Temporary Help Agencies and Workers' Occupational Mobility*

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Abstract

This paper focuses on the occupational mobility of temporary help agency workers by studying their job–to–job upgrading chances as opposed to those who have not been hired through these intermediaries. A screening approach to the role of those labor 'brokers' suggests that agency workers may expect greater chances of upgrading from one occupation to another. Results obtained with a sample of Spanish workers show that working through those intermediaries comparatively offers stronger prospects of occupational upgrading for workers of a medium qualification level. This basic result is reinforced when the existence of self–selection into this type of intermediated work is appropriately taken into account.

Keywords: Temporary help agencies, Screening, Self-selection, Switching models.

JEL Classification: J24, J62, C34

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1. Introduction

Temporary help agencies (THAs for short[1]) are companies that hire temporary workers and send them out to do temporary work on the premises of, and under the supervision of, client firms solicited from the business world. Their key feature is that workers remain on the THA's payroll while working for the client firm: i.e., workers engaged by THAs and placed at the disposal of client firms become a part of the triangular relationship between the worker, the THA and the firm in which the work is performed. This constitutes the main difference with respect to other variants on the use of temporary help like employee "leasing" firms —which have no role in worker recruitment or screening and basically take on the payroll of the existing workforce from (mainly) small firms in order to write the paycheck, pay the taxes, prepare and implement personnel policies and other paperwork— or private employment agencies —which do not directly contract workers and rather limit their operation to only facilitating employment relationships between client workers and firms for a fee charged to either the employer or the employee.

In Spain THAs were allowed to operate for the first time under regulation provided for by the 1994 labor market reform. Prior to this date, THAs had developed in Spain in fairly anarchical conditions, free of the constraints of a well–defined legal framework (for details, *vid.* Rodriguez–Piñero, 1992 and 1994).

During the last five years, the use of THA workers by employers has increased tremendously. As can be seen in Table 1, in Spain the proportion of temporary contracts managed by THAs over the total of temporary contracts registered in the Spanish Public Employment Office (*Instituto Nacional de Empleo, INEM*) has

[1] Other frequent names in the literature in order to address to these private intermediaries (especially in the U.S.) are temporary staff agencies, temporary work businesses, temporary services employment agencies or temporary services supply firms.

almost multiplied by three between 1995 and 1999. Nowadays, almost 16 percent of all temporary contracts are being managed by THAs. Among these contracts, the majority are based on unskilled jobs (59 per cent in 1998). However, the main clients of these firms are not in general badly educated workers: in 1998, the proportion of contracts in THAs for individuals in possession of secondary or higher education was 76 per cent in contrast to a proportion of only 64.7 per cent in the total number of registered contracts[2] . Hence, as the THA labor force becomes more numerous and diverse, it is important to explore which economic implications this form of labor contracting may have for workers.

This objective is also important because the opponents to temporary help agencies have been increasingly vociferous against the pernicious social reality that those intermediaries are supposedly hiding.[3] There is an implicit assumption in much of the literature on motivations for employers' reliance on THA–intermediated work that this form of labor contracting serves primarily to buffer firms' core regular employees from changing demand conditions and as a means of cutting per–hour labor costs. Although these demand factors are obviously relevant for discussing the importance in determining the growth of this form of temporary employment, this approach neglects an important complementary point of view: THAs develop a task of screening in order to match the individuals with the most appropriate level of skills to the jobs in question. It is to this

[2] Similarly, for the U.S. labor market, Segal (1996) finds that personnel supply services workers are more educated, on average, than other hourly workers.

[3] Literature explaining THA work is scant and in general biased towards rejecting this form of labor contracting. Common criticisms are that (1) THA workers only receive brief assignments interspersed with relatively long periods of unemployment (Bronstein, 1991); (2) that not only THA workers are paid less than core workers for working at similar types of jobs, but also that their chance of obtaining employee benefits are less than that for traditional core workers (Emerson, 1988; Moberly, 1987); (3) that such a situation may create uncertainty and greater economic risk for these workers (Blank, 1998); and (4) that extensive reliance on THA workers may create two classes of employees: permanent workers with relatively secure, high–paying employment and THA workers (along with temporary workers in general) who have only sporadic, low–paying work (Mangum *et al.*, 1985).

issue that the present analysis is addressed. Our goal is to assess empirically the importance of this THA screening role as revealed by how it may be affecting workers' occupational mobility rates. It should be clear at the outset that we are not asserting that those demand–driven factors are unimportant in influencing the growth of this form of labor contracting. Rather, we maintain that the THA screening role is also relevant, judging by its effect on the dynamics of workers' occupational mobility. That is, we focus on an important indicator of economic performance: the attainment of economic gain as people advance through their careers. Our main hypothesis, then, is that workers engaged through those intermediaries will have improved chances of increasing their labor earnings over time.

The analysis is tackled for the Spanish labor market with a data source recently provided and constituted by the Social Security records. We have information for a ten–year period on the complete employment histories of two groups of workers: the first one is constituted by workers employed sometime by a THA; the second one is composed by no–THA workers, and is taken as a control group. There are two features of this empirical analysis that are worth emphasizing. First, we provide a new data source for studying intermediation in the labor market in Spain by making use of the Spanish Social Security records. So far, the lack of studies on labor market intermediation is largely due to the absence of accurate data bases on employment histories for workers; our database contains a better employment history than any other longitudinal survey of comparable length. Second, we focus on the major output of temporary help agencies, the employment history of their workers, in order to understand the implications of this type of labor contracting.

Our dataset allows us to estimate the extent to which individual's progress over time is achieved by THA workers in comparison to no–THA workers. Mobility in this study is defined as the change in workers' occupational group as established

by the contribution category associated to its wage level. An econometric model of occupational mobility is presented where the possible existence of self–selection into THA–intermediated work is also taken into account by jointly estimating two processes: one for the change in the worker's occupational group and another one for the previous selection of whether or not to be working through a THA. Thus, we will use a *switching model* to test our hypothesis.

Main findings are that —with the only exception of highly qualified workers— THA work allows workers to maintain constant their occupational trajectory more often once the THA employment spell has finished. Moreover, the probability of occupational upgrading is higher for THA workers with a medium qualification level, and that of occupational demotion much lower for those THA workers. In addition, it is important to underline that self–selection does, indeed, matter: without adjusting for self–selection bias —as regards THA versus no–THA work— it is found that no–THA work is associated with similar (or even greater, in some cases) expected upgrading chances than THA work, controlling for measurable personal characteristics. However, accounting for self–selection, the chances of occupational upgrading given THA work is substantially improved over that given no–THA work.

We organize the paper as follows. First, we show the main theoretical predictions upon which the empirical research is presented. Second, we describe the data and the econometric model used in our analysis. Third, we present the empirical results. The last section concludes.

2. Theoretical background

2.1. Screening

When hiring, one of the most important information concerns for firms is the "quality" of prospective employees. If individuals differ in their capabilities ac-

cording to the jobs they perform, and if substitution of labor is imperfect between jobs, then firms' output will be larger if workers can be identified and assigned to their most productive use.

THAs constitute one of the screening devices available to firms for identification of these qualities. The tests implemented by those intermediaries to screen job applicants —which often include written applications, interviews, physical exams, cognitive/dexterity checks and reference checks— may well be used by firms as predictors of job productivity. It is precisely the imperfect information about the quality of prospective employees which is giving a stimulus for THA market screening[4] . Indeed, several recent studies confirm the notion for the U.S. that THAs generate employees with high productivity; for instance, data on the use and perceived effectiveness (by employers) of THAs indicate that a majority of users believed that temporary employees are as efficient as or more efficient than regular employees[5] . Users especially appreciate the fact that THAs assume responsibility for staff selection, an often complex task which is all the more burdensome when short–term recruitment is involved (Bronstein, 1991). In this same vein, Houseman (1997) found that one–fifth of client firms in the U.S. addressed to THAs as a source for future recruitment[6] . And, in some sectors, THAs represent the primary way to auditing and hiring new workers (See, Autor, 2000). This qualitative evidence therefore suggests that employers who use THAs seem to regard workers hired through those intermediaries as being more "reliable" than direct applications from prospective employees.

Does the fact of being hired by a THA affect opportunity for advancement and

[4] Naturally, if productivity could be directly measured prior to employment, there would be no need for such screening.

[5] American Management Association (1991), "Temporary Help Survey Results", *Professional Management Bulletin*, January.

[6] The use of fixed–term labor contracts in general has also been presented as a source of candidates for permanent jobs. For instance, Abraham (1988), found that 23 percent of firms that used "flexible" forms of employment intended to identify adequate candidates for permanent jobs

future wages? Suppose that two otherwise identical individuals end up working in the same job of the same firm, but one of them placed by a THA and the other not. Will their career paths differ as a result of the different hiring procedures they have gone through?[7] In particular, can we expect individuals to achieve occupational upgrading more likely out of THA jobs than others?

To answer these questions, consider an economy in which neither individuals —who differ in the comparative skills with which they can perform different jobs— nor the market knows workers' abilities, and where, in addition, firms act competitively and no intermediation by THAs were possible. Will the actual employer —who is able to know worker's ability after the first employment period— promote this employee to a better–payed job in the following period of work?

Naturally, the decision (or assignment rule) will consist of promoting the worker if the benefit obtained by promotion is higher than otherwise (i.e., it will be the result of her profit maximizing behavior). Interestingly, Waldman (1984) found that for some ability levels, workers will not be assigned to jobs that best fit their ability: in particular, since the information about the worker's ability can be kept secret by her employer, and promotion constitutes a signal of high ability, it would pay the actual employer to inefficiently underpromote some of their employees (otherwise, the employer would have to pay a too high wage to the promoted workers, since competition for workers would lead the employer to pay their expected productivity given the assignment). This underpromotion result is undesirable because the barriers to better jobs that it creates would lead those workers to be trapped in jobs either which they dislike or for which they are relatively unsuited.

It is in this asymmetrically informed labor market where THAs' screening devices may be playing an important role. To see this, consider now the existence

[7] The term 'path' refers to the ability to increase one's labor earnings over time.

of a THA which runs tests of ability before the first job assignment in order to filter out low–ability workers. Then, being a THA worker becomes a publicly available part of the individual's employment history: it identifies her with a superior group in the pool of workers. That is, the ability certification by the THA reveals worker's quality and results in separation from top down. It can be shown that this THA certification of unobserved worker ability in a labor market under asymmetric information results in equilibrium characterized by higher promotion rates for THA workers[8] . Therefore, the previous missasignment of workers to tasks proved by Waldman (1984) can be therefore confined. The intuition behind this result is that THA intermediation helps to attenuate information asymmetry among employers in the economy: THA certification makes public information on worker's ability and if the actual employer intended to underpromote some of the workers (exploiting, again, the private information on workers' true ability level), then the THA would have incentives to reassign the temporary worker to another firm, since other firms would bid for worker's service.

2.2. Self–selection

To confirm the predictions arising from these screening considerations, we have to take into account a problem present in the data: the fact of observing a given individual working through a THA is not exogenous to the characteristics which determine whether the worker is promoted or not. That is, our attempt to compare expected promotion chances of THA and no–THA workers suffers from a self–selection problem.

Several explanations may be offered to justify the presence of self–selection. However, the most straightful may be to think on the determinants of addressing to those intermediaries: we may expect that individuals will search employment

[8] Muñoz–Bullón and Rodes (2001) formalize this idea in a job–assignment signalling model which builds on the inefficiency first pointed out by Waldman (1984).

through a THA only if THA-work offers a particularly high net "return" (as regards expected upgrading chances after leaving the THA) relative to no-THA work. That is, it is natural to assume that individuals decide whether or not to address to a THA to find a job depending on their expected upgrading chances arising from this decision relative to the cost of addressing to a THA[9] . Therefore, according to this view, neither individuals with ability levels high enough to find a better job without an intermediary THA, nor low–ability workers who will likely fail to pass the THA screening tests will address to those agencies. Hence, it may be considered that only those with "average" ability levels will address THAs[10] .

In addition, it may be the case that workers decide to address THAs only after direct methods to find a job have proved fruitless. Then, the group of THA workers will be disproportionately composed by the "losers", i.e., workers who inherently have more difficulty finding direct jobs by themselves. It would then be precisely those workers who cannot get a job via direct methods who are effectively "sorted" into the class of THA users[11] . Again, and as explained above, the unobservable characteristics which are making them address THAs could also be affecting their relative chances of promotion. Therefore, controlling for the observable worker characteristics when explaining upgrading chances will be insufficient, as some additional process may be influencing those upgrading

[9] There exists evidence indicating that THA workers may be earning less than no–THA workers for the same position in the same firm; therefore, addressing to a THA to find a job may imply an opportunity cost for the workers. For instance, Blank (1998) found that the median THA worker receives 63 percent of the wage received by full–time workers.

[10] In the job assignment signalling model previously cited, it is proved the existence of a perfect Bayesian equilibrium with THA certification of workers' ability characterized by: (1) a pool of workers which opt for certification, this pool consisting of all workers of average ability; (2) and the remaining ones (low and high ability workers) who prefer to remain uncertified (*vid.* Muñoz–Bullón and Rodes, 2001). Thus, being a THA worker identifies the individual with the "average" group of workers in the candidate's pool.

[11] Indeed, as pointed out in the introduction, even though THA workers are not in general badly educated workers, at the same time most of them are actually on unskilled jobs. This fact indicates that —as opposed to no–THA individuals— those addressing to THAs may be having unobservable variables which make them accept jobs requiring lower qualification levels that it may be expected according to their skills.

chances, namely, the process determining whether or not an individual has worked through a THA. Then, once we have controlled for this sorting effect by taking into account the self–selection problem present in the data, we will be better able to analyze the extent to which the prediction of the screening considerations stated above are confirmed.

3. Data and variables

The data used are two representative random samples of workers from the Social Security Records — *Fichero de Vida Laboral*— provided by the Spanish Ministry of Labor. They contain the work history from 1990 until 1999 of 15,503 affiliated individuals, some of them working for a THA in some moment.[12] The original database's total number of records is 301.277. Each record corresponds to the affiliation of an individual to a particular Social Security account and, therefore, represents a spell of employment in a particular firm (i.e., a matching).

The data provided includes information about age and gender of the workers, professional category of the worker's contribution to the Social Security[13] , dates when the employment spell starts and ends, type of Social Security system for the worker, the reason for the termination of the spell (voluntary quit, dismissal or retirement), the Spanish province where the employment spell took place, an identifier indicating whether or not each employment spell is accomplished through

[12] In fact the sample criterium was to select people who were working for a THA at the 31st of December of 1995 and, as a control group, workers who were non-employed at the same date. It must be underlined that this control group is not composed by long-term unemployed individuals, who were, from the beginning, left out of the sample. That is, these non–employed individuals also have several employment spells along the observed time period, both before and after the end of 1995.

[13] It must be underlined that the professional categories of the worker's contribution to the Social Security in the database do not collect the workers' level of qualification, but the required level of qualification for the job. For instance, an individual working in the lowest category, "*peón*", may well be in possession of an academic degree. In any case, we will refer to contribution categories from here onwards as "qualification", although this remark should be remembered for the subsequent analysis.

a THA and, finally, the type of contract the worker is holding (temporary or permanent).

We eliminate incomplete records and keep only workers affiliated to the General System (*Régimen General*) in order to avoid the bias in the estimations that special systems like Agriculture, Fisheries, and so on would provoke. In order to achieve greater homogeneity, we also eliminate records destroyed for reasons other than dismissals. In addition, we keep out of the samples all those employment records were individuals are holding permanent contracts, since our focus is on the effect of THA work for individuals who are assigned to temporary assignments in client firms compared to other temporary workers (but not with those holding permanent contracts). Moreover, given that in order to identify our switching model (see next section) we use a variable indicating the proportion of THA contracts over the total of labor contracts, and that no data for this variable were disposable before 1995, we restrict our samples to those employment spells beginning from the year 1995 onwards. Finally, in order to avoid capturing changes that are solely attributable to good or bad years, we also control for the economic cycle through the annually growth rate of the gross domestic product, and for the geographical zone influence through both the province unemployment rate and a dummy for the region where the employment takes place[14] . The Appendix offers a complete description of the variables used in the estimation process.

As other studies using data from the Social Security records have done[15] , we group contribution categories in the following four groups: Qualification High collects the highest level in between the contribution categories, that is, 1 *(ingenieros* and *licenciados),* 2 *(ingenieros técnicos, peritos* and *ayudantes titulados)* and 3 *(jefes administrativos* and *de taller).* Qualification Medium–High collects contribution categories 4 *(ayudantes no titulados),* 5 *(oficiales administrativos)*

[14] Six zones are defined: Cataluña, Madrid, South, East, Center and North.
[15] See, for instance, García–Fontes and Hopenhayn (1996), or García–Pérez (1997).

and 6 (*subalternos).* Qualification Medium–Low collects contribution categories 7 (*auxiliares administrativos)* and 8 (*oficiales de primera* and *segunda*). Finally, Qualification Low collects contribution categories 9 (*oficiales de tercera* and *especialistas) and* 10 (*peones*). We also tried other different groupings of contribution categories, and results obtained are maintained, although they are stronger with the four–class classification actually reported above; this is why we decided to keep this classification along the paper. In addition, wage differences for this classification are significant; according to a complementary data set, the median 1984 wage for those four groups in constant 1985 pesetas are: 160,824 for the Qualification High, 110,772 for the Medium–High, 81,460 for the Medium–Low and 74,763 for the Low group. Hence, the average differences for those four groups are quite important: 7.51% between the Low and Medium–Low, 37.38% between the Medium–Low and Medium–High, and 47.51% between the Medium–High and High[16] .

Sample characteristics for each category group are presented in Tables 2, and Table 3 collects empirical contribution category transitions across successive employment spells of each individual. In the highest skill category, THA workers are predominantly men, 53.10%, and are more likely to be under 30 years–old than no–THA individuals; from Table 3 we also obtain that THA workers in these categories are substantially more likely to reduce their skill level from the actual job to the following one when compared to no–THA high qualified individuals (only 51.03% of THA workers keep constant their qualification when changing jobs, as opposed to 75.08% of no–THA workers). Medium–High qualified THA workers are more likely to be women, 62.68%, as opposed to no–THA workers, only 46.41%. Again, THA individuals are much more likely to be under 30 years–old. And, as can be observed in Table 3, THA workers from this qualification

[16] We would like to thank Samuel Bentolila and Olympia Bover for providing these information.

group are more likely to increase their occupational category across employment spells. Medium–Low THA workers are basically women, 62.29%, and as in the other previous groups, in this group many more THA workers than no–THA ones are under 30 years–old. Table 3 shows that THA workers in these categories are more likely to maintain constant and even increase their occupational category than no-THA workers. Finally, both THA and no–THA low–qualified workers are essentially men and younger workers (under 30). Finally, Table 3 shows that THA low qualified individuals are less likely to achieve occupational upgrading than equally qualified no–THA workers.

4. Econometric modelling

By analyzing upward and downward changes across jobs in the individuals' Social Security contribution category, we may capture the expected positive impact of THA–intermediated work on individuals' wage prospects. Each of the professional contribution categories in the database has, as an associated element, a certain range of *base de cotización* or 'contribution base'. This constitutes the base for the payroll tax. The higher the contribution category, the higher the individual qualification level required for the job and, correspondingly, the higher the contribution base associated with the job. This is confirmed above when we provide data on median wages for each of the category groups considered.

As the theory predicts (see Section 2 above) given that the THAs make public individual information by signalling that she has an ability level above a minimum required for becoming a THA worker, individuals who are employed through these intermediaries are expected to experiment higher chances of mobility towards a higher–level occupation after a non–employment spell. Therefore, we focus on the extent to which —given an occupation of origin— THA–intermediated work increases the likelihood of occupational upgrading. We consider this probabil-

ity of occupational upgrading as a proxy for the wage growth associated with occupational mobility.

The extent to which the occupation can be improved is also likely to be affected by the duration of the non–employment spell in between both jobs. Two effects may be at work here. On the one hand, those who —while unemployed— face more rapid skill depreciation, might be more likely to accept a job requiring a qualification level below the ones of previously–held jobs. On the other hand, staying more time unemployed may allow the worker to increase her ability to look for better jobs, so that the likelihood of better matches could be increasing with the duration of the unemployment spell. Another important variable which has to be considered is the duration of the actual employment spell. As tenure in the current job increases, the accumulation of human capital can be larger and, therefore, the probability of occupational upgrading should be larger. Finally, we also control whether or not the employer in the two jobs is the same or not. We would expect that, after a non–employment spell, working in the same firm will have a positive impact on the probability of occupational upgrading. Two factors may be at work here: first, after a first employment spell in the firm, the employer can screen out low–valued matches, so that the quality of the worker is better assessed; second, working with the same firm provides specific skills that affect productivity only as long as workers remain in the same firm.

We model contribution category transitions by an ordered categorical dependent variable which orders from 0 to 3 the possible changes in contribution category, where 0 represents the worst outcome —maximum possible reduction in qualification— and 3 the best outcome —maximum possible increase in qualification. We have used an ordered dependent variable because not only is the likelihood of occupational upgrading relevant, but also the "vertical" distance between occupations. For instance, wage growth actually differs if an individual

actually working through a THA as "*auxiliar administrativo*" expects to be assigned in the following mission to work as "*subalterno*" —which is the immediate upper category— than if she expects to work as "*oficial administrativo*" —i.e., two categories up from the actual one. We then use this categorical and ordered variable as the dependent variable in an *ordered probit model* describing the vertical distance between contribution categories in two successive occupations of the same individual[17] .

However, we cannot consider the effect of working for a THA as only that of another explanatory variable in the *ordered probit model*. As explained in Section 2.2. above, a problem that we must take into account is the possibility of individual self–selection: the data on labor histories that we have are generated by individuals making choices of addressing or not to a THA to look for a job. Controlling for the observable characteristics when explaining contribution category changes is insufficient, as some additional process may be influencing those category changes, namely, the process determining whether or not an individual works through a THA. As a consequence, the observed distribution of category changes is determined by this choice, so that standard regression techniques would lead to inconsistent estimates of the parameters. Therefore, it is necessary to test whether selection into THA–intermediated work matters[18] .

In order to analyze this issue, we propose a *switching model* which describes the choice of THA work along with contribution category transitions under the assumption that the assignment of individuals to the two groups is by self–selection

[17] We also estimated two different probit models, one for the increases in contribution categories, and another for reductions in qualifications in two successive occupations of the same individual, and results obtained do not significantly differ from the ones presented with the use of our ordered probit model in the paper.

[18] To be more precise, not only matters the decision of the worker of whether or not to address to a THA to find a job. In addition, the THA decision of whether or not to hire the worker is present, given that we observe the worker in a THA spell only if she has actually been hired by the THA. The database has no available information on individuals who addressed to THAs but who were not finally hired by them.

rather than by random assignment[19] . To implement this model we use two equations: a *selection equation* and a *category equation.*

The *selection equation* is given by:

$$z^* = \beta_s' x_s + u_s \tag{4.1}$$

where z^* is the latent value of addressing to and being hired by a THA for each worker. We observe a THA employment spell if $z^* > 0$, and we observe a no–THA employment spell otherwise. Vector x_s collects worker characteristics, and u_s captures unobserved individual specific heterogeneity influencing both the decision of addressing to a THA and the one by the THA of hiring the worker.

The *category equations*, one for each possible selection choice are given by:

$$y_k^* = \beta_{ck}' x_{ck} + u_k, \ k = 0, 1 \tag{4.2}$$

where 1 denotes THA and 0 denotes no–THA. That is, conditional on the individual's choice of THA versus no–THA work, she may later achieve or not occupational upgrading (i.e., wage growth associated with occupational mobility). Her initial THA versus no–THA choice enters endogenously into the category equations by estimating each equation conditional on the THA decision of the worker. It is this category equation which is estimated by an ordered probit model with four possible outcomes.

If x_s does not contain at least one element that is excluded from the category equations, the model is not well identified.[20] Therefore, satisfactory identification requires data on factors that affect the value of addressing to a THA but do not directly affect contribution category transitions. We have selected one

[19] This model is used normally to consider the effect of an endogenous regressor over our variable of interest. Other papers applying this methodology to different aspects in the field of labor studies are, for example, Pezzin and Schone (1999), Carrasco (1998) or Prescott and Wilton (1992).

[20] However, given the non-linearity of the model, it can also be just functionally identified.

variable from labor statistics that, given worker's characteristics, we consider to be unrelated to contribution category changes but is still related to the switching behavior. This variable is the proportion of THA assignment contracts in each province and year over the total of temporary contracts registered by the Spanish Ministry of Labor. Whether a worker addresses or not to a THA may well be correlated with the relative importance of THA contracts in the province where she lives (so that as this number is higher, more workers are likely to consider those intermediaries as potential employers). Therefore, in the analyses below, we include this variable as another determinant of the *selection equation*, but we exclude it from the *category equations*.

Since in the *selection equation* the observed dependent variable z assumes two values, one if $z^* > 0$ and zero otherwise, we can describe it by means of a *probit model*.

Hence, the *switching model* can be rewritten as:

$$\begin{aligned} \text{THA} \quad &: y^* = \quad y_1^* \text{ if } z^* > 0 \\ \text{No–THA} \quad &: y^* = \quad y_0^* \text{ if } z^* \leq 0 \\ (u_1, u_0, u_S) \quad &\sim \quad N(0, \Sigma) \end{aligned}$$

where z^*, y_1^* and y_0^* are given by equations (4.1) and (4.2), and Σ is the covariance matrix of the error terms. As usual in switching models, we are able to estimate the correlation coefficient between u_S and u_1 and that between u_S and u_0.

5. Empirical results

The estimations of the switching model for each qualification group are presented in Tables 4-7. The "full" model in each of those tables accounts for self–selection, while the "constrained" model imposes exogeneity of THA–intermediated work

in the contribution category equation and, therefore, constrains the correlation coefficient between the selection and contribution category equations (ρ_{sc}) to be equal to zero.

Some results for the four groups of individuals can be commented from the estimated *selection equations*. *Age* has an important negative impact on the probability of working for a THA for any qualification group. Except for the Low and High qualification groups, women are more likely to be THA workers than men. As expected, workers in those Spanish provinces that present larger yearly proportions of THA contracts are much more likely to work for THAs. And (when significant) workers are less likely to address to THAs the larger the growth rate of the gross domestic product —which indicates that the THA business cycle dependence can be considered as countercyclical. The provincial unemployment rate has a significant positive impact for the Medium–Low group (i.e., in provinces with higher unemployment, the likelihood of addressing a THA is larger), while it is significantly negative for the Medium–High and Low groups. Finally, some differences can also be observed depending on which exact contribution category inside each of the four groups the individual has: for example, individuals with contribution category 3 (*jefes administrativos and de taller*) are more likely to address a THA in the highest qualification group.

Contribution *category equations* for each group reflect the impact of individual variables on the likelihood of occupational upgrading from the actual job to the following one. Estimated coefficients vary in the full and constrained models due to the existence of endogeneity in the THA indicator.

Except for Low–qualified THA workers, *Age* has a positive impact on the likelihood of occupational upgrading (and at a decreasing rate for Medium–Low and Low groups). In general, therefore, older workers are more likely to upgrade their contribution category which —according to the fact that different categories

correspond to different wage levels— can be associated with steeper wage improvements.

We have also included as an explanatory variable the duration of the non–employment spell in between the two jobs considered for each individual. Its estimated effect is not significant for the highly qualified group, negative for the Medium-High group, and positive both for Medium-Low qualified workers and for THA Low qualified workers.[21]

With respect to the duration of the actual employment spell (i.e., tenure), the results are not very clear cut. When significant, the effect is positive for THA workers, while for no–THA individuals its effect is negative for the Medium–High category. Thus, the theoretical prediction of higher upgrading probabilities as the job lengthens is only verified for THA workers. However, we have to take into account that our sample of estimation is exclusively composed of temporary jobs; Table 2 shows the mean duration of those employment spells; as can be seen there, only THA High–qualified workers present average durations beyond 200 days.

By last, those workers with two subsequent occupations within the same firm, present higher probabilities of occupational upgrading in all qualification categories but for the lowest one, where the effect is negative. This result indicates that workers in this group —where the qualification level cannot even be lower— achieve occupational upgrading by changing employers: given that the actual employer already knows workers' skills and that this type of jobs requires almost no qualification, workers must address different firms in order to work in jobs requiring higher category levels.

Given that differences in the estimated parameters among the full and constrained models vary from one qualification group to another and that the esti-

[21] In these two latter categories the effect of this variable has been modelled through a quadratic polynomial along with a dummy variable, *dur30,* indicating whether (value 1) or not (value 0) the non–employment spell of the individual is shorter or equal to 30 days. This is the way of estimating the effect of non-employment duration that offered the best results.

mated coefficients do not show a sharp contrast between those two models, in order to aid interpretation, we have calculated predicted probabilities of occupational upgrading for THA and no–THA workers in Tables 8a and 8b. These tables show the unconditional probabilities for each skill category both for THA and no-THA workers; Table 8a reports those probabilities taking into account the self–selection problem, while Table 8b does not. Important differences attributed to the problem of self–selection exist between the predictions of the full and the constrained model[22] . We find that not accounting for self–selection understates the differences between THA and no-THA workers. When self-selection is correctly taken into account, the probability of occupational demotion for THA workers in the two Medium qualification groups is much lower when compared to the no–THA ones. Moreover, the probability of increasing the professional category is 6.7% higher for THA workers in the Medium-High category in the exogenous model (2.24% versus 2.10%) whereas this difference is almost 46% once we control for self-selection (2.13% versus 1.46%). The effect of self-selection is even stronger for the Medium-Low category: while the exogenous model predicts higher upgrading probabilities for no-THA workers, the prediction is reversed once we control by self-selection. Hence, we can conclude that, in general, the correction for self-selection in this dataset is resulting in higher differences between THA and no–THA workers.

Hence, according to Table 8a, THA workers can clearly expect "better" results in the sense of attaining larger wage increases from one occupation to the subsequent one for the Medium–High and Medium–Low groups. Moreover, having worked for a THA is appealing for those two medium–qualified groups in the sense of avoiding a reduction in the contribution category from the THA employment spell to the following one. Furthermore, our results are consistent with the hy-

[22]It must be underlined that for no group do the full model estimations show at the same time non–significance of the correlation coefficients between the selection and category equations (a test of the hypothesis that there is no selection bias is a test of whether the correlation coefficient ρ_{sc} is equal to zero, as this parameter captures the dependence between u_s and u_c).

pothesis of the theoretical section. The principal effect of having worked through a THA is to enhance one's expectations of occupational upgrading. Moreover, after controlling for self-selection, the effect for medium-qualified groups is stronger; this confirms that those workers addressing THAs present unobservable variables which make them "do worse" along their career path[23] .

Going one step forward, we can work out what the predicted conditional probabilities are, in order to study contrafactual probabilities. That is, we desire to compare the probability of occupational upgrading of a THA worker conditional on having been engaged by a THA and its contrafactual: i.e., what value this probability would have acquired if the worker had not been hired by any THA. Table 9 shows those estimated probabilities. In the first panel (Table 9a) the upgrading probabilities conditional on having been hired by a THA are presented; in the second panel (Table 9b) the ones conditional on not having been contracted by a THA are shown.

We can then compare the upgrading and demotion probabilities of those hired by THAs with their contrafactuals. For instance, for the case of high–skilled workers (second and first columns, respectively, in Table 9a), we obtain that the demotion probability would have been almost zero in case they had not been hired by a THA (0.01 as opposed to the actual 51.74). A result in the same direction is achieved in the subsample of no–THA workers (see Table 9b): their demotion probability would have been higher in case they had been engaged by a THA (46.03 as opposed to the actual 16.69). Therefore, this analysis indicates that THAs do not constitute a proper mechanism in order for those workers to avoid

[23] We have carried out a test of robustness of this result by estimating a different model where unobserved heterogeneity of these workers can be better treated. We have estimated a *conditional logit* model for the probability of upgrading and for that of occupational demotion, making use of the various observations we have for each of the workers in the sample. These results, not shown, basically tell us that, after controlling for unobserved heterogeneity, the probability of occupational upgrading is, for all category groups, 17.08% higher for THA workers. Moreover, the predicted probability of occupational demotion is 25.06% lower for THA workers.

occupational demotions.

As with the previously–obtained unconditional probabilities, the results for Medium-High and Medium-Low skilled workers are improved when being engaged by THAs. Those individuals present higher (lower) upgrading (demotion) probabilities than in case they had not been THA workers —compare columns 3 and 4 (5 and 6) for Medium–High (Medium–Low) skilled workers in Table 9a. Therefore, for those two groups of workers, THAs are fulfilling a role of career development via higher upgrading probabilities. As regards no–THA individuals in those two medium–qualification groups (Table 9b), results do not significantly differ for Medium–High ones, while Medium–Low individuals would have improved their expectations of wage growth had they become THA workers.

Finally, the impact of THA–intermediation in the labor market as regards the career potential of the lowest qualified workers can be derived from columns 7 and 8 in Tables 9a and 9b: the contrafactual for those THA workers (Table 9a) is slightly "worse" in terms of upgrading chances; that is, had not they addressed a THA, their promotion probabilities would have been lower. However, on the contrary, this result is not reinforced in Table 9b for the subgroup of no–THA workers: those individuals would have suffered reduced expectations of category improvements had they addressed THAs to find a job. Therefore, in spite of the fact that THA and no–THA workers in this category group present different expectations, they are being "correctly" assigned to the "best" subsample in terms of upgrading chances: for those working through a THA, the intermediary seems to work well and for those who have not addressed to a THA, their results in terms of occupational upgrading would have been much worse had they worked through a THA.

6. Conclusion

This paper has examined one of the patterns of occupational mobility related to THA work in Spain. In particular, our emphasis has been on the extent to which THA–intermediated work allows individuals to achieve occupational upgrading.

Our empirical testing of the dynamics of workers' contribution categories is tackled taking into account the possible existence of self–selection into THA–intermediated work. That is, we develop a *switching model* which allows us to describe the choice of THA work along with contribution category transitions under the assumption that the assignment of individuals to THA and no–THA work is by self–selection rather than by random assignment. This represents the first attempt to estimate the determinants of the choice of THA over no–THA work.

We obtain the main result that all skill categories of THA workers but the highest one are, indeed, substantially more likely to avoid occupational demotion. In addition, THA individuals in every category group —except for the lowest one— present larger chances of occupational upgrading from one job to the following. This lack of career potential as regards the highest and lowest qualified workers might be attributed to the model construction: this group of workers cannot respectively upgrade (downgrade) their contribution category.

Our results may help to promote a recognition of the social value of Temporary Help Agencies. Even though the present paper says nothing on the satisfaction displayed by workers who are in this type of employment arrangement, on the amount of wages or fringe benefits they may be receiving or on the actual level of provision of social protections for those THA workers, we offer one reason why THA work may be recognized as a valid form of employment in its own right in spite of being certainly distinct from the standard employment relationship. In particular, we have found that THA work can not be completely relegated to

a second–class status in which temporary workers are doomed to occupational stagnation: at least, for some groups of workers in our study we have found no support to the idea that THA work is a form of underemployment because THA workers may be suffering from few advancement opportunities or little chances to use their skills at the workplace.

Appendix: Explanatory variables

The explanatory variables used in this study are the following ones:

- *Gender*: 1 for men and 0 for women
- *Age*: age of the individual at the beginning of the employment spell
- *dur(unemployment)*: length (in days, divided by 100) of the unemployment spell following the actual employment spell.
- *dur(employment)*: length (in days, divided by 100) of the actual employment spell.
- *Equal employer*: 1 if the employer for the following employment spell is the same as the one of the actual employment spell; 0 otherwise.
- *% THA contracts*: percent proportion of the number of THA assignment contracts registered in each province and year corresponding to the beginning year of the employment spell.
- *Gross domestic product (GDP) growth rate:* for the selection (category) equations, this variable collects the yearly growth rate of the GDP for the beginning (ending) quarter of the employment spell.
- *Unemployment provincial rate*: for the selection (category) equations, this variable collects the unemployment rate for the province and the first quarter of the beginning (ending) year of the employment spell.

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Table 1
Temporary contracts managed by THAs in Spain

Year	**Temporary Contracts (1)**	**Temporary Contracts managed by THAs (2)**	**Proportion [(2)/(1)]*100**
1995	5,519,350	361,633	6.55%
1996	8,273,175	748,601	9.05%
1997	9,386,084	1,260,524	13.43%
1998	10,692,315	1,707,842	15.97%
1999	12,017,063	1,892,284	15.75%

Source: Spanish Ministry of Labor

Table 2
Main sample characteristics for estimation of the magnitude of the change in contribution category

	Qual. High		**Qual.Med-High**		**Qual.Med-Low**		**Qual. Low**	
	THA	No THA	THA	No THA	THA	No THA	THA	No THA
Total	145	931	1,037	1,881	6,613	6,552	10,481	9,305
Unempl. Dur.	27.76	41.03	40.55	37.20	38.03	35.21	36.93	34.35
Employ. Dur.	220.37	83.05	116.18	88.96	87.83	94.72	79.30	101.36
Equal Employer	19.31	29.75	35.29	21.79	38.76	19.17	34.64	16.64
Male	53.10	37.49	37.32	53.59	37.71	62.21	66.57	62.44
Contr.cat=1	34.49	42.33	—	—	—	—	—	—
Contr.cat=2	35.86	41.67	—	—	—	—	—	—
Contr.cat=3	29.65	16.00	—	—	—	—	—	—
Contr.cat=4	—	—	9.64	9.73	—	—	—	—
Contr.cat=5	—	—	44.45	41.04	—	—	—	—
Contr.cat=6	—	—	45.91	49.23	—	—	—	—
Contr.cat=7	—	—	—	—	65.34	33.21	—	—
Contr.cat=8	—	—	—	—	34.66	66.79	—	—
Contr.cat=9	—	—	—	—	—	—	20.23	33.89
Contr.cat=10	—	—	—	—	—	—	79.77	66.11
Age 16-25	18.62	9.67	43.29	27.01	42.32	24.01	49.88	32.49
Age 25-30	34.48	15.36	25.26	25.68	23.03	17.81	20.25	18.57
Age 30-40	37.93	72.71	25.45	43.86	24.06	51.69	22.29	43.93
Age>40	8.96	2.25	5.98	3.46	10.58	6.49	7.57	4.99

Notes: All variables are proportions with respect to the first row except *Employ. Dur.* and *Unempl. Dur.* which represent the mean duration, in days, of the actual employment spell studied and of the intermediate spell of non–employment between this and the following employment spell.

Table 3
Contribution category transitions across employment records

	In a THA	Not in a THA
Qualification High		
= Qual.	51.03	75.08
∇ Qual. = 1	18.62	4.94
∇ Qual. = 2	14.48	9.24
∇ Qual. = 3	15.86	10.74
Qualification Medium-High		
Δ Qual. = 1	3.47	3.03
= Qual.	46.67	41.57
∇ Qual. = 1	24.78	22.59
∇ Qual. = 2	25.07	32.80
Qualification Medium-Low		
Δ Qual. = 2	1.24	1.04
Δ Qual. = 1	6.43	5.83
= Qual.	72.24	67.03
∇ Qual. = 1	20.10	26.10
Qualification Low		
Δ Qual. = 3	0.58	1.06
Δ Qual. = 2	3.56	5.29
Δ Qual. = 1	14.45	20.12
= Qual.	81.40	73.53

Note: Transition rates are computed according to the distribution of contribution categories at employment record $t + 1$, conditional on the category at record t.

Table 4a

Estimation results for qualification High: Selection Equation

(unsigned t–ratios in parentheses)

	Full Model	**Constrained Model**
Constant	7.307 (4.86)	7.616 (4.74)
Gender	0.348 (3.10)	0.307 (2.71)
Age	-0.500 (5.48)	-0.524 (5.40)
Age^2	0.007 (5.02)	0.007 (4.97)
Contr. categ = 2	-0.099 (0.68)	-0.075 (0.54)
Contr. categ = 3	0.240 (1.57)	0.263 (1.75)
% THA Contracts	2.413 (0.90)	3.068 (1.13)
$(\%\ \text{THA Contracts})^2$	-21.18 (2.11)	-21.50 (2.10)
GDP growth rate	-0.063 (0.68)	-0.086 (0.88)
Unemp. provincial rate	0.009 (0.79)	0.011 (0.94)

Note: Reference category is: Female, contr. categ.=1.

Table 4b

Estimation results for qualification High: Category Equations

(unsigned t–ratios in parentheses)

	Full Model	**Constrained Model**
THA workers		
Constant	1.465 (1.31)	1.391 (1.31)
Gender	-0.728 (2.77)	-0.705 (3.05)
Age	0.040 (1.52)	0.037 (1.97)
Contr. categ = 2	0.496 (1.70)	0.493 (1.69)
Contr. categ = 3	0.313 (0.95)	0.327 (1.03)
dur(unemployment)	0.028 (0.10)	0.031 (0.11)
dur(employment)	0.364 (2.78)	0.365 (2.80)
dur(employment)^2	-0.023 (1.37)	-0.024 (1.36)
Equal employer	0.064 (0.19)	0.067 (0.20)
GDP growth rate	-0.084 (0.46)	-0.089 (0.50)
Unemp. provincial rate	-0.068 (1.97)	-0.066 (2.00)
Threshold $c_{ett,1}$	0.610 (4.13)	0.612 (4.11)
Threshold $c_{ett,2}$	1.206 (6.91)	1.209 (6.94)
ρ_{sc}	-0.074 (0.15)	—
Non–THA workers		
Constant	1.699 (3.80)	1.421 (2.91)
Gender	0.102 (0.87)	0.066 (0.52)
Age	-0.005 (0.59)	0.007 (0.82)
Contr. categ = 2	-0.244 (2.05)	-0.249 (2.00)
Contr. categ = 3	-0.731 (4.97)	-0.883 (5.65)
dur(unemployment)	0.016 (0.23)	0.022 (0.29)
dur(employment)	-0.145 (1.49)	-0.209 (1.97)
dur(employment)^2	0.026 (1.51)	0.035 (1.82)
Equal employer	1.722 (8.25)	1.845 (8.63)
GDP growth rate	0.081 (1.05)	0.107 (1.27)
Unemp. provincial rate	-0.017 (1.40)	-0.026 (2.00)
Threshold $c_{nett,1}$	0.452 (9.39)	0.486 (9.68)
Threshold $c_{nett,2}$	0.647 (11.29)	0.700 (12.07)
ρ_{sc}	0.861 (6.63)	—
Mean Log Likelihood	-1,164.33	-1,169.66
Size	1,076	1,076

Note: Reference category is: Female, contr. categ.=1, Madrid. The full model imposes no constraints on ρ_{sc} whereas $\rho_{sc} = 0$ in the constrained one. Controls for geographical zones are also included.

Table 5a

Estimation results for qualification Medium High: Selection Equation

(unsigned t–ratios in parentheses)

	Full Model	**Constrained Model**
Constant	0.923 (4.55)	0.962 (4.06)
Gender	-0.283 (5.66)	-0.277 (5.31)
Age	-0.034 (9.77)	-0.029 (8.03)
Contr. categ = 4	0.041 (0.50)	0.064 (0.73)
Contr. categ = 5	0.063 (1.22)	0.088 (1.64)
% THA Contracts	6.019 (5.13)	6.372 (4.78)
(% THA Contracts)^2	-19.086 (4.86)	-23.558 (5.26)
GDP growth rate	-0.079 (2.26)	-0.089 (1.98)
Unemp. provincial rate	-0.016 (3.27)	-0.021 (3.93)

Note: Reference category is: Female, contr. categ.=6.

Table 5b
Estimation results for qualification Medium High: Category Equations
(unsigned t–ratios in parentheses)

	Full Model	**Constrained Model**
THA workers		
Constant	-0.107 (0.35)	-0.109 (0.35)
Gender	-0.171 (1.42)	-0.167 (2.24)
Age	0.013 (0.98)	0.013 (2.57)
Contr. categ = 4	0.418 (3.38)	0.416 (3.37)
Contr. categ = 5	0.683 (8.27)	0.682 (8.34)
dur(unemployment)	-0.103 (2.54)	-0.103 (2.54)
dur(employment)	0.130 (2.37)	0.131 (2.37)
dur(employment)^2	-0.014 (1.60)	-0.014 (1.60)
Equal employer	0.567 (6.87)	0.568 (6.95)
GDP growth rate	0.036 (0.60)	0.036 (0.61)
Unemp. provincial rate	-0.005 (0.52)	-0.005 (0.52)
Threshold $c_{ett,1}$	0.757 (16.95)	0.758 (17.10)
Threshold $c_{ett,2}$	2.720 (29.41)	2.721 (29.94)
ρ_{sc}	0.020 (0.043)	—
Non–THA workers		
Constant	-1.537 (8.58)	-0.464 (1.99)
Gender	-0.003 (0.07)	-0.211 (3.79)
Age	0.033 (9.62)	0.026 (6.35)
Contr. categ = 4	0.221 (2.70)	0.334 (3.43)
Contr. categ = 5	0.117 (2.34)	0.193 (3.36)
dur(unemployment)	-0.032 (1.61)	-0.034 (1.13)
dur(employment)	0.078 (2.76)	0.149 (3.53)
dur(employment)^2	-0.003 (0.75)	-0.008 (1.26)
Equal employer	0.880 (11.44)	1.160 (12.18)
GDP growth rate	0.013 (0.40)	-0.008 (0.18)
Unemp. provincial rate	0.009 (2.01)	0.002 (0.30)
Threshold $c_{nett,1}$	0.497 (18.85)	0.684 (22.69)
Threshold $c_{nett,2}$	2.133 (37.69)	2.634 (43.82)
ρ_{sc}	-0.939 (34.04)	—
Mean Log Likelihood	-4,890.51	-4,918.49
Size	2,918	2,918

Note: The reference category is: Female, contr. categ.=6, Madrid. The full model imposes no constraints on ρ_{sc} whereas $\rho_{sc} = 0$ in the constrained one. Controls for geographical zones are also included.

Table 6a

Estimation results for qualification Medium Low: Selection Equation

(unsigned t–ratios in parentheses)

	Full Model	**Constrained Model**
Constant	3.515 (14.42)	3.536 (14.48)
Gender	-0.131 (4.50)	-0.128 (4.39)
Age	-0.271 (17.88)	-0.272 (17.93)
Age^2	0.004 (17.26)	0.004 (17.30)
Contr. categ = 7	0.658 (22.06)	0.662 (22.15)
% THA Contracts	7.061 (11.32)	7.041 (11.19)
$(\%\ THA\ Contracts)^2$	-18.702 (8.85)	-18.817 (8.83)
GDP growth rate	-0.197 (9.89)	-0.198 (9.85)
Unemp. provincial rate	0.019 (8.68)	0.019 (8.34)

Note: Reference category is: Female, contr. categ.=8.

Table 6b

Estimation results for qualification Medium Low: Category Equations

(unsigned t–ratios in parentheses)

	Full Model	**Constrained Model**
THA workers		
Constant	-0.758 (1.97)	-0.615 (1.873)
Gender	-0.107 (2.74)	-0.116 (3.21)
Age	0.079 (2.57)	0.063 (3.04)
Age^2	-0.001 (1.88)	-0.0007 (2.00)
Contr. categ = 7	0.385 (5.07)	0.429 (10.79)
dur(unemployment)	-0.049 (1.17)	0.049 (1.18)
$\text{dur(unemployment)}^2$	0.003 (0.71)	0.035 (0.70)
dur(unemployment) ≤ 30	0.027 (0.56)	0.028 (0.58)
dur(employment)	0.104 (3.99)	0.103 (3.94)
dur(employment)^2	-0.007 (1.51)	-0.007 (1.49)
Equal employer	0.200 (4.85)	0.199 (4.82)
GDP growth rate	-0.002 (0.07)	-0.005 (0.21)
Unemp. provincial rate	0.007 (0.17)	0.0016 (0.41)
Threshold $c_{ett,1}$	2.350 (66.40)	2.358 (84.63)
Threshold $c_{ett,2}$	3.170 (57.26)	3.180 (68.93)
ρ_{sc}	-0.106 (0.71)	—
Non–THA workers		
Constant	-1.713 (3.59)	-0.619 (1.76)
Gender	-0.056 (1.54)	-0.085 (2.42)
Age	0.115 (4.12)	0.059 (2.57)
Age^2	-0.002 (3.51)	-0.001 (1.88)
Contr. categ = 7	0.097 (1.64)	0.249 (7.05)
dur(unemployment)	0.0107 (1.72)	0.112 (1.72)
$\text{dur(unemployment)}^2$	-0.019 (1.79)	-0.020 (1.78)
dur(unemployment) ≤ 30	0.093 (1.75)	0.098 (1.79)
dur(employment)	-0.084 (3.42)	-0.087 (3.44)
dur(employment)^2	0.011 (2.69)	0.011 (2.75)
Equal employer	0.389 (6.55)	0.403 (6.56)
GDP growth rate	0.032 (1.27)	0.019 (0.73)
Unemp. provincial rate	0.002 (0.67)	0.004 (1.43)
Threshold $c_{nett,1}$	2.111 (39.31)	2.184 (79.23)
Threshold $c_{nett,2}$	2.909 (38.18)	3.009 (62.26)
ρ_{sc}	-0.346 (3.25)	—
Mean Log Likelihood	-18,402.96	-18,407.70
Size	13,165	13,165

Note: Reference category is: Female, contr. categ.=8, Madrid. The full model imposes no constraints on ρ_{sc} whereas $\rho_{sc} = 0$ in the constrained one. Controls for geographical zones are also included.

Table 7a

Estimation results for qualification Low: Selection Equation

(unsigned t–ratios in parentheses)

	Full Model	**Constrained Model**
Constant	4.040 (21.59)	4.047 (21.50)
Gender	0.093 (4.87)	0.099 (5.18)
Age	-0.226 (18.52)	-0.229 (18.73)
Age^2	0.003 (16.01)	0.003 (16.23)
Contr. categ = 9	-0.433 (21.09)	-0.432 (21.00)
% THA Contracts	4.563 (9.87)	4.991 (10.37)
$(\%\ THA\ Contracts)^2$	-11.351 (7.19)	-12.795 (7.74)
GDP growth rate	-0.170 (10.97)	-0.168 (10.51)
Unemp. provincial rate	-0.004 (2.09)	-0.003 (1.76)

Note: Reference category is: Female, contr. categ.= 10.

Table 7b

Estimation results for qualification Low: Category Equations

(unsigned t–ratios in parentheses)

	Full Model	**Constrained Model**
THA workers		
Constant	0.209 (0.79)	-0.890 (3.09)
Gender	-0.058 (2.11)	-0.118 (3.86)
Age	-0.059 (3.44)	0.029 (1.57)
Age^2	0.001 (2.71)	-0.0005 (1.69)
Contr. categ = 9	-0.037 (1.04)	0.164 (4.59)
dur(unemployment)	0.202 (4.90)	0.233 (4.84)
dur(unemployment)^2	-0.021 (3.97)	-0.024 (3.97)
dur(unemployment) ≤ 30	0.012 (0.30)	-0.010 (0.22)
dur(employment)	-0.025 (1.11)	-0.019 (0.71)
dur(employment)^2	0.001 (0.23)	0.0007 (0.13)
Equal employer	-0.632 (18.88)	-0.721 (20.40)
GDP growth rate	-0.041 (1.94)	-0.032 (1.30)
Unemp. provincial rate	0.0005 (0.18)	0.002 (0.63)
Threshold $c_{ett,1}$	0.771 (32.76)	0.886 (41.11)
Threshold $c_{ett,2}$	1.519 (32.61)	1.699 (36.13)
ρ_{sc}	0.815 (8.66)	—
Non–THA workers		
Constant	-3.039 (5.02)	-2.504 (7.61)
Gender	-0.050 (1.68)	-0.042 (1.45)
Age	0.159 (5.29)	0.137 (6.32)
Age^2	-0.002 (5.29)	-0.002 (5.98)
Contr. categ = 9	0.135 (2.74)	0.094 (3.14)
dur(unemployment)	-0.0035 (0.07)	0.0029 (0.06)
dur(unemployment)^2	0.0028 (0.40)	0.0028 (0.40)
dur(unemployment) ≤ 30	0.002 (0.04)	0.0031 (0.06)
dur(employment)	-0.083 (3.48)	-0.085 (3.56)
dur(employment)^2	0.008 (1.85)	0.008 (1.90)
Equal employer	-0.941 (18.26)	-0.947 (18.80)
GDP growth rate	-0.005 (0.23)	-0.010 (0.44)
Unemp. provincial rate	-0.0001 (0.02)	-0.0005 (0.17)
Threshold $c_{nett,1}$	0.933 (38.44)	0.940 (46.60)
Threshold $c_{nett,2}$	1.731 (36.23)	1.744 (42.78)
ρ_{sc}	-0.162 (1.01)	—
Mean Log Likelihood	-25,404.63	-25,412.54
Size	19,786	19,786

Note: Reference category is: Female, contr. categ.=10, Madrid. The full model imposes no constraints on ρ_{sc} whereas $\rho_{sc} = 0$ in the constrained one. Controls for geographical zones are also included.

Table 8a:

Contribution category equation: Unconditional Predictions for Full Model

	High		**Med–High**		**Med–Low**		**Low**	
	No THA	THA	No THA	THA	No THA	THA	No THA	THA
Δ Qual=3	–	–	–	–	–	–	0.43	0.26
Δ Qual=2	–	–	-	–	0.46	0.73	2.96	1.79
Δ Qual=1	–	–	1.46	2.13	3.09	4.49	15.21	8.10
= Qual.	85.10	53.35	27.82	45.29	58.43	71.40	81.39	89.85
∇ Qual=1	4.07	21.81	18.80	28.15	38.02	23.38	–	–
∇ Qual=2	6.25	14.98	51.92	24.43	–	–	–	–
∇ Qual=3	4.57	9.85	–	–	–	–	–	–

Table 8b:

Contribution category equation: Unconditional Predictions for Constrained Model

	High		**Med–High**		**Med–Low**		**Low**	
	No THA	THA	No THA	THA	No THA	THA	No THA	THA
Δ Qual=3	–	–	–	–	–	–	0.59	0.48
Δ Qual=2	–	–	-	–	0.81	0.47	3.76	3.33
Δ Qual=1	–	–	2.10	2.24	4.92	3.34	17.70	14.95
= Qual.	82.42	48.71	44.57	46.04	67.07	68.26	77.94	81.22
∇ Qual=1	4.98	22.69	25.94	27.98	27.20	27.93	–	–
∇ Qual=2	7.45	16.63	27.39	23.73	–	–	–	–
∇ Qual=3	5.14	11.96	–	–	–	–	–	–

Note: Predicted probabilities are calculated by holding all variables at their sample mean. Constrained Model imposes that $\rho_{sc} = 0$. Full Model imposes no constraints on ρ_{sc}.

Table 9a:
Contribution category equation: Conditional predictions for THA workers

	High		**Med–High**		**Med–Low**		**Low**	
	Pr *(y_{NE})*	Pr(y_E)	Pr *(y_{NE})*	Pr(y_E)	Pr *(y_{NE})*	Pr(y_E)	Pr *(y_{NE})*	Pr(y_E)
Δ Qual=3	–	–	–	–	–	–	*0.28*	0.48
Δ Qual=2	–	–	-	–	*0.18*	0.90	*2.21*	3.32
Δ Qual=1	–	–	*0.00*	2.24	*1.73*	5.23	*12.90*	14.88
= Qual.	*99.99*	48.26	*0.05*	46.03	*53.24*	73.12	*84.61*	81.32
∇ Qual=1	*0.00*	22.73	*1.95*	27.96	*44.84*	20.75	–	–
∇ Qual=2	*0.00*	16.80	*98.00*	23.76	–	–	–	–
∇ Qual=3	*0.00*	12.20	–	–	–	–	–	–

Table 9b:
Contribution category equation: Conditional predictions for no-THA workers

	High		**Med–High**		**Med–Low**		**Low**	
	Pr(y_{NE})	Pr *(y_E)*	Pr(y_{NE})	Pr *(y_E)*	Pr(y_{NE})	Pr *(y_E)*	Pr(y_{NE})	Pr *(y_E)*
Δ Qual=3	–	–	–	–	–	–	0.61	*0.00*
Δ Qual=2	–	–	-	–	1.02	*1.40*	3.84	*0.00*
Δ Qual=1	–	–	2.24	*2.07*	5.76	*7.07*	17.91	*0.19*
= Qual.	83.31	*53.97*	42.63	*44.90*	69.07	*75.29*	77.63	*99.81*
∇ Qual=1	4.57	*21.70*	27.79	*28.24*	24.14	*16.24*	–	–
∇ Qual=2	7.00	*14.77*	27.35	*24.78*	–	–	–	–
∇ Qual=3	5.12	*9.57*	–	–	–	–	–	–

Note: Predicted probabilities are conditional in each panel on being in an THA and not being in an THA, respectively. The contrafactual probabilities are in cursive.