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Abstract:

Training costs may hamper intra-firm human capital accumulation. As a consequence, firms may be tempted to have workers paying for their on-the-job training (OJT). In this paper, we analyse the links of OJT and worker remuneration in the suburb of Tunis, using case-study data for eight firms. We find that the duration of former OJT negatively influences starting wages, while there is no anticipated effect of future training on wages at the firm entry. In contrast, current wages are positively affected by former OJT, but negatively affected by ongoing OJT. These results provide very rare empirical support in LDCs for classical human capital theories and cost sharing theories applied to OJT.

Keywords: Wages, On-the-job training, Tunisia.

JEL Classification: J24, J31, O12.

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1. Introduction

On-the-job training (OJT) involves training provided by the firm and may be a substantial source of growth in emerging economies accumulating human capital. It may occur under diverse forms, such as attending presentations by co-workers, formal courses or practical exercises. However, OJT remains distinct from mere imitation or learning-by-doing, which are rather associated with tenure. We base our investigation of OJT processes on the possibility of examining OJT costs sharing between firms and workers through an analysis of the signs of the coefficients of OJT variables in different wage equations. In this respect, one persistent question in the seminal labour economics literature is hence whether OJT either positively, negatively, or insignificantly affects wages.[1] Positive coefficients arise presumably because of workers' productivity gains, and negative signs perhaps because of compensation imposed by the firm to workers for providing OJT service. These issues are important because training costs may hamper intra-firm human capital accumulation. Yet, firms may be tempted to have workers pay for their within-firm training.

In this paper, we conduct an econometric analysis of the links between OJT and worker remuneration in the suburb of Tunis, using case-study data based on eight firms. The data have two main advantages, which offset the fact that the number of firms surveyed is small and that selectivity and endogeneity issues can only be controlled using a few firm characteristics. First, they provide details about OJT inside the firm, our primary concern; second, they contain detailed description of firms and their workers, the so-called matched employer-employee feature.

As a matter of fact, little is currently known about the effect of OJT on worker remunerations in Tunisia, while these questions are crucial in a policy perspective. High unemployment in Tunisia was around 16 percent in 1999, the date of the survey. The government attempted to reduce this

[1] See Lynch (1992), Barron et al. (1989, 1998), Dearden et al. (1996), Loewenstein and Spletzer (1996).

unemployment through policies enhancing the skills of the Tunisian workers. However, with the termination of the Multi-Fibre Arrangements in 2005 and the implementation in 2007 of the Association Agreement with the EU, Tunisian firms face fiercer competition. Moreover, economic globalization has brought further challenges to Tunisian workers. In 1994, the wages of unskilled industrial workers were on average lower than for Mediterranean competitors (CNUCED/PNUD, 2001). Nonetheless, wages at the same skill levels are still three times lower in China and India than in Tunisia. Improving sector productivity by enhancing human capital is a response. In 1996, the Tunisian government set a firm modernisation programme (MANFORME), which includes some fostering of within-firm training and vocational training. Between 1996 and 1999, 1,161 million dinars (UNDP, 1994) were spent on this programme. In March 2000, more than 1300 firms had been assisted, amounting for 40 percent of total employment in firms of more than 20 employees. Accordingly, the survey we use in this paper allows having a close look at the cost sharing issue of OJT in a period when these within-firm training programmes were gradually implemented, but were also raising high policy expectations.

Our approach to these issues is hence to examine simultaneously wages and OJT. Since the 1970s, the relationship between human capital and earnings has been studied through wage equations by using regressors that describe education, training and other skills generated by work experience, while mostly for industrialised countries. Beyond formal education, other acquired skills may affect remunerations. For example, Dickerson and Green (2002) show in the UK that most generic skills have a substantial and growing impact on wages over the traditional human capital indicators like education and experience. Focusing on OJT, rather than on traditional human capital, has several advantages. First, OJT, work and wage setting decisions are nearer in time than general education and work, which should help when investigating their links. Second, OJT can often be simultaneously observed along with work performance and the type of tasks carried out. Third, OJT

allows firm and worker skills to swiftly adjust to changing economic environment. In the meantime, the instantaneous cost-sharing of OJT between firm and worker can be captured by analysts.

In Section 2, we discuss the modelling approach. In Section 3, we present the data. In Section 4, we report the estimation results. Section 5 concludes.

2. The Modelling Approach

2.1. General setting

The standard human capital accumulation model, based on perfect labour market assumptions, yields the equalization of worker net productivity (i.e. productivity minus training costs) with wage rate. In these conditions, OJT in the form of general training at the firm entry may correspond to a lower starting wage because of contemporary compensation for training cost and, later on, to a higher current wage (if observed a few years after OJT) because of the subsequent productivity rise due to the initial training. In this framework, workers bear the full cost of general training and get the full return to it. However, not all human capital generated by training is general. By definition, specific human capital is accumulated in a given firm and is useful only in that firm, while general human capital can be used in any firm. This distinction matters for understanding how OJT is financed.

2.2. Sharing the training cost

In a seminal theoretical study, Becker (1962) shows that, under perfect labour and product markets

and renegotiation possibilities, the worker should receive all the returns and pay all the costs of the training if it is general. On the other hand, if training is specific and the firm sets wages, the firm receives all the returns and pays all the costs. However, the training return is lost if firm and worker separate. In that case, they should rather share the return. Leuven (2005) reviews works that have proposed diverse models for such sharing process (Becker, 1975; Hashimoto, 1981).

In the case of specific training, workers and firms may share both costs and returns. Workers may pay part of their OJT costs by accepting a lower starting wage, and realize later a return to this investment through greater wage growth. In some cases, the firm may accept to pay the whole cost of OJT because this would correspond to highly firm-specific training, which would not be associated with a decrease in starting wage. In any case, empirical evidence is needed to ascertain what the correlations of starting and current wages with OJT are.

2.3. Review of empirical results

Since the end of the 1970s, a few empirical studies of the interactions of OJT and wages in developed countries are available. However, most of these studies cannot control for both observed and unobserved firm characteristics through specifying firm effects. To our knowledge, only Kahyarara and Teal (2008) introduce firm effects for a developing country.

In a seminal article, Barron et al. (1989), using a survey of US workers in entry level positions, find no significant OJT effect on starting wage and a positive significant effect on subsequent wage growth. Using a longitudinal data set on US young workers, Lynch (1992) finds that OJT is concentrated among white married unionized males with longer work experience. All training measures (including ongoing or former OJT in the firm) positively affect wages (rather starting wages since only for young workers), except off-the-job training and OJT in previous job. Parent

(1999) avails himself of a larger sample, although taken from the same survey as Lynch. He finds that OJT with the current employer has a negative effect on starting wages, but not on current wages.

Similarly, using either national survey data or case studies, several authors (Blanchflower and Lynch, 1994; Bartel, 1995; Loewenstein and Spletzer, 1996; Krueger and Rouse, 1998; Dearden et al., 2006) find that OJT contributes to raising wages in the UK and the US. However, Lynch's conclusions of OJT specificity are challenged by Barron et al. (1998) who argue that training lowers starting wages only when workers' unobserved ability differences can be controlled for.

For Africa, the literature is scant partly due to the lack of appropriate data on OJT, wages and worker characteristics. Using firm data from five African countries, Rosholm et al. (2007) observe that firms pay for and provide general and specific training, especially to the better educated workers, and that trained workers receive significant wage premiums. Kahyarara and Teal (2008), using workers panel data in Ghanaian and Tanzanian manufacturing firms, exhibit a positive effect of former job training on current earnings. By incorporating firm fixed effects, they find ongoing OJT to be negatively correlated with current earnings. Using worker level data in Ghana, Frazer (2006) finds that, during the 90s, the returns to apprenticeship were not statistically different form zero. Monk et al. (2008) find yet some heterogeneity within this country and across education levels. Finally, Johanson and Wanga (2008) report large wage returns to training in the Tanzanian informal sector.

Face to this inconclusive body of empirical results on positive, insignificant or negative effects of OJT on wages, our contribution is first to report evidence of OJT cost sharing using data from a case study of eight exporting firms in Tunisia. A shortcoming of these data is that only few firms are

surveyed. However, this is offset by the joint presence of rare information: details about OJT, detailed description of firm and worker characteristics, matched employer-employee data[2]. These data are currently the only available to investigate the issues of interest in Tunisia, for which little is known. We now turn to these data.

3. The Data

3.1. The survey and the firm sample

We base our econometric investigation on matched worker-firm survey data, for the first time for Tunisia[3]. This is useful for distinguishing specific versus general human capital, which requires simultaneously observing the worker and the firm so as to be able to see if something different happens in different firms.

The data provide rich information on workers, while we can control for firm unobserved heterogeneity by using firm dummy variables. These data were directly collected in the workplace in 1999[4]. Eight firms of the formal sector and with no fewer than 50 employees were selected among exporting firms which are not fully foreign owned. Four firms belong to the textile-clothing sector and four firms to the Mechanics, Metallurgical, Electrical and Electronics Industries (IMMEE). Although the firms were randomly selected in these two sectors, the sample is too small to accurately represent the underlying firm population. Therefore, we present our results as those of a

[2] Recent evidence on wage returns to training using matched employer-employee data in various developing countries, albeit not Tunisia, is reported in Almeida and Lince de Faria (2014, Table A1).
[3] Matched worker-firm data have been collected as part of the World Bank's Regional Program for Enterprise Development (RPED) surveys in Africa. Each of these surveys constitutes a sample of about 200 firms with about 10 interviewed workers in each firm. However, similar data are not yet available for Tunisia.
[4] The methodology of the Tunisian survey appears in Nordman (2002) and Destré and Nordman (2003).

case study. The eight firms are located in the Tunis area and they have on average 130 employees. The occupational structure within each firm, which was obtained from interviewing employers with a specific questionnaire, was used to constitute representative sub-samples of their workers. The surveyed workers were randomly chosen within each occupation strata and at least 10 per cent of the workforce was interviewed in each selected firm.

3.2. The workers

The 231 workers in the final sample were interviewed in February 1999. The employee questionnaire provides precise information about each worker, which is summarized in Table 1: individual characteristics (matrimonial status, number of dependent children, geographic origin, father's education), wages, educational investments (number of years spent in primary, secondary, higher and vocational education), post-school vocational training (apprenticeships, former internships, formal training within the current firm), total experience in the labour market and occupation in the current firm. The sample is balanced across sectors and gender: 54.1 per cent of the selected employees work in the four textile firms and 45.9 per cent in the four IMMEE firms; half of the workers are female.

The average education, which is 9.6 years over the sample, is calculated using information on the highest education level reached. Successful educational years are higher for males (10.6 years) than for females (8.7 years)[5]. Only very few (0.8 per cent) observed workers have never been to school, 9.9 per cent have only primary education, 71.8 per cent have achieved secondary education and 17.3 per cent have reached higher education. 31.6 per cent of employees have a vocational diploma connected to their current job.

[5] When calculated instead from the age at school leave, from which 6 years are deducted, the average number of schooling years nearly amounts to 13. Thus, by eliminating unsuccessful years of education, we obtain an education variable net from repeated classes. For comparison, Angrist and Lavy (1997) estimate the number of repeated classes at two to three years in Morocco. UNDP (1994) report that Tunisia in the 1980's had a higher rate of repeated classes at the primary school than Morocco.

Average tenure in the current firm is 5.9 years. Total actual experience is on average 9.1 years. This experience variable describes the actually stated years of experience, as opposed to just extrapolating experience from age. Thus, it excludes unemployment and other inactivity periods. On average, male workers in the sample have accumulated over 10 years of total experience against less than 8 years for female workers. Previous experience off the current job is on average 3.3 years. Thus, the ratio of mean tenure to mean overall work experience is 64 per cent, a favourable situation that allows proper separation of the human capital accumulated off and on current firm. This also indicates a non-negligible proportion of young, first-time workers, which is confirmed by an average age at 29.5 years.

OJT in the current firm is described by three variables. One dummy variable reports the worker's answer as to whether he/she received formal OJT in his/her current firm (FORMAD, 1 if yes). A second variable shows the number of years spent in formal OJT up to the interview date (FORMAA). The third OJT variable identifies either whether training is still ongoing at the interview date or if it occurred for workers in the firm for less than two years (FORSTIL, 1 if yes).

Although, 18 per cent of the workers have benefited from OJT within the current firm, its occurrence is much higher for males (34.5 per cent versus 1.7 per cent for females). Moreover, the average OJT duration for trainees is small: about 6 month. Among the 42 trainees of the overall sample, 10 are still undergoing or have just finished OJT. Most OJT is concentrated in the IMMEE firms.

Some wage characteristics are worth noting. The average monthly wage by employees corresponds to 213 US dollars[6], while male wages are on average 1.7 times female wages. Beyond differences in human capital endowments between sexes, the large female share of the labour force in textile firms, where wages are generally low, contributes to this wage differential: 94 per cent of the observed female workers belong to the clothing sector, while male workers of this sector represent only 14 per cent of all male workers. The average wage in the IMMEE sector is 1.6 times higher than in the textile sector. Educational and training differences partially explain this gap. On average, the IMMEE workers have 10.6 years of education compared to 8.9 years for textile workers.

The two legal minimum wages (SMIG, *Salaire Minimum Interprofessionnel Garanti*) correspond to 40 hours and 48 hours per week. In 1999, the SMIG of employees working 40 hours per week amounted to 156.7 dinars, while the SMIG for 48 hours per week was 177.8 Dinars. Workers in the textile sector are all rationed to a maximum of 48 hours of work per week, while in the IMMEE sector this boundary only concerns non-executive workers. The workers' current monthly wages in the two sectors are concentrated around values slightly above the minimum wages, while heavy right tails account for a small number of very skilled workers. Instead, while monthly starting wages are also very concentrated, they are often below the current minimum wage. This may be due to the rise in the SMIG since firm entry, as well as to workers actually paid under the SMIG.

4. The Results

4.1. The econometric specification of the wage equations

[6] The average monthly wage corresponds to 1.8 times the monthly SMIG of 1997 for 48 hours per week (177.8 Tunisian Dinars, that is: 125 US dollars in 2001). The declared monthly wages are those of January and February 1999.

As a consequence of the theoretical points about the sharing of the cost of OJT between firms and workers, in the first period, before or during OJT, the actual wage is lower than the alternative wage. In the second period, after OJT, the wage rises at a level intermediate between that of the marginal product of the worker's labour in this firm and in alternative firms. These features translate into wage equations characterised by a negative coefficient of OJT for starting wage equations and for current wage equations when OJT is still ongoing.

By contrast, we expect a positive OJT coefficient in current wage equations, that is, after OJT has been completed and the worker productivity has risen. Consequently, this characterisation in terms of the signs of OJT coefficients in starting and current wages, consistent with naive human capital theories, can be extended to a broader framework, making these signs particularly plausible.

Accordingly, equations for starting wage that include OJT independent variables and current wage are the basis of our investigation. The standard human capital accumulation model, without OJT, yields the usual Mincer log-wage equation. We complement it with OJT and firm dummy variables, while distinguishing tenure and off-firm experience.

On the one hand, for starting wages (w_start_i), the specified equation for a worker i is:

$$\log(w\_start_i) = x_i' b^S + OJT_i\, c^S + D_{j(i)}\, d^S_{j(i)} + u^S_i,$$

where $D_{j(i)}$ is the dummy variable for the firm j where worker i works, OJTi is his/her OJT training, X_i regroups the other controls. The coefficient vectors b^S, c^S and $d^S_{j(i)}$ must be estimated. Variable u^S_i is an error term. As mentioned before, OJT_i can appear in several forms, to account or not for the training duration and the timing of training.

On the other hand, for current wages ($w\_current_i$), the specified equation for a worker i is similar:

$$\log(w\_current_i) = x_i' b^C + OJT_i\, c^C + D_{j(i)}\, d^C_{j(i)} + u^C_i,$$

where again the coefficient vectors b^C, c^C and $d^C_{j(i)}$ must be estimated, and variable u^C_i is an error term. The following signs are expected from our theoretical discussion when training is specific: $c^S < 0$, for wage preceding or during OJT; and $c^C > 0$, once OJT is finished.

Controlling for firm characteristics through firm dummies is important on several grounds. It first accounts for unobserved firm characteristics that may affect wages and thus limits omitted variable bias. Second, it helps us control for the fact that many OJT decisions, and their connections with wages, may be firm specific. In particular, some of the human capital accumulation during OJT may not be portable to other firms, thus being firm-specific.

If we could separate specific and general investment, then we would be able to detect the corresponding effects with different signs or significance of the coefficients of OJT in these equations. However, in the usually available data both kinds of investment are mixed, perhaps in most firms. In this situation, what can be estimated are attenuated effects corresponding to specific human capital investment, since general investment should be associated to insignificant effects.

The fact that one firm has peculiar characteristics should not change anything about the logical bargaining problem between this firm and workers on the labour market. However, its peculiarity may make more plausible the fact that human capital investment in this firm be rather specific. As a consequence, omitting firm characteristics in the above wage equations without including the firm dummies may generate an endogeneity bias because OJT may be correlated with unobserved firm characteristics that could be included in the error terms (say, $v^S_i = D_{j(i)}\, d^S_{j(i)} + u^S_i$ and $v^C_i = D_{j(i)}\, d^C_{j(i)} + u^C_i$, to simplify notations).

In that case, if for example the linear correlation coefficient between $D_{j(i)}$ and OJT_i is positive, and if the residual error u_i is not correlated with the variables in X_i, D_j and OJT_i, and assuming that the

variables in X_i are uncorrelated with OJT, then the limit in probability of the OLS estimator of the coefficient of OJT (c^S or c^C) is the true value of this coefficient plus the limit in probability of the product OJT_iD_i by a constant coefficient. If moreover the firm is specially productive, this latter coefficient should be positive and the effect of OJT is therefore overestimated by omitting firm dummies. Of course, if the X_i are correlated with OJT, the formula of the bias would be different, although it is reasonable to think that in many cases, the presence of these variables should not offset completely the overestimation. On the opposite, if firm dummies are included to account for unobserved firm characteristics, like in our specification, the OLS estimates of the effects of OJT are unbiased and therefore consistent, as long as the model is well specified.

Wages may also be determined by rents from institutions, such as belonging to specific industries, unions, or the presence of different minimal wages. These effects are also controlled using firm dummies.

Additional correlates describing unions, minimal wages and industries are also included, as further controls on the variables could be correlated with OJT. As mentioned before, the technological characteristics of the firms are controlled through firm dummies, and but also using information on the type of job occupied by the workers (team work, production line, and supervisor). The latter is useful as a possible determinant of wage heterogeneity through the differences in quality and productivity of different jobs. It is also important because OJT may affect wages differently depending on the types of jobs. Due to limited degrees of freedom, we cannot run separate regressions or include interacted effects for different job types, but at least we can attempt to control for them with these dummies. Finally, as often, the number of years of education, as well as the other human capital variables, can be suspected of being endogenous. OJT may depend on wages and be endogenous through several mechanisms. Firstly, there may exist a significant wage elasticity

of education and training demand in developed economies (Friedmann, 1986). In that case, wage and OJT-education could be determined simultaneously. Secondly, wages and training may both respond to labour supply factors (as in Hoddinot, 1996, for urban Africa), which would generate another type of simultaneity. Finally, unobserved ability affecting wages and OJT may be correlated through faster learning of the most talented workers. As our attempts at 2SLS estimation with additional instruments did not seem very convincing due to the unlikely validity of the available instruments,[7] we only deal with the endogeneity isssues with the large set of controls included of the model.

Typically, two sources of bias of OLS estimates of education are invoked in log wage equations. The first one is the attenuation bias due to measurement error in the education variable, rather leading to underestimation of the return to education. The second one is the ability bias, typically associated with genetic stock, family background or worker motivation, which is usually believed to correspond to overestimation of the return to education. It is therefore natural to think that similar bias on the OJT coefficient may be present, since OJT is another kind of training variable, with the hope that all the controls introduced suffice to mitigate enough the biases for the analysis.

4.2. Wage equation estimates

The estimates of wage equations are discussed in the following order. We first present basic OLS estimates, which include education and OJT regressors. Then, additional regressors are incorporated to control for characteristics of firms and jobs: firm dummies, job type (production line, denoted by CHAINE; team work, denoted by TEAM; and executive positions, denoted by ENCADR). They help us control for task complexity, ability and screening effects. For all models, the standard errors of the estimated coefficients are corrected (or not) for cluster effects at the firm

[7] The excluded instruments are: PPRIM, PANAL, ENFT, ENFT^2, ENFT*AGE, PROVE, MARI*FEMALE, MARI*MALE, CHOMA, CHOMA^2, EMSIM, APPRENTI, STAGAN, PPRIM*AGE, PANAL*AGE, PPRIM*ENFT, PSECON*ENFT, PSUP*ENFT, PANAL*ENFT, PPRIM*CHOMA, PSECON*CHOMA, PANAL*CHOMA.

level, and using (or not) robust estimators. Little differences in the results emerge by varying these procedures. We do not provide separate estimates for male and female workers so as to preserve degrees of freedom. Besides, introducing dummies for female workers is generally found to be insignificant.

In the estimates, higher impact of OJT on wages may result from worker selection by firms and vice versa. For example, assuming that high ability workers can learn faster from OJT, there may be selection of the more able workers into OJT. It may be that the observed firms, more modern and export-oriented than many Tunisian firms, select or attract workers of higher unobserved productivity or more motivated. Moreover, firms may decide to invest in the human capital only of these employees they seek to retain. Although such or other selectivity effects may take place, it is impossible to control completely for them in these data. We thus have little choice but to assume that selectivity and matching effects are well accounted for by the included controls, including firm dummies, and that residual effects may be overlooked for the purpose of investigating OJT issues in the Tunisian case. However, due to the rigidity and inefficiency of the Tunisian formal labour market (with sluggish administrative procedures, and little public information on jobs and workers), it is plausible that selection effects are less intensive than in industrialized countries.

In Muller and Nordman (2005), wage equations for different wage quartiles were investigated with these data. With such a specific specification and a basic set of correlates, we found preliminary evidence of correlation of OJT with current wages. Similarly, Muller and Nordman (2011) include OJT variables in current wage equations, while focusing on within-firm human capital externalities. However, in these previous studies, the dynamic dimension of the data on wages was not exploited, in particular the possibility of combining the employees' starting and current wages in the analysis. We sequentially report the estimated equations for starting and current wages, and for the specifications shown in Tables 2 to 4.

4.2.1. Starting wages

We first describe the effects of the OJT variables on starting wages. In Table 2, we first report an OLS starting wage equation (column 1), and then sequentially report results with additional regressors: firm dummies (column 2), firm dummies plus alternative or additional OJT regressors (columns 3 and 4), the same previous regressors plus individual heterogeneity controls (column 5), and finally the same previous regressors adding interacted terms for a specific firm (column 6).

The coefficient of the number of years of OJT in the current firm is significant and negative in all OLS specifications of starting wage equations. Yet, this effect vanishes for the inefficient, negative, and perhaps biased 2SLS estimates (not shown), as in much of the literature results, where the OJT effect in starting wages is modest or indiscernible. Moreover, the coefficient of the dummy for OJT in the current firm is not significant at the 5 per cent level, perhaps because of high correlation of the dummy with the number of OJT years. Then, the number of OJT years captures some of the information about OJT occurrence, which may contribute to the effect described by the negative coefficient. Despite the latter caveat, the results are consistent with OJT cost sharing between firm and worker, at least at the firm entry where most former OJT takes place.

In order to test for a possible agreement at the firm entry between firm and worker about some future training, which may be accounted for while bargaining for the starting wage, we include ongoing OJT in the regressors (column 4). However, since the coefficient of ongoing OJT is never significant, it may be that cost sharing does not take place at the firm entry in the case of training spells occurring a few years later, although it is hard to conclude since standard errors are high. It is plausible that these training spells are not anticipated at the firm entry.

For the firm dummies (FDM) OLS model of column 5, we introduce three dummies to control for heterogeneity related to task complexity, as in Barron et al. (1998): for executive or supervisor

(ENCADR), for working in production line (CHAINE), and for working in a team (EQUIPE). In our data, these variables have no significant effects in the starting wage equation, except for ENCADR which slightly reduces starting wages, perhaps offsetting future promotion opportunities. However, their inclusion refines downwards the estimated negative impact of OJT on starting wages, and reinforces the cost sharing hypothesis. This result is expected if individual heterogeneity biases lead to underestimate the negative impact of OJT on the starting wage (as discussed in Parent, 1999).

The effect of off-firm experience is highly significant and positive in all estimated models, exhibiting an expected concave profile. At the sample mean, the marginal return to off-firm experience amounts to 6.9 per cent in the FDM OLS model of column 5, but this rate of return is relatively stable along the estimated models (1) to (5).

We now briefly describe the impact of the other determinants of starting wages. The estimated effect of the education years is generally not significant, whatever the specification and estimation method. The fact that education years do not determine much the starting wages suggests that something distinct from pure productivity assessment may be taking place when employers set wages at the firm entry. Similarly, the human capital accumulation in Koranic school is not converted into higher wages in these firms. By contrast, former internship years have a strong positive effect on entry wages, hinting at the importance of specific human capital in these industries.

Finally, the estimates of the firm dummies' coefficients are large and sometimes strongly significant, except for: (a) the second firm that shares similar characteristics with the reference firm 6, and (b) in Column (6) for which too few degrees of freedom are available. This result is in accordance with the usual persistence of wage differentials across individuals with identical productive characteristics in empirical studies. However, we are here dealing with wage at the firm entry instead of current wages

in most studies. In these data, workers with comparable measured characteristics earn different starting wages partly because they enter different firms. There is no significant effect of firm dummies interacted with OJT or education, including for the most technology-intensive firm, which is firm 6 (column 6). This feature rather favours the basic human capital theory interpretation of the negative OJT coefficient rather than more sophisticated risk-sharing theories for specific OJT.

4.2.2. Current wages

We now turn to the current wage equations (Table 3). We proceed in the same way as for the previous equations, i.e. we add sequentially further controls and alternative OJT regressors. As an additional control of endogeneity problems in current wage equations, we also provide OLS estimates where the tenure variable is excluded (column 7). Indeed, first, tenure may be endogenous and hard to instrument, and second, it is not considered in the standard Mincer model.

The estimates show a positive impact of former OJT in the current firm, as work productivity may have grown over time as a consequence of the training, and a negative impact of ongoing OJT, as firms and workers may share the cost of ongoing training. Although the coefficients of the OJT years in the current firm are not significant (columns 1 and 2), the dummy for former OJT has always a positive and significant coefficient. Therefore, only OJT incidence affects wage differentials, as opposed to OJT duration. A similar result has been obtained by Veum (1995) using US data, who interprets it as originated from measurement error in duration, a characteristic hard to recall with accuracy.

Moreover, the coefficient of the dummy for ongoing OJT is negatively significant at the 10 per cent level for all specifications. These results, jointly with the results in the starting wage equations,

support both OJT raising worker productivity and the presence of contemporary cost sharing between firm and worker.[8]

Years of former internship have significant and positive effects at the 5 per cent level in all OLS regressions. Job tenure and its square are newly introduced variables, as compared to the starting wage equations. Recall that if general and specific human capitals were identical, the marginal returns to experience and tenure would be the same. As a matter of fact, the estimated marginal returns of tenure appear to be lower than those of off-firm experience. However, the results of Wald tests fail to reject the hypothesis of equality of the marginal returns to tenure and experience in current wage equations, and this, whatever the used estimation technique. These results support our intuition that, for our sample, acquired human capital over time may be mostly general and therefore transferable across firms.

The highly statistically significant marginal return to tenure (at the sample mean) is insensitive to the inclusion of OJT variables. This finding does not support its introduction in wage equations which is partly motivated by the capture of the effects of OJT (Mincer and Jovanovic, 1981). Such approach may be too coarse to properly account for OJT characteristics. For example, tenure may be mostly related to informal training as opposed to formal OJT. Furthermore, our personal observations of these firms suggest us that informal learning processes are widespread. Workers informally learn on-the-job through their own experience and by watching others performing tasks. For example, in garment firms, experience often enhances productivity through trial-and-error spells applied to clothing scraps.

[8] Interacting OJT with education years produces mixed results (not shown). On the one hand, former OJT crossed by education years is never significant whether in starting or current wages equations. On the other hand, current OJT crossed by education years is not significant in the starting wage equation, while it has a positive significant effect in the current wage equation, indicating that OJT may be more efficient for better educated workers. Yet, in order to preserve on degrees of freedom with our small sample, we choose not to introduce the interacted effects of OJT and education.

4.2.3. Comparing starting and current wage equations

A few words of discussion are of order to clarify the non-correspondance of significant OJT variables in starting and current wage equations. In particular, the insignificance of the effect the number of years of OJT in current wage equations is to be contrasted with its strong significance in the starting wage equations. This may be explained by the imperfect and ambiguous nature of the information collected in the OJT years variable. According to the theory, this variable may play tow distinct roles. On the one hand, in the current wage equations, it is a proxy for productivity gains in the worker's activities. Then, it should be considered as a particularly noisy variable for capturing the exact extent unobservable characteristics. This large amount of measurement error may explain what it does not appear significantly in current wage equations. On the contrary, the presence of *some* OJT is likely to be often a robust requirement for wage progression, and is easier to pin down. On the other hand, in the starting wage equations, the OJT years variables accounts for possible sharing of OJT costs. It looks reasonable to assume that these costs are rather well perceived by the firm and the worker, and proportional to OJT years. This is consistent with the strong significance of its coefficient in starting wage equations, and such cost is badly proxied by merely using the dummy for OJT.

We compute the marginal returns to the main human capital variables obtained from the estimates from starting and current wage equations displayed in columns (5) of Tables 2 and 3. As typically found in the literature on returns to schooling in Africa[9], private returns are higher at secondary and post-secondary levels, which implies that they are increasing with the number of education years. This may be due to the fact that those who enrolled at higher levels are more likely to come from the most educated families, and as a result may benefit from intra-family education externalities. There may also be a shortage of high skills, relative to firm and state labour demands, on the Tunisian

[9] Schultz (2004), Kahyarara and Teal (2008), Kuépié et al. (2009).

labour market. Using data from National Population-Employment Surveys in Tunisia in 1980 and 1999, Zouari-Bouattar et al. (2004) also find education returns increasing with education levels in simple Mincer-type equations.[10]

The marginal returns to education and experience considerably drop when moving from starting wage (respectively 0.0828 and 0.0693) to current wage equations (respectively 0.0599 and 0.0401), at the sample mean, even if those returns are more significant for current wages. This may be attributed to several factors. First, returns may have been higher in the past when the Tunisian manpower was generally less skilled. Second, the impact of education and experience on starting wages includes a short-run 'selection premium' in the sense that the ablest workers could be hired more easily and simultaneously get higher earnings than less experienced or less educated workers. Once incorporated in the firm, the additional premium to more able workers may be lower, since they would have to pay a fixed cost to leave it. This would contribute to increasing the apparent relative returns to human capital at the entry.

Let us make the plausible assumption that, for most trained workers, OJT dummies correspond to about one year duration or less.[11] Then, we find that the current wage premium for former OJT, 0.232, is significantly higher at the 5 per cent level than the marginal returns to education and experience. OJT content may be more valuable to the firm than mere experience or schooling. Moreover, OJT sessions may be much more intensive than spending time routinely learning at work or at school. Another reason why post-training OJT returns appear as high may be the occurrence of promotions for which OJT is required.

Focusing on FDM OLS estimates, we find that the possible compensation suffered by the workers for the OJT at the entry is substantial, about three times the marginal return to education. For current

[10] Their estimated mean education return is 9.5 per cent in 1980 and 5.9 per cent in 1999.
[11] Recall that the mean duration for trained worker is six months.

wages, the coefficients of the OJT dummies are also considerable: minus 3.7 times the marginal return to education for ongoing OJT, and plus 3.9 times for former OJT. Clearly, omitting OJT would miss an important part of the relation between wages and human capital accumulation for these workers. Finally, we briefly discuss the observable determinants of OJY in the next subsection.

4.3. OJT determination

The role of OJT in work organisation is now analysed through a Probit model of OJT determination (either former or ongoing). In this model, we introduce (1) the available variables describing the worker characteristics such as age and human capital characteristics, and (2) family, period and environment characteristics. Firm characteristics are incorporated through a Textile industry dummy, and through firm dummies. In particular, strongly significant firm dummy coefficients in the OJT Probit estimates should be a hint that there is something firm-specific about OJT in these firms.

The estimates are reported in Columns 1 and 2 of Table 4. The specification is similar to that in Lynch (1992) and Veum (1995). Krueger and Rouse (1998) estimate similar Probit models for two given firms separately, although they also include log hourly wage, which we exclude to avoid endogeneity issues. Using all firm dummies is not possible with our data because some dummies correspond to too many perfect predictions of OJT occurrence. In particular, OJT has not been observed for the interviewed workers within firms 2, 4, and 5, which is accounted for in Column (3) for which observations for these firms have been excluded.

In our estimates, a worker participation in OJT has four significant determinants at 10 per cent level: technology (i.e. industrial sector), education (hinting at capacity to follow the training since

schooling improves ability to learn, as found in Rosenzweig, 1995), family situation (through the number of children) and gender. On the other hand, being married, age and geographical origin are all insignificant at the 10 per cent level. We also checked that working in a team or as a supervisor does not significantly change the probability of OJT, which justifies why we excluded these variables to save on degrees of freedom. Unlike results found by Lynch or Veum, and as those of Krueger and Rouse, former work experience and tenure with the current employer do not significantly increase the likelihood of receiving OJT in these data. Even the coefficient of previous training experiences was insignificant when included.

Firms could react to the imposition of a legal minimum wage by reducing non-pecuniary job attributes like OJT, as argued in Hashimoto (1982). We did not find this effect since the coefficient of the dummy for proximity to the SMIG is insignificant in the OJT Probit estimates. Between 1989 and 1997, the movements of bottom wages were contained as real minimum wages for agriculture and industry remained almost constant. Note that a previous period of unemployment seems to be a disadvantage for being selected for OJT (Columns 2 and 3).

There is little OJT in the textile sector, in which usual tasks may not require much skills. This explains the significantly negative coefficient of the corresponding dummy variable. As a matter of fact, employees working in production line, a common feature of Textile industry, have never been selected for OJT in this sample. In that sense, there is a clear sector-specificity component in OJT occurrence. However, this does not imply that within each sector, there is firm-specificity of OJT.

Moreover, we find that more education significantly raises the probability of formal OJT, although only slightly, with a marginal effect of 0.009 in the regression without period dummies (respectively 0.003 with period dummies). That general education matters only to some extent for OJT participation, as also found by Lynch, is confirmed by the fact that having attended a Koranic

school, former internship, apprenticeship or vocational degree (ETUTPA) have no significant effect on OJT probability.

Finally, having many children is positively correlated with high OJT probability. Here, the marginal effect is stronger at 0.025. An extended family may make the worker more likely to seek OJT - and sometimes an accompanying prospect of future promotion - in order to provide for large family needs. Meanwhile, female workers are less likely to be involved in OJT. This situation may be associated with an indirect mechanism of gender discrimination, contributing to the gender wage gap.

Once the three firms without OJT are omitted, a sector dummy can be included. One could think that there remains little scope for firm effects in this estimation. This is not so, as shows the strongly and significantly negative coefficient of Firm 8 dummy. Some firm-specificity of OJT may be at the origin of this. On the whole, as in other papers of the literature, only limited explanation of OJT can be reached by using typical variables in labour force surveys. This may be because the firm training decisions depend on many other factors than the typically observed worker characteristics.

5. Conclusion

Using matched employer-employee data from Tunisia, we have investigated the interaction of OJT investment and wages. Using a case study of firm-employee data in the area of Tunis, we find that the duration of former OJT negatively influences starting wages, while there is no anticipated effect of delayed future training on wages at the firm entry. Besides, current wages are positively affected by former OJT, but negatively affected by ongoing OJT.

These results support the hypothesis that there may be both productivity gains and cost sharing along with OJT. Our estimation results are consistent with popular human capital theories and broader OJT cost sharing theories. Although these results call for confirmation from other data from Tunisia, our case study encourages further investigation. In particular, understanding better the determinants of OJT could be a fertile avenue of research.

Our estimation results may suggest policy implications, although caution should be taken not to extrapolate results for a few firms to the whole Tunisian manufacturing sector or more broadly. Technical change and intensifying competition resulting from trade liberalization imply more advanced skills and higher productivity from workers. From a social point of view, such skill upgrade is also important for improving the incomes of vulnerable groups and the youth in Tunisia, who are increasingly politically active as during recent unrest accompanying and following President Ben Ali's fall.

The private sector may contribute to enhancing the labour force skills through OJT programmes, all the more so that much of the human capital accumulated through OJT seems to be portable between firms. However, our estimates show that firms are bearing much of the cost of OJT. This situation is sustainable only if this cost does not jeopardize their profitability.

Subsidies to stimulate within-firm OJT programmes (Cammett, 2007) may be useful if they lead firms to substantially raise their training initiatives. Fostering OJT in that way would benefit to young workers by preserving their remunerations at the firm entry, thereby contributing to the country's political stability.

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APPENDIX

Table 1. Workers' characteristics

Variables	Mean	Standard deviation	min	max
Age of individuals (AGE)	29.532	7.774	15	52
Sex (FEMALE, 1: woman; 0 man; conversely for MALE)	0.498		0	1
Geographical origin (PROVE, 1: rural area; 0 otherwise)	0.147		0	1
Matrimonial situation (MARI, 1: if married; 0 if divorced, widowed or single)	0.368		0	1
Single male (CELIBAH, 1: yes; 0 otherwise)	0.303		0	1
Number of dependent children (ENFT)	0.580	1.060	0	5
Father has a level of Primary school (PPRIM, 1: yes; 0 otherwise)	0.173		0	1
Father has a level of Secondary school (PSECON, 1: yes; 0 otherwise)	0.164		0	1
Father has a level of Higher education (PSUP, 1: yes; 0 otherwise)	0.125		0	1
Father is illiterate (PANAL, 1: yes; 0 otherwise)	0.194		0	1
Years of schooling (EDUCATION)	9.676	3.880	0	18
Individual went to Koranic school only (KORAN, 1: yes; 0 otherwise)	0.177		0	1
Previous apprenticeship in a firm (APPRENTI, 1: yes; 0 otherwise)	0.363		0	1
Periods of internship related to the current job (STAGA, in years)	1.468	3.617	0.00	24.0
Periods of internship not related to the current job (STAGAN, in years)	0.121	0.759	0.00	6.00
Unemployment spells (CHOMA, in years)	1.385	2.825	0.00	18.0
Previous relevant experience (EMSIM, 1: yes; 0 otherwise)	0.554		0	1
Previous professional experience (EXPE*, in years)	3.261	4.689	0	22
Start date in the current firm (ENTREE)	1992.1	5.901	1968	1997
Tenure in the current firm (TENURE, in years)	5.898	5.902	0.17	30.08
Former formal training received in the current firm (FORMAD, 1: yes; 0 otherwise)	0.182		0	1
Former formal training period in the current firm in years (FORMAA)	0.091	0.323	0	3
Ongoing or recent formal training in the current firm (FORSTIL, 1: yes; 0 otherwise)	0.043		0	1
Member of an union (SYNDIC, 1: yes; 0 otherwise)	0.203		0	1
Work in team (EQUIPE, 1: yes; 0 otherwise)	0.367		0	1
Work in production line (CHAINE, 1: yes; 0 otherwise)	0.320		0	1
Executive or supervisor (ENCADR, 1: yes; 0 otherwise)	0.190		0	1
Current hourly wage (in dinars)	1.893	1.347	0.29	7.57
Starting hourly wage (in dinars)	1.138	1.019	0.04	6.73
Log of current hourly wage (LNSALH)	0.197	0.251	-0.54	0.88
Log of starting hourly wage (LNSALEH)	-0.213	0.863	-3.209	1.906
Current monthly wage (in dinars)	315.13	231.38	52	1350
Starting monthly wage (in dinars)	190.19	172.07	6	1000
Proximity to the minimum wage (SMIG, 1: if 150<=SAL<=190; 0 otherwise)	0.17	0.37	0	1
Firm dummies **				
FIRM 1 (IMMEE sector)	0.134		0	1
FIRM 2 (IMMEE sector)	0.160		0	1
FIRM 3 (Textile sector)	0.143		0	1
FIRM 4 (Textile sector)	0.130		0	1
FIRM 5 (Textile sector)	0.130		0	1
FIRM 6 (IMMEE sector)	0.087		0	1
FIRM 7 (IMMEE sector)	0.078		0	1
FIRM 8 (Textile sector)	0.139		0	1

*: This experience variable is an actual measure, as opposed to a potential one based on age. It excludes experience in the current job (TENURE) and possible unemployment and inactivity periods.
**: The means of the firm dummies describe the sample distribution of the workers across firms and sectors.

Table 2. Starting Wages

Dependent variable: Log hourly starting wage (LNSALEH)

	(1) OLS	(2) FDM OLS	(3) FDM OLS	(4) FDM OLS	(5) FDM OLS	(6) FDM OLS
Individual socio-economic characteristics						
Years of education (EDUC)	-0.0479	0.0164	0.0172	0.0202	0.0118	0.0280
	(0.0438)	(0.0423)	(0.0417)	(0.0417)	(0.0419)	(0.0436)
Years of education squared ($EDUC^2$)	0.0065***	0.0032	0.0032	0.0030	0.0037*	0.0027
	(0.0022)	(0.0022)	(0.0021)	(0.0021)	(0.0021)	(0.0023)
Years of former internships (STAGAA)	0.4088***	0.3811***	0.3672***	0.3662***	0.3545***	0.3256***
	(0.1276)	(0.1237)	(0.1225)	(0.1224)	(0.1230)	(0.1245)
Off-the-job actual experience (EXPE)	0.1051***	0.0973***	0.0957***	0.0954***	0.0993***	0.0902***
	(0.0231)	(0.0224)	(0.0222)	(0.0222)	(0.0222)	(0.0230)
(Off-the-job actual experience)^2	-0.0050***	-0.0047***	-0.0045***	-0.0046***	-0.0046***	-0.0040***
	(0.0011)	(0.0011)	(0.0011)	(0.0011)	(0.0011)	(0.0011)
Dummy for female (FEMALE)	-0.3468***	-0.1595	-0.1844*	-0.1741	-0.1252	-0.1285
	(0.0839)	(0.1105)	(0.1090)	(0.1091)	(0.1210)	(0.1242)
Age when entering firm (AGENTR)	0.0476***	0.0425***	0.0416***	0.0414***	0.0408***	0.0442***
	(0.0093)	(0.0090)	(0.0089)	(0.0089)	(0.0089)	(0.0092)
Dummy for Koranic school (KORAN)	-0.0979	-0.1606*	-0.1220	-0.1247	-0.1344	-0.1538
	(0.0931)	(0.0907)	(0.0918)	(0.0917)	(0.0931)	(0.0942)
Dummy for trade union membership (SYNDIC)	-0.2608***	-0.2180**	-0.2154**	-0.1974**	-0.2074**	-0.2092**
	(0.0999)	(0.0970)	(0.0961)	(0.0970)	(0.0980)	(0.0989)
On-the-job training (OJT) variables						
Dummy for former formal OJT in the current firm (FORMAD)	-0.0316	0.0394				
	(0.1002)	(0.1189)				
Years of former formal OJT in the current firm (FORMAA)			-0.2345*	-0.2368**	-0.2426**	-0.2496**
			(0.1195)	(0.1194)	(0.1203)	(0.1217)
Dummy for ongoing OJT in the current firm (FORSTIL)				0.2120	0.2184	0.2592
				(0.1671)	(0.1674)	(0.2479)
Individual heterogeneity controls						
Dummy for executive or supervisor at the time of the survey (ENCADR)					-0.1644*	-0.1862*
					(0.0927)	(0.0951)
Dummy for work in production line at the time of the survey (CHAINE)					-0.1247	-0.1366
					(0.1159)	(0.1175)
Dummy for work team at the time of the survey (EQUIPE)					0.0422	0.0219
					(0.0842)	(0.0853)

Firm dummies and interactions						
EDUC*FIRM 6						0.2567
						(0.5162)
EDUC2*FIRM 6						-0.0057
						(0.0197)
FORMAA*FIRM 6						-0.3197
						(1.3833)
FORSTIL*FIRM 6						0.0891
						(0.3939)
FIRM 1		-0.5328***	-0.4559***	-0.4178**	-0.3577**	2.1899
		(0.1662)	(0.1686)	(0.1710)	(0.1786)	(3.3375)
FIRM 2		-0.1328	-0.2096	-0.1533	-0.1096	2.4146
		(0.1710)	(0.1560)	(0.1620)	(0.1733)	(3.3284)
FIRM 3		-0.3022*	-0.3576**	-0.3051*	-0.2149	2.3200
		(0.1777)	(0.1684)	(0.1732)	(0.1783)	(3.3406)
FIRM 4		-0.5587***	-0.6058***	-0.5534***	-0.4429**	2.0718
		(0.1851)	(0.1755)	(0.1801)	(0.1876)	(3.3374)
FIRM 5		-0.3211*	-0.3692**	-0.3137*	-0.2246	2.2997
		(0.1787)	(0.1677)	(0.1731)	(0.1785)	(3.3378)
FIRM 7		-0.3387*	-0.3779**	-0.3332*	-0.3055*	2.2223
		(0.1735)	(0.1677)	(0.1711)	(0.1748)	(3.3338)
FIRM 8		-0.7986***	-0.8461***	-0.8014***	-0.7347***	1.8011
		(0.1726)	(0.1617)	(0.1652)	(0.1699)	(3.3417)
Constant	-1.5632***	-1.4043***	-1.3200***	-1.3892***	-1.4024***	-4.0277
	(0.2810)	(0.2968)	(0.2826)	(0.2874)	(0.3117)	(3.3387)
Observations	231	231	231	231	231	231
R-squared	0.67	0.73	0.73	0.73	0.74	0.74
Pseudo Squared						

Standard errors are in parentheses. ***, ** and * mean respectively significant at the 1%, 5% and 10% levels.

Variables are defined in Table 1.

Table 3. Current Wages

Dependent variable: Log hourly current wage (LNSALH)

	(1) OLS	(2) FDM OLS	(3) FDM OLS	(4) FDM OLS	(5) FDM OLS	(6) FDM OLS	(7) FDM OLS
Individual socio-economic characteristics							
Years of education (EDUC)	-0.0880***	-0.0487*	-0.0413	-0.0416*	-0.0371	-0.0309	-0.0183
	(0.0268)	(0.0254)	(0.0251)	(0.0250)	(0.0247)	(0.0254)	(0.0271)
Years of education squared $(EDUC)^2$	0.0088***	0.0064***	0.0059***	0.0059***	0.0050***	0.0047***	0.0035**
	(0.0013)	(0.0013)	(0.0013)	(0.0012)	(0.0012)	(0.0013)	(0.0014)
Years of former internships (STAGAA)	0.2271***	0.1656**	0.1759**	0.1788**	0.2011***	0.1800**	0.1967**
	(0.0777)	(0.0748)	(0.0737)	(0.0733)	(0.0722)	(0.0730)	(0.0797)
Off-the-job actual experience (EXPE)	0.0415***	0.0502***	0.0512***	0.0519***	0.0493***	0.0475***	0.0421***
	(0.0118)	(0.0115)	(0.0113)	(0.0113)	(0.0111)	(0.0113)	(0.0122)
(Off-the-job actual experience)^2 $(EXPE)^2$	-0.0007	-0.0012*	-0.0012*	-0.0012*	-0.0014**	-0.0012*	-0.0013*
	(0.0007)	(0.0006)	(0.0006)	(0.0006)	(0.0006)	(0.0006)	(0.0007)
Tenure in the firm (TENURE)	0.0489***	0.0590***	0.0597***	0.0571***	0.0523***	0.0515***	
	(0.0101)	(0.0097)	(0.0095)	(0.0096)	(0.0095)	(0.0096)	
$TENURE^2$	-0.0008*	-0.0012***	-0.0012***	-0.0011**	-0.0012***	-0.0012***	
	(0.0005)	(0.0004)	(0.0004)	(0.0004)	(0.0004)	(0.0004)	
Dummy for female (FEMALE)	-0.2885***	-0.1990***	-0.1788***	-0.1805***	-0.1766**	-0.1846**	-0.1259
	(0.0508)	(0.0665)	(0.0658)	(0.0655)	(0.0715)	(0.0727)	(0.0786)
Dummy for Koranic school (KORAN)	-0.0482	-0.0619	-0.0631	-0.0626	-0.0339	-0.0415	-0.0296
	(0.0580)	(0.0553)	(0.0534)	(0.0531)	(0.0528)	(0.0531)	(0.0584)
Dummy for trade union membership (SYNDIC)	-0.0972	-0.0907	-0.0887	-0.0994	-0.0763	-0.0847	0.0434
	(0.0647)	(0.0612)	(0.0602)	(0.0602)	(0.0607)	(0.0609)	(0.0634)
On-the-job training (OJT) variables							
Years of former formal OJT in the current firm (FORMAA)	0.0982	0.0371					
	(0.0696)	(0.0727)					
Dummy for former formal OJT in the current firm (FORMAD)			0.1861***	0.2323***	0.2321***	0.2021**	0.2393***

			(0.0707)	(0.0750)	(0.0736)	(0.0838)	(0.0813)
Dummy for ongoing OJT in the current firm (FORSTIL)				-0.1919*	-0.2240**	-0.2584*	-0.3590***
				(0.1079)	(0.1061)	(0.1557)	(0.1153)
Individual heterogeneity controls							
Dummy for executive or supervisor at the time of the survey (ENCADR)					0.1917***	0.1750***	0.3530***
					(0.0617)	(0.0631)	(0.0599)
Dummy for work in production line at the time of the survey (CHAINE)					-0.0533	-0.0615	-0.0697
					(0.0678)	(0.0686)	(0.0747)
Dummy for work team at the time of the survey (EQUIPE)					-0.0738	-0.0859*	-0.0894*
					(0.0490)	(0.0493)	(0.0540)
EDUC*FIRM 6						0.2971	
						(0.3049)	
$EDUC^2$* FIRM 6						-0.0092	
						(0.0117)	
FORMAD* FIRM 6						0.1227	
						(0.1843)	
FORSTIL* FIRM 6						0.1251	
						(0.2189)	
FIRM 1		-0.4423***	-0.4535***	-0.4837***	-0.5414***	1.9208	-0.3982***
		(0.1077)	(0.1037)	(0.1045)	(0.1058)	(1.9656)	(0.1137)
FIRM 2		-0.4611***	-0.3566***	-0.3787***	-0.4805***	1.9485	-0.5386***
		(0.0949)	(0.1016)	(0.1018)	(0.1064)	(1.9598)	(0.1170)
FIRM 3		-0.5901***	-0.5082***	-0.5342***	-0.6280***	1.8120	-0.7222***
		(0.1025)	(0.1057)	(0.1062)	(0.1087)	(1.9665)	(0.1184)
FIRM 4		-0.5578***	-0.4762***	-0.4966***	-0.5824***	1.8526	-0.5700***
		(0.1079)	(0.1108)	(0.1108)	(0.1136)	(1.9650)	(0.1239)
FIRM 5		-0.5940***	-0.5067***	-0.5299***	-0.6071***	1.8273	-0.6075***
		(0.1029)	(0.1068)	(0.1070)	(0.1085)	(1.9648)	(0.1192)
FIRM 7		-0.5906***	-0.5332***	-0.5518***	-0.5868***	1.8568	-0.4979***
		(0.1039)	(0.1046)	(0.1046)	(0.1044)	(1.9631)	(0.1143)
FIRM 8		-0.5911***	-0.5060***	-0.5199***	-0.6047***	1.8374	-0.6021***
		(0.0992)	(0.1030)	(0.1028)	(0.1035)	(1.9666)	(0.1138)
Constant	0.1390	0.4410***	0.3101**	0.3451**	0.5123***	-1.9295	0.6710***

	(0.1343)	(0.1396)	(0.1465)	(0.1471)	(0.1629)	(1.9579)	(0.1784)
Observations	231	231	231	231	231	231	231
R-squared	0.73	0.78	0.79	0.79	0.80	0.81	0.76
Pseudo Squared							

Standard errors are in parentheses. ***, ** and * mean respectively significant at the 1%, 5% and 10% levels.

Variables are defined in Table 1.

Table 4. Probit Models of OJT

	(1)	(2)	(3)
	Pr(OJT) Marginal Effects	**Pr(OJT) Marginal Effects**	**Pr(OJT) Marginal Effects**
SEX	-0.0502*	-0.0221*	-0.1775**
	(1.78)	(1.80)	(1.96)
AGE	-0.0051	-0.0012	-0.0224
	(0.68)	(0.37)	(0.74)
AGE^2	0.0001	0.0000	0.0006
	(0.52)	(0.41)	(1.19)
MARI	-0.0184	-0.0050	0.0341
	(0.83)	(0.54)	(0.39)
ENFT	0.0263**	0.0103**	0.0639
	(2.18)	(2.02)	(1.44)
SMIG	-0.0201	-0.0032	0.0340
	(0.76)	(0.25)	(0.19)
PROVE	-0.0101	-0.0000	-0.0094
	(0.57)	(0.00)	(0.13)
CORAN	0.0497	0.0260	0.1092
	(1.56)	(1.62)	(0.89)
EDUCATION	0.0092**	0.0034**	0.0105
	(2.19)	(2.01)	(0.69)
APPRENTI	0.0087	0.0032	0.0218
	(0.40)	(0.34)	(0.23)
ETUTPA	0.0041	0.0055	0.0307
	(0.26)	(0.77)	(0.55)
STAGA	0.0074	-0.0026	-0.0408
	(0.38)	(0.32)	(0.64)
CHOMA	-0.0162	-0.0092*	-0.1015*
	(1.54)	(1.78)	(1.95)
TENURE	0.0019	0.0009	-0.0472
	(0.41)	(0.23)	(1.28)
$TENURE^2$	-0.0000	-0.0001	0.0001
	(0.26)	(0.98)	(0.15)
EXPE	-0.0003	-0.0008	-0.0234
	(0.07)	(0.46)	(1.38)
Textile Sector	-0.0858***	-0.0404***	

	(2.97)	(2.88)	
PERIOD 2		-0.0438**	-0.1037
		(2.20)	(0.84)
PERIOD 3		-0.0207	-0.4519
		(0.56)	(1.10)
FIRM 1			0.2096
			(1.51)
FIRM 3			-0.0988
			(1.36)
FIRM 7			-0.0743
			(1.31)
FIRM 8			-0.1390**
			(2.31)
FIRM 2			
FIRM 4			
FIRM 5			
Observations	231	231	134
Log-likelihood	-61.75	-55.10	-37.29
Pseudo R2	0.44	0.50	0.55

Absolute value of robust z statistics are in parentheses. Column (3) excludes firms 2, 4 and 5. ***, ** and * mean respectively significant at the 1%, 5% and 10% levels.