5945)	(0.1431)
Net income	0.0000	0.0001	0.0000	0.0000	0.0001	0.0000	0.0001	0.0001	0.0000	0.0001	0.0001	0.0000
	(0.0001)	(0.0001)	(0.0000)	(0.0001)	(0.0001)	(0.0000)	(0.0001)	(0.0001)	(0.0000)	(0.0001)	(0.0001)	(0.0000)
Married							-0.1688	-0.1019	-0.0252	-0.1884	-0.1083	-0.0268
							(0.4694)	(0.3679)	(0.0942)	(0.4682)	(0.3722)	(0.0956)
Single Mother/Father							-0.2362	-0.1445	-0.0323	-0.2575	-0.1456	-0.0325
							(0.6698)	(0.5408)	(0.1135)	(0.6737)	(0.5438)	(0.1138)
Male & Kids							-0.1911	-0.1638	-0.0375	-0.1976	-0.1642	-0.0375
							(0.3803)	(0.3561)	(0.0781)	(0.3752)	(0.3565)	(0.0780)
Married & Kids							0.2503	0.2399	0.0578	0.2519	0.2463	0.0593
							(0.5862)	(0.5948)	(0.1451)	(0.5787)	(0.5941)	(0.1448)
Time Preference												
Present oriented				-0.0394	-0.1006	-0.0236				-0.0684	-0.1021	-0.0238
				(0.2026)	(0.1696)	(0.0390)				(0.2138)	(0.1698)	(0.0389)

Control Variables												
Manufacturing & Industry	0.0074	-0.0045	-0.0011	-0.0162	-0.0345	-0.0082	0.0330	0.0139	0.0033	0.0095	-0.0168	-0.0040
	(0.3552)	(0.3704)	(0.0883)	(0.3524)	(0.3684)	(0.0868)	(0.3811)	(0.3804)	(0.0909)	(0.3823)	(0.3789)	(0.0895)
Service Sector	-0.1548	-0.1584	-0.0378	-0.1825	-0.1920	-0.0458	-0.1400	-0.1498	-0.0357	-0.1686	-0.1840	-0.0438
	(0.3518)	(0.3653)	(0.0873)	(0.3494)	(0.3642)	(0.0870)	(0.3677)	(0.3721)	(0.0887)	(0.3670)	(0.3711)	(0.0884)
Health, Education & Social Services	-0.7340	-0.6881	-0.1199*	-0.7456	-0.7031	-0.1215**	-0.7011	-0.6814	-0.1187*	-0.7159	-0.6973	-0.1203*
	(0.5176)	(0.5420)	(0.0617)	(0.5159)	(0.5433)	(0.0607)	(0.5458)	(0.5517)	(0.0632)	(0.5434)	(0.5537)	(0.0621)
Liberal Professions	-0.3827	-0.2983	-0.0610	-0.4187	-0.3128	-0.0634	-0.3785	-0.3298	-0.0661	-0.4122	-0.3462	-0.0686
	(0.7748)	(0.7967)	(0.1363)	(0.7755)	(0.8110)	(0.1360)	(0.8290)	(0.7986)	(0.1308)	(0.8410)	(0.8141)	(0.1303)
_cons	-0.7730	-1.5787		-0.7070	-1.5615		-1.3224	-1.7008		-1.2493	-1.6844	
	(2.1637)	(1.3215)		(2.0278)	(1.3248)		(2.2655)	(1.3358)		(2.1782)	(1.3384)	
Prob > χ^2	0.1412	0.0203		0.1829	0.0210		0.1767	0.0524		0.2257	0.0519	
N	527	363		527	363		527	363		527	363	
Participation equation: participation in continuing vocational training												
Vocational Training												
Apprenticeship	0.3756*			0.3796*			0.3895*			0.3973*		
	(0.2157)			(0.2104)			(0.2225)			(0.2180)		
Full-Time Vocational School	0.0476			0.0409			0.0021			-0.0014		
	(0.2466)			(0.2420)			(0.2648)			(0.2594)		
Master Craftsman	0.6983**			0.6499*			0.6698*			0.6252*		
	(0.3472)			(0.3480)			(0.3646)			(0.3649)		
University of Applied Sciences	0.7584*			0.8219**			0.8676**			0.9486**		
	(0.4165)			(0.4070)			(0.4196)			(0.4090)		
University	0.4522			0.4314			0.5540			0.5330		
	(0.3769)			(0.3749)			(0.3824)			(0.3825)		
Professional Status												
White-collar worker	0.0088			0.0141			-0.0179			-0.0122		
	(0.1758)			(0.1784)			(0.1787)			(0.1808)		
Self-employed person	-0.3433			-0.4061			-0.4275			-0.4880		
	(0.3084)			(0.3116)			(0.3018)			(0.3063)		

Employment Characteristics												
Full time employed	-0.2853 (0.2059)			-0.3216 (0.2081)			-0.3447 (0.2126)			-0.3840* (0.2187)		
Change	0.2367* (0.1270)			0.2635** (0.1284)			0.2660** (0.1289)			0.2931** (0.1303)		
Meeting the needs	-0.2060 (0.1813)			-0.1933 (0.1832)			-0.1935 (0.1833)			-0.1857 (0.1847)		
Computer private	0.5050*** (0.1479)			0.5185*** (0.1489)			0.5256*** (0.1471)			0.5390*** (0.1483)		
Computer on-the-job	0.6177*** (0.1528)			0.5992*** (0.1529)			0.6320*** (0.1551)			0.6120*** (0.1555)		
Number of employees	0.0000 (0.0000)			0.0000 (0.0000)			0.0000 (0.0000)			0.0000 (0.0000)		
Individual Characteristics												
Age	0.0202 (0.0542)			0.0173 (0.0543)			-0.0023 (0.0579)			-0.0063 (0.0581)		
Age squared	-0.0001 (0.0007)			0.0000 (0.0007)			0.0001 (0.0007)			0.0002 (0.0007)		
Sex	0.1413 (0.2022)			0.1657 (0.1979)			0.1464 (0.2364)			0.1601 (0.2358)		
Kids	-0.0699 (0.1513)			-0.0855 (0.1514)			0.0757 (0.4233)			-0.0203 (0.4301)		
Net income	0.0002 (0.0002)			0.0002 (0.0001)			0.0002 (0.0002)			0.0002 (0.0002)		
Married							0.6229** (0.2963)			0.6285** (0.2996)		
Single Mother/Father							0.7223* (0.3833)			0.7842** (0.3904)		

Male & Kids							0.2152 (0.2642)			0.2323 (0.2651)		
Married & Kids							-0.4125 (0.4271)			-0.3348 (0.4329)		
Time preference												
Present oriented				-0.2722** (0.1278)						-0.2799** (0.1291)		
Influence on part. decision												
Strain	-0.4109*** (0.1563)			-0.4004** (0.1553)			-0.4539*** (0.1473)			-0.4425*** (0.1505)		
Control Variables												
Manufacturing & Industry	0.0649 (0.2709)			0.0319 (0.2751)			-0.0286 (0.2660)			-0.0611 (0.2692)		
Service Sector	0.1167 (0.2742)			0.0770 (0.2797)			0.0493 (0.2659)			0.0106 (0.2710)		
Health, Education & Social Services	0.3751 (0.3531)			0.3425 (0.3549)			0.2848 (0.3456)			0.2476 (0.3475)		
Liberal Professions	0.7685 (0.6149)			0.8517 (0.5994)			0.8246 (0.6341)			0.8908 (0.5967)		
_cons	-1.3279 (1.0510)			-1.1422 (1.0671)			-1.1115 (1.0964)			-0.9010 (1.1218)		
Prob > χ^2	0.6476			0.5945			0.8241			0.7850		
ρ	-.4713			-.5073			-.2566			-.3016		

Robust std.errors in parentheses; *** (0.01), ** (0.05), * (0.10).

Table 4: Job security

	Basic equation		… & time preference		… & interaction terms		… & time preference, interaction terms	
	MLE		MLE		MLE		MLE	
	Coef	Marginal effects	Coef	Marginal effects	Coef	Marginal effects	Coef	Marginal effects
Outcome equation: Job security								
Vocational Training								
Apprenticeship	0.0353	0.0101	0.0330	0.0095	0.0211	0.0060	0.0218	0.0063
	(0.1984)	(0.0561)	(0.1946)	(0.0555)	(0.2056)	(0.0586)	(0.2054)	(0.0592)
Full-Time Vocational School	0.1083	0.0321	0.1223	0.0366	0.0931	0.0275	0.1176	0.0354
	(0.2349)	(0.0715)	(0.2323)	(0.0717)	(0.2451)	(0.0741)	(0.2443)	(0.0756)
Master Craftsman	0.2881	0.0909	0.3071	0.0980	0.1518	0.0460	0.1672	0.0515
	(0.2571)	(0.0875)	(0.2575)	(0.0887)	(0.2673)	(0.0846)	(0.2672)	(0.0858)
University of Applied Sciences	0.2548	0.0799	0.2619	0.0828	0.0777	0.0230	0.0750	0.0224
	(0.3601)	(0.1217)	(0.3554)	(0.1210)	(0.3823)	(0.1162)	(0.3761)	(0.1152)
University	0.0129	0.0037	0.0389	0.0114	-0.0355	-0.0101	-0.0030	-0.0009
	(0.3612)	(0.1047)	(0.3635)	(0.1081)	(0.3597)	(0.1009)	(0.3675)	(0.1068)
Professional Status								
White-collar worker	-0.1842	-0.0533	-0.1922	-0.0561	-0.2119	-0.0616	-0.2201	-0.0647
	(0.1875)	(0.0550)	(0.1884)	(0.0556)	(0.1940)	(0.0574)	(0.1958)	(0.0587)
Self-employed person	0.0335	0.0097	0.0669	0.0198	-0.0095	-0.0027	0.0419	0.0124
	(0.3035)	(0.0892)	(0.3151)	(0.0955)	(0.3213)	(0.0918)	(0.3376)	(0.1013)
Employment Characteristics								
Full time employed	-0.1796	-0.0533	-0.1568	-0.0466	-0.1366	-0.0403	-0.1032	-0.0306
	(0.2115)	(0.0644)	(0.2129)	(0.0648)	(0.2270)	(0.0684)	(0.2301)	(0.0693)
Change	0.0511	0.0147	0.0327	0.0095	0.1051	0.0302	0.0849	0.0247
	(0.1394)	(0.0400)	(0.1419)	(0.0410)	(0.1457)	(0.0416)	(0.1491)	(0.0432)
Meeting the needs	-0.0547	-0.0160	-0.0567	-0.0167	-0.0645	-0.0189	-0.0638	-0.0189
	(0.2063)	(0.0613)	(0.2070)	(0.0619)	(0.2137)	(0.0639)	(0.2153)	(0.0650)

Computer private	0.1816 (0.1638)	0.0504 (0.0438)	0.1508 (0.1664)	0.0424 (0.0454)	0.2087 (0.1788)	0.0578 (0.0471)	0.1727 (0.1835)	0.0488 (0.0495)
Computer on-the-job	0.5136*** (0.1712)	0.1382*** (0.0422)	0.5174*** (0.1763)	0.1403*** (0.0434)	0.4949*** (0.1854)	0.1338*** (0.0445)	0.4931** (0.1920)	0.1350*** (0.0460)
Number of employees	0.0000** (0.0000)	0.0000** (0.0000)	0.0000** (0.0000)	0.0000** (0.0000)	0.0000** (0.0000)	0.0000** (0.0000)	0.0000** (0.0000)	0.0000** (0.0000)
Individual Characteristics								
Age	-0.0730 (0.0573)	-0.0210 (0.0166)	-0.0788 (0.0594)	-0.0228 (0.0175)	-0.1187* (0.0646)	-0.0342* (0.0190)	-0.1298** (0.0659)	-0.0378* (0.0198)
Age squared	0.0009 (0.0007)	0.0003 (0.0002)	0.0010 (0.0007)	0.0003 (0.0002)	0.0014* (0.0008)	0.0004* (0.0002)	0.0015* (0.0008)	0.0004* (0.0002)
Sex	0.4055** (0.1907)	0.1160** (0.0543)	0.3773* (0.1950)	0.1088* (0.0563)	0.6712*** (0.2403)	0.1914*** (0.0690)	0.6456*** (0.2461)	0.1863** (0.0727)
Kids	0.0640 (0.1574)	0.0184 (0.0452)	0.0824 (0.1592)	0.0238 (0.0460)	1.3130*** (0.4860)	0.3646*** (0.1308)	1.4028*** (0.4769)	0.3918*** (0.1304)
Net income	-0.0001 (0.0001)	0.0000 (0.0000)	-0.0001 (0.0001)	0.0000 (0.0000)	-0.0001 (0.0001)	0.0000 (0.0000)	-0.0001 (0.0001)	0.0000 (0.0000)
Married					1.0865*** (0.3898)	0.2178*** (0.0514)	1.1331*** (0.4200)	0.2270*** (0.0532)
Single Mother/Father					0.1196 (0.4807)	0.0358 (0.1487)	0.1005 (0.4912)	0.0302 (0.1516)
Male & Kids					-0.4412 (0.2912)	-0.1155* (0.0698)	-0.4596 (0.2979)	-0.1214* (0.0731)
Married & Kids					-1.1481** (0.4801)	-0.3090** (0.1221)	-1.2057** (0.4656)	-0.3268*** (0.1202)
Time preference								
Present oriented			0.1537 (0.1439)	0.0453 (0.0435)			0.2114 (0.1564)	0.0630 (0.0489)
Control Variables								
Manufacturing & Industry	0.1772 (0.2971)	0.0519 (0.0888)	0.2346 (0.3019)	0.0696 (0.0920)	0.1269 (0.3166)	0.0371 (0.0938)	0.1970 (0.3276)	0.0586 (0.0996)

Service Sector	-0.0419 (0.3081)	-0.0120 (0.0885)	0.0176 (0.3113)	0.0051 (0.0901)	-0.1391 (0.3256)	-0.0400 (0.0937)	-0.0721 (0.3345)	-0.0210 (0.0975)
Health, Education & Social Services	0.0775 (0.3907)	0.0228 (0.1180)	0.1165 (0.3944)	0.0350 (0.1227)	-0.0785 (0.3994)	-0.0220 (0.1089)	-0.0325 (0.4077)	-0.0094 (0.1163)
_cons	0.0774 (1.2193)		0.1218 (1.2658)		0.1312 (1.3269)		0.2083 (1.3555)	
Prob > χ^2	0.0524		0.0799		0.0582		0.0724	
N	519		519		519		519	
Participation equation: participation in continuing vocational training								
Vocational Training								
Apprenticeship	0.3605* (0.1899)		0.3781** (0.1880)		0.3989** (0.1919)		0.4105** (0.1921)	
Full-Time Vocational School	0.0114 (0.2235)		0.0123 (0.2213)		-0.0186 (0.2307)		-0.0203 (0.2303)	
Master Craftsman	0.6842* (0.3519)		0.6258* (0.3488)		0.6690* (0.3632)		0.6170* (0.3614)	
University of Applied Sciences	0.8103* (0.4170)		0.8452** (0.4092)		0.8994** (0.4171)		0.9362** (0.4050)	
University	0.5393 (0.4518)		0.5283 (0.4445)		0.6781 (0.4501)		0.6605 (0.4462)	
Professional Status								
White-collar worker	0.0394 (0.1785)		0.0453 (0.1801)		-0.0009 (0.1821)		0.0042 (0.1832)	
Self-employed person	-0.3957 (0.3081)		-0.4327 (0.3110)		-0.4691 (0.3032)		-0.5067 (0.3080)	
Employment Characteristics								
Full time employed	-0.2497 (0.1908)		-0.2655 (0.1907)		-0.3253* (0.1965)		-0.3459* (0.1966)	
Change	0.2189* (0.1280)		0.2528* (0.1297)		0.2492* (0.1295)		0.2814** (0.1306)	

Meeting the needs	-0.2117 (0.1811)		-0.1996 (0.1815)		-0.2001 (0.1834)		-0.1928 (0.1836)	
Computer private	0.5205*** (0.1463)		0.5302*** (0.1471)		0.5321*** (0.1465)		0.5420*** (0.1473)	
Computer on-the-job	0.6136*** (0.1462)		0.5977*** (0.1479)		0.6214*** (0.1477)		0.6062*** (0.1491)	
Number of employees	0.0000 (0.0000)		0.0000 (0.0000)		0.0000 (0.0000)		0.0000 (0.0000)	
Individual Characteristics								
Age	0.0267 (0.0509)		0.0238 (0.0513)		0.0018 (0.0531)		-0.0001 (0.0529)	
Age squared	-0.0001 (0.0006)		-0.0001 (0.0006)		0.0001 (0.0006)		0.0001 (0.0006)	
Sex	0.1602 (0.1797)		0.1828 (0.1806)		0.1591 (0.2096)		0.1729 (0.2108)	
Kids	-0.0832 (0.1490)		-0.0969 (0.1505)		0.1130 (0.4003)		0.0226 (0.4050)	
Net income	0.0002** (0.0001)		0.0002* (0.0001)		0.0002* (0.0001)		0.0002* (0.0001)	
Married					0.6806** (0.2849)		0.6690** (0.2855)	
Single Mother/Father					0.7092* (0.3667)		0.7512** (0.3751)	
Male & Kids					0.1748 (0.2670)		0.1894 (0.2678)	
Married & Kids					-0.4461 (0.4042)		-0.3698 (0.4077)	
Time preference								
Present oriented			-0.2426* (0.1285)		0.0000 (0.0000)		-0.2483* (0.1297)	

Influence on participation decision								
Strain	-0.4521*** (0.1214)		-0.4604*** (0.1192)		-0.4774*** (0.1230)		-0.4803*** (0.1237)	
Control Variables								
Manufacturing & Industry	0.0507 (0.2691)		0.0216 (0.2727)		-0.0259 (0.2613)		-0.0577 (0.2656)	
Service Sector	0.0857 (0.2779)		0.0489 (0.2810)		0.0341 (0.2670)		-0.0020 (0.2708)	
Health, Education & Social Services	0.2620 (0.3529)		0.2407 (0.3545)		0.2209 (0.3453)		0.1918 (0.3477)	
_cons	-1.4149 (1.0469)		-1.2531 (1.0515)		-1.2295 (1.0640)		-1.0637 (1.0599)	
Prob > χ^2	0.0345		0.0589		0.0493		0.0923	
ρ	.8448		.8168		.7155		.6766	

Robust std.errors in parentheses; *** (0.01), ** (0.05), * (0.10); none of the eight workers with a liberal profession could considerable increase his job security and that is the reason why they are excluded.

Table 5: Prospect on the labor market

	Basic equation			… & time preference			… & interaction terms			… & time preference, interaction terms		
	MLE	Probit		MLE	Probit		MLE	Probit		MLE	Probit	
		Coef	Marginal effects		Coef	Marginal effects		Coef	Marginal effects		Coef	Marginal effects
Outcome equation: prospect on the labor market												
Vocational Training												
Apprenticeship	0.0351	-0.0491	-0.0196	0.0298	-0.0492	-0.0196	0.0244	-0.0495	-0.0197	0.0237	-0.0497	-0.0198
	(0.2067)	(0.2112)	(0.0842)	(0.2052)	(0.2110)	(0.0842)	(0.2341)	(0.2099)	(0.0837)	(0.2188)	(0.2097)	(0.0836)
Full-Time Vocational School	0.1715	0.1989	0.0792	0.1700	0.1983	0.0789	0.1596	0.1849	0.0737	0.1585	0.1845	0.0735
	(0.2396)	(0.2561)	(0.1014)	(0.2407)	(0.2558)	(0.1013)	(0.2491)	(0.2573)	(0.1020)	(0.2473)	(0.2570)	(0.1019)
Master Craftsman	-0.1482	-0.3213	-0.1256	-0.1685	-0.3236	-0.1264	-0.2328	-0.3716	-0.1443	-0.2414	-0.3728	-0.1448
	(0.3064)	(0.2771)	(0.1047)	(0.2954)	(0.2774)	(0.1047)	(0.3844)	(0.2816)	(0.1046)	(0.3353)	(0.2822)	(0.1048)
University of Applied Sciences	0.7222**	0.6020	0.2306*	0.7311**	0.6028	0.2309*	0.7188*	0.5894	0.2264	0.7302*	0.5900	0.2266
	(0.3601)	(0.3784)	(0.1321)	(0.3624)	(0.3785)	(0.1321)	(0.4255)	(0.3950)	(0.1389)	(0.4110)	(0.3953)	(0.1390)
University	0.4527	0.4013	0.1576	0.4413	0.3988	0.1566	0.4818	0.4189	0.1643	0.4733	0.4174	0.1637
	(0.3225)	(0.3389)	(0.1282)	(0.3234)	(0.3388)	(0.1282)	(0.3335)	(0.3378)	(0.1273)	(0.3286)	(0.3375)	(0.1272)
Professional Status												
White-collar worker	-0.2540	-0.2780	-0.1106	-0.2537	-0.2781	-0.1106	-0.2976	-0.3079	-0.1223	-0.2957	-0.3080	-0.1224
	(0.1839)	(0.1930)	(0.0763)	(0.1846)	(0.1930)	(0.0763)	(0.1914)	(0.1928)	(0.0760)	(0.1892)	(0.1928)	(0.0760)
Self-employed person	-0.3547	-0.2277	-0.0897	-0.3669	-0.2316	-0.0913	-0.4077	-0.3074	-0.1202	-0.4231	-0.3095	-0.1210
	(0.3692)	(0.3655)	(0.1414)	(0.3666)	(0.3674)	(0.1420)	(0.3997)	(0.3757)	(0.1422)	(0.3894)	(0.3770)	(0.1426)
Employment Characteristics												
Full time employed	0.3413	0.4630**	0.1811**	0.3424	0.4607**	0.1803**	0.3240	0.4315*	0.1691**	0.3192	0.4302*	0.1686**
	(0.2415)	(0.2147)	(0.0812)	(0.2347)	(0.2149)	(0.0814)	(0.3134)	(0.2211)	(0.0841)	(0.2782)	(0.2217)	(0.0844)
Change	0.1449	0.0842	0.0335	0.1504	0.0858	0.0342	0.1842	0.1322	0.0526	0.1898	0.1331	0.0530
	(0.1385)	(0.1418)	(0.0565)	(0.1404)	(0.1427)	(0.0568)	(0.1576)	(0.1450)	(0.0576)	(0.1529)	(0.1457)	(0.0579)
Meeting the needs	-0.3295	-0.3256	-0.1289	-0.3297	-0.3262	-0.1291	-0.3145	-0.3090	-0.1225	-0.3141	-0.3092	-0.1225
	(0.2159)	(0.2271)	(0.0882)	(0.2158)	(0.2271)	(0.0882)	(0.2237)	(0.2295)	(0.0895)	(0.2220)	(0.2295)	(0.0895)

Computer private	0.0080	-0.2038	-0.0811	0.0015	-0.2020	-0.0804	0.0168	-0.1411	-0.0562	0.0194	-0.1401	-0.0558
	(0.2495)	(0.1811)	(0.0718)	(0.2366)	(0.1819)	(0.0721)	(0.3315)	(0.1830)	(0.0728)	(0.2769)	(0.1839)	(0.0732)
Computer on-the-job	0.4603**	0.2733	0.1081	0.4463**	0.2729	0.1079	0.4306	0.2793	0.1104	0.4243*	0.2791	0.1103
	(0.2008)	(0.1750)	(0.0683)	(0.1933)	(0.1748)	(0.0682)	(0.2787)	(0.1740)	(0.0678)	(0.2314)	(0.1739)	(0.0678)
Number of employees	0.0000**	0.0000*	0.0000*	0.0000*	0.0000*	0.0000*	0.0000**	0.0000*	0.0000*	0.0000**	0.0000*	0.0000*
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Individual Characteristics												
Age	0.0274	0.0163	0.0065	0.0273	0.0167	0.0066	-0.0130	-0.0178	-0.0071	-0.0132	-0.0176	-0.0070
	(0.0542)	(0.0564)	(0.0225)	(0.0544)	(0.0565)	(0.0225)	(0.0577)	(0.0585)	(0.0233)	(0.0574)	(0.0585)	(0.0233)
Age squared	-0.0004	-0.0003	-0.0001	-0.0004	-0.0003	-0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	(0.0007)	(0.0007)	(0.0003)	(0.0007)	(0.0007)	(0.0003)	(0.0007)	(0.0007)	(0.0003)	(0.0007)	(0.0007)	(0.0003)
Sex	-0.0639	-0.1471	-0.0586	-0.0618	-0.1449	-0.0577	-0.0999	-0.1441	-0.0574	-0.0980	-0.1433	-0.0571
	(0.2064)	(0.1994)	(0.0793)	(0.2064)	(0.1999)	(0.0795)	(0.2458)	(0.2351)	(0.0935)	(0.2399)	(0.2359)	(0.0938)
Kids	-0.1064	-0.1025	-0.0408	-0.1104	-0.1041	-0.0415	0.5841	0.6447	0.2525	0.5681	0.6424	0.2516
	(0.1568)	(0.1659)	(0.0660)	(0.1577)	(0.1665)	(0.0663)	(0.4935)	(0.4798)	(0.1814)	(0.4850)	(0.4812)	(0.1820)
Net income	-0.0001	-0.0001	0.0000	-0.0001	-0.0001	0.0000	-0.0001	-0.0001	0.0000	-0.0001	-0.0001	0.0000
	(0.0001)	(0.0001)	(0.0000)	(0.0001)	(0.0001)	(0.0000)	(0.0001)	(0.0001)	(0.0000)	(0.0001)	(0.0001)	(0.0000)
Married							0.9240***	0.8517**	0.3108***	0.9274***	0.8513**	0.3107***
							(0.3341)	(0.3567)	(0.1104)	(0.3346)	(0.3568)	(0.1104)
Single Mother/Father							0.4310	0.2760	0.1095	0.4396	0.2765	0.1097
							(0.5027)	(0.4860)	(0.1902)	(0.4892)	(0.4862)	(0.1902)
Male & Kids							0.2168	0.1500	0.0598	0.2207	0.1508	0.0601
							(0.3057)	(0.2911)	(0.1159)	(0.2963)	(0.2908)	(0.1157)
Married & Kids							-0.9948**	-0.9992**	-0.3809**	-0.9819**	-0.9981**	-0.3805**
							(0.4770)	(0.4844)	(0.1691)	(0.4732)	(0.4850)	(0.1693)
Time Preference												
Present oriented				-0.0890	-0.0181	-0.0072			0.0000	-0.0684	-0.0100	-0.0040
				(0.1496)	(0.1517)	(0.0604)			(0.0000)	(0.1628)	(0.1536)	(0.0612)
Control Variables												
Manufacturing & Industry	0.3405	0.4014	0.1590	0.3361	0.3972	0.1574	0.3151	0.3803	0.1508	0.3076	0.3778	0.1498
	(0.3192)	(0.3301)	(0.1289)	(0.3192)	(0.3318)	(0.1296)	(0.3574)	(0.3310)	(0.1296)	(0.3428)	(0.3332)	(0.1305)

Service Sector	0.3007 (0.3171)	0.3321 (0.3337)	0.1318 (0.1312)	0.2940 (0.3200)	0.3274 (0.3362)	0.1299 (0.1322)	0.2784 (0.3332)	0.3131 (0.3344)	0.1243 (0.1316)	0.2710 (0.3307)	0.3104 (0.3376)	0.1232 (0.1329)
Health, Education & Social Services	0.5023 (0.3755)	0.4578 (0.3947)	0.1792 (0.1478)	0.4965 (0.3774)	0.4543 (0.3951)	0.1779 (0.1481)	0.4426 (0.3814)	0.4176 (0.3949)	0.1641 (0.1497)	0.4374 (0.3819)	0.4156 (0.3958)	0.1634 (0.1501)
Liberal Professions	0.0152 (0.6326)	-0.1354 (0.6699)	-0.0537 (0.2632)	0.0248 (0.6313)	-0.1360 (0.6685)	-0.0539 (0.2626)	0.0716 (0.6847)	-0.0530 (0.6915)	-0.0211 (0.2745)	0.0846 (0.6765)	-0.0531 (0.6905)	-0.0211 (0.2742)
_cons	-1.2189 (1.3568)	-0.1794 (1.1884)		-1.1379 (1.3160)	-0.1761 (1.1878)		-0.8605 (1.6400)	-0.1098 (1.1974)		-0.8231 (1.4291)	-0.1073 (1.1977)	
Prob > χ^2	0.0713	0.1515		0.1085	0.1884		0.0202	0.0746		0.0278	0.0945	
N	527	363		527	363		527	363		527	363	
Participation equation: participation in continuing vocational training												
Vocational Training												
Apprenticeship	0.3384* (0.1868)			0.3471* (0.1871)			0.3672* (0.1900)			0.3768** (0.1894)		
Full-Time Vocational School	-0.0144 (0.2245)			-0.0197 (0.2226)			-0.0466 (0.2398)			-0.0528 (0.2357)		
Master Craftsman	0.7002** (0.3522)			0.6608* (0.3513)			0.6741* (0.3685)			0.6339* (0.3685)		
University of Applied Sciences	0.7226* (0.4279)			0.8144* (0.4308)			0.8258** (0.4166)			0.9256** (0.4139)		
University	0.4742 (0.3969)			0.4637 (0.3977)			0.5707 (0.3949)			0.5586 (0.3971)		
Professional Status												
White-collar worker	0.0665 (0.1825)			0.0700 (0.1827)			0.0242 (0.2034)			0.0293 (0.1952)		
Self-employed person	-0.3373 (0.3269)			-0.4056 (0.3262)			-0.4326 (0.3103)			-0.4968 (0.3137)		
Employment Characteristics												
Full time employed	-0.2505 (0.1941)			-0.2786 (0.1948)			-0.3224 (0.2010)			-0.3571* (0.2020)		

Change	0.2349* (0.1263)			0.2670** (0.1281)			0.2618** (0.1301)			0.2944** (0.1300)		
Meeting the needs	-0.2319 (0.1848)			-0.2253 (0.1866)			-0.2070 (0.1855)			-0.2040 (0.1869)		
Computer private	0.5195*** (0.1461)			0.5286*** (0.1463)			0.5394*** (0.1470)			0.5497*** (0.1465)		
Computer on-the-job	0.6324*** (0.1446)			0.6160*** (0.1457)			0.6345*** (0.1458)			0.6163*** (0.1467)		
Number of employees	0.0000 (0.0000)			0.0000 (0.0000)			0.0000 (0.0000)			0.0000 (0.0000)		
Individual Characteristics												
Age	0.0279 (0.0514)			0.0247 (0.0515)			0.0022 (0.0536)			-0.0018 (0.0535)		
Age squared	-0.0001 (0.0006)			-0.0001 (0.0006)			0.0001 (0.0007)			0.0001 (0.0007)		
Sex	0.2060 (0.1890)			0.2226 (0.1855)			0.1967 (0.2299)			0.2043 (0.2166)		
Kids	-0.0803 (0.1527)			-0.0883 (0.1532)			0.0848 (0.4188)			-0.0028 (0.4231)		
Net income	0.0002* (0.0001)			0.0002* (0.0001)			0.0002* (0.0001)			0.0002* (0.0001)		
Married							0.6199** (0.2834)			0.6341** (0.2827)		
Single Mother/Father							0.7333** (0.3733)			0.7929** (0.3778)		
Male & Kids							0.1810 (0.2837)			0.2072 (0.2741)		
Married & Kids							-0.4076 (0.4169)			-0.3408 (0.4197)		

Time preference												
Present oriented				-0.2722** (0.1290)						-0.2845** (0.1295)		
Influence on part.decision												
Strain	-0.4044*** (0.1402)			-0.4025*** (0.1325)			-0.4351** (0.1692)			-0.4288*** (0.1497)		
Control Variables												
Manufacturing & Industry	0.0780 (0.2742)			0.0454 (0.2777)			-0.0274 (0.2684)			-0.0613 (0.2719)		
Service Sector	0.1115 (0.2794)			0.0714 (0.2834)			0.0392 (0.2711)			-0.0036 (0.2758)		
Health, Education & Social Services	0.3596 (0.3552)			0.3336 (0.3567)			0.2800 (0.3486)			0.2451 (0.3500)		
Liberal Professions	0.8258 (0.6472)			0.8928 (0.6095)			0.8479 (0.6797)			0.9202 (0.6289)		
_cons	-1.4755 (1.0527)			-1.2827 (1.0578)			-1.2280 (1.0754)			-1.0098 (1.0677)		
Prob > χ^2	0.3654			0.3096			0.6316			0.5241		
ρ	.6754			.6450			.5427			.5426		

Robust std.errors in parentheses; *** (0.01), ** (0.05), * (0.10).

Table 6: Participation decision

	Basic equation		… & time preference		… & interaction terms		… & time preference, interaction terms	
	Probit		Probit		Probit		Probit	
	Coef	Marginal effects	Coef	Marginal effects	Coef	Marginal effects	Coef	Marginal effects
Vocational Training								
Apprenticeship	0.3430*	0.1188*	0.3463*	0.1198*	0.3723**	0.1290*	0.3779**	0.1308*
	(0.1880)	(0.0671)	(0.1888)	(0.0674)	(0.1889)	(0.0678)	(0.1899)	(0.0681)
Full-Time Vocational School	0.0164	0.0054	0.0089	0.0030	-0.0170	-0.0056	-0.0228	-0.0076
	(0.2271)	(0.0748)	(0.2269)	(0.0749)	(0.2325)	(0.0775)	(0.2330)	(0.0778)
Master Craftsman	0.7034**	0.1829***	0.6530*	0.1730**	0.6721*	0.1763**	0.6261*	0.1670**
	(0.3509)	(0.0646)	(0.3510)	(0.0681)	(0.3660)	(0.0691)	(0.3665)	(0.0725)
University of Applied Sciences	0.7351*	0.1866**	0.8126*	0.1991***	0.8566**	0.2054***	0.9437**	0.2172***
	(0.4238)	(0.0736)	(0.4194)	(0.0663)	(0.4199)	(0.0628)	(0.4149)	(0.0556)
University	0.4547	0.1299	0.4302	0.1238	0.5547	0.1519*	0.5315	0.1466*
	(0.3801)	(0.0897)	(0.3783)	(0.0912)	(0.3835)	(0.0818)	(0.3838)	(0.0836)
Professional Status								
White-collar worker	0.0219	0.0073	0.0298	0.0099	-0.0127	-0.0042	-0.0051	-0.0017
	(0.1720)	(0.0572)	(0.1739)	(0.0578)	(0.1758)	(0.0581)	(0.1773)	(0.0586)
Self-employed person	-0.3484	-0.1248	-0.4091	-0.1479	-0.4324	-0.1566	-0.4925	-0.1798
	(0.3103)	(0.1179)	(0.3138)	(0.1208)	(0.3006)	(0.1160)	(0.3057)	(0.1191)
Employment Characteristics								
Full time employed	-0.2581	-0.0823	-0.2879	-0.0913	-0.3317*	-0.1042*	-0.3658*	-0.1140**
	(0.1892)	(0.0577)	(0.1894)	(0.0571)	(0.1939)	(0.0574)	(0.1949)	(0.0568)
Change	0.2387*	0.0791*	0.2650**	0.0877**	0.2687**	0.0888**	0.2960**	0.0976**
	(0.1271)	(0.0420)	(0.1285)	(0.0423)	(0.1290)	(0.0425)	(0.1302)	(0.0427)
Meeting the needs	-0.2111	-0.0665	-0.2021	-0.0637	-0.1975	-0.0622	-0.1917	-0.0604
	(0.1815)	(0.0541)	(0.1823)	(0.0545)	(0.1834)	(0.0549)	(0.1841)	(0.0552)

Computer private	0.5091*** (0.1464)	0.1783*** (0.0534)	0.5226*** (0.1473)	0.1830*** (0.0537)	0.5274*** (0.1461)	0.1845*** (0.0532)	0.5409*** (0.1472)	0.1892*** (0.0536)
Computer on-the-job	0.6318*** (0.1460)	0.2180*** (0.0516)	0.6146*** (0.1469)	0.2118*** (0.0519)	0.6399*** (0.1464)	0.2204*** (0.0516)	0.6214*** (0.1475)	0.2136*** (0.0520)
Number of employees	0.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)
Individual Characteristics								
Age	0.0274 (0.0506)	0.0091 (0.0168)	0.0257 (0.0508)	0.0085 (0.0168)	0.0018 (0.0527)	0.0006 (0.0174)	-0.0010 (0.0527)	-0.0003 (0.0174)
Age squared	-0.0001 (0.0006)	0.0000 (0.0002)	-0.0001 (0.0006)	0.0000 (0.0002)	0.0001 (0.0006)	0.0000 (0.0002)	0.0001 (0.0006)	0.0000 (0.0002)
Sex	0.1720 (0.1772)	0.0571 (0.0588)	0.1964 (0.1775)	0.0651 (0.0588)	0.1634 (0.2074)	0.0541 (0.0685)	0.1797 (0.2083)	0.0594 (0.0687)
Kids	-0.0763 (0.1500)	-0.0253 (0.0497)	-0.0886 (0.1510)	-0.0293 (0.0500)	0.0748 (0.4211)	0.0247 (0.1394)	-0.0177 (0.4260)	-0.0059 (0.1407)
Net income	0.0002* (0.0001)	0.0001* (0.0000)	0.0002* (0.0001)	0.0001** (0.0000)	0.0002* (0.0001)	0.0001* (0.0000)	0.0002* (0.0001)	0.0001* (0.0000)
Married					0.6351** (0.2821)	0.2315** (0.1086)	0.6438** (0.2826)	0.2347** (0.1088)
Single Mother/Father					0.7233* (0.3800)	0.1892*** (0.0728)	0.7856** (0.3858)	0.2003*** (0.0692)
Male & Kids					0.2143 (0.2654)	0.0685 (0.0817)	0.2296 (0.2660)	0.0731 (0.0814)
Married & Kids					-0.4184 (0.4211)	-0.1396 (0.1407)	-0.3426 (0.4262)	-0.1141 (0.1424)
Time preference								
Present oriented			-0.2718** (0.1283)	-0.0920** (0.0441)			-0.2796** (0.1293)	-0.0945** (0.0444)
Influence on part.decision								
Strain	-0.4329*** (0.1261)	-0.1466*** (0.0434)	-0.4254*** (0.1264)	-0.1439*** (0.0434)	-0.4630*** (0.1280)	-0.1565*** (0.0440)	-0.4542*** (0.1285)	-0.1533*** (0.0440)

Manufacturing & Industry	0.0597 (0.2720)	0.0197 (0.0893)	0.0316 (0.2757)	0.0104 (0.0909)	-0.0336 (0.2655)	-0.0112 (0.0884)	-0.0640 (0.2690)	-0.0213 (0.0899)
Service Sector	0.1147 (0.2756)	0.0380 (0.0913)	0.0812 (0.2793)	0.0269 (0.0925)	0.0468 (0.2667)	0.0155 (0.0882)	0.0113 (0.2702)	0.0037 (0.0893)
Health, Education & Social Services	0.3710 (0.3536)	0.1104 (0.0926)	0.3429 (0.3556)	0.1028 (0.0950)	0.2818 (0.3456)	0.0860 (0.0962)	0.2465 (0.3476)	0.0759 (0.0990)
Liberal Professions	0.7217 (0.6188)	0.1818* (0.1058)	0.7892 (0.5873)	0.1924** (0.0922)	0.8107 (0.6512)	0.1952** (0.0985)	0.8676 (0.6063)	0.2030** (0.0850)
_cons	-1.4183 (1.0396)		-1.2642 (1.0450)		-1.1700 (1.0461)		-0.9853 (1.0501)	
Prob > χ^2	0.0000		0.0000		0.0000		0.0000	
N	527		527		527		527	

Robust std.errors in parentheses; *** (0.01), ** (0.05), * (0.10).