

Careers, Human Capital and Managerial Styles

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Preface

The study of career paths within organisations is an issue that has received strong attention in the theoretical literature of organisational economics and management¹. From the empirical point of view, however, research in this topic is scarcer and less comprehensive. The gap has been caused to a large extent by the unavailability of data tracking worker's career moves in employee-level surveys and by the lack of information about career management policies in firm-level data. This thesis contributes to fill such hole. It investigates how workers' careers and their behaviour as managers depend on the characteristics of the firms where they work and their own personal characteristics, with a strong emphasis in the role of human capital. The research is carried out using micro data at both worker and firm level, available only in relatively recent data sets.

The interaction between accumulation of human capital and workers' employment horizons has been frequently recognised as a key issue in explaining why some firms maintain long-term relationships with their employees while others remain closer to what it could be considered spot-market labour contracting². There are nonetheless important factors that have been usually absent in the literature of organisations. This is the case of internal firm structures that may improve or discourage the interactions between different hierarchical levels, affecting eventually to the costs of job change involved in promotions.

Both human capital and organisation-relational aspects of career paths are objects of study of this thesis. First, it is analysed how the characteristics of employers and the markets where they work affect the general or firm-specific nature of employees' human capital and, therefore, to the type of employment relationship held. Second, it is investigated how differences in employees' personal characteristics affect their career horizons, the management of their human capital and the type of career moves done. Finally, the effects of these factors on career path outcomes are examined, in terms of leadership behavioural

¹ See Robert Gibbons and Michael Waldman's "Careers in Organizations: Theory and Evidence," in Orley Ashenfelter and David Card (eds.): *Handbook of Labor Economics*, vol 3B, 1999. North Holland, Amsterdam. See also other references therein.

² See, for example, Peter B. Doeringer and Michael J. Piore's *Internal Labour Markets and Manpower Analysis*, 1971. Heath, Lexington Books, Lexington.

differences among those arriving at managerial levels. A particular attention is paid the important differences between the careers of men and women that are also found in their managerial style.

The essays that compose this thesis address each of the above issues subsequently. In the first chapter, I develop a simple game theoretical model of reputation to show how firms operating in concentrated sectors have to credibly commit with prospective employees to offer them a profitable career, and this may lead to the provision of further (general) human capital. Employees of firms that operate in concentrated sectors learn skills that are valuable only for a limited number of alternative employers. This gives monopsonistic power to the training firm over the trained workers. Foreseeing it, potential employees will be reluctant to start working for such a firm unless the employer is able to commit herself not to take advantage of such situation. Since the commitment includes compensations to specifically trained workers above their best market alternative, human resources policies including the provision of (general) human capital contribute to reduce employers' commitment costs. Evidence from the Spanish 1995 wave of the *European Community Household Panel* (ECHP) shows that, consistently with the predictions of the model, firms from more concentrated sectors are more likely to provide their workers with training, education and health.

In the second chapter, I analyse the relationship between job-related training and career progress of workers. Since most theories of career paths and task assignment rely on human capital accumulation, it seems natural to assess their empirical validity by analysing the effect of training on the career progress of an individual. I use the sample of workers from twelve waves of the *British Household Panel Survey* (BHPS, 1991-2002) to study the impact of training over the probability of making a career-improving move, using both between-groups and within-group panel data estimators. I find that job-related training received by female workers boosts significantly their chances of being promoted in the next future, while leaving virtually unaffected the chances of male workers. Then, I investigate how training and promotion jointly influence wage growth. The results show that their interaction is, if any, positive. Additional evidence confirms that the career path of female workers seems to be importantly affected by the market value of their human capital, while

that of men might be more influenced by institutional mechanisms devised to provide incentives.

The third chapter tackles sex differences in managerial behaviour, by testing the extent to which such differences match those expected from gender stereotypes. Unlike previous research on the topic, always based on opinions about individual managers, this investigation uses firm-level evidence from the *British 1998 Workplace Employment Relationship Survey* (WERS 98). This means that some problems usually present in individual-level studies, including *answer stereotyping* and selection of female managers into specific responsibilities, are avoided in the research presented here. The results show that workplaces where the presence of women at management is higher are driven in a more democratic fashion, with more interpersonal and interactive relationships between managers and subordinates, and with more employee-mentoring responsibilities taken by managers. No sex differences were found for more structural policies, such as the degree of delegation on supervisors or the extension of payment by results.

The analysis of career management done in the following chapters is therefore performed from three different points of view: the circumstances of the labour market, the type of labour force managed and the internal firm structures that may favour specific policies. This provides a global perspective of the topic, since all three factors are found to be strongly relevant in shaping the career paths developed within firms, both in terms of wages and in terms of responsibilities.

Overall, the research presented here sheds light on what career management schemes adapt better to different product and labour market circumstances. It opens as well a number of challenges for the study of human resources management and shows that population-wide surveys can be very useful tools to carry out empirical investigations in this area, usually dominated by narrower and less representative surveys.

CHAPTER 1

Why Do Firms Sponsor Education? An analysis Based on Labour Market Competition

1.1. Introduction

This paper analyses the role of the sponsorship of education as a tool of firms' human resources policy, stressing its relevance in concentrated sectors.

Many firms sponsor the training of their employees. They do not only “teach” the workers the specific knowledge needed for their tasks but also pay for them to take courses usually considered as general-purpose education, as it is the case of Executives MBAs³.

This work addresses two main reasons that explain why firms would make such large expenditures in education, both of them related to the specificity of the “on the job” training previously done by workers. First, there may be some complementarities between the technical skills acquired on the job and the new ones obtained with further education; this would make such education more specific to the sponsoring firm that it could seem at first. Second, if the skills learned on the job by the workers are of low value outside the training firm, the employer has to commit herself to pay them above such outside value in order to attract prospective workers. A profitable way to do it could be to increase the employees’ outside opportunity by providing them with further education. Both arguments lead us to think that those firms requiring specific technical skills from their employees may be also more willing to provide them with education. Along this paper, specificity of skills is argued to stem from high concentration of the industry.

³ Executive Education, for example, is a very illustrative case. Baron and Kreps (1998) estimated in \$230,000 the actual total costs for a firm of sponsoring a one-year MSc degree in Stanford University, with tuition close to \$47,000 in 1997. Given the general rise in such fees that nowadays are close to \$60,000, total costs may be currently around \$250,000. Nevertheless, figures depict a large increase of firm’s expenditures in executive education. Apart from large companies like GM, GE or ATT that send each year thousands of managers to this kind of programs, smaller firms also seem to follow such trend. The average US Company that spent \$2 million in managerial education in 1992 was spending \$10 million in 1998. Overall, the evolution of US firm's expenditure in corporate training seems to have doubled each four years in the last decades, as Table 1.1 shows.

There are many examples of skills that can be acquired in one firm and be specially valued by other potential employers in the same industry. Information about the preferences of clients and providers, knowledge of the industrial regulation and its tricky applications, expertise on the technology employed, or even the ability to perform some specific administrative tasks can be included within this category, for a wide range of different jobs. Therefore, those abilities acquired "by-doing" are usually quite specific to the firms working in the same industry and industrial structure may determine the best outside opportunity for the worker. High costs of switching the employer and bad fit of skills make such opportunity especially low in highly concentrated industries. Consequently, an employer in any of such sectors could take advantage of the lack of competition for the (specifically) skilled human capital and appropriate part of the returns generated by the worker's accumulation of such a specific knowledge. She could do it simply by paying him a wage lower to the (unenforceable) one agreed at the beginning of the employment relationship.

Take the example of a physicist shortly after his graduation. If he accepts an offer to work for, let us say, a nuclear power station, the set of skills acquired with experience after some years will probably have low value outside the power station, given the differences in technology that may exist with respect to other nuclear stations. Even in the case that such skills were almost fully applicable with any alternative employer, the relocation costs he would have to face could be huge. If the same physicist, instead, initially agrees to work for an electronics technology firm, the skills he may acquire there will be valuable for a large number of potential firms, and the employer will have to pay him a wage close to the added value of his productivity.

In the case of the electronics technology company, the worker may be attracted by the multitude of opportunities he may have once he becomes an expert technician in electronics; the market is the safeguard for the worker's investment. The owner of the nuclear station, on the contrary, must show that she is really offering to her employees a profitable career, safe from the hazards from becoming too specialised. Otherwise, she would develop a bad reputation that would prevent her from hiring new employees. In such

setting, the firm may find profitable to give such “safeguard” to the worker in the form of further education. Such new instruction may not be otherwise paid by the firm, since it is to some extent a general form of human capital, nor be it paid by the worker, given credit constraints and the risk of appropriation by the firm.

Alternative interpretations of labour relationships in concentrated sectors, based in large specific investments done by employers and quasi-rents appropriated by workers, lead to very different conclusions. Following such interpretations, senior workers of a firm in a concentrated sector have monopolistic power (in the market for skilled labour) that enable them to take part of the quasi-rents generated by the firm's assets (so, the firm has little need to commit with them). Moreover, the employer would not be willing to sponsor education to employees, since they can take most of the returns of the investment. Empirical studies, then, should assess under what circumstances each explanation fits better.

Although the previous literature on both human capital theories and the labour contractual approach is largely vast, I have no notice of any work that handled directly the relationship between market structure and the human resources policy of the firms.

In his seminal work, Becker (1964) already suggested the specific nature of the human capital of workers employed by a monopolist. He proposed a theory where workers pay the cost of their general human capital investments, and share with the firm the cost of the specific part of it. The evidence from the works of Mincer (1974) pointed out that direction. However, in the last ten years, many economists have provided evidence that casts doubts on this aspect of such standard theory. Cole (1992) and Acemoglu and Pischke (1998) suggested that some institutional factors and complementarities between general and specific skills could give the employer some monopsonistic power over their trained workers, and this would lead her to pay also general human capital investments. Acemoglu and Pischke (1996) and Barron (1999) stated that such monopsonistic power over workers with general skills can also arise from the informational advantage that the training firm

may have when the instruction is done in-house: the employer can learn about the ability of her workers during the training period.

On the other hand, economists concerned with the specificity of investments have systematically analysed the appropriatory actions that could take the worker, leaving often a marginal interest for those that could be taken by the firm. On the theoretical part, Malcomson (1997) analysed the incentives to invest under different contractual frameworks, stressing the point in the incentives for the firms. On the empirical part, Abowd and Allain (1996) obtained, from a data set of French workers and firms, a significant negative relationship between worker's bargaining power and firm's market share

Closer to the focus of this paper, Stevens (1994) argued that most forms of human capital are rather transferable, instead of completely general or totally specific to one firm. In a model with finite heterogeneous firms bidding for the transferable skills of the worker, she showed that as the number of potential bidders increases, also increases the expected outside value of the skills and decreases the probability of the worker staying at the firm. On the other hand, Neal (1995) used data from displaced workers to show that workers are compensated, to a large extent, for skills that are specific to the sector, rather than purely general or specific. In a sense, I join in this paper the messages of these last two works: workers are paid for skills specific to the sector and, with lower bidders for these skills, their outside opportunity is lower. This provides us a framework to analyse the human resources policy of firms in concentrated sectors.

Along the next section, I will introduce a simple game theoretical model to analyse the commitment problem faced by firms providing specific on-the-job skills to their workers. Given that firms achieving good reputation must credibly offer higher compensation packages to prospective workers, the main results arising from this section are: (i) sponsoring (general or specific) education may be profitable for firms that commit to wages above workers' outside option if the educational investment is efficient and (ii) in such case, the proportion of workers sponsored by an employer with good reputation should be

higher when the transferability of skills learned on the job is lower. In Section 1.3, the rationale and implications of such model are discussed, as well as other arguments supporting alternative hypotheses, with a special emphasis on the possibility of appropriation of quasi-rents by workers. Section 1.4 shows some evidence related to the relationship between labour market structure, compensation of the workers and sponsoring decisions. The evidence presented in that section is highly consistent with the results from the theoretical analysis, although it does not allow us to clearly reject alternative interpretations of the issue. The last section is devoted to summarise the conclusions and to point out future empirical research in this topic.

1.2. The Model: Training and Commitment Decisions

The proposed model is an infinitely repeated sequential game (close to that described in Kreps (1986)) that the firm “plays”, in principle, with a worker in each generation (later, the analysis will be done for a pool of workers in each generation). The extensive form of the sequential move stage game is represented in Figure 1.1.

There are two players in each stage game: the infinitely lived firm, and the worker of the t -th generation, so that the total number of players is infinite. The t -th stage game is developed in three sub-stages. First, the worker of the t -th generation decides either to start working and build a career in a given firm, learning some technical skills (action I), or to do it in any other company (action O); in the latter case, he will receive a payoff of V' while the company obtains a payoff of 0. Secondly, if the worker signs up with the firm and gets the mentioned skills, the firm decides either to sponsor him further education or not, and to make him an offer as compensation for his work (action W_{mba}) if education is sponsored and action W otherwise⁴. Finally, the worker decides whether to accept the offer done by the firm (action A), or reject it (action R), pursuing his best *ex post* opportunity outside the firm. If the firm has not paid for the worker to get the instruction, the payoffs for the employee and the employer are, respectively, W and $P(W)$ if the worker accepts the offer and W_0 and 0 if he rejects it. If the firm has sponsored the worker, the payoffs are W_{mba} and

⁴ The label of the actions will be identified with the exact offers made in each case.

$P_{mba}(W_{mba})$ if the worker accepts the offer and W_{mba}^0 and $-c$ if he rejects it. Information is assumed to be complete and perfectly known by all agents. This means that each agent knows the payoffs to be obtained in every outcome, as well as the full history of the play of the game at each decision node.

The set of skills learnt by a worker signing up with the firm can be acquired at no explicit cost⁵. They increase his productivity within the firm up to V_I , which is the net present value of technical skills from the moment he finishes the on-the-job training to the end of his career. If the worker does not agree to work for the firm, he obtains his best *ex ante* outside opportunity for his career (including the returns from on-the-job training anywhere else), which has a net present value⁶ V' . A rational worker, thus, will not be initially willing to “enrol” in the firm if he expects a payoff below that value.

Let $\alpha \in [0,1]$ denote the proportion of skills learned on the job that cannot be applied outside the training firm; $(1-\alpha)$ is, therefore, a measure of the “transferability” of such knowledge. Hence, once the worker has acquired these skills, his *ex post* outside opportunity $W^o = (1-\alpha)V_I$. In that moment, the employer can expect the worker to accept any offer above this value.

Within this framework, it can be characterised the problem of *ex post* opportunism to be analysed: Before the training, the employer may promise the prospective employee any compensation; but after the training period, the employer can retain the worker with an

⁵ Actually, the cost for the worker of such “passive learning” is the opportunity cost, this is, the value of the skills he could be learning in other firm at that time.

⁶ The analysis is done omitting the flow of payments along that first period. Incentives for ex-post opportunism appear only on the employer's side once the worker acquires the technical skills. In some two-period models commitment problems arising from investment in specific assets are solved through first period compensating higher wages. This is ruled out here by the assumption that payoffs only occur in the second period (or, alternatively, that all workers are paid exactly his productivity in the first period). Although this approach faces the risk of being too simplistic in the analysis of the problem, I consider it more realistic than assuming that legal and incentives issues do not strongly constraint employers' ability to offer compensations in the first period.

offer below the amount agreed and, more importantly, below his *ex ante* best outside opportunity. The following definition states when such problem is present:

Definition 1: *Ex post opportunism by the firm.* There exists an problem of ex post opportunism by the firm if $(1-\alpha)V_I < V'$. The presence of this problem means that, whenever the worker's outside opportunity is lower after the on-the-job training period, the employer must credibly commit herself to pay him at least V' if she wants to attract any prospective employee.

Let us assume that exists an educational program of cost c , where the senior worker may acquire new (managerial) skills that also allow him to make a better use of his (already acquired) technical skills. The net present value of the abilities obtained in such program would be, then: $V_{mba} = S + \lambda V_I$, where S is the value of the new knowledge acquired and λ denotes the improvement in the use of technical skills achieved thanks to the complementarities with the managerial skills learned. The value added by such program is partly specific to the training firm, to the extent that it depends on specific skills previously obtained. More exactly, the firm can take $\alpha\lambda V_I$ from the investment, retaining the employee the rest, since his outside opportunity after the program increases to $W_{mba}^o = S + (1-\alpha)(1+\lambda)V_I$.

Credit constraints and other transaction costs can be assumed to prevent the worker from financing himself the course (this issue will be discussed in the next section). On the other hand, it seems that the firm would only be willing to pay the cost of the course if its returns are specific enough. However, as it will be shown, whenever the employer has to commit to pay a minimum compensation to the worker, she may want to sponsor the instruction even if it is apparently unprofitable for her to do so. The main reason is that providing education may be a cheaper way to fulfil the needed commitment.

Definition 2: *The investment on further education of the worker is **apparently unprofitable** for the firm if the part of the value that can be directly taken by the employer does not compensate her for the cost (i.e., if $\alpha\lambda V_I < c$).*

Definition 3: *Sponsorship of education is **valuable enough to attract prospective** workers if a worker expecting to be paid the course will be willing to sign up with the firm, (i.e.: $S+(1-\alpha)(1+\lambda)V_I \geq V'$).*

1.2.1. Equilibria with a Single Worker in Each Generation

Suppose that it exists a problem of *ex post* opportunism by the firm and, on the other hand, sponsoring education is apparently unprofitable for the employer. Let us consider first the case when a single worker is hired in each recruiting round, so that the firm is unable to carry out a mixed strategy. Three sub-game-perfect Nash equilibria, then, could be observed (see Figure 1.2):

Equilibrium 1.1: *Firm fulfils each worker's expectations by paying him V' .* In order to be able to attract prospective workers, the employer offers and pays to the senior worker of each generation his *ex ante outside opportunity*. The t -th worker's equilibrium strategy is: (i) in the first sub-stage, action I (to sign up and train within the firm) if $t=1$ or if the last worker employed by the firm obtained a compensation larger or equal to V' , and action O otherwise; (ii) in the third sub-stage, action A (to accept the offer of the firm) if the offered compensation is not smaller than his *ex post* outside opportunity (W_{mba}^o if he has been provided with instruction and W^o otherwise), and action R (reject the offer) otherwise. The strategy of the firm is “fulfil with money”: always offer (and pay) $W = V'$ to each senior worker. The resulting outcome, if this equilibrium exists, is that each worker agrees to work for the firm, he is offered V' , and he accepts the offer.

Equilibrium 1.2: *Firm fulfils each worker's expectations providing him with further education.* In this case, the employer makes less costly the fulfilling of her commitment, thanks to the sponsorship of an educational program. The t -th worker's equilibrium strategy is the same as in Equilibrium 1.1. On the other hand, the equilibrium strategy of the firm is, in this case, “fulfil with education”: always sponsor education to each senior worker and

offer (and pay) him⁷ $W_{mba} = \max \{V', W_{mba}^0\}$. If $V' > W_{mba}^0$, the employer has still to pay to the workers more than their *ex post* best outside opportunity to maintain her reputation. If $W_{mba}^0 > V'$, the course sponsored is valuable enough to attract prospective workers.

Equilibrium 1.3: *Firm is unable to hire any worker*. After the technical training, the employer would only be willing to pay the employee his *ex post* best outside opportunity; however, she is not given the opportunity to behave that way. The t -th worker's equilibrium strategy in this case is: (i) in the first sub-stage, action O in any case (he never agrees to start working for the firm), and (ii) if (by error) he signs up, he takes action A in the third sub stage (to accept the offer of the firm) if the offered compensation is greater or equal to his *ex post* outside opportunity (W_{mba}^0 if he has been provided with instruction and W^0 otherwise) and action R otherwise. The strategy of the employer is “always cheat” the expectations of any worker she could hire, by offering him only his *ex post* best outside opportunity $W = W^0 = (1-\alpha)V_I$ once he is technically trained⁸

As it can be noticed, Equilibria 1.1 and 1.2 represent the two different ways that the employer has to fulfil her commitment. In both cases, the strategy of the workers is to rely on the reputation of the firm. Then, the best response compatible with such strategy will lead to either Equilibrium 1.1 or 1.2 (or neither of them) depending on the value added by the course and the specificity of the technical training. Equilibrium 1.3, on the other hand, is always feasible: if the firm is going to pay the worker less than V' , his best response is in any case not to sign up with the firm; and if the employer has no expectation of hiring any prospective worker, her best response is always to exploit at maximum any hired worker.

Why are Equilibria 1.1 to 1.3 the only sub-game perfect Nash equilibria that can be observed under pure strategies? First, any strategy by the employer that provides each employee with a payoff below V' leads the worker to follow action O (not to sign up); then,

⁷ More specifically, the offer of the employer will be of V' when the course is not valuable enough to attract prospective workers, and W_{mba}^0 otherwise.

⁸ Note that if the employer finds profitable to cheat to the first worker, she would also find profitable to do it in the t -th one, if given the chance to do it.

such strategy is dominated by the strategy “always cheat” that characterises Equilibrium 1.3. Second, consider any strategy of the employer that allows her to keep a good reputation by giving a payoff higher or equal to V' to each senior worker; such strategy is always dominated by the strategy “fulfil with education” or “fulfil with money” (or by both), that lead to Equilibria 1.1 and 1.2 respectively. Third, given that worker's decision power is limited to accept or reject offers, the set of strategies available for him is very constrained. Prospective employees will sign up if they expect to be paid above V' ; on the other hand, a senior employee will be willing to go on working within the firm for any compensation above his *ex post* best outside opportunity, since any strategy different from this one would be an incredible threat.

Moreover, within the framework of this section where no mixed strategies are allowed, any strategy of the firm alternating offers above and below V' should follow a systematic pattern. In that case, however, workers anticipate the behaviour of the firm and respond by signing up only when they expect to be paid at least V' . Equilibria of this type always yield outcomes with payoffs that are, for all agents, lower or equal to those obtained from either Equilibrium 1.1, 1.2 or 1.3.

To be more specific, the following propositions develop the conditions for each of the possible outcomes of the game in pure-strategies equilibrium (see Figure 1.2).

Proposition 1.1. *Equilibrium 1.3 is the only sub-game-perfect Nash Equilibrium if and only if:*

- (a) *The firm hires a single worker in each generation, and the provision of further education is not valuable enough to attract prospective workers (i.e., $V' \geq W_{mba}^0$ and*
- (b) *Neither of the two following inequalities holds:*

$$(1/r)(V_I - V') \geq \alpha V_I \tag{1}$$

$$(1/r)[(1+\lambda)V_I + S - c - V'] \geq \alpha V_I \quad (2)$$

In such case, the outcome of the game is that each worker follows his best ex ante outside opportunity, not signing up with the firm.

Proof: See Appendix A.1

Being r the “inter-generations” rate of discount, conditions (1) and (2) basically determine whether it pays for the firm to maintain a good reputation or not. If condition (1) holds, then it is more profitable for the employer to pay a compensation of V' to her senior employee and be able to hire a prospective workers than to cheat his expectations and create a bad reputation. Similarly, if condition (2) holds, it is better for the firm to subsidise education to the worker and pay him V' than simply to pay him the *ex post* outside opportunity and be unable to hire any new worker. Firms that are growing, or have a stable position in the market, will be more concerned about the future and, therefore, they will apply a lower discount rate r to the long run benefits of having a good reputation. For such type of firms, conditions (1) and (2) are more likely to hold. On the other hand, a firm cheating the expectations of the employee would be disabled to hire any new worker to go on with its activity. Since in a long-term setting only firms keeping a good reputation are expected to survive, a greater interest will be paid to analyse the means used by the employers to do it.

Proposition 1.2. *Equilibrium 1.1 is a sub-game-perfect Nash Equilibrium of the game if and only if*

- (a) *The firm hires a single worker in each generation, and the provision of further education is not valuable enough to attract prospective workers (i.e., $V' \geq W_{mba}^0$) and*
- (b) *Condition (1) holds and the following inequality is not strictly satisfied:*

$$(1+\lambda)V_I + S - c - V' \geq V_I - V' \leftrightarrow \lambda V_I + S \geq c \quad (3)$$

In this case, the outcome of the game is that each worker agrees to work for the firm, the employer makes him an offer of V' , which is accepted by the senior employee.

Proof: See Appendix A.1

Proposition 1.3. *Equilibrium 1.2 is a sub-game-perfect Nash Equilibrium of the game if and only if:*

- (a) *The firm hires a single worker in each generation, and the provision of further education is not valuable enough to attract prospective workers (i.e., $V' \geq W_{mba}^0$) and*
- (b) *Conditions (2) and (3) are satisfied.*

In this case, the outcome of the game is that each worker agrees to work for the firm, the employer provides him with further education, and makes him an offer of V' , which is accepted by the senior employee.

Proof: See Appendix A.1

Condition (3) states whether it is profitable for the firm to use the investment in education to fulfil the commitment done. If this is the case, given that the employee's *ex post* outside opportunity after the course is still below the payment committed by the firm ($V' \geq W_{mba}^0$), the employer can take all the returns to the investment. On the other hand, if the cost of sponsoring the course is high enough, the benefits from being able to take the mentioned returns do not pay for such cost in comparison with the cash option. Therefore, she will be willing to pay the education as long as it is an efficient investment (i.e., the returns are higher than the costs).

If the course improves the value of the productivity of the worker outside the firm above its *ex ante* value, the conditions for each outcome are different, given that the firm can not take all the returns to the investment:

Proposition 2.1. *Equilibrium 1.3 is a sub-game-perfect Nash Equilibrium of the game if and only if:*

- (a) *The firm hires a single worker in each generation, and the provision of further education is valuable enough to attract prospective workers (i.e., $W_{mba}^0 \geq V$) and*
- (b) *Neither condition (1) nor the following inequality hold:*

$$(1/r)[(1+\lambda)\alpha V_I - c] \geq \alpha V_I \quad (4)$$

In this case, the outcome of the game is that each worker follows his best ex ante outside opportunity, not signing up with the firm

Proof: see Appendix A.1.

The meaning of Proposition 2.1 is similar to that of 1.1, but the conditions affecting the profitability for the employer of providing education differ, for she can only take part of the returns generated. Specifically, condition (4) determines whether it pays to maintain a good reputation by sponsoring education to her workers, or it is better for her to “cheat” the expectations of one of them and hire no more in the future. Such condition is also more likely to hold for growing or stable firms that have a lower discount rate r .

Proposition 2.2.. *Equilibrium 1.1 is a sub-game-perfect Nash Equilibrium of the game if and only if:*

(a) *The firm hires a single worker in each generation, and the provision of further education is valuable enough to attract prospective workers (i.e., $W_{mba}^0 \geq V'$) and*

(b) *Condition (1) holds and the following inequality is not strictly satisfied:*

$$(1+\lambda)\alpha V_I - c \geq V_I - V' \quad \leftrightarrow \quad V' - (1-\alpha)V_I + \alpha\lambda V_I \geq c \quad (5)$$

In this case, the outcome of the game is that each worker agrees to work for the firm, the employer makes him an offer of V' , which is accepted by the senior employee.

Proof: see Appendix A.1.

Proposition 2.3. *Equilibrium 1.1 is a sub-game-perfect Nash Equilibrium of the game if and only if:*

(a) *The firm hires a single worker in each generation, and the provision of further education is valuable enough to attract prospective workers (i.e., $W_{mba}^0 \geq V'$) and*

(b) *Condition (4) and (5) are satisfied*

The outcome of the game, in this case, is that each worker agrees to work for the firm, the employer provides him with further education, and then makes him an offer of $W_{mba}^0 = S + (1-\alpha)(1+\lambda)V_I$, which is accepted by the senior employee.

Proof: see Appendix A.1.

The role of condition (5) in propositions 2.2 and 2.3 is analogous to that of condition (3) in propositions 1.2 and 1.3, and is the key in the firm's election of the way to fulfil. Suppose that the employer commits herself to pay at least V' to the senior worker. Then, if (5) holds,

it is more profitable for her to do it through the provision of additional education than simply through a payment of V' . Two reasons are important here. First, by increasing above V' , the value of the general-purpose skills of the worker, the firm can take all the rents generated by the specific part of his previous training without losing reputation as employer. Second, as long as there are complementarities between the previous training and the new education, such “specific rents” are higher. On the other hand, if the cost of sponsoring the course is high enough to keep condition (5) not holding, the benefits for the employer from being able to take her part of the returns do not pay for such cost in comparison with the cash option.

Suppose that α , the (un)transferability of the skills learned with training, depends on the number of external bidders for such skills and, therefore, on the concentration of the market. Then, a higher concentration in the industry (that is, a higher α) makes more likely that an employer uses the sponsorship of education to maintain her reputation. First, higher α means that the circumstances of Proposition 1 are more likely to hold⁹; in that case, only efficiency of the investment is required for education to be a better way to keep reputation. Second, if the circumstances of Proposition 1 are not present, it comes directly from condition (5) that a higher specificity increases the profitability of fulfilling with education with respect to the money option. With higher α , there are more “specific rents” to be obtained by maintaining reputation through the financing of the course; thus, it is more likely that the profits from doing so compensate its cost c .

1.2.2. A Pool of Workers in Each Generation

Let us consider now the case when a pool of many homogenous workers is hired in each generation. It enables the employer to adopt a combined behaviour by, for example, fulfilling the expectations of some of the workers, while cheating those of the rest. The introduction of several hires in each period let us consider the case that the employer follows mixed strategies observed by prospective employees. Let us then assume that risk-

⁹ Note that, when specificity of skills is very large, it is less likely that further education rises the senior worker's best outside opportunity above its *ex ante* value.

neutral prospective employees can observe the payoffs received by all senior workers, and that their perceived probability of obtaining each of the payoffs is exactly the proportion of senior employees that are receiving it¹⁰. Under the further assumption of homogenous workers, some combinations of strategies are clearly dominated by any of the pure strategies described before. In particular, the employer will not be willing to fulfil her commitment just with money with some of the employees and through education sponsorship with the rest of them: if using the instruction program to keep reputation is profitable, it will be so for all the workers, otherwise, none of them will be sponsored.

On the other hand, any strategy of the firm including the possibility of cheating some of the employees while fulfilling the commitment with the rest, has to offer prospective workers an expected payoff greater or equal than V' . Otherwise, such combination of strategies would be dominated by the pure strategy “always cheat” that leads to Equilibrium 1.3¹¹.

The only type of combination that we should consider, then, is when the firm cheats the expectations of some of the workers, while fulfilling (either just with money or also with education) those of the rest, so that prospective worker's expected payoff from signing up with the firm is greater or equal than V' .

Let us suppose that the employer decides to maintain a good reputation by paying high compensations to some of her workers and cheating the rest. Given that workers are assumed to be risk neutral, a firm carrying out such strategy should compensate the loss suffered by the employees cheated with payoffs proportionally higher than V' for the rest of workers. Therefore, such combination of strategies would mean only a redistribution of payoffs among senior employees, resulting in (expected) payoffs for both firm and worker

¹⁰ Note that, if the prospective employees can observe the randomization of the behaviour of an employee adopting mixed strategies, all the results from this section can be applied to the setting of one worker hired in each generation.

¹¹ It seems quite obvious that, if the firm will not be able to attract prospective workers anyway, the best strategy of the firm is to cheat all the workers, when given the opportunity.

equal to those obtained with the pure strategy “fulfil with money” described in the previous section.

Hence, the most interesting combined strategy to be considered by the firm is a policy where the employer “fulfils with education” the expectations of part of her workers, while “cheats” the rest, so that the expected payoff of a prospective worker is still V' . Again, we have to distinguish here between the cases in that education is valuable enough to attract prospective workers and when it is not.

If the investment is not valuable enough (i.e., $V' > W_{mba}^0$), any combination “fulfilling with education” and “cheating” should include payoffs higher than V' for workers sponsored to compensate the lower payoffs obtained by those “cheated”. However, any equilibrium strategy of this kind must include education sponsorship for all the workers: if the employer wants to offer an expected payoff of V' to prospective workers and can use the provision of education to do it cheaper, it will be optimal for her to sponsor all senior employees (and take the full returns to education from all the workers). Furthermore, every strategy including the sponsorship of education to all the workers a minimum pay of W_{mba}^0 and an average compensation offer of V' would be equally good.

If the investment is valuable enough (i.e.: $V' \leq W_{mba}^0$), the situation differs. To the extent that the final payoff of an employee provided with the new education is higher than V' , the employer could sponsor only some senior workers in each generation. By doing it, she could pay below V' to the rest of them without losing the needed level of reputation, as long as the payoff expected by prospective employees stays at V' . More specifically, the employer would choose to subsidise the proportion p of employees that would make maximum her profits in each generation, subject to the restriction of maintaining the reputation, with respect individually rational future workers:

$$\begin{aligned} & \underset{p}{\text{Max}} \quad p[(1+\lambda)\alpha V_I - c] + (1-p)\alpha V_I \\ & \text{subject to: } V' \leq p[S + (1-\alpha)(1+\lambda)V_I] + (1-p)(1-\alpha)V_I \end{aligned}$$

From the assumption that the education is *apparently unprofitable for the firm*, it comes straightforwardly that the firm's profits increase as p decreases. On the other hand, the right hand side of the restriction is increasing in p (the higher the proportion of workers sponsored, the better the reputation of the firm). Therefore, the firm will choose the p that satisfies such constraint as equality. The resulting proportion p^* of workers sponsored in each generation will be:

$$p^* = [V' - (1 - \alpha)V_I] / [S + (1 - \alpha)\lambda V_I] \quad (6)$$

Within the framework of this analysis, it is clear¹² that $p \in [0, 1]$. This strategy of “fulfil with a proportion p^* ” dominates any other combination of this kind. In particular, it dominates the strategy with $p=1$, “fulfil with education”, described in the previous section. Without considering reputation concerns, sponsoring the course is not itself profitable for the firm. Therefore, the employer would prefer to pay education to a proportion lower than 1 of senior employees as long as it does not prevent her from hiring prospective workers.

In summary, with a pool of workers in each generation, four possible sub-game-perfect Nash equilibria types can be observed:

Equilibria Set 2.1: *Firm offers an average payment V' to senior workers.* The employer can cheat the expectations of any proportion of workers without losing reputation if she pays proportionally more to other workers, so that the expected payoff of a prospective employee is V' . The equilibrium strategy of each worker of the t -th generation is here analogous to that of Equilibrium 1.1¹³: (i) in the first sub-stage, action I (to sign up and train within the firm) if $t=1$ or if the last group of workers employed by the firm obtained an average compensation larger or equal to V' , and action O otherwise; (ii) in the third sub-stage, action A (to accept the offer of the firm) if the offered compensation is not smaller

¹² More specifically, the existence of an *ex post* opportunism problem by the firm guarantees that $p^* > 0$, while the fact that the investment in this case is valuable enough to attract prospective workers guarantees that $p^* < 1$.

¹³ In fact, Equilibrium 1.1 can be redefined as a particular case within the Set 2.1.

than his *ex post* outside opportunity (W_{mba}^0 if he has been provided with instruction and W^0 otherwise), and action R (reject the offer) otherwise.

Equilibria Set 2.2a: *Firm sponsors instruction to all the employees and keeps a good reputation.* Suppose that the employer can make less costly the compliance of her commitment through the sponsorship of instruction and that, even after the provision of further education, worker's *ex post* best outside opportunity of the worker is below the *ex ante* value. In such setting, it is optimal for the employer to pay for the instruction of all her employees and offer them any combination of high and low compensations, such that each offer is not lower than W_{mba}^0 and the average offer made is V' for each generation of workers. The equilibrium strategy of each worker of the t -th generation is the one described for Equilibria Set 2.1.

Equilibrium 2.2b: *Firm sponsors instruction to a proportion p^* of employees and keeps a good reputation.* The equilibrium strategies of agents in this case are: on the one hand, the employer sponsors education to a proportion p^* of her employees (that are offered W_{mba}^0) while “cheats” the rest (by offering them only $W^0 = (1-\alpha)V_I$); on the other hand, the equilibrium strategy of each worker is the one described in Equilibria Set 2.1. This equilibrium will exist whenever it is profitable for the employer to fulfil her commitment through the education of some workers and the best outside opportunity of the employee after the instruction is above its *ex ante* value.

Equilibrium 2.3: *Firm is unable to hire any worker.* This equilibrium has been already described in the previous section. The employer would “exploit” all the workers she could hire, by paying them only their *ex post* outside opportunity $W^0 = (1-\alpha)V_I$ after the “on the job” training period. Employees follow the strategy described in Equilibrium 2.1. No potential worker is then willing to sign up with the firm.

When the employer faces a group of workers to be hired in each recruiting round, there is one “new” equilibrium that may improve the equilibrium payoffs (per worker) for the firm with respect the outcomes of the previous section. Equilibria sets 2.1, 2.2a, and equilibrium

2.3 are just generalisations of equilibria 1.1 to 1.3 respectively. That is not the case of Equilibrium 2.2b, which, as long as $V' \leq W_{mba}^0$ and mixed strategies are allowed, leads a better outcome for the firm than that of Equilibrium 1.2.

The conditions for each of the possible outcomes can be stated in the following way:

Proposition 3. (Generalisation of Propositions 1.1, 1.2 and 1.3). *Assume that an employer wants to hire a group of workers in each generation, and that $V' \geq W_{mba}^0$ (the provision of further education is not valuable enough to attract prospective workers). Then:*

- (i) *If neither condition (1) nor condition (2) are satisfied, the only sub-game-perfect Nash equilibrium of the game is Equilibrium 1.3, and the outcome of the game is that each worker follows his best ex ante outside opportunity, not signing up with the firm.*
- (ii) *If condition (1) holds and condition (3) is not strictly satisfied, any equilibrium from Equilibria Set 2.1 is a sub-game-perfect Nash equilibrium, and the outcome of the game is that all the workers of the generation agree to work for the firm, the employer makes an offer larger than W^0 to each of them, such that the average offer is V' and all the offers are accepted by senior employees.*
- (iii) *If condition (2) and (3) are satisfied, any equilibrium from Equilibria Set 2.2a is a sub-game-perfect Nash equilibrium and the outcome of the game is that all the workers of the generation agree to work for the firm, the employer provides all of them with further education and makes an offer larger than W_{mba}^0 to each of them, such that the average offer is V' ; all the offers are accepted by the senior employees.*

Proof: see Appendix A.1

As it can be noticed, when $V' \geq W_{mba}^0$, the fact that the firm hires a group of workers in each recruiting round does not change the conditions for each outcome: if the long run profits from keeping reputation high (either just with money or also with education) are large enough (i.e., if condition (1) and/or (2) hold), the employer will offer them an average payment of V' . Furthermore, in that case the firm will subsidise the investment in education to all the workers if it is efficient to do so (i.e., if condition (3) holds).

Proposition 4.1. *Equilibrium 1.3 is the only sub-game-perfect Nash equilibrium of the game if and only if:*

(a) *The firm hires a group of workers in each generation, and the provision of further education is valuable enough to attract prospective workers (i.e., $V' \leq W_{mba}^0$) and*

(b) *Neither condition (1) nor the following inequality hold:*

$$(1/r)\{p^*[(1+\lambda)\alpha V_I - c] + (1-p^*)\alpha V_I\} \geq \alpha V_I \quad (7)$$

Therefore, the outcome of the game in this case is that each worker follows his best ex ante outside opportunity, not agreeing to work for with the firm.

Proof: see Appendix A.1

Proposition 4.2. *Any equilibrium from the Equilibria Set 2.1 is a sub-game-perfect Nash equilibrium of the game if and only if:*

(a) *The firm hires a group of workers in each generation, and the provision of further education is valuable enough to attract prospective workers (i.e., $V' \leq W_{mba}^0$) and*

(b) *Condition (1) holds and the following inequality is not strictly satisfied:*

$$p^* [(1+\lambda)\alpha V_I - c] + (1-p^*)\alpha V_I \geq \alpha V_I - V' \quad \leftrightarrow \quad \lambda V_I + S \geq c \quad (8)$$

In this case, the outcome of the game is that each prospective employee signs up with the firm, the employer makes an offer larger than W^0 to each of them, such that the average offer is V' and all the offers are accepted by the senior employees.

Proof: see Appendix A.1 and Appendix A.2

Proposition 4.3. *Equilibrium 2.2b is a sub-game-perfect Nash equilibrium of the game if and only if:*

- (a) *the firm hires a group of workers in each generation, and the provision of further education is valuable enough to attract prospective workers (i.e., $V' \leq W_{mba}^0$) and*
- (b) *Conditions (7) and (8) are satisfied.*

The outcome of the game, in this case, is that each worker agrees to work for the firm, the employer sponsors education to a proportion p^ of the workers and makes them an offer of W_{mba}^0 while the rest are only offered W^0 . All the offers are accepted by the senior workers.*

Proof: see Appendix A.1

As stated above, Equilibrium 2.2b improves the outcome for the firm with respect the “fulfilling with education” strategy included in Equilibrium 1.2 for a single worker in each generation¹⁴. Since the employer only sponsors courses to a proportion of workers high enough to maintain a good reputation, she obtains higher profits by cheating the rest of the

¹⁴ In order to verify such improvement, we just have to check that the firm’s stage payoff in Equilibrium 2.2b, which is represented in the left-hand side of condition (8), is higher than the firm’s stage payoff in Equilibrium 1.2, which is represented in the left-hand side of condition (3).

employees. Such “superiority” is reflected in the fact that the conditions needed for Equilibrium 2.2b to exist are weaker than those for Equilibrium 1.2. Condition (7), which states whether it pays for the firm to keep a good reputation through the provision of education, is weaker (more likely to hold) than condition (4), its analogous in the previous section. Furthermore, if condition (8) holds, education sponsorship is a better strategy to keep reputation than just paying more. As it is shown in Appendix A.2, such condition (which is equivalent to condition (3)) is only a requirement of efficiency of the investment in education, and it is also weaker than condition (5), its analogous for the analysis of one worker hired in each generation.

Although in the last case analysed α does not affect here the election of the way to maintain reputation (which only depends on the profitable or unprofitable nature of the course), it has a crucial role in determining the proportion of workers sponsored by firms choosing to fulfil with education. It comes directly from equation (6) that $\partial\alpha/\partial p^* \geq 0$. Under efficiency of the investment, as α increases the employer has to sponsor a higher proportion of senior employees to maintain her reputation, since those not provided with further education suffer a greater loss. In the context of sector-specific skills learned on the job, the application of this result is intuitively clear: in concentrated industries, where there are less bidders for the technical skills of the worker, firms have to offer their prospective employees a higher probability of being sponsored education to compensate them for the low payoff obtained otherwise.

The overall effect of an increase in α is also an increase in the education subsidised by the employer, as long as the investment is efficient. The circumstances required for Proposition 3 (instead of those of Proposition 4) are more likely to hold for higher levels of α (the more specific the skills of the worker, the less likely is that education rises his best outside opportunity above the *ex ante* value). The comparative static exercise done in the simulation of Figure 1.3 shows directly the consequences of this: p^* is increasing in α until the point where education is no more valuable enough to attract prospective workers by itself, while it is $p^* = 1$ from then on.

The equilibrium analysis done above is based on two major assumptions: (i) it exists a problem of *ex post* opportunism by the firm and (ii) the investment in education is *apparently unprofitable for the employer*. Within the model, the possibility of *ex post* opportunism is the cause of the need of commitment that leads the employer to sponsor education. Potential for appropriation stems from the fact that “on the job training” done by the employee is to some extent specific to the training firm; therefore, a higher degree of specificity of his skills (i.e., higher α) would lead to more room for *ex post* opportunism (i.e. $(1-\alpha)V_I \leq V'$ more likely to hold), arising then the need for commitment. In the example displayed of Figure 1.3, this is reflected by the fact that the employer is willing to subsidise the education to some of her employees only when α is above a minimum value.

As for the assumption of “apparent unprofitability” of the investment for the employer (i.e.: $\lambda\alpha V_I < c$), its rationale is straight forward: if the specific rents from education were higher than the total costs, all the employees would be provided with it, independently of reputation or commitment concerns of the employer. Note, however, that the latter situation is more likely to be present for higher values of α , since the specific part of the productivity increase stemming from complementarities between previous training and further education is higher when such training is more specific. That general and specific human capital are complements is a reasonable assumption that, obviously, favours the sponsorship of education in environments where specific human capital is high. Nevertheless, such assumption is not needed for any of the displayed results: the described role of human capital provision in reducing employer’s commitment costs holds even when such new human capital does not involve any increase in specific skills. In terms of the model, all results hold for the particular case that $\lambda = 0$.

In summary, we have that, if the specificity of the technical training α is high enough (to create a problem of *ex post* opportunism), the employer has to commit herself to an average pay of at least V' if she wants to maintain a good reputation. If an efficient educational program exists (condition (3) is satisfied), the firm will use the sponsorship of such program to reduce the cost of fulfilling the commitment. Moreover, as the example of Figure 1.3 shows, the proportion of workers sponsored will increase with α since those

workers not sponsored receive a worse payoff. Finally, if α is large enough¹⁵, all the workers in each generation should be provided with the course. Therefore, to the extent that α is related to the number of external bidders for the worker's technical skills in the industry, higher market concentration should make firms operating in such markets more willing to sponsor further education to their senior employees.

Along this section, it has been stressed the role of education sponsorship in making cheaper firm's upholding of good reputation as employer. The use of education as the *paradigm* of human capital provision has the advantages of being a largely studied topic and, probably, being easier to analyse empirically. Nonetheless, the results are applicable to many other forms of increasing workers human capital (either generally or not). This may include, for example, the provision of free health care or the improvement of working conditions. To the extent that these activities could represent an investment in the general productivity of employees, they would be more likely to be provided to senior workers in firms where the skills acquired on the job are rather specific.

1.3. Discussion

Several issues concerning to the relevance of the previous analysis will be discussed in this section, including the chances of the worker to finance himself the course and the possibility that senior employees had some bargaining power to take part of the returns to their specific skills.

If the investment in education is efficient, non-sponsored workers could, in theory, be willing to pay for it or, at least, achieve a co-financing agreement with their firms. Transaction costs, however, can prevent them from doing it. Even if the worker had perfect information about the returns to investment and their allocation, liquidity and credit constraints would probably stop him from paying his part (specially when the course is

¹⁵ If α is so large that either "*education is not valuable enough to attract prospective workers*" (that is to say, $S + (1-\alpha)\lambda V_I < V$) or "*the course is itself profitable for the firm*" ($\alpha\lambda V_I > c$) or both, all workers will be provided with it.

generally oriented). Moreover, other costs could be making more expensive for a worker to finance himself the instruction than what it is for the firm. First, firms seem to be in a better position than workers for a potential bargaining with, let us say, a graduate school. Second, part of the costs of the course (finding and hiring a temporary substitute, for example) is directly beard by the firm and cannot be cheaply transferred to the worker. In absence of the commitment concerns analysed in the previous section, the employer will not be prepared to bear the full cost of the course, unless the part of the returns that she can take pay for it¹⁶.

An alternative to the analysis of the model has to be considered: The issue of specific investments done by the firm¹⁷. Employers, especially in concentrated markets, may have done large investments (to take advantage of economies of scale, for example). The acquired assets are specific to the employees to the extent that they cannot be employed with different workers without incurring in a significant loss of value¹⁸ (specially in the case of employees with specific information). Under these circumstances, workers would gain monopolistic power with respect to the firm and, if they organise themselves properly, they could appropriate part of the returns generated by the employer's investment. In such case, the need of commitment by the firm would be lower¹⁹, since employees' bargaining position could allow them to ask for compensations may be even higher than V' (in that case, prospective workers would already have incentives to sign up with the employer).

¹⁶ There exist ways for the employer to increase her part of the returns of the investment. Contractual solutions are perhaps the most common; contracts including “golden handcuffs” that compel the workers to work for the firm at a fixed wage for a minimum of years after the training are often observed (the worker has usually to pay termination damages to the firm if he quits during that period). However, such contracts are usually costly and their enforceability is extremely constrained by legal issues.

¹⁷ The point of specific assets and appropriation, which stimulated a large literature, was firstly analysed by Williamson (1975) and Klein, Crawford and Alchian (1978).

¹⁸ The specificity may depend, for example, on the ability of the workers to prevent the firm from finding a substitute if they stop working. For a short discussion on the specificity in employment relationships, see Arruñada (1998); for a more general analysis of specific assets, see the fundamental paper of Klein and Leffer (1981)

¹⁹ Note that if employees can appropriate part of the returns to employer's assets, the firm would have incentives to invest less than what it would have been optimal.

Consequently, an employer that shares part of the quasi-rents of her physical assets with the employees would have low incentives to sponsor courses to their workers. Indeed, if such appropriation of quasi-rents increased worker's payoff over V' , the employer would be willing to pay the education only if it were itself profitable for her to do it. Moreover, if the bargaining power of the employees were high enough to allow them to take part of the specific returns of the course, the employer would have low incentives to sponsor even specifically oriented education.

Therefore, the effect of the specificity of worker's technical skills on the firm's sponsoring decision is predicted with different sign depending on the interpretation of such specificity. The previous section stressed the relationship between specificity of the initial training of a worker and his best outside opportunity: if it were completely general ($\alpha = 0$) worker's outside opportunity would probably be close to his productivity within the firm, making him more willing to sign up, regardless of the reputation of the employer. Furthermore, if such specificity depended on the concentration of the market, firms of competitive sectors would sponsor only courses with highly idiosyncratic components, while companies of concentrated industries could be willing to subsidise even highly general education to their workers (given that they are committed to increase their compensation in any case).

If programmers of an information technology firm learn the secrets of C++ with their experience in such firm, they can make equally good use of such skills in hundreds of other firms in the sector and, probably, next to their home. Therefore, the programmers will obtain compensation close to what they could have expected elsewhere before signing on, and the firm will not have to promise anything to potential employees. On the other hand, if a petrol refining company wants to hire, say, a chemical engineer for the support and analysis of its oil prospecting, and fails to credibly offer him a good career perspective, the potential worker will probably reject the offer. If he becomes an expert in oil prospecting it will not be easy for him to find an alternative job without incurring in high switching costs (and the employer will know it). Therefore, unless the firm offers him some real chances of improving the compensation for his skills in the future, he will prefer an alternative option in, for example, the textile industry. Following the main result obtained from the model, the

employer may find efficient the use the sponsorship of educational programs to reduce her cost of commitment.

The alternative interpretation of specificity, on the other hand, would lead to the opposite conclusion. Workers of firms in concentrated sectors may have bargaining power to appropriate part of the quasi-rents generated by the employer's investments. In such case, employees, especially senior ones, would be able to obtain high compensations, and little commitment would be needed by the firm to attract prospective workers. Only courses that offered very specific returns would be candidates to be sponsored by the employer. Furthermore, even this type of courses would be less likely to be provided by a firm in such situation, since the workers would also have power to appropriate a part of the specific component of the acquired human capital. Therefore, a clear conclusion can be obtained from this alternative interpretation: less training and education (of all kind) should be sponsored in the presence of specific assets, especially common in highly concentrated industries.

In order to test empirically the relevance of each of the arguments discussed, it would be ideal to have a survey of firms' human resources policy, including also data about the business environment of the firm, characteristics of the skills of the workers and the type of courses sponsored. It would probably provide us a clear idea of the role of the education sponsored by firms in maintaining their reputation as employers. Unfortunately, such ideal database does not seem to be available for us at the moment. In the next section, in turn, I will make use of the data available in the European Panel for Spain to make an analysis of the relationship between market concentration and firm's human resources policies. Although the data is provided at a rather aggregate level, it can help us to determine the factors may condition different human capital management policies.

1.4. Some Evidence

In this section, several pieces of evidence about the relationship between sector concentration, firms' educational policy and worker compensation structures are presented.

The analysis illustrates the differences in human capital investments and compensatory strategies of firms across sectors with different levels of concentration.

The Spanish section of the European Community Household Panel (ECPH) is a survey where a sample of more than 17,000 Spanish individuals were interviewed about many demographic and economic variables. From this sample, I selected the answers in 1995 to labour-related question of 3,338 not self-employed workers, non civil servant employees that provided information about their employment relationship and employer characteristics. The reasons for excluding from the sample civil servants are quite obvious, given the special characteristics of the employment in the public sector, especially in Spain, where the employer is basically not allowed to dismiss employees. I also excluded self-employed workers, since the interest of this study is to analyze the compensation of firms to their employers as different parties. Finally, it must be noticed that the number of observation vary accross the different regression performed between 2,907 and 3,338, depending on the number of observations with valid values for all variables in each case. The relevant variables used are described in Appendix B. The survey included several questions related to the training and education pursued by the worker. Among them, I chose the only one that asked the respondent employee whether “the employer provides (free or subsidised) education or training” to him/her. This question is asked among other similar references to the provision of several benefits, including health care, housing help, children care and leisure activities, which will be also analysed here. Some other questions in the survey directly asked the worker about the actual training or education pursued in the last year, and whether it was general or specific. These questions, however, fail to include any reference to who paid or provided such training (except in the case of vocational training) and will only be used later to analyse differences in returns to training and education across sectors.

The ECPH also included information about the industries where respondents’ employers were being employed, in a classification of 17 different sectors related to the 2-digits Spanish CNAE²⁰. This information was matched to the concentration indexes obtained by

²⁰ “Código Nacional de Actividades Económicas”

Bajo and Salas (1998) for the Spanish economy in 1993, using data from tax collection sources provided by the “Instituto de Estudios Fiscales “ of the Spanish Ministry of Economy²¹. The index of concentration used in this the present paper is the CR(4)²² measure of concentration in employment, which falls, by construction, between 0 and 1. I used concentration in employment instead of concentration in sales (typically used in industrial organisation literature), because it is expected to capture more closely labour market competition, in terms of the number of external bidders for workers’ skills. In any case, Bajo and Salas (1998), found very high correlation between both indexes (specifically, the correlation coefficient was 0.88). Index information from Bajo and Salas (1998) was supplied at a less aggregated level than information from the ECHP for some 13 of the 17 sectors considered. For those cases, I aggregated the indexes by weighting each sub-sector according to its economic importance, so that the matching between both sources of data could be done. This aggregation and the gap of two years between concentration index and employment data may induce some error in the measurement of industrial concentration in 1995. Nevertheless, this is probably the most accurate match that can be done between employment information and industrial concentration indexes, given the extreme scarcity of the latter and the fact that concentration rates do not change greatly from year to year. Furthermore, such lack of later information on industrial concentration prevents us from testing its effect on human capital provision using the panel dimension of the ECHP.

The main prediction drawn by the model of Section 1.2 is that firms should be more willing to provide general human capital to their workers in more concentrated sectors. As Figure 1.4 shows graphically, average levels of education and training sponsorship are higher in sectors with higher concentration. Obviously, this positive correlation could be caused by other factors that, being positively related to sector concentration, could affect to the costs

²¹ Such information is included in the publication “*Las empresas españolas en las fuentes tributarias*”, Instituto de Estudios Fiscales.

²² The four concentration ratio, CR(4) measures the joint market share of the four firms with the highest shares of the sector. Technically: $CR(4) = \sum_{i=1}^4 S_i$, where S_i represents in this case the labour market share as buyer, for each of these four firms.

and returns from the human capital investment. Firm size is probably the clearest example, since larger firms are more frequently found in concentrated industries and there may have scale advantages in the provision of training and education. Nonetheless, other variables including worker characteristics, type of employment relationship hold, and regional effects may have also an impact that has to be accounted for.

Table 1.2 shows the resulting marginal effects at the mean²³ from a Logit regression that estimates the probability of enjoying different benefits as a function of the measure of concentration considered and a set of control variables within the categories mentioned above²⁴. Although the special interest of this paper relies on education sponsorship, the provision of health insurance, housing help, leisure activities and children care are also included, given of their potential relation to firm-specific investments done by the worker.

As it can be observed from the first column of Table 1.2, concentration has a significantly positive effect on the probability that a worker gets sponsored education from his/her employer. Either because they are able to take a part high enough of the returns generated or because they have already committed to workers' compensations above market value, it seems that employers tend to pay more for the education and training of their employees in concentrated sectors.

Similarly, the provision of health care insurance by employers also appears positively related to industrial concentration in Table 1.2. As it is stated below, health care insurance

²³ Instead of presenting directly the coefficients obtained, I have chosen to present the estimated marginal effect that an increase of each relevant independent variable has on the probability of being awarded each of the event if the rest of the independent variable were took their mean value. For a further discussion on Logit technique, see Greene (1997) or Hamilton (1992).

²⁴ Specifically, individual characteristics include sex, years of job market experience and 2 dummies of highest educational degree achieved. Employment relationship characteristics include 2 dummies accounting for the type of contract hold, a set of 18 dummies of workers' occupational status, 3 dummies capturing the tenure of the worker with him/her employer, a dummy variable registering whether the employee works part-time only, a dummy registering whether the worker needs to use several languages at the job and another one registering whether the worker considers himself/herself overqualified for the type of work done.

may be considered a long-run compensation mechanism, more likely to be provided by employers in presence of specific human capital. Nevertheless, to the extent that it is also a way to provide workers with general human capital (health), results from the second column of Table 1.2 also give support to the implication from the model that more general human capital is provided by employers in concentrated sectors.

Non-wage benefits like housing help, leisure activities or health and children care are usually provided (instead of higher wages) when they involve a tax reduction or when they can be more efficiently contracted by the firm than by each worker individually (because of economies of scale or reduced adverse selection problems for example)²⁵. In any case, all four fringe benefits share the feature of being especially valuable for workers that expect to maintain a long-term relationship with their employers. If workers' human capital is more firm-specific in concentrated sectors, longer term employment relationships are expected, and the mentioned compensation forms should result more attractive in such settings. Congruently with this prediction, results displayed in the last three columns of Table 1.2 show positive effects of concentration on the likelihood of provision of all four benefits, although the estimated coefficient is only significant for the case of leisure activities.

The results presented in Table 1.2 do not support the idea that larger firms at concentrated sectors are “*hold up*” by employee-specific investments. On the one hand, all benefits are more likely to be provided by large employers. This could be due to the existence of economies of scale in their provision but it is, at least, consistent with the thesis that workers can extract higher quasi-rents in larger firms. On the other hand, it must be noticed that tenure and other individual worker characteristics do not seem to affect so much to the probability of benefit provision as firm characteristics do, so that it cannot be said that tenured workers are especially likely to obtain it. Moreover, the fact that larger firms seem to be also more willing to sponsor worker's investments in education undermines an explanation of labour relationships based on worker's appropriatory power that predicts a lower ability of the firms to capture the returns to such education.

²⁵ See Woodbury (1984) or Hart (1983) for a comprehensive analysis of the relationship between wage and non-wage compensation.

A more indirect way to check the reality of the model developed in this paper is to analyse how wage returns to tenure and training interact with the concentration of the industry. If higher concentration leads to higher investment in the training of tenured workers by their employers, wages and returns to tenure should be equal or higher in concentrated industries than in the rest of the economy (unless employers do not maintain a commitment with workers with respect to compensations). On the other hand, if there are more pre-existent commitments to wages above employees' outside opportunities in these industries, general education and training (either firm-sponsored or not) should provide workers from such industries with lower wage increases than the rest.

Table 1.3 shows the results from a regression of log-wages on industrial concentration, worker's tenure cumulated in their firm, vocational training and general education pursued last year and the same set of control variables included in the analysis of training sponsorship. Results reveal that workers from higher tenure groups earn higher wages, all else equal. Consistently with the predictions stated above, workers from concentrated sectors earn higher wages (as well as non-wage compensations) and the interactions between higher tenure dummy variables and concentration are either non-significant or significantly positive.

Unfortunately, the lack of panel dimension of the data in this analysis prevents us from estimating wage increases upon vocational training or general education course. Last column of Table 1.2 shows that, in concentrated sectors, workers who followed a vocational training in the year previous to the survey earn especially higher wages than those who didn't do it. The same positive interaction is found for general education, although in this case the moderating effect is only significant at the 10% level. This could mean that workers obtain larger wage returns from training and education in concentrated industries (contrary to the predictions of the model developed in the previous section). Nonetheless, it may be simply reflecting that employers from this industries perform better

at selecting the most suitable employees for training and education, since longer-term employment relationships give them more time to learn about workers' abilities²⁶.

In sum, the complementary evidence presented in Table 1.3 gives a weaker support to the predictions of the model developed in this paper than that of Table 1.2. Compensation seems to be overall higher at concentrated sectors and concentration does not affect negatively to workers' returns to firm tenure. On the other hand, although wage increases upon training and education cannot be estimated in our analysis, the positive interactions between concentration and "last year training and education attainment" suggest that wage increases upon education might not be lower in concentrated industries.

All in all, the results from this section show that firms from more concentrated sectors tend to care more about the human capital of their employees, either through training and education sponsorship, or through health care provision. This gives support to the main prediction of the analysis done in Section 1.2. Also consistently with that analysis, wages and wage returns to tenure are higher or similar at concentrated sectors than in the rest of the economy. Finally, it is much less clear whether training or educational courses cause smaller wage increases in concentrated sectors, as predicted by the model. Nonetheless, a correct answer to this last question can only be obtained with the information on wage increases that a panel data structure would provide.

An alternative theory based on employee appropriation of firm's quasi-rents seems difficult to be argued on grounds of this evidence. Indeed, tenured workers seem to obtain higher wages in concentrated industries, especially those employees with more than 15 years of service. Nevertheless, tenure does not appear as an important characteristic to explain the benefits analysed in Table 1.2, which are mostly more likely to be provided in larger and concentrated industries. Furthermore, large employers at concentrated sectors would not be more willing than other firms to provide human capital to their employees, as results show, unless they had the power to obtain profit from it.

²⁶ Note that industrial concentration, as measured by CR(4), is significantly correlated with worker's firm tenure.

1.5. Summary and Conclusions

Many firms pay for the training and education of their workers, even for the generally applicable part of such instruction, as many economists have found in the last years. The model developed in this paper explains why, even when it seems unprofitable for them to finance these investments, employers that have to maintain a good reputation are likely to do it. Since the hazards for employees of becoming too specialised make the need of such reputation especially important in concentrated sectors, more sponsoring should be observed there.

Workers of firms operating in concentrated industries acquire skills that fit worse outside the training firm. This provides them with lower valued alternative employment options, giving monopsonistic power to the firm²⁷. Under these circumstances, prospective employees will be reluctant to sign up with an employer, unless she can credibly commit herself to compensate them. I have argued that an employer in such circumstances may be more willing to sponsor further education, even of a general kind, to her workers as a profitable way of carrying out such commitment. In general, there are transaction costs that stop workers from financing themselves such human capital investments. Firms, on the other hand, may be reluctant to sponsor them if, in principle, they cannot take the returns to such investment. If the employers have to commit in any case to pay wages above workers' outside options, they will be able to capture at least part of the returns generated²⁸.

The evidence presented in Section 1.4 shows that firms in concentrated sectors pay similar or higher wage returns to tenure and are more willing to sponsor their human capital acquisition of their employees (in the form of training, education and health). These

²⁷ Moreover, if the number of firms in the market is low, an implicit agreement between them to avoid "raiding" each other is easier to be achieved and maintained. An example of this "co-operative" behaviour can be found in the elite Japanese firms in the 70s and 80s.

²⁸ Under imperfect information, sponsoring education may be also a more effective way to signal the firm's commitment with the worker's career. It could be easier for potential employees to observe whether the employer is sponsoring education to her present workers than to investigate the compensation paths obtained by senior workers.

findings are consistent with the predictions of the model, although not conclusive in ruling out alternative explanations, especially those that assume high bargaining power of workers with strong specific knowledge.

From a practical point of view, the main implication of the analysis done along the paper is that less competition for skilled labour may result in (efficiently) increased investment in human capital. This is because shifting most of the bargaining power towards one of the parties (the monopsonistic firm) helps to avoid transaction costs that lead to underinvestment in human capital.

On the theoretical part, further research on the determinants of education sponsorship should pay attention to the problem of signalling in absence of perfect information about the workers' abilities. If the employer is able to learn about the workers' ability and their fit to the firm during the on-the-job training period, she may want to sponsor education only to her best employees; first, it allows her to take advantage of the complementarity between natural ability and acquired skills and, second, it could be used as a screening device designed to attract better employees²⁹. In such setting, the bad consequence for the employer is that she would signal to the rest of the employers who are the best workers or, more exactly, who are the ablest workers using the skills needed to become eligible for the further training. In that case, the employer, who could have gained an informative advantage about the ability of the worker, can lose it through the sponsorship of the course. Such problem is expected to be less important in the case of less competitive industries, given that there are less alternative employers interested in the ability of the worker using the acquired skills.

As for the empirical part, it remains to find out the extent to which employers of concentrated sectors are able to capture the returns to human capital investments. In this sense, an accurate evaluation on how individual wage increases after training and education

²⁹ If employees differ in ability, and the employer can find out such ability during the period of on-the-job training, she will be able to hire the best talents, as long as higher ability workers perceive a higher probability of being sponsored.

vary across industries is needed. On the other hand, firm-level evidence describing more in detail firms' policies with respect to human capital would also be useful to analyse the effects of market concentration. Although it would lack the ability to account for worker characteristics that surveys as the ECHP have, it would allow a higher precision to measure organisational attitudes towards human capital provision and their relationship with labour market circumstances.

1.6. References

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1.7. Tables

Table 1.1: Evolution of Expenditure of US firms in Corporate training (1987-1999)

Year	1987	1991	1995	1999
Total Estimated Expenditure of US firms in Corporate Training (millions of US\$)	2,000	4,000	8,000	16,000

Sources: The Economist (1992), Goett (1996), Reingold (1997) and Reingold, Schneider and Capell (1999)

Table 1.2: Logit Regression of the Probability of Obtaining each Benefit. Marginal Effects at the Mean.

<i><u>VARIABLE</u></i>	EDUCATION SPONSORSHIP	HEALTH INSURANCE	HOUSING HELP	CHILDREN CARE	LEISURE ACTIVITIES
<i>CR(4) Index</i>	0.201** (0.062)	0.297** (0.101)	0.014 (0.016)	0.018 (0.014)	0.051** (0.020)
<i>Size 5 to 19</i>	0.084** (0.028)	0.190** (0.030)	-0.001 (0.006)	0.011 (0.011)	0.023 (0.018)
<i>Size 20 to 49</i>	0.152** (0.038)	0.278** (0.031)	-0.004 (0.006)	0.024* (0.018)	0.050* (0.030)
<i>Size 50 to 99</i>	0.195** (0.046)	0.347** (0.031)	0.004 (0.009)	0.031** (0.023)	0.087* (0.044)
<i>Size 100 to 500</i>	0.364** (0.046)	0.419** (0.027)	-0.002 (0.007)	0.061** (0.003)	0.158** (0.057)
<i>Size >500</i>	0.446** (0.042)	0.435** (0.026)	0.036** (0.016)	0.064** (0.003)	0.268** (0.071)
<i>Public</i>	0.001 (0.033)	0.082 (0.056)	0.045** (0.026)	0.034** (0.020)	0.010 (0.016)
<i>Sex</i>	-0.013 (0.015)	-0.009 (0.025)	-0.011** (0.005)	0.004 (0.003)	-0.010* (0.006)
<i>Secondary</i>	0.069** (0.020)	-0.056** (0.028)	-0.004 (0.004)	0.002 (0.005)	0.002 (0.012)
<i>Third level</i>	0.073** (0.024)	-0.007 (0.035)	0.005 (0.007)	0.005 (0.006)	0.016* (0.010)
<i>Tenure 2 to 5</i>	-0.016 (0.019)	0.049 (0.031)	-0.002 (0.006)	0.003 (0.007)	0.004 (0.010)
<i>Tenure 6 to 14</i>	-0.010 (0.021)	0.113** (0.034)	0.000 (0.007)	0.007 (0.008)	-0.004 (0.009)
<i>Tenure > 14</i>	-0.031 (0.021)	0.038 (0.036)	0.007 (0.008)	0.005 (0.007)	0.002 (0.010)
<i>Part time</i>	-0.024 (0.026)	-0.066 (0.044)	-0.013** (0.005)	-0.004 (0.006)	-0.004 (0.012)
<i>Permanent</i>	0.026 (0.036)	0.340** (0.051)	0.003 (0.009)	0.009 (0.010)	-0.025 (0.016)
<i>Fixed-term</i>	-0.018 (0.035)	0.246** (0.037)	-0.002 (0.009)	-0.003 (0.010)	-0.028** (0.010)
<i>2nd Language at job</i>	0.034* (0.018)	0.024 (0.028)	-0.003 (0.004)	0.004 (0.004)	0.009 (0.007)
<i>Over- qualified</i>	0.003 (0.014)	0.023 (0.021)	-0.000 (0.004)	0.005 (0.003)	0.004 (0.005)
<i>Regional Dummies</i>	Yes	Yes	Yes	Yes	Yes
<i>Occupat. Dummies</i>	Yes	Yes	Yes	Yes	Yes
<i>Num. of obs.</i>	3273	3273	3273	3070	2907
<i>L-R test χ^2</i>	854.09**	812.86**	101.08**	141.89**	281.43**

* Significant at 10%. ** Significant at 5%.

Table 1.3 : OLS Log-Wage Regression. Dependent variable: Log (hourly wage). Regression coefficients

<i><u>VARIABLE</u></i>	<i><u>Model I</u></i>	<i><u>Model II</u></i>	<i><u>Model III</u></i>	<i><u>Model IV</u></i>
<i>CR(4) index</i>	0.369** (0.065)	0.367** (0.065)	0.138 (0.107)	0.033 (0.111)
<i>Tenure 2 to 5</i>	0.035* (0.019)	0.038* (0.019)	-0.004 (0.031)	-0.012 (0.032)
<i>Tenure 6 to 14</i>	0.101** (0.022)	0.104** (0.022)	0.092** (0.032)	0.089** (0.032)
<i>Tenure > 14</i>	0.242** (0.023)	0.246** (0.024)	0.171** (0.032)	0.493** (0.032)
<i>CR(4) × (Tenure 2 to 5)</i>			0.311* (0.177)	0.332** (0.176)
<i>CR(4) × (Tenure 6 to 14)</i>			0.121 (0.161)	0.118 (0.160)
<i>CR(4) × (Tenure > 14)</i>			0.486** (0.146)	0.493** (0.147)
<i>Vocational Training</i>		0.029 (0.021)	0.026 (0.021)	-0.098** (0.040)
<i>CR(4) × Vocational</i>				0.696** (0.192)
<i>General Education</i>		0.021 (0.021)	0.023 (0.021)	-0.038 (0.039)
<i>CR(4) × General</i>				0.366* (0.203)
<i>Number of observations</i>	3338	3338	3338	3213
<i>R²</i>	0.51	0.51	0.51	0.51

In addition to the variables showed here, all models include the same control variables included in Table 1.2.

* Effect is significant at 10%. ** Effect is significant at 5%.

1.8. Figures

Figure 1.1: Extensive Form of the Stage Game

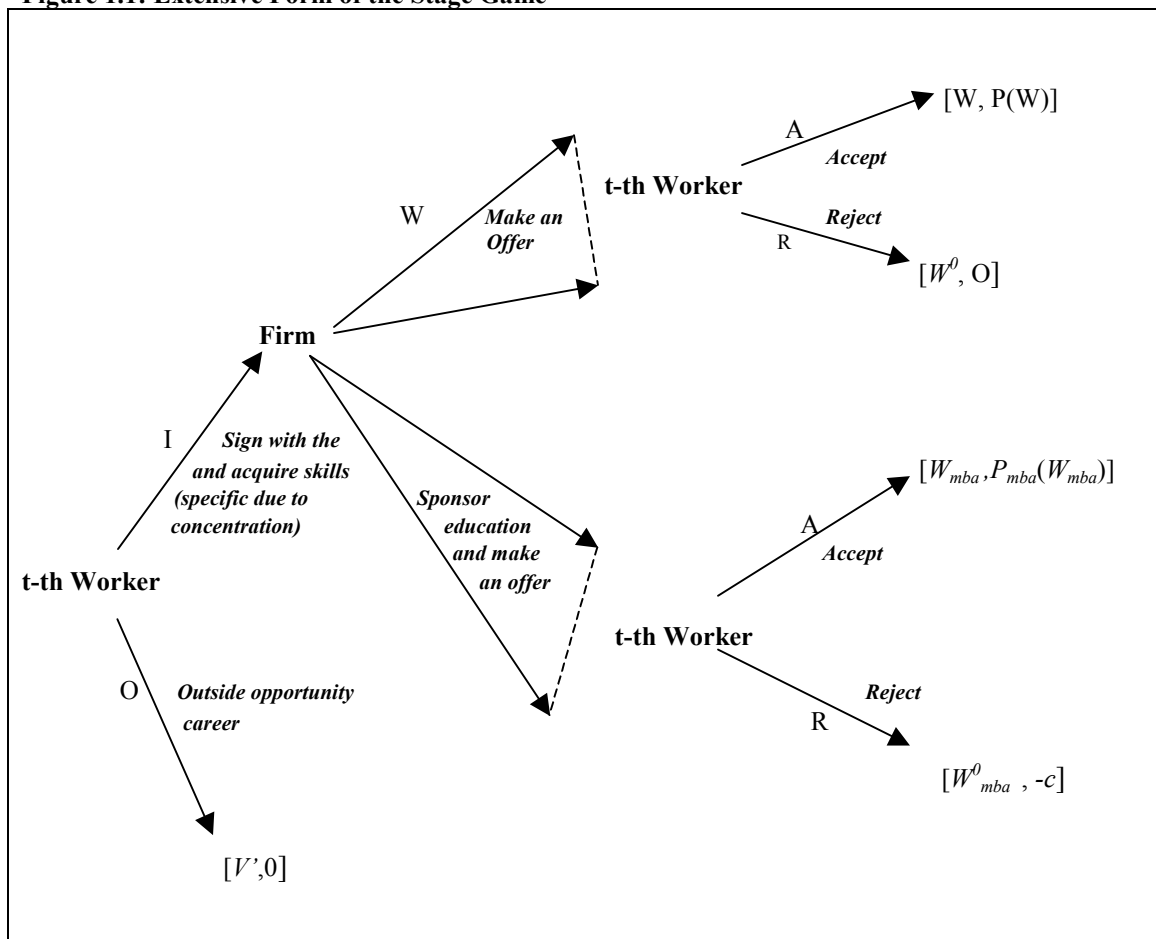


Figure 1.2: Summary of Equilibrium Outcomes

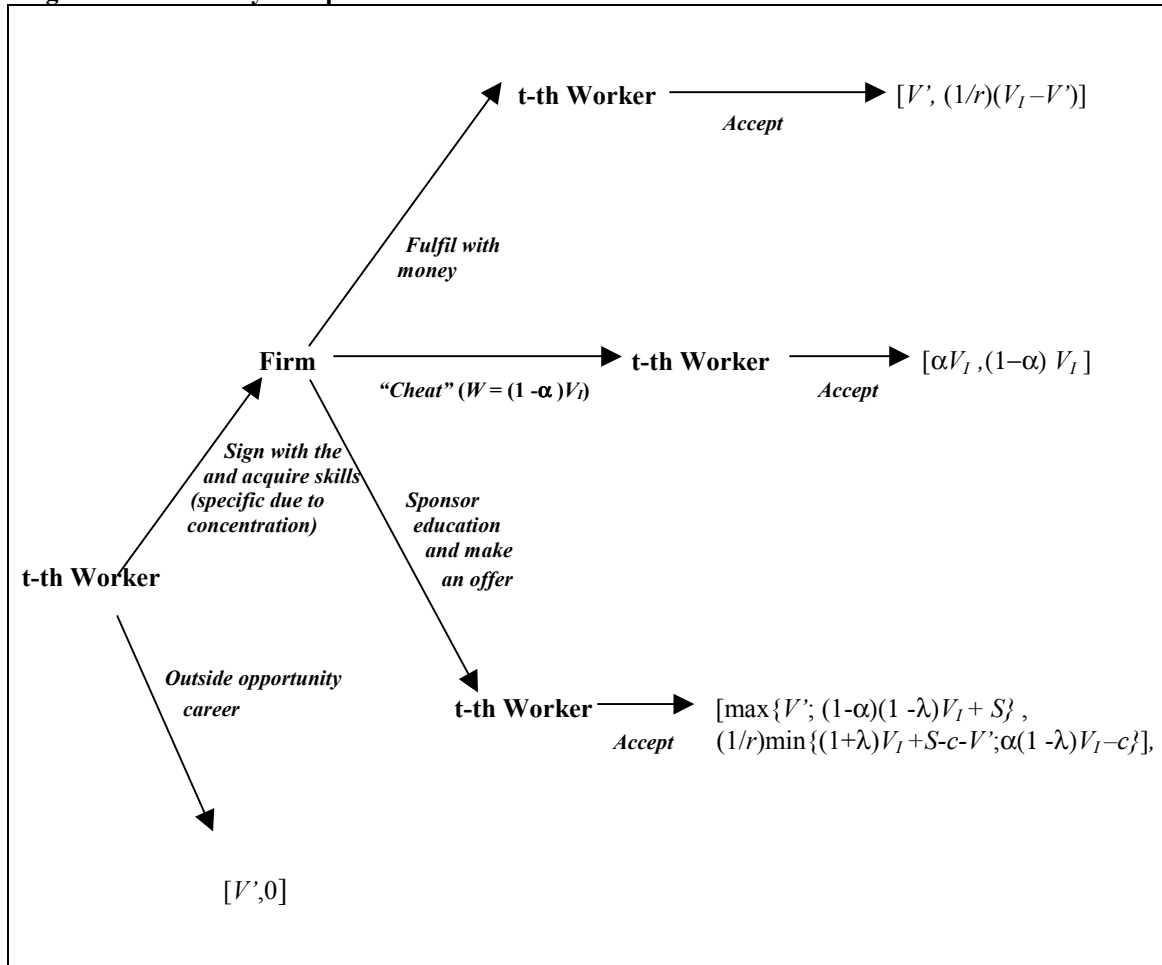
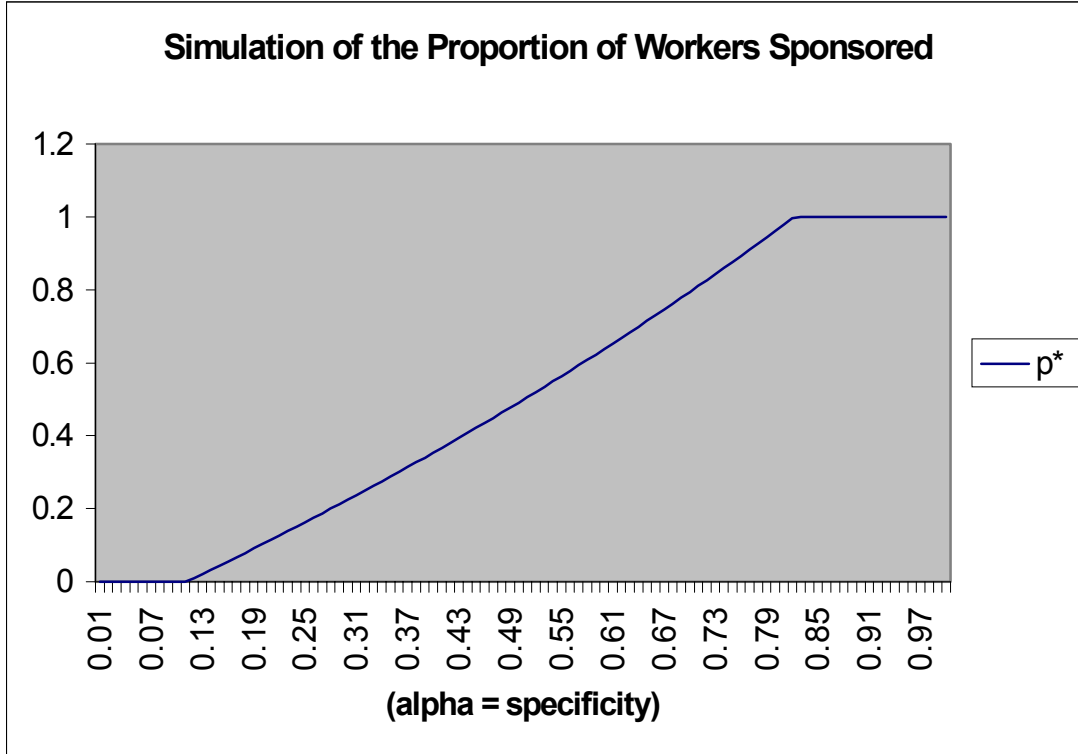


Figure 1.3: Simulation of the Proportion of Workers Sponsored as a Function of α

Value of exogenous variables:

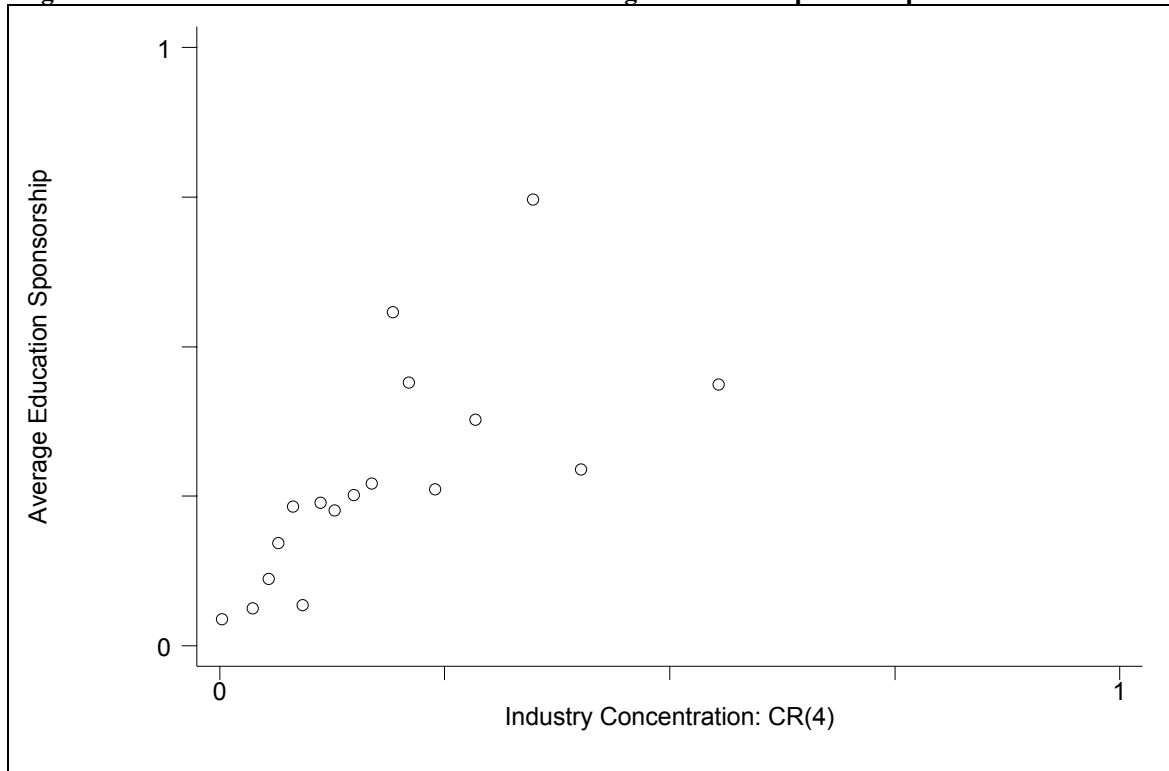
$$\begin{aligned}V' &= 4 \\V_I &= 4.5 \\ \lambda &= 0.25 \\ S &= 3 \\ c &= 3.5\end{aligned}$$



Notes:

- 1) The investment in education is an efficient investment ($S + \lambda V_I > c$) but apparently unprofitable for the firm ($\lambda \alpha V_I < c$)
- 2) There is a problem of *ex post* opportunism as long as $\alpha > 0.12$; otherwise no worker will be sponsored.
- 3) If $\alpha > 0.82$, sponsorship of the course is not enough to attract prospective workers, and all the workers are sponsored.

Figure 1.4: Labour Market Concentration and Average Education Sponsorship.



9.- Appendix A

A.1.-Proof of Propositions 1.1, 1.2 and 1.3:

Let us start from the arguments exposed before the statement of Proposition 1 that lead us to the conclusion that the only possible equilibria are Equilibrium 1.1 to Equilibrium 1.3. Then, the process to prove Proposition 1 can be organised in four steps:

(a) Show that Equilibrium 1.3 (firm is unable to hire any worker) is always a sub-game-perfect Nash equilibrium:

Here, we have to show that each of the strategy of the players is an optimal response to the other agent's one in every feasible sub-game that could be faced.

Let us begin with the t -th worker; first, the part of his strategy corresponding to the third movement “accept the offer if it is not smaller than his outside opportunity and reject it otherwise” is clearly a best response to any strategy of the firm, since it guarantees him the best payoff from those available at that point. Second, the part of his strategy corresponding to the first movement, “not agree to work for the firm and follow his best outside opportunity” is the best response to the employer's equilibrium strategy in the second movement, “cheat the expectations of the employee”, since $V' > (1 - \alpha) V_I$ by assumption.

As for the employer, the strategy “cheat the expectations of any worker se could hire” in the t -th period is the best response to the $(t+1)$ -th worker equilibrium strategy of “not agree to work”.

(b) Show that Equilibrium 1.1. (firm fulfils with money) is a sub-game-perfect Nash equilibrium if and only if condition (1) holds and condition (3) is not strictly satisfied:

In this case, it is quite obvious that the strategy of the t -th worker is a best response to the strategy of the firm. As it has been above, his strategy in the third movement (the same of Equilibria 1.2 and 1.3) allows him to take the best payoff available in that moment; moreover, his strategy in the first movement is optimal given that the firm fulfils, since he takes V' , his best possible payoff.

With respect to the employer, the optimality of the strategy “fulfil with money” in each sub-game faced is subject to the condition that the payoff obtained from doing so is higher than any other strategy. Nevertheless, there are only two alternative strategies to be compared with (since the rest have been shown to be “dominated strategies”): cheating and fulfilling with education. First, would it better for the employer to cheat the expectations of the worker by paying him only is *ex post* outside opportunity? The answer to this question depends on whether condition (1) holds or not; given that the strategy of the $(t+1)$ -th worker leads him not to trust in the employer if she has cheated anyone before, the benefits from cheating are αV_I in the t -th period, while those from “fulfilling with education” are $V_I - V'$ in all the remaining generations. Therefore, with an inter-generations rate of discount r , the condition for fulfilling with cash to be at least as good as the cheating option is (equivalent to condition (1)):

$$\alpha V_I \leq \sum_{t=1}^{\infty} (V_I - V') / (1 + r)^t$$

The second alternative strategy that has to be ruled out is that the employer fulfilled the commitment providing education to the senior employee. In that case, the payoff for the firm in each generation would be the full productivity of the worker minus the compensation paid to the worker and the cost of education, $S + (1 + \lambda)V_I - c - V'$ so that the condition for “fulfilling with money” to be as least as profitable as “fulfilling with education” is:

$$S + (1 + \lambda)V_I - c - V' \leq V_I - V'$$

Note that this condition is equivalent to condition (3) not being strictly satisfied. If the cost of the course is at least as high as its full return, then just paying cash is an optimal way of fulfilling.

(c) Show that Equilibrium 1.2. (Firm fulfils with education) is a sub-game perfect Nash equilibrium if and only if conditions (2) and (3) are satisfied

As in Equilibrium 1.1, it is straightforward that the worker strategy here is optimal given the firm's strategy, since it allows him to achieve the best payoff available in each moment. On the employer's side, the optimality of a “fulfil with education” as response to the worker's strategy has to be shown in comparison with the “cheating” and “fulfil with money” strategies by checking the resultant payoffs in each case, as it has been done in part (b). Thus, taking the above described one-period payoffs for each of the strategies, and taking into account that only fulfilling enables the worker to obtain payoffs in the following generations, the conditions for “fulfil with education” to be at least as good strategy as “cheat” and “fulfil with education” are, respectively:

$$\alpha V_I \leq \sum_{t=1}^{\infty} [S + (1 + \lambda)V_I - c - V'] / (1 + r)^t$$

$$V_I - V' \leq S + (1 + \lambda)V_I - c - V'$$

Note that both conditions are equivalent to conditions (2) and (3) respectively.

(d) Show that either Equilibrium 1.1. or Equilibrium 1.2. exists (as sub-game-perfect Nash Equilibrium) it will prevail over Equilibrium 1.3.

Let us suppose that conditions for Equilibrium 1.1 or 1.2 hold; then the firm can credibly promise to the worker $V' + \varepsilon$, with $\varepsilon \rightarrow 0$. If the employer has incentives to maintain her promise for V' (this is, if either (1) or (2) or both holds), she will be willing also to honour it for $V' + \varepsilon$; then (using backwards induction as refinement), the employer will agree to work for the firm, leading to either Equilibrium 1.1 or 1.2, which corresponding outcomes are the ones described in Figure 1.2 and in the statement of the proposition.

Note that:

- Propositions 2.1, 2.2 and 2.3 can be shown in a similar fashion, substituting conditions (2) and (3) by (4) and (5) respectively.
- The proof of Proposition 3 can be also done in an analogous way to Proposition 1, since it is only its generalisation. In this case Equilibria Sets 2.1 and 2.2a should substitute Equilibria 1.2 and 1.3 respectively.
- As for Proposition 4, the same method can be used for its proof: first, show that Equilibrium 1.3 is always a sub-game-perfect Nash equilibrium; second, show that any equilibrium from Equilibria Set 2.3 is a sub-game-perfect Nash equilibrium if and only if condition (1) holds and condition (7) are not strictly satisfied; third, show that Equilibrium 2.2b is a sub-game perfect Nash equilibrium if and only if conditions (7) and (8) hold; and fourth, show that if either Equilibrium 2.2b or any equilibrium from 2.3 is sub-game perfect, it will prevail over Equilibrium 1.3.

A.2.- Derivation of Condition (8)

The condition “fulfil with the education of a proportion p^* of workers” to be a better strategy for the firm than “fulfil with money” is:

$$p^* [(1+\lambda)\alpha V_I - c] + (1-p^*)\alpha V_I \geq V_I - V' \quad \leftrightarrow \quad \alpha V_I + p^* (\lambda\alpha V_I - c) \geq V_I - V'$$

Substituting in the latter expression the p^* optimal described in (6), simplifying and re-arranging terms, we have the following inequality:

$$(c - \lambda\alpha V_I) / [\lambda(1 - \alpha)V_I + S] \leq 1$$

From where we obtain:

$$c \leq \lambda V_I + S$$

Note that Condition (8) is weaker than condition (5) as long as the investment in education is valuable enough to attract prospective workers ($S + (1+\lambda)(1-\alpha)V_I \geq V'$)

$$V' - (1-\alpha)V_I + \alpha\lambda V_I \geq c \quad \rightarrow \quad \lambda V_I + S \geq c$$

Since:

$$S + (1+\lambda)(1-\alpha)V_I \geq V' \quad \leftrightarrow \quad S + \lambda V_I - \lambda\alpha V_I + (1-\alpha)V_I \geq V' \quad \leftrightarrow \quad \lambda V_I + S \geq V' - (1-\alpha)V_I + \alpha\lambda V_I$$

10.- Appendix B: Description of the data

The ECHP variables used for the empirical section is described in the following table:

Variable	Description	Measurement	Sample Mean	Standard Deviation
<i>Hourly Wage</i>	<u>Stated Monthly Wage</u> (Weekly Working Hours $\times$ (4.286))	Spanish Pesetas	821	502.13
<i>Education Sponsorship</i>	Whether the firm provides it or not	No = 0 Yes =1	0.266	0.442
<i>Health Insurance</i>	Whether the firm provides it or not	No = 0 Yes =1	0.472	0.499
<i>Housing Help</i>	Whether the firm provides it or not	No = 0 Yes =1	0.032	0.176
<i>Children Care</i>	Whether the firm provides it or not	No = 0 Yes =1	0.043	0.202
<i>Leisure Activities</i>	Whether the firm provides it or not	No = 0 Yes =1	0.076	0.264
<i>Sex</i>	Sex of respondent	Male = 0 Female =1	0.346	0.476
<i>Tenure < 2</i>	Whether working with current employer is less than 2 years	No = 0 Yes =1	0.307	0.461
<i>Tenure 2 to 5</i>	Whether working with current employer is between 2 and 5 years	No = 0 Yes =1	0.173	0.378
<i>Tenure 6 to 14</i>	Whether working with current employer is between 6 and 15 years	No = 0 Yes =1	0.204	0.403
<i>Tenure >14</i>	Whether working with current employer is more than 14 years	No = 0 Yes =1	0.287	0.452
<i>Primary</i>	Maximum educational degree achieved is primary or below	No = 0 Yes =1	0.544	0.498
<i>Secondary</i>	Maximum educational degree achieved is secondary	No = 0 Yes =1	0.200	0.400
<i>Third level</i>	Maximum educational degree achieved is third level	No = 0 Yes =1	0.256	0.436

Variable	Description	Measurement	Sample Mean	Standard Deviation
<i>CR(4)**</i>	CR(4) Index for the labour market	Values in the range [0,1]	0.166	0.117
<i>Size < 5</i>	Number of employees in workplace is lower than five	No = 0 Yes =1	0.226	0.418
<i>Size 5 to 19</i>	Number of employees in workplace is between 5 and 19	No = 0 Yes =1	0.285	0.451
<i>Size 20 to 49</i>	Number of employees in workplace is between 20 and 49	No = 0 Yes =1	0.151	0.358
<i>Size 50 to 99</i>	Number of employees in workplace is between 1 and 4	No = 0 Yes =1	0.093	0.290
<i>Size 100 to 500</i>	Number of employees in workplace is between 100 and 500	No = 0 Yes =1	0.110	0.313
<i>Size >500</i>	Number of employees in workplace is higher than 500	No = 0 Yes =1	0.135	0.341
<i>Public</i>	Whether the respondent works for the public sector (civil servants excluded)	No = 0 Yes =1	0.192	0.394
<i>Part time</i>	Whether the respondent works part time	No = 0 Yes =1	0.071	0.257
<i>Permanent</i>	Whether the respondent holds a permanent contract with the employer	No = 0 Yes =1	0.592	0.492
<i>2nd Language at job</i>	Whether the respondent's job involve the use of a foreign language	No = 0 Yes =1	0.216	0.412
<i>Overqualified</i>	Whether the respondent considers that he/she is overqualified for his/her job	No = 0 Yes =1	0.216	0.412
<i>Fixed term</i>	Whether the respondent holds a fixed-term contract with the employer	No = 0 Yes =1	0.331	0.471
<i>Casual</i>	Whether the respondent is employed in a casual work with no contract	No = 0 Yes =1	0.077	0.267
<i>Vocational Training</i>	Whether respondent pursued any vocational training course last year	No = 0 Yes =1	0.125	0.328
<i>General Education</i>	Whether respondent pursued any general education course last year	No = 0 Yes =1	0.122	0.331

* The value 4.286 corresponds to the exact number of weeks contained in a 30-days month.

** The CR(4) Index of concentration is the result from matching ECHP information on employment sector to industrial concentration data available in Bajo and Salas(1998) through own computations.

CHAPTER 2

Evidence on Training and Career Paths:
Human Capital, Information and Incentives

2.1. Introduction

A large part of the literature concerning task assignment and career paths recognises the important role of human capital accumulation. Nevertheless, little empirical research has been done regarding the effect of job related training provided to workers on their career progress. In this paper I deal with this issue by estimating the probability of both internal promotion and quit for better job in relation to training using both random-effects and fixed-effects panel data estimators for qualitative variables.

Promotion systems may be simple institutional mechanisms to provide incentives to lower level workers to exert effort at their jobs. However, if such effort includes learning firm-specific skills or if the promotion decision is motivated by a better allocation of talents, any job-related training carried out by the worker should have a role in the promotion decision. An in-depth analysis of the influence of job-related training on subsequent career progress and the joint effect of training and promotion on wages will be useful to disentangle which of the different views of promotions suits globally better to the labour market reality.

The only empirical work published to date that included training as a determinant of promotion receipt is Pergamit and Veum (1999) who used the 1989 and 1990 samples from the American National Longitudinal Survey of Youth (NLSY) to analyse the causes and consequences of promotion, including training among the variables of interest. Their study of the relationship, however, only includes cross-sectional estimators, since the specific questions about job changes were not part of the longitudinal questionnaire. Other studies that analyse the determinants and consequences of promotions are McCue (1996) using the American Panel Study of Income Dynamics (PSID) for period 1976-1988 and Francesconi (2001) using the British Household Panel Survey (BHPS) for the 1991-1995 waves. All of them use (continuous and discrete-time) random effects probability models to give a description of what type of workers are more likely to obtain promotions. Sicherman and Galor (1990) also used data from the 1976-1981 waves of the PSID to analyse determinants of within-firm and between-firms career moves. Consistently with their model, they found

that workers whose estimated probability of promotion was high but did not get the promotion were more likely to leave their firm.

Most of the relevant detailed evidence regarding career paths, however, comes from single firm evidence³⁰. Indeed, some papers like Medoff and Abraham (1980) and, especially, Baker Gibbs and Holmstrom (1994) stated the following stylised facts about task assignment and careers: (i) high correlation between measured worker's productivity and promotion prospects (ii) (partial) attachment of wage growth to promotions, (iii) serial correlation of wage increases and promotions, (iv) existence of *fast tracks*³¹ and (v) extremely low frequency of demotions. The subsequent building of theoretical models of careers in organisations, which will be summarised in the next section, have been largely conditioned by these results.

In this paper, I use twelve waves from the BHPS (1991-2002) to investigate specifically how job-related training affects the chances that a worker has of obtaining a career improvement, either in the form of a promotion or a quit for a better job, and how training and promotion interact in boosting wage growth. The first question is essential to evaluate to what extent training provides workers non-pecuniary rewards in the form of higher probabilities of a position upgrade³². The second issue is important in order to distinguish which part of a wage increase is due to training and which to promotion when they happen together and to what extent they complement each other. Overall, analysing both questions provides a framework to investigate which of the existent theories on human capital accumulation and task assignment fits better the reality of career paths in British firms.

The contribution of the results obtained in this work is twofold. On the one hand, the presented evidence shows what empirical shortcomings have each of the set of theories

³⁰ See report by Gibbons and Waldman (1999a)

³¹ The definition of *fast tracks* is basically this: Workers that have been promoted more quickly to a given level in the hierarchy of a firm tend to be promoted more quickly than the rest to the next level.

³² Francesconi (2001) reported significant increases in job satisfaction reported by workers, which not only affected to "satisfaction with pay", but also to "satisfaction with job itself".

analysed here and the extent to what each of them can be overcome. On the other hand, important sex differences are found in the way that training affects career moves and in the way that training and promotion affect wage growth. This suggests that sex differences in career paths and earnings should not be explained in terms of a single theory. Rather, they the career of men and women seem to fit in different theoretical paradigms.

The paper is organised as follows. In the next section, I summarise and broadly classify the different theories dealing with career dynamics in organisations, stressing the point on the role that is expected to play a change in workers' human capital through job-related training. Such predictions are then evaluated empirically with the BHPS data. In section 2.3, this is done generally for the whole sample of male and female workers. In section 2.4, the analysis is done separately for general and specific training, and segregating the sample by age and tenure groups. The last section concludes by giving an overall balance of the ability of each set of theories to fit these findings and making some recommendations for further research.

2. 2. Background

Theories regarding task assignment and career paths of workers within firms were firstly designed to accommodate some generally observed facts such as the existence of well-defined job ladders and seniority rules usually governing their dynamics. Later theoretical models have also been able to explain more recent findings such as the low frequency of demotions or the existence of fast tracks. Despite the particularities of each contribution to this literature, it is possible to distinguish some “broad” groups of theories that share their main relevant features: *i)* theories that rely on human capital accumulation and gradual (symmetric) learning by firms of workers' ability; *ii)* theories that consider such learning as asymmetric in favour of initial employers and *iii)* theories that remark the role of promotions as providers of incentives in organisations. These sets of theories, whose main predictions are summarised in Appendix A, are briefly described below.

2.2.1. Human Capital and Information

Promotions may be the natural *consequence of the acquisition of skills that are more productive at higher-responsibility jobs*. A simple example can illustrate this: let h_{it} be the amount of skills hold by worker i at period t , and $b_j + c_j h_{it}$ his/her productivity at job j ; the potential career of the worker is defined by a number of different jobs, where higher levels are defined by $c_{j+1} > c_j$ and $b_{j+1} < b_j$, so that a worker is efficiently promoted from job j to job $j+1$ when his/her amount of skills oversteps the threshold h' such that $b_j + c_j h' = b_{j+1} + c_{j+1} h'$. Job-related training would then lead to higher probabilities of promotion as long as it increases h_{it} . The most comprehensive version of this approach is the model by Gibbons and Waldman (1999, 2003)³³. They consider the effective ability of worker i at period t , $h_{it} = \theta_i f(x_{it})$, as a complementary combination of individual ability θ_i , learned progressively by all potential employers, and the human capital obtained at a decreasing rate through labour experience, $f(x_{it})$. They obtain then a set of predictions that accommodate well Baker et al.'s (1994) findings. Although the authors do not make any explicit reference to job-related training, it is straightforward from their model that any increase in the amount of human capital should boost promotion probabilities. Moreover, if the training investment decision is related to a positive update in the belief of the market about worker's ability, the decision itself will be correlated with higher promotion prospects and larger (although not necessarily strongly larger) wage increases.

2.2.2. Asymmetric Information

A related set of theories has stressed the strategic role of promotions in a setting of *private information* (Waldman 1984, 1990; Bernhardt 1993, 1995; and, less explicitly, Milgrom and Oster, 1987). In terms of the above example, the basic common point of these approaches is that incumbent employers have better information than other potential

³³ There are several previous models inspired by this approach, such as Sattinger (1975) or Rosen (1982). In this paper, I will focus on the Gibbons-Waldman's one because it generalizes and enriches most of them and draws similar predictions.

employers about their workers' ability θ_i . This informational advantage allows them to pay tenured workers below their current productivity. In the attempt to preserve such private information, employers fail to promote some workers that would be more productive at higher-level jobs. The result is that promotion rates will be lower than optimal and wages will be mostly attached to job levels, with low within-category variation. As suggested by Bernhardt (1995), the relationship of training and promotion in this setting will be positive as long as the current employer is actively involved in such training and this can be observed by other potential employers. Since the training firm reveals to the market that the worker is able enough to make profitable the investment, part of the wage increase after training will be due to the positive market update of the employee's expected productivity and a subsequent promotion would disclose less information. For the same reason, when training and promotion are observed to occur together, each of their wage returns are expected to be lower than when awarded separately. These *asymmetric information-related effects* (lower promotion rates, higher correlation between training and promotion, higher returns to training and to promotion with negative interactions) will be more important for those workers whose ability is more uncertain to potential employers; this is likely to be the case of younger workers, immigrants and, less clearly, of racial minorities³⁴.

2.2.3. Incentives

Other theories depict “*promotion schemes*” as contracts designed to provide incentives for (specific) human capital accumulation, rather than its consequence (see Carmichael, 1983; or Prendergast, 1983). Following these models, promotion prospects should depend importantly on seniority, but also on job-related training receipt, as long as it is of a firm-specific kind. Wages should be greatly attached to jobs (and therefore within-firm wage growth to promotions); furthermore, returns to specific training should depend mostly on promotion achievement.

³⁴ Milgrom and Oster (1987) developed their argument of the “invisibility hypothesis” in explicit relationship to population minorities. In empirical terms, however, it is very difficult to separate any effect coming from the “invisible” status of minorities from the effect of social and educational conditions.

A related stream of literature presents “*promotion systems*” as the incentive for workers to work hard (Lazear and Rosen 1981, Chang 1996, Fairburn and Malcomson 2001, Baker, Jensen and Murphy, 1988). Either in the form of the prize of a *tournament* or an automatic reward to “*stayers*” in *up or out* settings, promotions are argued to be the *carrot* that leads workers to put effort at the workplace. If a promotion were just a nominal change to justify the reward for higher effort, it should be significantly related to indicators of effort such as overtime work, while training or other forms of human capital accumulation would turn out rather irrelevant. The effect of effort on wage growth would depend on the obtaining the position upgrade, while returns to training should be independent of it.

Theories that remark the institutional role of promotions in providing incentives (either to effort or to obtain specific human capital) instead of being a mere question of market-induced efficient task assignment are strongly related to the internal labour markets approach described by Doeringer and Piore (1971). In organisations with established internal labour markets, jobs are only open to market competition at the lowest levels, while the rest of positions are reserved for promoted employees. Being their job out of the threat of outsiders, promotion prospects are the main sources of incentives for workers within these organisations.

Figuring out which of these theories explains more realistically the actual management of employees’ careers may be of special importance in order to explain why similar workers from different population groups have very different labour market outcomes. Theoretical approaches dealing with *male/female differences in career evolution and wage growth* are usually built upon the assumptions and mechanisms of the type of models described above. By comparing how training and other work-related variables affect promotion chances and wage growth for both genders, we can assess the performance of these different approaches in the general framework of the British labour market.

The two incentive-oriented views of promotion systems described above are often used to discuss such male/female differentials. Lazear and Rosen (1990), for example, argued that female workers have poorer career prospects because of their higher non-market

opportunities that make for them less profitable to exert effort in learning at their tasks in the search of a promotion. Likewise, stronger family commitments could make overtime work or participation in training courses relatively more costly for women, so that they would find themselves in a “mommy track”, with lower advancement prospects. Finally, Booth, Francesconi and Frank (2003) showed that in the case that female workers suffered discrimination in the form of worse job market opportunities than males, they would have equal or higher promotion chances than men, but they would obtain lower wage increases upon promotion and they would quit less for better jobs³⁵. All these theories assume that organisations’ promotion rules are equal for women and men. Therefore job-related characteristics that may affect promotion prospects (e.g.- overtime work, participation in training...) should have similar effects for men and women. Moreover, any potential difference in promotion rates should disappear as long after one can effectively control for effort exerted or training carried out. Wage increases observed upon promotion, however, may be higher for women because of selection issues (Lazear and Rosen, 1990) or lower because of discrimination (Booth et al., 2003).

As it can be observed in the first column of Appendix A, most theories agree in that workers’ cumulated human capital plays an important role in filling in higher-level jobs of an organisation, so that the empirical analysis of the effect of training on promotion prospects is far from a complete discriminatory check. Instead, it is presented in the next section as a first approach to the issue, complemented later with more specific pieces of evidence aimed to disentangle which of the existing theories is the most likely “driving force” of the registered stylised facts.

2.3. Evidence about Training, Careers and Wages

The most direct way to check how employees’ human capital affects their task allocation is perhaps to investigate whether the job-related training received by a worker affects his future career path, either within or outside the training firm. This is what it is done along

³⁵ Alternatively, the authors propose that, if discrimination comes in the form of lower propensity of challenged employers to match outside offers, female workers would quit more for better jobs.

this section, first by estimating how (internal and external) promotion probability is affected by training and other job-related variables and then by analysing to what extent the returns to training received by a worker are dependent on whether he/she steps forward in his career or not.

2.3.1. Data and Econometric Method

To address the first issue, I use the job history data recorded in the BHPS jointly with the job-related individual questions of the survey. Each year, individuals are asked about any change in their job status and, in case of having stopped doing the job reported in the last year, they are asked about the reasons for it³⁶. I used the answers to these questions to create a dichotomous variable registering the event of a “promotion with current employer” between t and $t+1$ whenever a worker stated, in the interview at $t+1$, that (i) he/she had stopped doing the job that he/she was doing at the moment of the interview at t , that (ii) he/she had started doing a different job for the same employer, and that (iii) such job change was a promotion³⁷. An analogous variable was created to code whether the worker quitted his/her current employer between t and $t+1$ for a better job elsewhere. To avoid a potential problem of endogeneity, this variable is analysed in relation to a set of individual and job characteristics observed at t . The main variable of interest, training received by the worker between $t-1$ and t , is measured both in terms of events and intensity, in order to permit higher flexibility³⁸ in the estimation. As long as some of the training might have an immediate effect on the probabilities of obtaining a promotion, the estimated effects may suffer a bias towards zero.

³⁶ See Appendix B for the exact code of questions.

³⁷ Therefore, the concept of promotion considered here is defined by the subjective perception of the employee obtaining it.

³⁸ Since the measure of job related training available in the BHPS only specifies who bears (in theory) the costs of job-related training for the sub-sample of the last five years, I will interpret the results assuming that both employers and employees are involved in one way or another in the effort to increase the value of human capital.

The panel nature of the BHPS allows the researcher to account for unobserved effects when estimating the probability of promotion. Specifically, the efficiency of the estimation can be improved through the integration of individual-specific effects as random. However, if such effects were correlated with the explanatory variables, a fixed effects approach would be needed to obtain consistent estimates. Since it is likely that unobserved variables, such as motivation of the worker, natural ability or quality of the match with the employer affect both the promotion chances of an individual and the incidence of training, I estimated a logit model, which is the only non-linear model that allows one to obtain consistent estimates through a fixed effects-like approach³⁹. To account for employer match-specific effects that could affect within-individual variations, I introduced a set of dummy variables accounting for each employer change.

A variable indicating whether the worker received a promotion in the last year is included as an additional regressor⁴⁰ in the random-effects specification of promotion probability, in order to attenuate the potential bias caused by unobserved characteristics. The analysis of the probability of quitting to a better job also includes such explanatory variable, since past promotions (or the lack of promotions) may crucially affect workers' quitting decision.

Our sample of British workers includes 37140 observations from 7894 workers, between 16 and 64 years old, working neither at the public sector nor at the armed forces, who had valid recorded data for all of the variables of interest. The mean values corresponding to these variables for both genders are depicted in Appendix C.

2.3.2. Results: Probability of a Career Move

Table 2.1 shows the Odds-Ratio estimates obtained from the logistic regressions of the probability of obtaining career improvement with either current employer (i.e. promotion),

³⁹ The “Logit -fixed method” or “Logit within-group” estimator, refers to the *Conditional Logit* method, developed in Chamberlain (1980).

⁴⁰ Note that such variable is not exactly a lagged dependent variable, since it also includes promotions obtained with employers other than the current one.

or a different one (i.e. quit for better job). The figures represent how an additional increase in each of the variables multiplies the odds favouring the change⁴¹. Therefore a positive (negative) effect in probabilities is associated to Odds-Ratios higher (lower) than one. For each gender, I estimated the probability of obtaining a promotion and the probability of quitting for a better job through both random effects and fixed effects specifications. The strong differences across models observed in some of the estimates suggest that person-specific and match-specific effects are relevant issues to control for in this type of analysis⁴². As it can be seen in Table 2.1, last year training incidence has a significant positive effect on promotion chances for both men and women in the random-effects specification. When considering the individual effects as fixed, however, the odds-ratio drops dramatically towards one for men (losing its significance), while it is also slightly reduced for women⁴³. Similar patterns can be observed in Table 2.2, where different versions of the same regression including different measures of training incidence and intensity in the last two years are shown. In all cases the effect decreases and becomes non-significant for men, while it remains relatively large and significant for the sample of women⁴⁴. The effects seem to be larger if one considers all the training received in the last

⁴¹ Odds-Ratios have been presented instead of marginal effects at the mean because the latter are sensitive to the distribution of individual effects. Since Conditional (fixed-effects) Logit does not allow one to compute the individual effects, it is not possible to know their true distribution, nor to obtain the corresponding marginal effects. On the other hand, Odds-Ratio estimates from the logit model are constant across all the values of other variables.

⁴² As a check for robustness, I also estimated the Chamberlain (1980) random-effects model that allows for correlation between individual effects and the individual means of the rest of explanatory variables. The results are qualitatively similar to those yielded by the fixed-effects approach.

⁴³ The corresponding marginal increase in probability associated to each odds-ratio will depend on the initial value of such probability. For a man with probability of promotion at the average (7.2%), having received training in the last year is expected to rise up to 9% such probability, keeping all other observed variables constant, while it only goes up to 7.5% when we also control for unobserved characteristics. In the case of women, training incidence is expected to increase promotion by more than two points up to 9.3% if we keep the rest of observed variables constant and up to 8.5% when we keep all other observed and unobserved variables constant.

⁴⁴ These results follow a similar pattern to those of Pergamit and Veum: in their Probit analysis of the probability of Promotion between 1989 and 1990 as a function of the training received between 1988 and

two years, suggesting that its impact on internal career prospects may be persistent over time. As for the effect of the training received on the probability of quitting for a better job, no clear conclusion can be drawn from the results displayed in Table 2.2: Training seems to slightly decrease the probabilities of switching employers for the sample of male workers while increasing the chances for the sample of women. These results, although consistent across specifications, are mostly not significant. Back to Table 2.1, it can be observed that the effect of other variables usually associated to human capital, such as job market experience or job tenure, are also strongly affected by the presence of unobserved heterogeneity. Chances of promotion decrease with job tenure for both male and female workers in the random-effects specification. Controlling for unobservable effects, however, the relationship takes inverted U shape for both genders, with probabilities of promotion increasing during approximately the first two years and decreasing afterwards. Previous job market experience, on the other hand, does not seem to have any significant effect. The odds that a worker switches employers to a better position strongly decrease with tenure and, to a lower extent, with his/her job experience with previous employers.

Table 2.1 also shows the effect of other job-related characteristics on the probability of promotion. While a temporary worker is clearly less likely to obtain a promotion than a permanent one (the omitted category), the effect is not that clear for fixed-term contract holders: the strong negative effect observed in the random-effects estimation for both genders becomes non-significant when we control for unobserved effects, suggesting that workers with poor promotion prospects are usually selected into fixed-term contracts. It is also remarkable that women with fixed-term contracts tend to quit for better jobs significantly more than permanent ones, while male workers do not. Overtime work and part-timer status have both strong impact, positive and negative respectively, on promotion chances. It is noticeable, however, that the estimated effects decrease to non-significant values for the sample of female workers when we control for unobserved individual and match effects. Working at an unionised firm seems to yield higher chances of internal progress to male workers, especially if they do not belong to the union; this result follows a

1999, they found that the effect were larger for women than for men and that the effect registered for the sample of men were not significant in conventional terms.

similar pattern for women, although in their case estimates are smaller and not statistically significant. The results also show that workers of both genders are less willing to quit for a better job when they are employed at unionised firms. Both types of findings fit well into the classical view of unions as protecting organisation's current employees against the competence of prospective ones, in this case by favouring the filling of vacancies through promotions instead of through external hires.

Recently promoted workers seem more likely to obtain a future promotion and tend to quit less than the rest. More educated workers, for whom previous studies have obtained ambiguous conclusions about their promotion probabilities (see McCue, 1996), appear to have higher chances of internal progress than less educated ones, suggesting that they follow "steeper" careers than the less educated counterparts. It is far less clear whether they are also more willing to switch firms in the search of better jobs.

The positive effect of training on the probability of internal promotion registered for the sample of British women is consistent with most theoretical models. In the case of male workers, the effect is surprisingly small and not significant for the within-group estimates. Furthermore, there is a stronger effect of full-time and overtime work on promotion chances for the group of men. Jointly, these findings reveal a substantial difference in the relevant driving forces of promotion for male and female workers. In particular, promotions appear more related to measures of effort and commitment with the firm in the case male workers (in terms of working hours) and to human capital accumulation (in terms of job-related training) in the case of females. Such human capital accumulated through training, however, does not seem to be firm-specific, since it is not related to lower probabilities of quitting for better jobs. Rather, the concave relationship between job tenure and promotion observed here as well as in most of previous empirical literature⁴⁵ is more consistent with models that consider (symmetric or asymmetric) employers learning than those about incentives.

⁴⁵ Francesconi (2001) divided workers in four tenure groups and found that belonging to the third one had the highest effect on probability of promotion. Pergamit and Veum(1999) estimated a negative quadratic effect, while McCue(1996) only found a positive linear effect on the hazard rate of promotion.

2.3.3. Results: Wage Returns to Training and Promotion

Another way to check that helps to figure out how accurately different theoretical models fit task-assignment practices at British firms is the joint analysis of wage returns to training and promotion. Given that the displayed evidence shows a correlation (especially significant for women) between job-related training receipt and future promotions, the evaluation of the returns that workers receive from the training investment must control for position upgrade. Otherwise such returns could be largely reflecting a better assignment of workers' skills. For analogous reasons, the estimation of wage increases upon promotion must account for training receipt. Finally, it seems plausible that both training and promotions have interdependent effects on wages, as the different theoretical approaches seem to predict. Therefore, an interaction of the impact of both actions is suitable in the wage regression analysis.

To account for these issues, the empirical model of wage-determination considered here will take the following shape:

$$\ln w_{ijt} = X_{ijt}'\beta + P_{ijt}\theta + T_{it}'\alpha + P_{ijt}T_{it}'\gamma + Y_t'\delta + \mu_i + v_{ij} + \varepsilon_{ijt} \quad (1)$$

Where $\ln w_{ijt}$ is the logarithm of the real hourly wage of individual i with employer j at time t ; the vector X_{ijt} includes a set of individual and firm characteristics that may affect wages; P_{ijt} is a dummy variable taking the value one if the worker has been promoted by his/her current employer and zero otherwise; Y_t is a vector of year-specific dummies and T_{it} represents different measures of job related training. I considered separately the training that individuals received while working for previous and current employers. In a similar fashion to Booth and Bryan (2002), I considered all the training accumulated by the worker since his/her first year in sample⁴⁶, in order to allow for higher flexibility in the estimation of the returns to training and attenuate any possible bias induced by measurement error. The variance in wages not explained by observable characteristics is segregated into an

⁴⁶ See Booth and Bryan (2002) for a further discussion of the advantages of this approach.

individual fixed component μ_i , a worker-employer match effect ν_{ij} , and a transitory shock ε_{ijt} . Potential correlation of the observed explanatory variables with the unobserved effects μ_i and ν_{ij} would lead, in principle, to biased estimates of the coefficients. I addressed these problems by estimating the model through a fixed-effect approach (identifying the slopes through within-individual variation) and including as explanatory variables the same set of dummies used previously in the Logit analysis to track the different employer matches of each worker.

Table 2.3 reports the most relevant estimates of different versions of equation (1) when training is measured through the cumulated number of training events carried out along the sample period⁴⁷. Models I and II refer to estimated returns to training and promotion respectively. The estimated wage returns to job-related training are relatively close to those obtained by Booth and Bryan (2002) for the 1998-2000 waves of the same data. Male and female workers have extra wage increases from current employer training of 1.6% and 1.9% respectively. Controlling for promotion (Model III), these coefficients are slightly reduced (to 1.4% and 1.8% respectively). The interaction of training and promotion (Model IV) is positive and significant only in the case of men, being their expected returns to training some 1% higher after obtaining a promotion. Training events with previous employers produce more uneven results: while women are expected to obtain 2.2% wage increase from them, the estimated effect for men is around 0.4% and not statistically significant. These effects are quite similar, 2.1% and 0.6% respectively, when we control for promotion receipt. The interaction between training received with previous employers and promotion is strongly negative although not statistically significant for both genders. In summary, a large part of the observed returns to training is independent of promotion attainment, although the only significant interaction found between both actions is highly positive. Model II reports 7% and 7.5% wage increases upon promotion for male and female workers respectively⁴⁸. These figures are reduced to 6.7% and 6.9% when we

⁴⁷ Given that during the first 7 waves of the sample it is only recorded whether the employee received training or not, I will count at most one event each year.

⁴⁸ These returns are slightly more even to those obtained by Francesconi (2001) for the first five waves, who registered 7% and 4% wage increases for men and women respectively. Similar figures around 8% were

control for training receipt. The significantly positive interaction between training and promotion mentioned above for male workers makes men's returns to promotion somewhat dependent on training received with current employer. Such returns are expected to increase by 1% with each additional training event carried out in the past, starting from a 5.4% wage increase for a non-trained worker. Voluntary quits to better jobs seem to reward workers worse than promotions in the short run: extra wage increase expected upon quit is only around 2%, with similar figures for men and women⁴⁹.

All the theoretical approaches described in the previous section fit well the fact that wage increases are higher when promotion occurs. A more interesting result is the observed significant returns to training accrued by workers when controlling for promotion and the relatively high value of training even when promotion is not achieved. The fact that workers do not have to wait until promotion to pick up returns to training suggests that promotion prospects are not the main motivation to make an effort in obtaining human capital. On the other hand, the estimated interactions between training and promotion in wage growth yield inconclusive results: the only significant estimate depicts a positive effect for men, which supports both the incentive-oriented and gradual-learning stories for this group, while other estimates are negative, more in the line of the private-information setting.

Summing up, the evidence from both types of analysis seems to encourage more a view of promotions as a consequence of human capital accumulation (and maybe employers learning) than as a device to encourage the acquisition of specific skills. This is specially true for the sample of women: their training has a positive impact on probabilities of promotion and on probabilities of quitting for a better job and their returns to training are quite independent of promotion achievement. The case of male workers is more ambiguous;

found by Brown (1989) and Pergamin and Veum (1999) for the American's representative PSID survey and young workers' NLSY respectively.

⁴⁹ These results are also close to those obtained by Pergamin and Veum (1999), who found that switching employers yielded American young workers 3% wage increases. Long-term cumulative wage growth, however, has been estimated to be much more affected by separations than by within-job mobility, especially for young workers (see Topel and Ward (1992) and McCue(1996))

their promotion prospects are not significantly boosted by their participation in training and their wage returns to training do not change very much when we control for promotion achievement. However, some of the evidence presented in this section for male workers is consistent with an institutional view of promotions as mechanisms to induce effort at job: working longer hours has significant effect on their promotion prospects, and the wage returns from the training carried out with their current employers are significantly larger when a promotion is also achieved.

With respect to gender differences in promotions, pooling the samples of men and women revealed that, other things being equal, women are slightly more likely to receive promotions and significantly less likely to quit for better jobs⁵⁰. This is consistent with either women having higher costs of mobility or suffering discrimination by potential “poacher” employers, although this latter explanation would be challenged by the slightly higher wage increase upon job quit that the presented evidence allocate to female workers. The most striking implication from the results of this section, however, is that is that the gender gap in earnings is difficult to explain in terms of a single theory of career paths as it has been traditionally done in the literature. In contrast, the driving forces of career progress seem to be different for male and female workers. The career progress of men appears more related to internal labour markets structures, with an important role of effort and training carried out within the firm. Conversely, women’s careers are more closely related to the value of their human capital, as shown by the fact that their training with previous employers affects positively their employment with prospective ones, in terms of both salaries and quality of job held.

Despite the trends pointed by the findings of this section, most of the results depicted are consistent with several theories. In the next Section, I deal with this issue by presenting additional evidence that can be used as more specific checks for the described models.

⁵⁰ The results for the pooled sample of men and women is not showed in this paper, but can be provided by the author upon request.

2.4. Additional Evidence

In order to obtain more discriminatory evidence of which of the explained forces has a stronger role behind the stylised facts about task assignment and career paths, I move now into more concrete aspects of the analysis of career progress where different theories either disagree in their predictions or at least differ in their capacity to fit the evidence.

2.4.1. Within-position wage growth after promotion

Predictions on how should wages evolve after promotion differs across different theories. Symmetric learning predicts a positive effect: if promotion is correlated with positive updates in the market belief about employee's ability, then he/she is also expected to accumulate human capital faster after promotion and therefore, obtain higher wage increases. Theories of asymmetric information will also foresee higher wage increases after promotion as long as promotion discloses to the market that the employee is able to accumulate human capital faster than initially expected. Finally, theories that consider promotion systems as the incentive to effort either in job tasks or in learning specific skills will predict low levels of within-job wage growth at any position within the firm. To analyse the effect of promotions on subsequent wage increase, I ran a number of regressions having as independent variable the yearly increase in log wages within position ($\ln w_{ijt+1} - \ln w_{ijt}$), including therefore only observations with two subsequent years observed at t and $t+1$, when no job change was observed⁵¹. The regression estimates, not presented here, did show significant influence of promotion receipt on within-position wage growth. Most estimated effects were of low absolute values and both positive and negative estimates were found for different specifications. Only quits for better job seemed to have a positive significant effect on subsequent wage growth for the sample of male workers⁵².

⁵¹ This regression has been estimated through a fixed-effect approach, yielding a “differences in differences of differences” method to account for unobserved heterogeneity that could be correlated with both wage growth and probability of promotion.

⁵² Specifically, quits for better job are expected to increase future within-position wage growth by additional 2.2% for men and between 1% and 2% for women. The estimated effects of promotion range between -0.2% and 0.5%.

2.4.2. *General and Specific Human Capital*

The information recorded in the BHPS concerning job related training of individuals also included several questions about the aim of the training received (if any). The last of these questions - “*Was any of this training to develop your skills generally?*” - will be exploited to explore the relationship between training and promotion in terms of Becker’s extended split of human capital into general-purpose and firm-specific types⁵³. If promotions were granted to workers as prizes for their effort in learning firm-specific skills, the provision of specific training should have larger effect on promotion chances than general training. In addition, the returns to specific training accrued by workers’ wages should decrease considerably when controlling for promotion achievement and the interaction between specific training and promotion should have positive and relatively large effect on wages. Conversely, if task assignment were determined by employers’ progressive learning of workers’ ability, promotion receipt would be similarly affected by general and specific training as long as both are equally useful at higher-level tasks. Theories remarking the role of current employer’s private information yield more uneven predictions: the cost of promoting an employee (in terms of wage increase associated to information disclosure) that faces an incumbent employer is higher when the skills of the worker are more general (Bernhardt, 1995). This is because any increase in his/her expected productivity with other potential employers will depend on the versatility of his/her skills⁵⁴. Therefore general training should be less strongly correlated (or even negatively correlated) with chances of future promotion than specific training. Moreover, the effect of the interaction between

⁵³ Here I interpret as firm-specific all the training that the worker declared it was not aimed to develop his/her skills generally. It may not be true that the features of the training that lead a worker to consider it as “not general” must be purely firm-specific; rather, they will be task-specific in most of the cases. Nevertheless, even the definition of firm-specific human capital is usually associated to combination of task-specific skills and therefore the chosen measure of “non general” training should be a good measure of firm-specific human capital.

⁵⁴ Note that this argument assumes the existence of complementarities between ability and learned skills: more able workers are capable to make a better use of general (and specific) skills.

promotion and general training in the wage equation must be higher than that of promotion with specific training.

The odds ratio estimates showed in Table 2.5 for the probability of promotion reveal that unobserved heterogeneity affects more the estimated effect of general training than the effect of specific training. The significant and important impacts of general training obtained in the random-effects specification for both genders disappear when we individual and firm effects are accounted for. The effect of specific training is only statistically significant for the sample of women, but it remains large even after we control for unobserved heterogeneity, consistently both with the asymmetric information story and the incentives-based explanation. Female workers are more likely to leave their firms for better jobs after receiving general job-related training and, as Table 2.6 shows, they are able to obtain higher returns to the general training carried out at previous employers than their male counterparts. Indeed, while male workers only obtain significant returns to the training (general or specific) done with their current employers, women get significant returns to general training around 2% per event, independently of the firms employing them during the training. These findings suggest again that there are substantial differences in the structure of career patterns for male and female workers, with women's possibilities of progress more attached to the market value of their skills.

A comparison of the figures corresponding to the effect of specific human capital across the three different models proposed in Table 2.6 discourages an "incentives to invest"-based view of promotions: returns to specific training with current employer do not vary when we control for promotion receipt (about 2.1% for male workers and non-significant 0.9% for females), and the estimated interactions between current employer specific training and promotion in the wage equation, although positive for the sample of men, are not statistically significant in any case. The predictions from private information stories are neither corroborated by this data. They forecast higher wage increases upon promotion when the upgrading is awarded jointly with general instead of specific training. This result is only found for the sample of women, as it can be observed from a comparison of the

interactions presented in the last two columns of Table 2.6. Even in that case, the differences are small and not statistically significant.

2.4.3. Differences by Age Groups

It is well known that labour market mobility, both within and across firms, is higher for young workers than for older ones. Here, I will go a step further and analyse, for different age groups, how training affects promotion probabilities, and how both actions affect wage growth. Theoretical models that consider (symmetric) learning as a key factor in promotion dynamics predict larger updates in the beliefs of ability for younger workers, so that their training should be more strongly correlated with future promotion and their training and promotion should provide them with larger wage increases. If promotion dynamics were conditioned by the private information held by current employers about their workers' ability, younger workers would suffer more from the problem of asymmetric information. Therefore, they would obtain higher wage increases upon promotion and their training would be especially correlated with promotion receipt. Finally, the incentive role of promotions remarked by other theories does not forecast different relationship between training and promotion for different age groups. These theories suggest, however, that the wage increases upon promotion needed to provide older workers with the right incentives to put effort should be higher than those offered to younger ones. This is because employers have to compensate the lower "option value" that a promotion contains for workers coming close to the end of their career (Rosen, 1986).

Table 2.7 shows the estimated odds-ratio effects of previous year training incidence on promotion chances for four different age groups: "twenties", "thirties", "forties" and "older"⁵⁵. The results are less than conclusive for the sample of men. The effect is relatively high for young men in their twenties and thirties in the random effects specification, but the strongest effect (and the only positive and significant one in the within-group specification) corresponds to the group of older workers. Results for female workers fit relatively well to

⁵⁵ The "twenties" group includes all workers who were under 31 years old by 2002, "thirties", includes all workers between 31 and 40, "forties" includes those workers between 41 and 50 and "older" those over 50.

the predictions of both information-oriented type of models. The correlation between training and future promotion chances is clearly higher for younger groups of females than for older ones in both random-effects and fixed-effects specifications. The effect of training receipt on the probabilities of quitting for a better job is not significant for most age groups, but it must be noticed that such effects evolve with age in opposite ways for males and females. Younger women are more likely to quit for a better job if they have received training while older women are less likely to do it; the reverse seems to hold for male workers⁵⁶.

Table 2.8 shows the effects of training, promotion and quits on wages for the four different age groups, following the preferred specification of equation (1) in terms of parsimony, which excludes interactions.

Results strongly favour the implications of information-related theories of task assignment dynamics and discourage a global interpretation of promotions in terms of incentives to invest in human capital. With the exception of “older” women, who obtain larger wage increases on promotion than women in their thirties and forties, estimated wage increases upon promotion are systematically lower for older groups of both genders -from expected wage increases of 9.17% for men below 30 to 2.78% for oldest males. Returns to training are also higher for younger workers. This fact is especially consistent with theories of learning or information disclosure, but it may be also reflecting the higher facility for learning that younger individuals have. Younger workers also seem to get higher wage increases from quits to better jobs, although this finding is harder to interpret, since the concept of “better job” is likely to be different for different age groups.

In sum, segregating our results by age groups yields a similar flavour to the joint analysis of previous section. Female careers seem to fit well in a model of dynamic learning, with

⁵⁶ The stronger correlation between training and quits found for young females with respect to older ones fits well the possibility that their training discloses information about their ability or turns them “more visible” (in terms of Milgrom and Oster, 1987). The converse effect found for male workers is more striking and does not seem to fit well with any of the existing theories.

more uncertainty about the ability of younger workers, whose promotion is more related to training receipt and who tend to enjoy higher wage increases upon promotion. The evidence for the sample of males, with younger groups whose training does not affect especially their promotion chances, is far less certain.

2.4.4. Differences by Seniority Groups

Some important variables whose effect on task allocation of workers has been discussed along this paper may differ across tenure levels. More senior workers are also more experienced ones, but they are surely also employees with more specific human capital.

In a framework of symmetric information learning, differences in workers' tenure are not relevant for the dynamics of their allocation to tasks, and any difference we may find by seniority groups should be only reflecting the different age and experience levels. Things are more complex, however, in a setting of private learning. In that case, higher tenure may imply a higher informational advantage for current employers, making worse the problem of asymmetric information and increasing the correlation between training, promotion, and wage growth. On the other hand, as long as more tenured workers are also older and more experienced, there will be less uncertainty about their ability in the labour market and such correlation could be lower for them. Thus, private information theories yield ambiguous predictions about more tenured workers, since their ability is less uncertain to the labour market, but different employers know it more asymmetrically. The provision of incentives through promotions it is also likely to be affected by tenure in two ways. First, the evaluation of tenured workers can be more accurately based on long term, more subjective, measures of performance and commitment, losing their relative weight more naive measures such as participation in training programs. Second, more tenured workers are also more likely to be closer to the end of their careers or to their top at the employer organisation; therefore their category upgrade must involve higher wage increases if it is designed to motivate them. In brief, an "incentive-provider" promotion should be less dependent of training receipt and imply an especially high wage increase to compensate its lack of option value

Table 2.9 displays the estimated effects of several important variables on the probability of obtaining a promotion. The estimated model is the same Logit model used in previous section with a random-effects specification⁵⁷ with different effects for different levels of seniority. Since there is not any specially useful rule to delimit the seniority groups, I decided to create 4 groups with an homogenous number of observation, using therefore the three quartiles of the sample distribution of seniority as cut-off points (set at 28, 73 and 159 months). This piece of evidence does not show any important differences by seniority levels in the effects of training on promotion probabilities for neither gender. For the sample of men, it seems that the training of more tenured employees is more strongly related to promotion than the training of rookies, but the estimated differences are not statistically significant. The ambiguous effect predicted by asymmetric information theories accommodates better this result than any of the other models described here.

One important aspect in the interpretation of the observed effect of job-related variables on promotion achievement is that different models may be more valid than others at different points in the career of a worker. Matching tasks to the observed skills could be, for example, a priority with respect to junior employees. On the other hand, motivating them increases its importance as they become more tenured and the threat of dismissal is too costly to be credible. This would be consistent with the observation that, for tenure levels around the median, overtime work has larger effect on promotion prospects and the achievement of a promotion in the last year has slightly lower effect. These differences in the impacts, however, are mostly not statistically significant and their sign is reversed for most tenured group.

⁵⁷ A fixed effects specification is not suitable for the analysis with segregated samples; since different observations from the same individual switch frequently from one category to another, the cell size remaining to estimate a Conditional Logit would be too small to obtain accurate estimates. On the other hand, results from the random effects specification must be interpreted carefully, since unobserved heterogeneity across individuals might be biasing them.

Table 2.10 shows the effect of training and promotion on wages for the four seniority groups. The first row reveals that male employees obtain higher returns to training with current employer than their more tenured counterparts (as information-related stories predict), while there is no clear trend for the sample of women. Training held with previous employers appears less and less valuable for more senior workers of both genders, with a striking highly negative effect over the wages of most tenured workers. The most interesting finding here is that senior male employees obtain generally higher wage increase upon promotion compared to less tenured males (as predicted by the theory of incentives), while exactly the opposite holds for female employees (as predicted by symmetrically-learning models). This suggests again that the career of men are more affected by incentives issues within their firm, while the occupation of women seem to be more related to their fit to each of the task and the information available about in the market about their skills.

2.5. Conclusions

Although the evidence presented in along this paper reveal that none of the existing theories regarding human capital and tasks assignment is definitively superior to the rest of them in explaining all the findings, some theories are more handicapped than others by the analysis reported here. The facts that non-promoted workers receive high returns to specific training and that younger employees receive higher returns upon promotions are difficult to reconcile with a view of promotions as incentives to invest in firm-specific human capital, since its predictions go in exactly the opposite way. The facts that trained workers do not obtain lower wage increases on promotion than untrained ones and that generally trained workers do not receive significantly higher wage increases on promotion than specifically trained ones undermine the private information story. The first issue can be justified by neglecting the signalling power of training provision; the second one is more difficult to overcome, since the value of the natural ability of a worker is likely to be also largely dependent on the skills he/she has acquired.

Globally, the theory that fits best the results presented in this paper is the symmetric learning approach, represented by the comprehensive model of Gibbons and Waldman (1999,2003). Its main drawback is the unfulfilled prediction of larger within-position wage growth after promotion. However, several arguments can be supplied to justify this fact without moving out of the theoretical framework. Employees' rates of human capital accumulation, for example, may vary across positions, being lower at higher ranks of a hierarchy where the cost of *learning by doing* is higher in terms of wrong decisions and forgone time used. Similarly, employer's learning rate about workers' ability may also be lower for top managers skills are better known.

A relevant result from is the strong gender differences found in the relationship of training and career prospects. Females' career progress is more related to their training activities, especially for younger and less tenured women, who also obtain higher wage increases upon promotion or quit for better job. In particular, receiving specific training has a larger influence on women's internal promotion chances, while general training has a larger effect on outside progress. All this seems to place women's career structures in the line of symmetric learning human capital accumulation and spot market contracting settings. Men's chances of career progress seem less affected by training receipt and such weak relationship is less dependent on the age of the worker. Moreover, "full time worker status" and "doing overtime work", two variables that are likely proxies of employees' effort and commitment to the organisation, seem to have higher effects on promotion prospects. Additional evidence shows that men obtain higher wage returns to specific training and slightly lower wage increases on quit for better jobs than women, and that more senior workers (whose promotion is likely to include a lower "option value") obtain higher wage increases upon promotion. This yields a mixed picture of men's careers, which includes more elements of internal labour markets and the institutional role of promotions (as incentive provider) than in the case of women. Such institutional role, however, would seem designed to encourage the effort of workers by rewarding overtime work, rather than to promote the acquisition of specific human capital.

The consequence for the existing theories that link the gender gap in earnings to career development dynamics is that narrow models with tightly defined determinants of promotion are not accurate. Rather, future research about the processes in the career building of workers that lead women to their well-known earnings disadvantage must take into account that even small differences in females' "initial conditions" at their entry in the labour market (for example, their lower expected probability of staying in the labour force, lower expected working hours in the future, or any systematic discrimination practice carried out by employers) may prevent their participation in certain long-term relational contracts and induce their selection into more spot market-oriented frameworks of labour relationship.

2.6. References

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2.7. Tables

Table 2.1: Effect of Last year Training Incidence on Probabilities of Career Progress (Odds Ratios)

<u>VARIABLE</u>	<u>PROMOTIONS</u>				<u>QUITS TO BETTER JOB</u>			
	Logit RE		Logit FE		Logit RE		Logit FE	
	<u>Men</u>	<u>Women</u>	<u>Men</u>	<u>Women</u>	<u>Men</u>	<u>Women</u>	<u>Men</u>	<u>Women</u>
Train	1.280***	1.326***	1.038	1.198**	0.967	1.213***	1.074	1.249**
Promoted (t-1)	1.777***	1.655***			0.552***	0.615***	0.582***	0.777
Tenure (months)	0.969	0.906***	1.146***	1.135***	0.824***	0.801***	0.799***	0.778**
Tenure squared	0.998	1.002	0.997**	0.997*	1.003**	1.003**	1.010***	1.004
Experience (months)	0.992	1.004	1.013	1.018	0.986*	0.980**	0.975*	0.961**
Experience sq.	1.000	0.999**	1.000	0.999	1.000	1.000	1.000	1.001
Temporal Contract	0.437***	0.393***	0.472*	0.545*	1.169	1.185	1.081	1.332
Fixed –Term Contract	0.682*	0.619**	1.012	0.866	1.138	1.419**	1.189	2.213***
Part-time	0.512***	0.563***	0.612	0.773	0.618***	0.819***	0.969	1.202
Overtime	1.232**	1.196**	1.240*	0.945	0.892	1.012	0.921	0.892
Bonus	1.186***	1.479***	1.045	1.566**	0.965	0.797***	0.856*	0.771**
Union Coverage	1.411***	1.189*	1.409**	1.264	0.750***	0.736***	0.814	0.666**
Union Membership	0.763***	0.836*	0.860	0.806	0.785**	0.780**	0.817	1.872
Higher Degree	2.149***	1.887***			0.971	1.335		
First Degree	2.449***	1.792***			1.217*	1.313**		
A- Level	1.910***	1.603***			1.176	1.409***		
O- Level	1.823***	1.397***			1.138	1.188*		
CSE	1.406**	1.288			1.256*	1.230		
<u>Other Controls</u>								
Mngr. Resp. Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm Size Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industrial Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Regional Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Employer Match			Yes	Yes			Yes	Yes
Number of Obs.	19146	18002	5583	4532	19146	18002	5197	4762
Model χ^2	600.2***	692.9***	183.4***	155.5***	621.6***	498.0***	607.6***	590.8***
Rho	0.081***	0.000			0.121***	0.095***		

*Significant at 10%. **Significant at 5%. ***Significant at 1%.

Table 2.2: Effect of Last two years training incidence and intensity on Career Progress (Odds Ratios)

<u>VARIABLE</u>	<u>PROMOTIONS</u>				<u>QUITS TO BETTER JOB</u>			
	Logit RE		Logit FE		Logit RE		Logit FE	
	<u>Men</u>	<u>Women</u>	<u>Men</u>	<u>Women</u>	<u>Men</u>	<u>Women</u>	<u>Men</u>	<u>Women</u>
Incidence last year	1.280***	1.326***	1.038	1.198**	0.967	1.213***	1.074	1.249**
Days last year	1.001	1.003**	0.999	1.004**	0.998	1.001	0.996**	1.001
Incidence last 2 years	1.388***	1.432**	1.106	1.260**	0.881*	1.088	0.927	1.114
Days last 2 years	1.002**	1.002***	1.000	1.002*	0.999	1.001	0.999	1.002

All regressions include the same control variables of the analogous regressions summarised in Table 2.1.

*Significant at 10%. **Significant at 5%. ***Significant at 1%.

Table 2.3: Effect of training incidence and promotion on wages. Fixed-Effects Log-Wage Regressions.

<u>VARIABLE</u>	Model I		Model II		Model III		Model IV	
	<u>Men</u>	<u>Women</u>	<u>Men</u>	<u>Women</u>	<u>Men</u>	<u>Women</u>	<u>Men</u>	<u>Women</u>
Training Incidence w/ current employer (cumulated events)	0.016*** (0.002)	0.019** (0.003)			0.014*** (0.002)	0.018*** (0.003)	0.013*** (0.003)	0.018*** (0.003)
Training Incidence w/ former employers (cumulated events)	0.004 (0.005)	0.019** (0.001)			0.006 (0.006)	0.021*** (0.007)	0.007 (0.006)	0.021*** (0.007)
Promotion w/ current employer			0.070*** (0.009)	0.075*** (0.010)	0.067*** (0.009)	0.069*** (0.010)	0.054*** (0.012)	0.070*** (0.015)
Promotion*Training w/ current employer							0.009* (0.006)	-0.001 (0.006)
Promotion*Training w/ former employer							-0.017 (0.034)	0.004 (0.034)
Quit for a Better Job	0.011 (0.009)	0.016 (0.010)	0.019** (0.009)	0.024** (0.010)	0.020** (0.009)	0.022** (0.010)	0.020** (0.009)	0.022** (0.011)
Tenure (years)	0.001 (0.001)	-0.005*** (0.001)	0.004*** (0.001)	-0.001 (0.002)	0.003** (0.001)	-0.002 (0.002)	0.003** (0.001)	-0.002 (0.002)
Tenure sq. $\times 10^3$	-0.201*** (0.045)	-0.093 (0.063)	-0.291** (0.047)	-0.199*** (0.064)	-0.269*** (0.047)	-0.184*** (0.064)	-0.270*** (0.047)	-0.183*** (0.064)
Previous Experience (years)	-0.004*** (0.000)	-0.004*** (0.001)	-0.004*** (0.000)	-0.004*** (0.001)	-0.004*** (0.000)	-0.004*** (0.001)	-0.004*** (0.001)	-0.004*** (0.001)
Previous Experience sq. $\times 10^3$	-0.038*** (0.011)	-0.021 (0.014)	-0.034*** (0.011)	-0.025* (0.014)	-0.040*** (0.011)	-0.022 (0.014)	-0.040*** (0.011)	-0.022 (0.014)
<u>Other Controls</u>								
Job Characteristics Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm Size Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industrial Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Regional Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Employer Match			Yes	Yes			Yes	Yes
R-square	0.031	0.074	0.038	0.078	0.040	0.078	0.040	0.078

*Significant at 10%. **Significant at 5%. ***Significant at 1%.

Table 2.4: Effect on wages of training intensity and career moves Fixed-Effects Log-Wage Regressions.

<u>VARIABLE</u>	Model I		Model II		Model III		Model IV	
	<u>Men</u>	<u>Women</u>	<u>Men</u>	<u>Women</u>	<u>Men</u>	<u>Women</u>	<u>Men</u>	<u>Women</u>
Training Intensity w/ current employer (cumulated days)	0.00019** (0.00006)	0.00018** (0.00007)			0.00017** (0.00006)	0.00016** (0.00006)	0.00017** (0.00006)	0.00016* (0.00007)
Training Intensity w/ former employers (cumulated days)	0.00031** (0.00010)	0.00030** (0.00015)			0.00031*** (0.00010)	0.00030** (0.00015)	0.00032** (0.00006)	0.00033** (0.00015)
Promotion w/ current employer			0.0704*** (0.0086)	0.0751*** (0.0101)	0.0714** (0.0092)	0.0740** (0.0109)	0.0720** (0.0095)	0.0743** (0.0116)
Promotion*Training w/ current employer							0.00001 (0.00009)	0.00002 (0.00012)
Promotion*Training w/ former employer							-0.00047 (0.00062)	-0.00077 (0.00063)

All regressions include the same control variables of the analogous regressions summarised in Table 2.3.

*Significant at 10%. **Significant at 5%. ***Significant at 1%.

Table 2.5: Effect of last year *General* and *Specific* training incidence on Career Progress (Odds Ratios)

<u>VARIABLE</u>	<u>PROMOTIONS</u>				<u>QUITS TO BETTER JOB</u>			
	Logit RE		Logit FE		Logit RE		Logit FE	
	<u>Men</u>	<u>Women</u>	<u>Men</u>	<u>Women</u>	<u>Men</u>	<u>Women</u>	<u>Men</u>	<u>Women</u>
“General” Training Incidence last year	1.275***	1.287***	0.973	1.145	0.948	1.206**	0.972	1.260**
“Specific” Training Incidence last year	1.046	1.327**	0.961	1.352**	0.970	1.115	1.121	1.167

All regressions include the same control variables of the analogous regressions summarised in Table 2.1.

*Significant at 10%. **Significant at 5%. ***Significant at 1%.

Table 2.6: General and Specific training , Quits and Wages. Fixed-Effects Log-Wage Regressions.

<u>VARIABLE</u>	Model I		Model II		Model III	
	<u>Men</u>	<u>Women</u>	<u>Men</u>	<u>Women</u>	<u>Men</u>	<u>Women</u>
<i>“General”</i> Training Incidence with current employer (cumulated events)	0.0131 ^{***}	0.0226 ^{***}	0.0111 ^{***}	0.0218 ^{***}	0.0102 ^{***}	0.0218 ^{***}
<i>“General”</i> Training Incidence with former employers (cumulated events)	0.0060	0.0203 ^{**}	0.0080	0.0223 ^{**}	0.0086	0.0232 ^{***}
<i>“Specific”</i> Training Incidence with current employer (cumulated events)	0.0209 ^{***}	0.0094	0.0217 ^{***}	0.0083	0.0211 ^{***}	0.0088
<i>“Specific”</i> Training Incidence w/ former employer (cumulated events)	-0.0187	0.0109	-0.0153	0.0111	-0.0165	0.0088
Promotion w/ current employer			0.0679 ^{***}	0.0677 ^{***}	0.0571 ^{***}	0.0699 ^{***}
Promotion* <i>General</i> Training with current employer					0.0074	-0.0005
Promotion* <i>Specific</i> Training with current employer					0.0084	-0.0061
Quit for a Better Job	0.0095	0.0170	0.0181 [*]	0.0229 ^{**}	0.0183 [*]	0.0230 ^{**}

All regressions include the same control variables of the analogous regressions summarised in Table 2.3.

^{*}Significant at 10%. ^{**}Significant at 5%. ^{***}Significant at 1%.

Table 2.7: Effect of Last year Training Incidence on the Probabilities of Career Progress (Odds Ratios) by Age Groups. Independent Variable: Incidence Last year

<u>AGE GROUP</u>	<u>PROMOTIONS</u>				<u>QUITS TO BETTER JOB</u>			
	Logit RE		Logit FE		Logit RE		Logit FE	
	<u>Men</u>	<u>Women</u>	<u>Men</u>	<u>Women</u>	<u>Men</u>	<u>Women</u>	<u>Men</u>	<u>Women</u>
Twenties	1.407***	1.468***	1.018	1.759***	0.929	1.301**	0.946	1.441**
Thirties	1.345***	1.416***	1.176	1.185	0.944	1.144	1.129	1.242
Forties	0.970	0.998	0.659**	0.943	1.207	1.289	1.340	1.089
Older	1.506**	1.390	1.634**	0.977	0.967	0.907	2.398**	0.878

All regressions include the same control variables of the analogous regressions summarised in Table 2.1.

*Significant at 10%. **Significant at 5%. ***Significant at 1%.

Table 2.8: Training, Promotion, Quits and Wages: Age Groups. Fixed-Effects Log-Wage Regressions.

<u>VARIABLE</u>	Twenties		Thirties		Forties		Older	
	<u>Men</u>	<u>Women</u>	<u>Men</u>	<u>Women</u>	<u>Men</u>	<u>Women</u>	<u>Men</u>	<u>Women</u>
Training Incidence w/ current employer (cumulated events)	0.0253*** (0.00834)	0.0326*** (0.00833)	0.0062 (0.00416)	0.0092* (0.00513)	0.0022 (0.00414)	0.0181*** (0.00535)	0.0077* (0.00460)	0.0004 (0.00514)
Training Incidence w/ former employers (cumulated events)	0.0319** (0.01473)	0.0234 (0.01603)	-0.0085 (0.00813)	0.0088 (0.01070)	-0.0122 (0.01019)	0.0344*** (0.01210)	-0.0054 (0.01603)	-0.0107 (0.01674)
Promotion w/ current employer	0.0917*** (0.02258)	0.0869*** (0.00834)	0.0627*** (0.01353)	0.0582*** (0.01650)	0.0364** (0.01510)	0.0383* (0.02113)	0.0278 (0.02027)	0.0740*** (0.02413)
Quit for a Better Job	0.0533*** (0.02034)	0.0550** (0.02251)	0.0206 (0.01441)	0.0097 (0.01723)	0.0227 (0.01844)	0.0087 (0.02136)	-0.0534** (0.02549)	0.0423* (0.02530)

All regressions include the same control variables of the analogous regressions summarised in Table 2.3.

*Significant at 10%. **Significant at 5%. ***Significant at 1%.

Table 2.9: Effect of Last year Training Incidence on the Probabilities of Internal Promotion (Odds Ratios) by Seniority Groups (quartiles of the distribution) .Random effects estimates.

<u>VARIABLE</u>	< 28 months		28 – 73 months		73 - 159 months		> 159 months	
	<u>Men</u>	<u>Women</u>	<u>Men</u>	<u>Women</u>	<u>Men</u>	<u>Women</u>	<u>Men</u>	<u>Women</u>
Train	1.290*	1.297*	1.251**	1.432**	1.373***	1.314**	1.363**	1.388*
Promoted (t-1)	1.982***	1.892***	1.994***	1.744***	1.466**	1.794***	3.059***	2.520***
Overtime	1.179	1.019***	1.231*	1.266**	1.357**	1.403**	1.149	1.159
Effect of seniority group	Baseline		1.072	0.824	0.903	0.678**	0.678**	0.580***

All regressions include the same control variables of the analogous regressions summarised in Table 2.1.

*Significant at 10%. **Significant at 5%. ***Significant at 1%.

Table 2.10: Training, Promotion, Quits and Wages: Seniority Groups. Fixed-Effects Log-Wage Regressions.

<u>VARIABLE</u>	< 28 months		28 – 73 months		73 - 159 months		> 159 months	
	<u>Men</u>	<u>Women</u>	<u>Men</u>	<u>Women</u>	<u>Men</u>	<u>Women</u>	<u>Men</u>	<u>Women</u>
Training Incidence w/ current employer (cumulated events)	0.0272*** (0.00799)	0.0018 (0.00790)	0.0199*** (0.00486)	0.0225*** (0.00452)	0.0151*** (0.00397)	0.0104*** (0.00387)	0.0141** (0.00473)	0.0121*** (0.00344)
Training Incidence w/ former employers (cumulated events)	0.0236*** (0.00959)	0.0134 (0.00827)	0.0298** (0.01213)	0.0102 (0.01044)	-0.0068 (0.01413)	-0.0190* (0.01263)	-0.0514 (0.03412)	-0.0316 (0.02112)
Promotion w/ current employer	0.0380 (0.02607)	0.1178*** (0.02326)	0.0861*** (0.01649)	0.0474*** (0.01508)	0.0420** (0.01716)	0.0567** (0.01485)	0.0813*** (0.02309)	0.0305** (0.01549)
Quit for a Better Job	0.0207 (0.01422)	0.0451*** (0.01307)						

All regressions include the same control variables of the analogous regressions summarised in Table 2.3.

*Significant at 10%. **Significant at 5%. ***Significant at 1%.

2.8. Appendix A: Theories about career paths

	Correlation training- promotion	Wage Growth	Interaction in wage growth	Other features
Human capital accumulation and Learning about ability	Positive	Higher <i>after</i> promotion, especially <i>upon</i> promotion	Positive	Ambiguous effect of seniority and experience on promotion
Incentives to invest in Specific human capital	Positive (specific human capital)	Much higher <i>upon</i> promotion	Positive (specific human capital, returns to training are otherwise nil)	- Positive effect of seniority on promotion - Lower returns to seniority for not promoted.
Incentives to effort	No prediction	Much higher <i>upon</i> promotion	No prediction	- Positive effect of measures of effort on promotion - Effect of measures of effort on wage decrease as we control for promotions
Asymmetric info	Positive	Much higher <i>upon</i> promotion	Negative	Stronger effects for younger and “more uncertain” groups.

Predictions of Gender differences theories	Correlation training-promotion and their interaction in wage growth	Gender differences in promotion rates	Gender differences in wage growth
Lazear-Rosen	Same effects of <i>incentives</i> theories. Similar effects for men and women	Women get less promotions	Promoted females earn more than promoted males
Booth/Francesconi/Frank		Women get same or more promotions	Promoted females earn more than promoted males

2.9. Appendix B: Key Questions from the BHPS

Question J9

Can you look at this card please and tell me which of the following descriptions comes closest to what you were doing immediately before then (the job change)?

- **Doing a different job for the same employer**
- **Working for a different employer**
- **In paid employment (not self employed)**
- **Working for myself (self-employed)**
- **Unemployed/looking for work**
- **Retired from paid work altogether**
- **On maternity leave**
- **Looking after a family or home**
- **In full-time education/student**
- **Long term sick or disabled**
- **On a government training scheme**
- **Something else (please give details)**

Question J21

Would you look at this card please and tell me which of the following statements on the card best describes why you stopped doing that job?

- **I was promoted**
- **I left for a better job**
- **I was made redundant**
- **I was dismissed/sacked**
- **It was a temporary job which ended**
- **I took retirement**
- **I gave up work for health reasons**
- **I left to have a baby**
- **I left to look after children/home**
- **I left to look after another person (not children)**
- **I left for another reason (please give details)**

-

2.10. Appendix C: Sample Means of the most relevant variables

<u>VARIABLE</u>	Men (standard deviation)	Women (standard deviation)	Difference (standard error)
N	19140	18000	
Promotion Receipt	0.0797 (0.2708)	0.0638 (0.2444)	0.0159*** (0.0027)
Training Incidence	0.3408 (0.4740)	0.3199 (0.4664)	0.0209*** (0.0049)
General Training Incidence	0.2754 (0.4467)	0.2616 (0.4395)	0.0138*** (0.0046)
Specific Training Incidence	0.0720 (0.2585)	0.0640 (0.2448)	0.008*** (0.0026)
Training Days	5.7279 (23.725)	5.6092 (25.817)	0.1184 (0.02631)
Age	36.196 (11.888)	36.022 (11.862)	0.1718 (0.1233)
Years of Tenure	4.6012 (6.0316)	4.0390 (5.0361)	0.5618*** (0.0578)
Job Market Experience	9.5474 (13.489)	9.7126 (13.408)	-0.183 (0.1396)
Temporary	0.0376 (0.1903)	0.0553 (0.2287)	-0.0177*** (0.0022)
Fixed –Term	0.0279 (0.1647)	0.0258 (0.1585)	0.0021 (0.0017)
Part-time	0.0573 (0.2324)	0.3638 (0.4811)	-0.3064*** (0.0039)
Manager	0.2500 (0.4330)	0.1469 (0.3541)	0.103*** (0.0041)
Foreman	0.1637 (0.3700)	0.1615 (0.3680)	0.0022 (0.0038)
Overtime	0.5854 (0.4927)	0.3843 (0.4864)	0.201*** (0.0051)
Receiving Bonus	0.4049 (0.4909)	0.2900 (0.4538)	0.1148*** (0.0049)
Union Coverage	0.4029 (0.4905)	0.3865 (0.4870)	0.0163*** (0.0051)
Union Membership	0.2602 (0.4388)	0.2201 (0.4143)	0.0401*** (0.0044)
Hourly Wage (£ of 1998)	8.7541 (6.2439)	6.3717 (5.2873)	2.382*** (0.0605)

CHAPTER 3

Sex Differences In Managerial Style: From
Individual Leadership To Organisational
Labour Relationships

3.1. Introduction

This paper investigates whether the currently increasing presence of women at firm's managerial ranks is affecting organisational labour relationships policies. This is done through the analysis of the firm-level evidence that the 1998 Workplace Employment Relationship Survey (WERS 98) provides about labour issues in British firms.

Men and women tend to differ not only in their actual social behaviour, but also in the way they are expected to behave in society. However, the former *sex* behavioural differences do not always match the latter *gender* behavioural differences. This happens in most social contexts and, as it is explained along this paper, organisations' managerial settings are not an exception: beyond social beliefs derived from gender behavioural stereotypes, individual-level studies seem to have found there some differences in the way that women and men managers lead.

Stereotypical differences in gender roles assume that, either because of *nature* or *nurture*⁵⁸, women's social behaviour is more people-caring oriented than that of men, with higher verbal and non-verbal communication abilities and a rather holistic approach to decision-making. Applying these stereotypes to managerial behaviour we have that, unless the collective of female managers came from a selected sample, women managers should lead in a more interpersonal and less task-based way than men, with more democratic (and less authoritarian) decision making. They should be as well better at managing with a "*transformational*" approach⁵⁹, with higher propensity to act as mentors of their employees and establishing a more intense feedback with them.

⁵⁸ There is an intense and interesting debate among social psychologist to determine the extent to which sex and gender behavioural differences have a biogenetic foundation (nature) or are determined by the socialisation of individuals (nurture). To learn more about this, see Lippa (2002).

⁵⁹ The categorisation of leadership styles is treated in Section 3.3 of the paper. For a good introduction to it, see Bass (1974).

The last decades have seen a steady increase in the proportion of women at management in all developed countries. In the United Kingdom, for example, the percentage of managers who were females increased from below 15% in the early eighties to about 30% in 2003⁶⁰. Furthermore, such change does not seem to be solely brought by start up companies: the presence of women at the management of firms established before 1990, for example, increased from 18.5% to 24.4% during the period 1990-1998⁶¹. If, as it is suggested by stereotypes, women differed from men in their managerial behaviour to the limit of favouring certain employee relations policies (more democratic structures for decision making and more interactive communication, for example), this change in managerial workforce composition could be bringing a change in organisational labour relationships. Precisely, this paper examines the extent to which women managers are leading the introduction of such changes. This is made by analysing how the percentage of women at management affects organisations' human resources policies in several aspects that include task definition, decision-making, communication, delegation and retribution.

There is large survey evidence dealing with the extent to which these gender stereotypical differences materialise in real sex differences among individual managers at work⁶². Initial research, largely influenced by feminist scholars, found little differences in the leadership styles of male and female managers, suggesting that the actual behaviour of women at administrative jobs was strongly influenced by executive role models that seemed to claim for masculinity (Henning and Jardim, 1978). Such failure to find differences between men and women in their managerial behaviour might have been importantly affected by a selection effect. First, as the recruitment of middle managers is done with this masculine role model in mind, a disproportional amount of women that do not fit into it are selected out. Second, as Lazear and Rosen (1990) explained in the context of job ladders, women that self-select into the long process of pursuing a managerial career must be productive enough as managers (within the "masculine manager" paradigm) to balance their higher opportunity cost in terms of household production. Later and more sophisticated research

⁶⁰ Estimations obtained from the different year releases of the *National Management Salary Survey*.

⁶¹ Own estimations done with data from the *WERS 1990-98 Panel Survey*.

⁶² See Powell and Graves (2003) for a good summary of research in both fields.

(see Eagly and Johnson, 1990, and Kabacoff, 1998) seems to have found a number of differences, most of them pointing in the direction of gender stereotypes. Females' leadership approach has been described as more oriented to tasks and interpersonal relationships. Furthermore, women managers consistently appear as putting higher emphasis in mentoring and inspiring their subordinates. Less clearly, some studies also found that female managers tend to be more democratic than their male counterparts. If these differences are real, they are expected to become more intense in the future, as the higher presence of women at management and the decline of the masculine stereotype of the good manager dilute selection effects.

In this paper, I address the question of sex differences in managerial style in a rather indirect way that avoids some problems suffered by previous research. Unlike prior investigations on managerial styles that relayed on self-reported or peers-reported data, I will look directly at the policies adopted at the workplace-level and relate them to the relative presence of women at management. This has the advantage of avoiding problem of "answer stereotyping" that individual-level studies suffer. It also helps to bypass the problem of female manager's selection into specific responsibilities that individual surveys may have if they do not control for it.

Whether the potential sex differences are being translated to the organisational philosophy of an organisation and to its profitability as the presence of women in managerial ranks increases is also itself a challenging question. Top executives may serve as leadership models in an organisation, largely influencing its organisational culture and managerial interactions. Hence, as women's penetration into management levels is being more intense at low and middle levels than at the level of the board of directors⁶³, such penetration may be having a rather limited effect on the global organisational behaviour setting of the firm.

⁶³ In the USA, the percentage of women at managerial ranks is about 37% (US Bureau of Labour Statistics 2003), while only 13% of boardroom sits are hold by female directors at large companies ("Women Board Directors of the Fortune 500", 2001 Catalyst Census). Differences are similar in the UK, where the percentage of female managers reaches the 30% level (WERS 98 and National Management Salary Survey 2003 and 2004, CELRE) and the percentage of female directors at large companies is around 5% (Corporate Women Directors International: www.globewomen.com/cwdi/cwdi.html)

From a practical point of view, the relevance of the connection between sex composition of managerial teams and work relationships policies stems from its potential consequences for corporate performance. The increase in the proportion of women managers could be, through the promotion of certain policies, accelerating their firms' transition towards the application of "high performance work practices" (see Appelbaum et al., 2000). These practices have been often found to have a positive effect on corporate performance in manufacturing sectors through enhanced labour productivity (Capelli and Neumark, 2001; Appelbaum et al., 2000). Consistently, raw correlation coefficients between changes in British organisations in the period 1993-98 show that firms where the participation of women at management has experienced larger increases have also enjoyed larger increases in labour productivity (see more detailed discussion of it in Section 3.4).

The main results obtained in this paper from the analysis of the data provided by the WERS 98 are the following ones. First, increases in the percentage of women at management ranks are associated to more intense interpersonal communication, higher involvement of managers in employee's career administration and, less clearly, to more democracy in decision-making at workplace. These results suggest that last decade changes towards more participatory management, higher involvement of employees in organisational issues and more intense manager-worker interactions might have been reinforced by an increasing presence of women at managerial ranks. Second, the percentage of females in the managerial body appears positively related to stricter definition of jobs and rather unrelated to the degree of managerial delegation on supervisors or to the use of payment by results schemes. Therefore, other recent organisational trends that aim to increase firm responsiveness to changes in global markets through higher task flexibility, increased decentralisation of decision-making and stronger direct incentives do not seem to be affected by the increasing weight of women in the administration of firms. Finally, the higher preference of women managers for certain type of policies is not reflected in especially higher ability to be more effective in implementing them. Thus, it seems that the extension of one type of policies or another is going to neither improve nor damage women's comparative advantage as managers.

The rest of this paper is organised as follows: in next section, I explain what researchers have found up to now about the beliefs and realities of sex differences in managerial behaviour more in detail. In section 3.3, I develop a set of hypotheses specifying how these male/female leadership style differences should translate into differences in organisational behaviour as a function of the proportion of managerial jobs held by women. In section 3.4, I use data from the WERS survey to test these hypotheses and discuss the results considering alternative explanations. Finally, I conclude in section 3.5.

3.2. Gender Stereotypes and Real Sex Differences in Managerial Styles

The fact that adult men and women are psychologically different is something much less discussed than the extent to which these differences are genetically determined or caused by differences in the socialisation of individuals. Furthermore, such differences frequently do not match differences in gender roles (i.e., differences in what society expects about the psychological qualities and behaviour of men and women). This mismatch between expected and real behavioural differences is especially important in the managerial environment, where feminine traits have often been seen incompatible with “good manager” features. Several studies replicated during the last thirty years (Schein, 1973; Brenner, Tomkiewicz and Schein, 1989; Powell, Butterfield and Parent, 2002), have consistently found that both practising managers and MBA students pursuing a managerial career perceive “good manager” characteristics as matching better the characteristics defining the masculine stereotype⁶⁴.

Studies that have surveyed the description and evaluation of managers’ leadership by their peers, bosses, subordinates and the managers themselves have found that there are qualitative differences in the way men and women lead. Paradoxically they found neither significant nor consistent differences in the aggregate effectiveness of their leadership. In a meta-analysis of a large number of previous studies, Eagly and Johnson (1990) reported

⁶⁴ This support for the masculine role of the good manager has nonetheless diminished substantially among female managers and female potential managers in the last years, while it has remained strong among male managers.

that women tend to manage in a more participative and democratic way, while male managers are more directive and autocratic. They found no evidence of differences between managers of both sexes in their reliance on interpersonal relationships or task definition for their leadership styles. Nevertheless, women seem to score higher in “*transformational*” style, which involves more intense interpersonal interactions to give individualised mentoring to subordinates, to serve them as managerial model and to be proactive at stimulating workers’ interest in the job. Men scored higher in “*Management by Default*” and “*laissez-faire*” styles, suggesting that male managers tend to delegate more and be less proactive in supervision tasks. In an analogous study, Eagly, Karau and Makhijani (1995) found that men and women did not generally differ in their organisational effectiveness⁶⁵. In a more recent work, Kabacoff (1998) matched 900 pairs of managers from different sexes, working at similar positions within the same firm, and analysed several dimensions of their managing styles and their organisational effectiveness. His results cast doubts about the more democratic leadership style of women, although the proxies used to measure it are rather indirect. This study also depicts women rating higher in both interpersonal and task-oriented styles, while male managers seem more concerned about “vision-creation”⁶⁶.

To sum up, any overview of the research done in the last years about sex differences in managerial style must conclude that, although there may be mixed results in specific pieces of evidence, women’s style tend to be more people-oriented than that of men⁶⁷, with no difference in the general effectiveness of men and women as managers.

⁶⁵ They also found, however, that men tended to rate higher in roles defined as highly masculine whereas women tended to rate higher in less masculine roles.

⁶⁶ More specifically, men at management were found to be more innovative, think more in strategic terms and have a higher ability to learn from the past to learn de future.

⁶⁷ The studies mentioned above have been done in the context of the United States corporate world. Nevertheless, things do not seem to differ much in Britain. Wajcman (1996) is the only study asking British men and women managers about their views of male/female differences in managerial styles. Consistently with gender stereotypes, she found that both men and women considered male managers to be more directive, aggressive and task-oriented than females, who were considered to be more participative, co-operative and people-oriented.

There are some drawbacks from this studies that the approach of the present paper intends to overcome. First, the analysis of managerial behaviour differences is frequently based on managers' opinions about differences between the typical male and typical women manager or, at most, on subjective evaluations of single managers' characteristics (as provided by their bosses, subordinates, peer managers or the individuals themselves). These judgements, even in the case of self-reports, may be affected by the gender stereotypes they have in mind, especially in the case of females at male-intensive working contexts where a female worker is more characteristically women than colleague, professional or boss (Kanter, 1977). This "answer stereotyping" problem is largely avoided here by using organisation-level instead of individual data. In the WERS 98 personnel managers are asked about the global behavioural patterns (policies) of organisation's management as a whole in their relationship with employees. By analysing the effect of increases in the percentage of female managers on the type of behavioural pattern prevailing at the management of the organisation, we can infer male/female differences in managerial behaviour through male/female differences in working relationships policies promoted.

A second advantage of the type of analysis done in this paper has to do with the type of managerial jobs usually done by women. Findings about male/female differentials in managerial style have been often neglected by the fact that presence of females is typically higher at managerial posts such as *HR or Controlling* than at other tasks such as *Engineering*. As most individual-level studies fail to control for this selection into different managerial areas, they cannot distinguish the extent to which sex differences in managerial behaviour are due to differences in their leadership style or to differences in the behavioural requirements that men and women face at their job. Data from the WERS 98 does not inform about female presence at the management of the different departments that may contain a workplace. Nevertheless, analysing differences in policies among firms with different proportion of women at managerial ranks is less problematic than comparing directly individual differences between male and female managers. The reason is that higher ratios of female managers can be associated to relatively more managerial responsibilities in the hands of women even if women manager tend to be selected into specific responsibilities.

The indirect approach to evaluate sex differences in managerial style adopted in this paper requires a specific formulation of the hypotheses to be tested. Instead of putting forward how should men and women differ in their managerial attitudes, I will hypothesise in the next section how the relative presence of women at management should affect to corresponding organisational policies.

The main limitation of the empirical strategy undertaken in this research is that workplace managers' decision power may be bounded by higher-level organisational structures. In general, it seems reasonable to assume that higher ratios of female managers are associated to more decision power in the hands of women. Nonetheless, since differences in female ratios at workplace's managerial teams are not necessarily linked to differences in female ratios at executive levels, women's different managerial style could be offset at the organisational context by their reduced presence at top executive boards. Male-dominated executive teams may design organisational structures that restrain strongly lower-rank managers' discretion to focus organisational relationships. Moreover, organisations' institutionalised models of successful leaders can be strongly influenced by the behaviour of top executives, obliging managers to adjust their behaviour to what is expected from such models. These two effects constrain what can be claimed from the obtained results. A significant effect on the degree of adoption of a given policy caused by higher presence of women at management can be said to reflect sex differences in their preferences for such policy or in their skills to apply it. On the other hand, the failure to obtain significant effects on the adoption of other policies can be due to the lack of sex differences in preferences and the aptitudes to apply such policies, but also to tight institutional constraints in the ability of workplace managers to apply their preferred policies.

Overall, the findings of this paper give a much direct a measure of the extent to which female managers are being able to bring or accelerate changes in the managerial philosophy at organisations than individual-level studies of sex differences in managerial styles. The results, however, do a better job in unveiling the specific aspects in which women managers advocate for a different focus of organisational relationships than in explaining why their relative presence at management does not make any difference in other aspects.

3.3. Hypotheses on the Organisational Consequences of Sex-Differentiated Managerial Styles

Are workplaces with higher presence of women at managerial ranks run in a different way? To answer this question one must first hypothesise how “different” should labour relationships be at workplaces lead by women if females’ individual leadership style tended to differ from that of men in the ways explained in the previous section. Many aspects of leadership can be considered in this context. The most important of them, selected on grounds of a balance between relevance, comparability with previous studies and ability to be observed at the organisational level, are included below: *the orientation of their leadership* (what channels do managers use to address the actions of their subordinates), *their decision-making style* (whether they take decisions at the workplace in a democratic fashion or in a rather authoritative way), *their involvement in subordinates’ job* (the extent to which they are able to mentor and serve as models and sources of motivation for employees), *their reward for performance* (the extent to which they associate the reward of each employee to his/her performance) and *their degree of delegation* (the amount of tasks that managers delegate on lower level employees). Of course, not all the aspects that define an individual managerial approach are equally transferable to organisation-level attitudes. It is probably easier to agree in a common guideline on whether managerial activities are more or less task-based than to agree in common patterns about the inspirational ability of the group of managers. Being aware of this, the following set of hypotheses is designed to predict the consequences that higher presence of women at managerial ranks should have on organisational labour relationships if female managers’ differential features matched those expected from gender stereotypes and could be easily transmitted to organisational values.

3.3.1. Orientation of Leadership: Task-Based Style

One common dimension used to analyse managerial styles is the orientation of their leadership, i.e. the type of behaviour they may use to influence the actions of their subordinates. Researchers have commonly distinguished between task-based leadership

style and interpersonal-relations style (see Bass, 1974) in a non-excluding way. This means that, in principle, a manager may base his/her leadership highly in both task definition and interpersonal relationships, only in one of the mentioned dimensions, or in neither of them. Specifically, task-oriented managers are characterised as relying on the definition of jobs, the assignment of projects, or the setting of goals and procedures to exert their leadership. Less task-oriented managers, on the other hand, would be less specific in the definition of jobs and objectives and might enjoy higher flexibility in the distribution of tasks. Employees under the direction of more task-styled managers should know in more exact terms what is expected from them through the provided description of their job and goals to be achieved. In terms of gender stereotypes, a high propensity to display task-oriented managerial behaviour is normally associated to the masculine trait of more structured thinking (Powel and Graves, 2003). At the workplace level, a more task-oriented management body should involve more rigid definition of tasks with more structured jobs. Then, gender stereotypes tell us that working relationships in firms with proportionally more women at management should be less dependant on formal definition of jobs.

Hypothesis 1 (Task orientation): At organisations with higher presence of women at managerial ranks, employees' work should be less strictly tied to the formal definition of their tasks.

3.3.2. Orientation of Leadership: Interpersonal Style

Interpersonally oriented managers use personal contacts and interactions to influence the behaviour of their subordinates. They build their leadership on keeping the morale of their subordinates high and caring for their self-esteem by, for example, showing concern about their welfare at work or congratulating those who achieve good performance. In contrast, less interpersonally oriented managers would rely less on these activities to promote their leadership. Gender stereotypes clearly suggest that women tend more to adopt these attitudes, fitting much better into the interpersonally-oriented model of management. At firms where the interpersonal style is dominant among leaders, more frequent and more direct personal interactions between managers and subordinates should be observed.

Consequently higher presence of women at managerial ranks should be associated to the promotion of more intense and less structured interactions between managers and employees.

Hypothesis 2 (Interpersonal orientation): At organisations with a relatively high proportion of women in the management, the personal interactions between managers and subordinates should be equal or more frequent and rely equally or less on formal interviews.

3.3.3. Democracy in Decision-Making

Another dimension of managerial behaviour where men and women have been found to differ is the decision-making process. Leaders that discuss potential changes with their subordinates and try to build a consensus with them to obtain a better implementation of the change are qualified as more *democratic* managers. Those who adopt a directive style, defining by themselves all the actions and changes to be carried through before communicating them to their subordinates are considered *autocratic* managers. This latter style of decision-making is more associated to the masculine stereotype, characterised by dominance and control. Conversely, the democratic style appears more related to the feminine stereotype, reflecting a higher emphasis on the involvement of others. Organisations with a more democratic behaviour among managers would result in more consultation activities and more decisions taken by the management in agreement with their employees.

Hypothesis 3 (Democracy versus Autocracy): Organisations with higher presence of women in the management should consult more to their employees before taking decisions.

3.3.4. Transformational Style

Most leadership studies in the last 20 years have been highly influenced by a platonic benchmark proposed by Burns (1978): the *Transformational Manager*. A *transformational*

leader is supposed to establish high behavioural standards by acting as role model for his/her subordinates, setting with them individualised mentoring and high level of empowerment, being their constant source of inspiration and stimulation, and obtaining therefore the maximum contribution to the organisation capabilities from them. Such style is usually described by researchers in contrast to *transactional* style, which associates managerial relationships with subordinates to exchange relationships, and *laissez-faire* style, normally associated to a simple failure in fulfilling managerial activities.

Most features of the *transformational* style cannot be associated to either gender stereotype. Nonetheless, the more intense social behaviour of the feminine stereotype puts women in a better place to offer mentoring and encouragement to their subordinates. It is also difficult to predict which special characteristics should have a workplace with a majority of managers that fit well within the “*transformational-style*” category. Since this type of style was defined almost completely in terms of how the “ideal” behaviour of a manager should be composed, *transformational*-styled managers should add especially high value to their organisations through better and more productive labour relationships. In organisational terms, the spirit of the definition of *transformational* management suggests that at firms where this style is pre-eminent, there should be more frequent contacts between managers and subordinates, who should be able to report incidents, concerns or suggestions directly to their bosses. These characteristics are somehow similar to those of a firm where managers tend to use interpersonal style, not less because *transformational* style is itself interpersonally-based. However, it must be noticed that the special features of transformational managers is that they go further by not only building their leadership in inter-personal relationships (as interpersonally-oriented managers do), but using them to act as individual mentors of their subordinates, to provide them with challenging views of their tasks and to transmit values and excitement about the organisational objectives.

Hypothesis 4 (Transformational management): In organisations where women represent a larger proportion of the managerial ranks, the report of incidences, suggestions or concerns from labour force to management should be more direct. Employees’ mentoring

and development should be a relatively more important issue among managers at these firms.

3.3.5. Reward for Performance

For those managers who fail to approach the *transformational* behaviour, researchers have also categorised different style trends (see Bass, 1974). First, *transactional* leaders tend to delegate tasks, offer suitable rewards in exchange for objective accomplishment and manage “*by exception*”, intervening only to correct their subordinates’ performance. In contrast, *laissez-faire* managerial style covers the basic characteristics undesirable for a good manager, avoiding decision-making responsibilities, failing to provide performance feedback to their subordinates and tending to stay away from employee-development tasks⁶⁸. As it happens with *transformational* style, *transactional* and *laissez-faire* styles cannot be globally associated to either the masculine or the feminine managerial stereotype. Nevertheless, there may be some gender differences in the specific assets of these styles. In particular, stereotypes that assign higher orientation to tasks to male managers also suggest that they are more likely to offer explicit rewards for performance. This is possible because they define goals and individual tasks more explicitly, so that performance can be measured more objectively. At the organisational level, the pre-eminence of males at management should result in higher incidence of *payment by results* schemes.

Hypothesis 5 (Contingent Reward): Payment by results should be a less common practice at firms with higher presence of women at management.

⁶⁸ It must be noticed that, while *laissez-faire* leadership is presented as completely opposite to *transformational*, the concept of *transactional* leadership still contains some behavioural elements that fit well to the *transformational* approach. This is especially true in the *contingent reward* aspect of management, since in both approaches payment by results is an important managerial tool for the provision of incentives.

3.3.6. Degree of Delegation

Finally, managers also differ in the degree to which they delegate decision making on employees. Gender stereotypes present the managerial behaviour of women as more participative than that of men to extreme of making decisions in a more democratic fashion. Such higher participation of employees in the administration of organisations may also be reflected in the amount of independence awarded to subordinates to make decisions in their working context. Therefore, gender stereotypes would suggest that women managers tend to delegate more on lower levels while male managers would tend to accumulate decision-making responsibilities at higher levels. In this sense, higher presence of women at management should be associated to higher degree of delegation of decisions.

Hypothesis 6 (Delegation): At firms where the proportion of female managers is higher, the degree of delegation on supervisors is higher.

3.4. Evidence from UK firms

In the previous section, I have hypothesised how the observed sex differences in managerial style, which only partially support gender managerial stereotypes, should affect organisational-level labour relationships as women gain access to managerial jobs. In order to test these hypotheses empirically, data about workplace managerial patterns is needed. The data contained in the WERS 98 survey is then the most suitable for performing this analysis from a workplace-level perspective.

The WERS 98 is a national survey of 2091 British workplaces⁶⁹ selected from all workplaces with 10 or more employees through stratified random sampling. The survey consists of information about employment relations at the place of work provided by the management, a sample of employees and a representative of workers. The main source of

⁶⁹ Note, however, that the final number of observations used in each type of analysis of this section is lower as long as valid data for all the variables in play is needed. Specifically, the total number of observations considered for each analysis varies between 1455 and 1603.

data for the present analysis is a set of questions extracted from the *Main Management Interview* section, although variables from the *Survey of Employees* section are also used to control for workforce characteristics. A majority of the relevant issues for this paper are materialised in the survey in the form of questions that concern the degree of application of several specific policies. Therefore, most of the variables used for the analysis are coded in qualitative terms or discrete scales, as it is shown in the description of variables provided in the Appendix.

The percentage of women at managerial ranks registered at the WERS 98 survey was about 30%. More than 48% percent of interviewed managers reported an increase of such proportion in their workplaces in the period 1993-1998, while only 4% stated a decrease. At the same time, a majority of managers reported increase in labour productivity (80% against 4% that reported decrease) but also in labour costs (64% against 16% that reported decrease). Panel A of Table 3.1 reflects how do these changes in performance correlate with changes in managerial workforce composition: Increases in proportion of females at management appear significantly correlated with increases in labour productivity and, less strongly, with decreases in labour costs. This would be consistent with the thesis that women managers are able to create more value through a more intensively *transformational* approach to management. Furthermore, correlation coefficients from Panel B of Table 3.1 show that those workplaces where the increase in females at management has been higher have also experienced higher increases in the importance of employee relations as strategic targets, the influence of employees on managerial decision-making, the extension of payment by results to employees and the autonomy of workers at their jobs. In other words, it seems that workplaces where the relative increase of women at management has been stronger, have also become more people caring, more democratic and rely more on contingent rewards and delegation.

The significant correlations reported above, however, do not imply any type of causality respect to the stated hypotheses. First, there can be other factors that could be causing both trends at the same time that must be controlled for, such as product and labour market conditions of the specific industry, size of the firm or age, education and occupational

composition of the labour force. Second, several of the different policies studied here may need to be applied jointly to be truly effective. Increases in delegation, for example, are usually accompanied by increases in payment by results, in order to balance higher decision-making power awarded to employees with stronger incentives to make a good use of it. This would make difficult to identify which policies are the ones that women managers tend to promote more and which are the ones adopted complementarily. To solve the first problem, a number of relevant factors are kept constant while analysing how the proportion of women at workplace affect the extent of application of different policies. The second issue will be discussed later.

3.4.1. Measurement of the Different Policies

Before describing the results of the analysis, it is necessary to clarify how the different policies referred in hypotheses are measured empirically. Of course, a policy is usually something that cannot be measured in a completely objective and unequivocal fashion. For this reason, I will proxy each of them through the degree of application of one or several concrete patterns in employee-managerial relationships that can be associated to the existence of such policy.

- Hypothesis 1 states that a higher presence of managerial women makes employee's work less strictly attached to their set of specified tasks. This is measured through the variable *EMPSHELP* -the extent to which managers ask employees to help them in ways not specified in their job description. The higher the attachment of employee's work to their defined task, the lower the value of *EMPSHELP* will be. Therefore, Hypothesis 1 implies that *EMPSHELP* should be higher in workplace with higher proportion of women managers.
- Hypothesis 2 says that personal interactions between managers and subordinates should be equal or more frequent and equal or more informal at workplaces with higher proportion of women managers. Two variables are chosen to measure this: the extent to which management prefers to consult directly with employees instead of their

representatives (*DIRECONS*) and whether managers are considered as instruments for workers to make direct suggestions (*IMPRMGMT*). Both variables are assumed to be directly connected to interpersonal interactions, so that both of them must be positively related to the relative presence of women at management if Hypothesis 2 holds

- Four variables are used to test the degree of democracy in decision-making at the workplace. Hypothesis 3 claims that decisions should be done in a more democratic way at workplaces where the presence of women at managerial jobs is higher. *DECSATOP* states whether management considers that those at top are best placed to make decision and *EMPSNOCO*, whether most decisions are made without consulting employees. The proportion of women at management must have a negative effect both variables if Hypothesis 3 holds. On the other hand, *EMPSCHAN* describes the extent to which management discusses possible workplace changes with workers before introducing them and *CONSTARG* codes whether managers set targets in consultation with employees or not. The presence of women at management is expected to affect positively to these two latter variables if the claim of Hypothesis 3 is true.
- Hypothesis 4 stated that employees' reporting of incidences, suggestions or concerns to management should be more direct at organisations with higher presence of women at management and that employees' mentoring and development should be a relatively more important managerial task at these workplaces. The two dependent variables chosen to test this are *PARTBRIE* and *DISCUSS*. These variables could have been partially associated to Hypothesis 2 to the extent that they are somehow related to the level of interpersonal interactions between employees and managers. Their definition, however, fits better into the particular features of the *transformational* leadership style for which Hypothesis 4 was designed. *PARTBRIE*, for example, reflects the extent to which management encourages the implication of workers in organisational issues, by dedicating more time in briefing meetings to express their points of view and suggest improvements. *DISCUSS*, on the other hand, is a more general index coding whether the firm uses performance appraisals to give feedback to employees, discuss their career

moves or set their personal objectives. Hypothesis 4 predicts that both variables should be positively affected by an increase in the proportion of women at management.

- Hypothesis 5 deals with the evolution of the use of contingent rewards as the presence of women at management increases. Three dummy variables are used to measure the use of explicit payment by results: *PROFREL* states whether employees receive profit-related payment; *SHAROWN*, whether there exist employee share ownership plans at the company and *PAYPERF*, whether workers at the firm are paid through “pay per performance” schemes. All three variables should be negatively related to the proportion of women at management if, as Hypothesis 5 states, payment by results were a less common practice in firms with higher presence of women at management.
- Finally, Hypothesis 6 states that higher proportion of women at managerial positions brings more delegation on supervisors. I will use four measures of delegation on supervisors to test it, the percentage of supervisors (*EMPSUPV*) at the workplace and three dummies coding whether supervisors have the right to hire workers (*SUPVTAKE*), to decide on their pay (*SUPVPAY*) or to dismiss them (*SUPVEDISM*).

3.4.2. Explanatory Variables

The key variable used to test the hypotheses stated above is *PROPFEMG*, the proportion of managers who are females. A number of other variables that could be related at the same time to *PROPFEMG* and some of the policies are included in the analysis in order to control for their effect:

- *The Proportion of Female Workers* is included through the variable *PROPWOM*. A higher proportion of female managers can be the outcome of higher proportion of female employees. Since firms with relatively more women in the workforce may present specific characteristics, it is worthwhile to control for it.

- The *Sex of the Respondent Manager* is coded through the dummy variable *RESPFEMG*. Higher proportion of female managers increases the probability that the survey's respondent manager is a women, and there are potential sex differences in the view of how employment relationships are carried out in the workplace that have to be kept under control.
- The *Characteristics of the Workplace Labour Force* must also be taken into account, since potential differences in age, education or the type of occupations hold by workers may also be important in determining the type of policies that can be applied. The mentioned characteristics are summarised in *AVGAGE*, the average age of workplace's employees, *AVGEDUYR*, the average years of education of workplace's employees, and a set of variables including the proportion of workplace's employees in each of 7 different occupations. All these variables are computed average obtained from the data included in the *Survey of Employees* section of the WERS98.
- The *Workplace Size* may also be a relevant variable in explaining the extent of application of some of the policies analysed. Thus, it is controlled through the total number of employees at the workplace, *NUMEMPS*.
- The *Autonomy of the Workplace*: The ability of workplace's managers to promote a given policy and the support that they may have from the board of directors to implement it may depend on who owns the firm. For this reason, I included three dummy variables coding whether the organisation is owned by a majority of foreign capital (*FOREING*), whether it works for the public sector (*PUBLIC*), and whether it is a completely independent organisation (*INDEPEND*)
- The *Longevity of the Workplace* is measured through the number of years that the workplace has been operating *LONGEV*. The rationale for including it as a control variable relies in that policies are usually easier to implement over "green field" than on well-established workplaces.

- The *Sector* where the organisation is operating is controlled through 12 dummy variables associated to the 1-digit SIC 1992 code. Technological differences across industries may be huge, and they may have an influence in both the possibilities of women to obtain managerial positions and the type of policies that can be adopted.
- The presence of any type of Union at the workplace may have an influence on women's chances to arrive to managerial jobs in that workplace and, at the same time, affect their ability to introduce specific policies.

3.4.3. Estimation Results

Tables 3.2 to 3.7 show the results from the Ordered Logit⁷⁰ analysis of the effect that the ratio of females at workplace's management may have on the extent of application of different employment relationship policies. The results, in relation to what previous research has found about each managerial style associated to each policy, are described below.

Individual-survey evidence discredits the role assignment setting proposed in Hypothesis 1. Eagly and Johnson (1990) did not find any sex difference in task style and the differences found by Kabacoff (1998) portrayed women as more intense task-styled managers than men. Somehow consistently with this evidence, the results depicted in Table 3.2 are closer to deny than to support Hypothesis 1. The effect of *PROPFEMG* on *EMPSHELP* is negative in all the presented models, although it loses its statistical significance when we control for the ratio of females at workplace (*PROPWOM*) and the sex of the manager in charge of human resources relationships at the firm (*RESPFEMG*). The high correlation between *PROPFEMG* and *PROPWOM*, (correlation coefficient is 0.65) or between *PROPFEMG* and *PROPWOM* (correlation coefficient is 0.41) suggest that the observed negative effect of Model I could be in fact reflecting the effect of a larger proportion of women at workplace or the larger incidence of a women in charge of labour relationships. On the other hand, estimates from the rest of the models (for this and the rest of dependent

⁷⁰ See Maddala (1983) to learn about the structure and distributional assumptions behind this method

variables) might suffer a problem of multicollinearity, a failure to disentangle the effects of the three variables. All in all, the negative effect of female ratio at management in Model I on *EMPSHELP* (significant at the 10% level) and the consistently negative effect registered even after controlling for the female ratio at workplace and sex of the respondent manager, seem to go against Hypothesis 1. Model V includes an interaction effect between the proportion of managers and the percentage of women at workplace. Although the value of such interaction is not significant, its negative sign suggests that the presence of women at management has a more negative effect on the flexibility of task definition if the proportion of women at workplace is also high. Kabacoff (1998) argued that the finding that women tend to score higher in task-oriented leadership style could be associated to higher vulnerability of women at management that makes them more needed of explicit rules and higher security of having the job done. In this sense, the negative interaction from Model V is at least counterintuitive, since a higher proportion of women in the workforce should imply a less strongly masculine model of the good manager⁷¹ and higher ability of women managers to be flexible in task definition.

Individual-level studies on sex differences in the interpersonal orientation of leadership weakly support the gender stereotype behind Hypothesis 2. The meta-analytical findings of Eagly and Johnson (1990) stated that women tend score higher than men in interpersonal style in laboratory experiments and assessment studies with non-leaders, but were not able to find similar differences for actual managers. Kabacoff (1998), on the other hand, found a significantly stronger interpersonal orientation in the managerial style of women managers. As it can be observed from Table 3.3, both *DIRECONS* and *IMPRMGMT* are positively affected by *PROPFEMG*. In first case, the effect is only significant at standard levels when we do not control for the proportion of women at workplace. In the second case, the coefficient is only significant once the proportion of women at workplace is accounted for. Both results back Hypothesis 2 as long as they reflect that interpersonal interactions of managers and subordinates are more intense at organisations where the presence of women at management is higher. Neither *RESPFEMG* nor *PROPWOM* have a consistent effect

⁷¹ As stated by Powell, Butterfield and Parent (2002) the association between the stereotypical characteristics of the good manager and masculine characteristics is currently lower among female than among males.

across the two mentioned proxies of the degree of interpersonal orientation of working relationships.

Consistently with the predictions of gender stereotypes, most studies have found that women tend to be more democratic and less autocratic leaders than men (Eagly and Johnson, 1990). An exception is the case of Kabacoff (1998), where the small sex differences found in democratic decision-making suggested that women could be even more authoritarian than men in the same managerial position⁷². The results displayed in Table 3.4 are also mixed. As the Panels 3.4.2 and 3.4.3 depict, the variables directly related to whether management consults or not with employees (*EMPSCHAN* and, especially, *EMPSNOCO*) are clearly affected by the proportion females at management in the direction that Hypothesis 3 predicts. Furthermore, the significant interaction effects of *PROWOM* and *PROPFEMG* on both variables suggest some type of synergies that makes female managers behave more democratically when their subordinates are mostly women. On the other hand, the estimated effects of *PROPFEMG* on *DECSATOP* and *CONSTARG* were not significant.

A distinctive feature of variable *DECSATOP* is that it does not require the interviewed manager to describe the general managerial behaviour at the workplace as other questions do, but it asks him/her about his/her opinion on who has the relevant information and power to make decisions, so that one would perhaps expect personal characteristics of the respondent to especially affect the answer. In this respect, it is remarkable (and consistent with Hypothesis 3) the result from Panel 3.4.1 that female respondents significantly consider “*those at top*” worse placed to make decisions than male respondents do.

The only variable for which the effect of female managers ratio contradicts Hypothesis 3 is *CONSTARG*, which reflects a much more specific aspect of managerial decision-making

⁷² The author of this latter study argued that such mismatch with the literature could be due to a selection effect in the previous studies by which women generally tend to occupy functions and levels that require a more democratic style. To the extent that his study controls for this issues by matching male and female managers from the same organisation at the same level, his results should be more valid.

-target setting- than the rest of variables. Therefore one could argue that this particular variable reflects worse than the rest the general managerial attitude towards democratic decision-making as it is more affected by the idiosyncrasy of target-setting decisions. Overall, the lack of significant effects of *PROPFEMG* on these two “indirect” measures of decision-making implies that findings of Table 3.4 cannot be claimed to provide more than a weak support to Hypothesis 3.

There is a large degree of agreement among the existing individual-survey evidence in that female leaders are more *transformational*, as predicted by gender stereotypes. Studies from different countries have found that women managers tend to score higher in managerial attributes such as charisma, inspirational motivation and individualised consideration of subordinates than their male counterparts (Carless, 1998; Eagly and Johannesen-Schmidt, 2001)⁷³. Consistently with such survey evidence, Hypothesis 4 is strongly supported by the results of this paper. As the two panels of Table 3.5 show, *PROPFEMG* is positively associated to both measures of the extension of a *transformational* style among managers, *PARTBRIE* and *DISCUSS*, with consistent and significant effects in all specifications. Managerial teams with higher ratio of females encourage more the implication of workers and are more intensive in collecting performance appraisals to improve worker’s performance and discuss career paths. The proportion of women at workplace, on the other hand, does not seem to have a significant role in determining managerial behaviour, neither directly nor through its interaction with the ratio of females at management. The last columns of both panels of Table 3.5 show non-significant interaction effects with opposite signs, so that it is not clear whether tendency of female managers towards a more transformational leadership style steps up or decreases with the proportion of women among their subordinates.

⁷³ Interestingly, survey evidence that assigns such higher scores to women in styles associated to higher effectiveness (transformational), also assigns to men higher scores in styles assigned to lower effectiveness (laissez faire) (Lowe, Kroeck and Sivasubramaniam, 1996). At the same time, studies on effectiveness (Eagly et al., 1995; Kabacoff, 1998) reveal that the overall perceived effectiveness of female managers is not larger than that of men. This suggests the existence of other behavioural features affecting managerial effectiveness out of the axis transformational–laissez faire styles where men could be enjoying some advantage.

Researchers that studied sex differences in managerial style have also addressed the extent of use of contingent rewards. As in the case of task-style orientation of management, their findings seem to go in the opposite way to what gender stereotypes predict. Eagly and Johannesen-Schmidt (2001) found that women tend to score higher in the *contingent reward* dimension of managerial style, being therefore more likely to establish concrete compensations for well-done jobs. The results exhibited in Table 3.6 show that *PROPFEMG* has no significant effect on none of the three measures of payment by results (*PROFREL*, *SHAROWN*, and *PAYPERF*), and that the sign of the effect varies across dependent variables and specifications. Hence, female managers cannot be said to rely more or less than males in contingent rewards (at least for the explicit part of them), so that neither the gender managerial stereotypes behind Hypothesis 5 nor individual survey evidence on managerial sex differences in explicit rewards for performance are supported in Table 3.6. It is interesting to note that firm characteristics, such as *INDEPEND* (the independence of the organisation), *FOREING* (its ownership by foreign capital) and *PUBLIC* (its public service character) are more important in explaining the adoption of payment by results plans than the sex composition of the managerial body. This would suggest that explicit incentive policies such as those analysed in Table 3.6 are rather structural and strongly determined by top-executives' decisions. In this sense, the lack of significant effect of *PROPFEMG* on neither dependent variable may be due to the low influence that managers out of the board of directors have over the adoption of incentives policies at the organisational level.

The results of Eagly and Johannesen-Schmidt (2001) suggested that male managers, who scored higher in “*management by exception*” and *laissez faire* managerial style, tended to delegate more than their female equivalents. The results depicted in Table 3.7 seem more consistent with this evidence than with the gender roles that determined Hypothesis 6. The sign of the estimated coefficients of *PROPFEMG* on the different measures of delegation on supervisors (*EMPSUPV*, *SUPVTAKE*, and *SUPVPAY*) is negative in almost all specification for all measures of delegation considered, but it is never statistically significant. Hypothesis 6 is then clearly not supported by the results of this paper.

Summing up, the results depicted in Tables 3.2 to 3.7 support the hypotheses that, at workplaces with higher ratios of women at management, manager-employee interactions are more intense and interpersonal, with higher a involvement of the former in the career development of the latter. There is also some support in this evidence for the hypotheses that at workplaces with proportionally more women managers, the decision-making process is carried out in a more democratic fashion. In contrast, the hypothesis that higher presence of women at management implies stricter definition of tasks, with less explicit payment by results and more delegation on supervisors are definitively not sustained by the data.

3.4.4. Robustness Check and Quantitative Assessment

Most of the ordered logit estimates presented in Tables 2 to 7 correspond to effects over dependent variables that are coded in more than two categories. This implies that the results may be driven by an especially large effect on the probability of achieving a single category. In order to check the robustness of the results presented above, I compressed each dependent variable coded in three or more categories into two categories and applied binomial logit analysis. The sign and significance of the relevant estimates pointed in almost all the cases⁷⁴ in the same direction to that showed by the ordered logit analysis. Furthermore, the differences in estimates across different models showed in each panel of Tables 2 to 7 were mimicked in the compressed case.

An advantage of the binomial logit analysis is that it allows us to give a quantitative assessment of the estimated significant effects through the computation of estimated marginal effects at the mean. In the case of interpersonal relationships, for example, the results imply that an increase in 10% in the proportion of female managers is expected to increase between 0.7% and 1% (depending on the model) the probability that the

⁷⁴ Since most of the dependent variables were coded in terms of a discrete scale of “agreement” from 1 to 5, where option 3 represented “neither agree nor disagree”, I applied a more conservative method of compressing the categories, which assigned categories 1 to 3 to a “tend to disagree” category and categories 4 and 5 to a “tend to agree” category. I also explored an alternative method, which included category 3 into the “tend to agree” category. The results were substantially the same for the relevant variables, except in the case of *EMPSHELP*, for which no significant effect of *PROPFEMG* was found in the compressed approach.

respondent manager “tends to agree” with the statement that “managers rather consult directly with employees than with representatives”, keeping all the covariates at the mean. A quantitatively similar effect is found for the probability that “managers are considered a channel through which employees can make suggestion”. With respect to the extent of democracy on the workplace, 10% increases in the presence of women at management are associated to increases between 0.3% and 0.8% in the probability of “tending to agree” with the statement that “managers discuss with workers any change before introducing it” and to decreases between 0.7% and 1% in the probability of “tending to agree” with the statement that “most decisions at workplace are made without discussing them with employees”. Finally, the largest effects are found for variables related to “*Transformational Management*”: 10% increases in the proportion of women at managerial ranks are associated to estimated increases between 0.9% and 1.4% in the probability that “more than 25% of the time in briefing meetings is given to employees to offer views and pose questions” and to estimated increases between 0.8% and 1.1% in the probability that “the firm uses performance appraisals to give feedback to employees, discuss their career moves and set their personal objectives”. Although these figures give an idea of the relative importance of the sex composition of the managerial team on the type of labour relationship policies adopted, it must be taken into account that, by the construction of the logit estimator, the estimated marginal effects may differ strongly from those reported here as firm characteristics differ from the average.

3.4.5. *Potential Correlation Between Policies*

An important issue that we must tackle before discussing these results is the potential effect of the correlation between the different dependent variables considered here. Complementarity between several organisational policies could make them more profitable when applied jointly instead of separately. Therefore, we might see that, in practice, policies are usually implemented “in packages” rather than in isolation (Milgrom and Roberts, 1995) and have difficulties to assert that the observed effect of female ratio at management over a given policy variable is not in fact reflecting such correlation with other relevant policy variables. Table 3.8 shows the matrix of sample correlations for the

different proxies for policies used in the previous analysis. As it can be observed, correlations between variables that proxy different policies are rather small (all of them below 0.2 and most of them below 0.1), but statistically significant in most cases, so that potential complementarities cannot be ruled out. To explore the extent to which the policies approached by our variables are adopted “in bundles”, I performed principal components and maximum likelihood factor analysis to identify potential higher level “policy trends” associated to especially high or low degree of implementation of several of the 16 dependent variables considered in Table 3.2. The results from the factorisation, presented in Table 3.9, discourage a generalisation of the analysed proxies on meta-variables capturing different policy trends. The rotated factors obtained from both methods seemed to be associated to a strong presence of either a single variable or, at most, one of the policy groups defined by the hypotheses stated in the previous section⁷⁵. This suggests that correlation between policies should not be an important problem for interpreting regression results of Tables 3.2 to 3.7. On the other hand, the information contained in these variables did not appear easily summarised in a few factors or components. Principal components analysis, for example, revealed that at least 10 components would be needed to capture a 75% of the total variance, encouraging the researcher to maintain the analysis of each of the policy variables separately on grounds of ease of interpretation.

3.4.6. Female Managers, Policies and Performance

The evidence presented above shows that the way workplaces are managed varies with sex composition of the managerial team, and that such differences are consistent with some of the sex differences found in individual managerial behaviour. Conversely, other differences observed at the individual manager level do not seem to translate to the workplace scope. One argument for this discrepancy is found in the “glass ceilings” (Powell, 1999) that keep women from achieving executive positions. The intensity of interpersonal contacts, the degree of worker mentoring or even the amount of democracy in decision-making are “softer” aspects of managerial tasks where each manager has to fully decide how to cope

⁷⁵ Specifically, Hypothesis 3 (democratic decision-making) Hypothesis 5 (payment by results) and Hypothesis 6 (delegation) are individually well captured by the different factors retained.

with. In contrast, the degree of decentralisation of responsibilities and the extension to employees of payment by results schemes are “harder” aspects of the organisational policy, more related to the rules imposed by the organisational structure designed at executive ranks. Hence, to the extent that the presence of women at executive boards is much lower than at the rest of the administrative bodies even in firms with a high percentage of female managers, policies related to delegation and incentives will be much less affected by the sex composition of managerial teams. At the same time, this evidence also implies that women’s individual tendency towards a more task-based, interpersonal, democratic and employee-mentoring orientation in their leadership style is not limited by the potential masculine role modelling of a male-dominated executive body. Overall, this finding suggests that if, as usually claimed in the literature, sex differences in leadership orientation are constrained in practice by a disproportionately larger presence of men at top levels⁷⁶, such constraints would come from male-designed organisational structures rather than from female managers’ attempts to fit to a male-manager role model.

As stated before in the paper, individual leadership studies that assign higher amount of *transformational* attributes to women suggest that female managers should be better at motivating and obtaining commitment from employees. To the extent that the empirical analysis shows evidence consistent with Hypothesis 2 and 4 that generalise this attribute to the workplace level, organisations with higher proportion of female managers should obtain a greater performance from encouraging more interpersonal and interactive manager-subordinate relationships. To deal with this issue, I will investigate how the different policies analysed above affect firms’ performance and, especially, how the effect of these policies depends on the presence of women at the management. Though the WERS 98 does not provide any objective measure of performance, managers are asked to evaluate the degree of commitment of workers to the values of the organisation (*FULLYCOM*) and three other aspects of performance at their organisation in comparison to the rest of the industry: labour productivity (*LABPROD*), product quality (*PRODQUAL*) and financial performance (*FINPERF*). Although these subjective answers are likely to be biased upwards (most managers state that their workplace perform better than the average of the industry in all

⁷⁶ See Powell and Graves (2003) for the specific case of the UK, see Li and Wearing (2002)

aspects), variation in answers will capture well variation in actual performance as long as the excess of optimism displayed by managers is correlated neither with actual performance levels nor with our explanatory variables. Taking this into account, I performed Ordered Logit Regression analysis to capture the effect over these performance measures of the six types of policies analysed above and their interaction with female ratios. The regression accounts for the same firm and workforce characteristics used previously in the paper plus additional controls for other organisational policies that could affect performance and, at the same time, be correlated with other policies⁷⁷.

The results of such analysis are displayed in Table 3.10. For each measure of performance, the first specification depicted includes the effect on it of each policy, while the second model shows how such effect depends on the presence of women at management and the proportion of women at workforce. Less strict definition of tasks and more participative decision-making seem to have a significant positive effect over the commitment of workers to firm's values. On the other hand, more interpersonal manager-employee relationships do not seem to have such effect, although the extension of the specific practices of the *transformational* manager (captured by *PARTBRIE* and *DISCUSS*) do also affect positively to workers' commitment. In general, however, these described significant effects are not found for the rest of performance measures; only *EMPSCHAN PARTBRIE* registered a statistically significant effect over the perceived labour productivity and quality of the main product, and only the latter has a significant effect over the workplace's financial performance. Interestingly, the opposite happens with measures of payment by results, which either do not have a significant effect or have a significantly negative effect on the degree of commitment of workers to firm's values⁷⁸, but their presence is consistently

⁷⁷ Specifically, these include the extent the firm offers long term employment relationship to workers (*LTEMPLOY*), the degree to which vacancies are filled with promotions from within (*WITHINPR*), whether the firm has a formal policy for equal opportunities employment (*FOREQOPS*) and whether it has a special policy to hire women returning to work after childbearing (*EMPMOTH*).

⁷⁸ Specifically, there is a significant negative relationship between the existence *Pay per Performance* schemes and the commitment of the workers to the values of the organisation. This is consistent with the traditional theory of human resources that predicts some substitution between intrinsic and extrinsic motivation to work (see Baron and Kreps, 1998).

associated to higher financial performance in all cases. As for delegation, no consistent linkage appeared between its different proxies and the measures of performance.

To investigate whether manager women perform better at applying the policies that they seem to “prefer”, the second specification of each dependent variable of Table 3.10 shows the extent to which their effect on performance depends on female ratios of women at management (keeping constant the moderating effect of the proportion of women at management). In general, the results do not sustain the idea that women at management are better at implementing the policies that they tend to apply. Female managers, for example, tend to be stricter in task definition but, as the interactions of *HELP*×*FEMG* show, a more flexible task definition has a more positive effect on the commitment of workers and organisational financial performance when the presence of women at management is higher. Similarly, while female managers seemed to promote more interpersonal employment relationships, the benefits from them seem to increase significantly as the female ratios at management decrease. No significant or consistent interactions were found between the effectiveness of rest of policies and the proportion of women managers applying them.

On the whole, results from Table 3.10 tell us that the inclination of women managers for certain type of policies is more related to personal preferences or lower personal costs to carry them out than to any comparative advantage they may have in their application. In this sense, these results are not as optimistic as Rosener (1990) in suggesting the superiority of women at managing in a more interpersonal and interactive way. They rather support the line of Wajcman (1996) in claiming that male managers can be in principle as effective as females in applying such “softer” managerial style.

In general, the message that can be extracted from the evidence analysed in this section is that several of the individual sex differences in managerial style found at the individual level are also found in organisational policies while others are not. Hence, as sex composition of workplace’s managerial team changes, policies related to worker-employee direct interactions change substantially, while policies related to organisational structure

seem to remain unaffected. As it happens with individual sex leadership differences (see Powel and Graves, 2003), the disparities in preferences for organisational policies by sex composition of management do not seem to translate to differences in performance at applying such policies.

There are, of course, limitations of this analysis. One of them is the fact that all the considered dependent variables are coded in discrete scales that reflect the assessment of managers about organisation-wide issues. These subjective assessments are, by definition, subject to biases in the perception and interpretation of reality by the respondent and might lead to artificial correlations if the interviewed managers were heterogeneous in their biases. This problem, however, is balanced against deeper organisational introspection that allows us to observe policy variables that cannot be measured objectively. A second problem is potential unobserved heterogeneity and its relationship with the analysed variables. The effects identified along this paper control for an important set of organisational issues and industrial dummies. Nevertheless, there might be some other unobserved factors affecting both female ratios at management and policy variables that would be therefore biasing the estimated effects. This problem can be partially solved if one can observe how changes over time in female ratios at management correlate with changes in policies⁷⁹. Unfortunately, neither the 1990-98 *WERS* Panel Survey⁸⁰ nor, up to my knowledge, other panel studies are able to approach the different policies of our analysis as the *WERS* 98 does.

⁷⁹ Such differences-in-differences analysis is only effective to control for fixed unobserved effects, while it does not control for changes over time in unobserved factors that could be correlated with changes over time in both dependent and explanatory variables.

⁸⁰ The 1990-98 *WERS* Panel Survey is a survey run by the same time than the *WERS* 98, where a sample of about 900 surviving organisations that have been surveyed in the *WIRS* 1990 study (a former equivalent of the *WERS* 98) were interviewed again about a number of issues. These issues, however, didn't include a detailed description of the organisational employment practices as the *WERS* 98 does.

3.5. Concluding remarks

Feminist literature has evolved in the last thirty years from discrediting the idea that women lacked the needed capabilities to perform managerial tasks (see, for example, Henning and Jardim, 1978) to denounce the role of male-oriented organisational cultures in preventing female managers from exploiting their specific leadership strengths (see Hearn and Parkin, 1987). The results displayed in the previous section encourage a different view of this issue, since they show that the managerial approach to relationships with subordinates is more in line with those “feminine qualities” at workplaces where women represent a higher proportion of the managerial team. The “masculine constraint” is therefore shown to have, at most, a limited effect.

On the opposite extreme of the debate, a number of authors like Loden (1985) and, especially, Rosener (1990) have predicted that the highly *transformational* and interactive leadership style of women will suit better than the masculine “command and control” style to the context of today’s less hierarchical and more flexible organisations where teamwork is more important. The results of this paper seem to fit well to the idea that women are, at least in labour relationships aspects, developing a different leadership style and implementing different policies as long as they are suitable to organisations’ structural needs. This, however, does not seem to be reflected in females’ better organisational performance at applying their preferred policies.

Policy measures related to provision of explicit incentives and delegation on supervisors do not seem to be affected by the presence of women at workplace’s management. These results could be reflecting either the non-existence of sex differences in these areas of decision or the inability of workplace managers to decide in these aspects. Decisions about decentralisation of decision-making and the establishment of reward systems are usually considered rather structural components of organisational design (see Brickley, Smith and Zimmerman, 2001), at least in comparison to the rest of the policies analysed in this paper. Therefore, the fact that these are the only two sets of variables for which no effect was

found suggest the existence of such a structural rigidity preventing workplace managers from going too far in these aspects.

Although women are becoming more and more present at managerial teams, their access to boards of directors is still rather limited. Given that top executives play the double role of designing organisational structures and serving as models for lower level managers, the sex composition of organisational executive bodies may be an important factor to complement the findings of this paper. In this sense, having data about the different rates of female executives at boards of directors will improve importantly future investigations in this topic.

3.6. References

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3.7. Tables

Table 3.1: Correlation between the evolution of the proportion of women in managerial posts and changes in organisational policies and outcomes in the period 1993-1998. Correlation coefficients, with their corresponding p-values in parentheses.

Panel A: Labour Costs and Productivity Outcomes				
	CHLABPRO	CHLABCST		
CHPROFMG	0.105 (0.000)	-0.043 (0.062)		
Number of Observations	1881	1887		
Panel B: Organisational Policies				
	CHEMPREL	CHDECMAK	CHPBR	CHEMPINF
CHPROFMG	0.118 (0.000)	0.174 (0.000)	0.071 (0.002)	0.105 (0.000)
Number of Observations	1926	1925	1909	1926

Table 3.2: Effect of the proportion of women at management on the degree to which management ask employees to help them in ways unspecified in their task definition. Ordered Logit estimates with standard errors in parentheses.

<i>Dep. Var.:</i> <i>EMPSHELP</i>	<u><i>Model I</i></u>	<u><i>Model II</i></u>	<u><i>Model III</i></u>	<u><i>Model IV</i></u>	<u><i>Model V</i></u>
<i>PROPFEMG</i>	-0.342* (0.187)	-0.142 (0.207)	-0.280 (0.200)	-0.078 (0.220)	0.438 (0.519)
<i>PROPWOM</i>		-0.638** (0.287)		-0.641** (0.220)	-0.477 (0.324)
<i>FEMG×WOM</i>					-0.754 (0.687)
<i>RESPFEMG</i>			-0.091 (0.105)	-0.094 (0.105)	-0.091 (0.105)
<i>NUMEMPS × 10⁻³</i>	0.189** (0.081)	0.185** (0.081)	0.189** (0.081)	0.185** (0.081)	0.177** (0.081)
<i>AVGAGE</i>	-0.002 (0.010)	-0.004 (0.010)	-0.002 (0.010)	-0.003 (0.010)	-0.003 (0.010)
<i>AVGEDU</i>	0.036 (0.035)	0.025 (0.035)	0.038 (0.035)	0.027 (0.035)	0.023 (0.035)
<i>UNION</i>	-0.125 (0.125)	-0.107 (0.126)	-0.129 (0.125)	-0.111 (0.126)	-0.110 (0.126)
<i>INDEPEND</i>	-0.239* (0.129)	-0.245* (0.129)	-0.240* (0.129)	-0.244* (0.129)	-0.251* (0.129)
<i>FOREING</i>	0.240 (0.170)	0.226 (0.170)	0.238 (0.170)	0.225 (0.170)	0.232 (0.170)
<i>PUBLIC</i>	-0.123 (0.167)	-0.128 (0.168)	-0.121 (0.168)	-0.126 (0.168)	-0.128 (0.168)
<i>LONGEV</i>	0.002 (0.001)	0.002 (0.001)	0.002 (0.001)	0.002 (0.001)	0.002 (0.001)
<i>1-digit Industry Dummies</i>	Yes	Yes	Yes	Yes	Yes
<i>Percentages of Workforce in each Occupation</i>	Yes	Yes	Yes	Yes	Yes
<i>Number of observations</i>	1601	1601	1601	1601	1601
<i>L-R test χ^2</i>	80.20**	85.14**	80.96**	85.95**	87.15**

* Significant at the 10% level. ** Significant at the 5% level

Table 3.3: Effect of the proportion of women at management on the degree of interpersonal interactions at the organisation. Ordered Logit estimates with standard errors in parentheses.

Panel 3.3.1: Extent to which Managers Consult Workplace Issues Directly to Employees

<i>Dep. Var.:</i>					
<i>DIRECONS</i>	<u><i>Model I</i></u>	<u><i>Model II</i></u>	<u><i>Model III</i></u>	<u><i>Model IV</i></u>	<u><i>Model V</i></u>
<i>PROPFEMG</i>	0.361* (0.186)	0.242 (0.205)	0.440** (0.199)	0.336 (0.218)	-0.284 (0.514)
<i>PROPWOM</i>		0.339 (0.289)		0.340 (0.289)	0.139 (0.326)
<i>FEMG×WOM</i>					0.909 (0.683)
<i>RESPFEMG</i>			-0.115 (0.105)	-0.116 (0.105)	-0.121 (0.105)
<i>NUMEMPS × 10⁻³</i>	-0.296** (0.075)	-0.296** (0.075)	-0.296** (0.075)	-0.296** (0.075)	-0.286** (0.076)
<i>AVGAGE</i>	-0.025** (0.010)	-0.024** (0.010)	-0.025** (0.010)	-0.024** (0.010)	-0.024** (0.010)
<i>AVGEDU</i>	-0.046 (0.034)	-0.040 (0.035)	-0.043 (0.035)	-0.037 (0.035)	-0.032 (0.035)
<i>UNION</i>	-0.872** (0.126)	-0.882** (0.126)	-0.876** (0.126)	-0.886** (0.126)	-0.889** (0.126)
<i>INDEPEND</i>	0.427** (0.130)	0.425** (0.130)	0.424** (0.130)	0.423** (0.130)	0.432** (0.131)
<i>FOREING</i>	0.442** (0.170)	0.446** (0.170)	0.439** (0.170)	0.443** (0.170)	0.436** (0.170)
<i>PUBLIC</i>	-0.939** (0.166)	-0.938** (0.166)	-0.938** (0.166)	-0.936** (0.166)	-0.937** (0.166)
<i>LONGEV</i>	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)
<i>1-digit Industry Dummies</i>	Yes	Yes	Yes	Yes	Yes
<i>Percentages of Workforce in each Occupation</i>	Yes	Yes	Yes	Yes	Yes
<i>Number of observations</i>	1602	1602	1602	1602	1602
<i>L-R test χ^2</i>	406.09**	407.07**	407.29**	408.68**	410.45**

* Significant at the 10% level. ** Significant at the 5% level

Panel 3.3.2: Whether Managers Are Considered a Channel for Employees' Suggestions

<i>Dep. Var.:</i>					
<i>IMPRMGMT</i>	<u><i>Model I</i></u>	<u><i>Model II</i></u>	<u><i>Model III</i></u>	<u><i>Model IV</i></u>	<u><i>Model V</i></u>
<i>PROPFEMG</i>	0.336 (0.269)	0.585* (0.308)	0.209 (0.286)	0.459 (0.322)	1.448** (0.708)
<i>PROPWOM</i>		-0.714* (0.412)		-0.718* (0.413)	-0.372 (0.465)
<i>FEMG×WOM</i>					-1.536 (0.983)
<i>RESPFEMG</i>			0.193 (0.142)	0.193 (0.142)	0.196 (0.142)
<i>NUMEMPS × 10⁻³</i>	0.427** (0.121)	0.430** (0.121)	0.429** (0.121)	0.432** (0.121)	0.409** (0.121)
<i>AVGAGE</i>	-0.008 (0.014)	0.006 (0.014)	0.008 (0.014)	0.005 (0.014)	0.007 (0.014)
<i>AVGEDU</i>	0.052 (0.048)	0.039 (0.049)	0.047 (0.048)	0.034 (0.049)	0.025 (0.049)
<i>UNION</i>	0.337* (0.174)	0.371** (0.176)	0.347** (0.175)	0.381** (0.176)	0.386** (0.176)
<i>INDEPEND</i>	-0.756** (0.215)	-0.741** (0.215)	-0.744** (0.215)	-0.730** (0.215)	-0.747** (0.216)
<i>FOREING</i>	0.048 (0.212)	0.041 (0.212)	0.054 (0.212)	0.047 (0.212)	0.057 (0.212)
<i>PUBLIC</i>	0.402 (0.239)	0.390 (0.239)	0.403* (0.239)	0.392 (0.239)	0.394* (0.240)
<i>LONGEV</i>	0.001 (0.002)	0.001 (0.002)	0.002 (0.002)	0.001 (0.002)	0.001 (0.002)
<i>1-digit Industry Dummies</i>	Yes	Yes	Yes	Yes	Yes
<i>Percentages of Workforce in each Occupation</i>	Yes	Yes	Yes	Yes	Yes
<i>Number of observations</i>	1559	1559	1559	1559	1559
<i>L-R test χ^2</i>	232.56**	235.61**	234.40**	237.46**	239.93**

* Significant at the 10% level. ** Significant at the 5% level

Table 3.4: Effect of the proportion of women at management on the degree of democracy in managerial decision-making.(Ordered) Logit estimates with standard errors in parentheses.

Panel 3.4.1: Extent to Which Interviewed Manager Thinks Those at Top Are the Best Placed to Make Decisions

<i>Dep. Var.:</i> <i>DECSATOP</i>	<u><i>Model I</i></u>	<u><i>Model II</i></u>	<u><i>Model III</i></u>	<u><i>Model IV</i></u>	<u><i>Model V</i></u>
<i>PROPFEMG</i>	-0.149 (0.185)	-0.161 (0.205)	0.092 (0.199)	0.090 (0.219)	-0.445 (0.521)
<i>PROPWOM</i>		0.037 (0.282)		-0.009 (0.282)	-0.162 (0.320)
<i>FEMG×WOM</i>					0.774 (0.686)
<i>RESPFEMG</i>			-0.350** (0.104)	-0.350** (0.105)	-0.353** (0.105)
<i>NUMEMPS × 10⁻³</i>	-0.003 (0.079)	-0.003 (0.079)	-0.004 (0.079)	-0.004 (0.079)	0.005 (0.081)
<i>AVGAGE</i>	-0.009 (0.010)	-0.009 (0.010)	-0.007 (0.010)	-0.008 (0.010)	-0.008 (0.010)
<i>AVGEDU</i>	-0.004 (0.034)	-0.003 (0.034)	0.005 (0.034)	0.005 (0.034)	0.009 (0.034)
<i>UNION</i>	-0.156 (0.124)	-0.157 (0.124)	-0.171 (0.124)	-0.172 (0.124)	-0.174 (0.124)
<i>INDEPEND</i>	0.645** (0.128)	0.645** (0.128)	0.635** (0.128)	0.635** (0.128)	0.642** (0.129)
<i>FOREING</i>	0.087 (0.168)	0.088 (0.168)	0.089 (0.168)	0.089 (0.168)	0.084 (0.168)
<i>PUBLIC</i>	-0.015 (0.162)	-0.015 (0.162)	-0.017 (0.162)	-0.017 (0.162)	-0.016 (0.162)
<i>LONGEV</i>	0.003** (0.001)	0.003** (0.001)	0.002** (0.001)	0.002** (0.001)	0.002** (0.001)
<i>1-digit Industry Dummies</i>	Yes	Yes	Yes	Yes	Yes
<i>Percentages of Workforce in each Occupation</i>	Yes	Yes	Yes	Yes	Yes
<i>Number of observations</i>	1602	1602	1602	1602	1602
<i>L-R test χ^2</i>	84.41**	84.42**	95.64**	95.64**	96.92**

* Significant at the 10% level. ** Significant at the 5% level

Panel 3.4.2: Extent to Which Managers Discuss Changes to Be Done at the Workplace with Employees before Introducing Them

<i>Dep. Var.:</i>					
<i>EMPSCHAN</i>	<u><i>Model I</i></u>	<u><i>Model II</i></u>	<u><i>Model III</i></u>	<u><i>Model IV</i></u>	<u><i>Model V</i></u>
<i>PROPFEMG</i>	0.347* (0.191)	0.173 (0.212)	0.347* (0.204)	0.172 (0.224)	-0.847 (0.530)
<i>PROPWOM</i>		0.569* (0.304)		0.569* (0.304)	0.225 (0.344)
<i>FEMG×WOM</i>					1.488** (0.702)
<i>RESPFEMG</i>			0.001 (0.109)	0.002 (0.109)	-0.004 (0.109)
<i>NUMEMPS × 10⁻³</i>	0.055 (0.077)	0.058 (0.077)	0.055 (0.077)	0.058 (0.077)	0.074 (0.078)
<i>AVGAGE</i>	0.004 (0.010)	0.005 (0.010)	0.004 (0.010)	0.006 (0.010)	0.005 (0.010)
<i>AVGEDU</i>	-0.022 (0.035)	-0.012 (0.036)	-0.022 (0.035)	-0.012 (0.036)	-0.004 (0.036)
<i>UNION</i>	0.620** (0.131)	0.607** (0.132)	0.620** (0.131)	0.607** (0.132)	0.602** (0.132)
<i>INDEPEND</i>	-0.168 (0.133)	-0.169 (0.133)	-0.168 (0.133)	-0.168 (0.133)	-0.158 (0.133)
<i>FOREING</i>	-0.023 (0.172)	-0.011 (0.173)	-0.023 (0.172)	-0.011 (0.173)	-0.024 (0.173)
<i>PUBLIC</i>	-0.013 (0.172)	-0.004 (0.172)	-0.013 (0.172)	-0.004 (0.172)	0.001 (0.173)
<i>LONGEV</i>	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)
<i>1-digit Industry Dummies</i>	Yes	Yes	Yes	Yes	Yes
<i>Percentages of Workforce in each Occupation</i>	Yes	Yes	Yes	Yes	Yes
<i>Number of observations</i>	1602	1602	1602	1602	1602
<i>L-R test χ^2</i>	120.20**	123.72**	120.20**	123.72**	128.21**

* Significant at the 10% level. ** Significant at the 5% level

Panel 3.4.3: Extent to which Decisions at Workplace are Made without Being First Discussed with Employees

<i>Dep. Var.:</i>					
<i>EMPSNOCO</i>	<u><i>Model I</i></u>	<u><i>Model II</i></u>	<u><i>Model III</i></u>	<u><i>Model IV</i></u>	<u><i>Model V</i></u>
<i>PROPFEMG</i>	-0.481** (0.192)	-0.427** (0.213)	-0.508** (0.206)	-0.454** (0.226)	0.987* (0.534)
<i>PROPWOM</i>		-0.169 (0.297)		-0.168 (0.297)	0.293 (0.335)
<i>FEMG×WOM</i>					-2.102** (0.707)
<i>RESPFEMG</i>			0.040 (0.109)	0.039 (0.109)	0.046 (0.109)
<i>NUMEMPS × 10⁻³</i>	-0.083 (0.082)	-0.084 (0.082)	-0.083 (0.082)	-0.084 (0.082)	-0.110 (0.083)
<i>AVGAGE</i>	-0.013 (0.010)	-0.014 (0.010)	-0.013 (0.010)	-0.014 (0.010)	-0.013 (0.010)
<i>AVGEDU</i>	-0.030 (0.035)	-0.033 (0.036)	-0.031 (0.035)	-0.034 (0.036)	-0.048 (0.036)
<i>UNION</i>	-0.422** (0.130)	-0.416** (0.131)	-0.421** (0.130)	-0.416** (0.131)	-0.408** (0.131)
<i>INDEPEND</i>	0.542** (0.133)	0.542** (0.133)	0.544** (0.133)	0.544** (0.133)	0.532** (0.134)
<i>FOREING</i>	0.315* (0.173)	0.311* (0.174)	0.316* (0.173)	0.313* (0.174)	0.329* (0.174)
<i>PUBLIC</i>	-0.160 (0.172)	-0.164 (0.172)	-0.159 (0.172)	-0.162 (0.172)	-0.173 (0.172)
<i>LONGEV</i>	-0.002* (0.001)	0.002* (0.001)	-0.002* (0.001)	0.002* (0.001)	0.002* (0.001)
<i>1-digit Industry Dummies</i>	Yes	Yes	Yes	Yes	Yes
<i>Percentages of Workforce in each Occupation</i>	Yes	Yes	Yes	Yes	Yes
<i>Number of observations</i>	1602	1602	1602	1602	1602
<i>L-R test χ^2</i>	192.35**	192.67**	192.48**	192.80**	201.68**

All regressions include 1-digit SIC industrial dummies and six controls of workforce composition. * Significant at the 10% level. ** Significant at the 5% level

Panel 3.4.4: Whether Managers Set Establishment Targets in Consultation with Employees

<i>Dep. Var.:</i>	<u><i>Model I</i></u>	<u><i>Model II</i></u>	<u><i>Model III</i></u>	<u><i>Model IV</i></u>	<u><i>Model V</i></u>
<i>CONSTARG</i>					
<i>PROPFEMG</i>	-0.124 (0.225)	-0.169 (0.252)	-0.146 (0.241)	0.104 (0.267)	-0.753 (0.641)
<i>PROPWOM</i>		0.137 (0.342)		0.127 (0.343)	-0.139 (0.387)
<i>FEMG×WOM</i>					1.248 (0.846)
<i>RESPFEMG</i>			-0.388** (0.125)	-0.387** (0.125)	-0.390** (0.125)
<i>NUMEMPS × 10⁻³</i>	-0.198* (0.112)	-0.197* (0.112)	-0.199* (0.112)	-0.198* (0.112)	-0.181 (0.111)
<i>AVGAGE</i>	0.013 (0.012)	0.013 (0.012)	0.014 (0.012)	0.015 (0.012)	0.014 (0.012)
<i>AVGEDU</i>	-0.070* (0.041)	-0.067 (0.041)	-0.061 (0.041)	-0.058 (0.042)	-0.050 (0.042)
<i>UNION</i>	-0.291** (0.147)	-0.295** (0.147)	-0.304** (0.148)	-0.307** (0.148)	-0.308** (0.148)
<i>INDEPEND</i>	0.000 (0.157)	0.001 (0.157)	-0.016 (0.158)	0.017 (0.158)	-0.005 (0.158)
<i>FOREING</i>	-0.179 (0.193)	-0.176 (0.193)	-0.189 (0.193)	-0.187 (0.193)	-0.192 (0.194)
<i>PUBLIC</i>	0.212 (0.195)	0.212 (0.195)	0.210 (0.195)	0.211 (0.195)	0.208 (0.195)
<i>LONGEV</i>	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)
<i>1-digit Industry Dummies</i>	Yes	Yes	Yes	Yes	Yes
<i>Percentages of Workforce in each Occupation</i>	Yes	Yes	Yes	Yes	Yes
<i>Number of observations</i>	1455	1455	1455	1455	1455
<i>L-R test χ^2</i>	85.18**	85.34**	94.88**	95.02**	97.22**

All regressions include 1-digit SIC industrial dummies and six controls of workforce composition. * Significant at the 10% level. ** Significant at the 5% level

Table 3.5: Effect of the proportion of women at management on the degree to which management-subordinate relationships are interactive. (Ordered) Logit estimates with standard errors in parentheses.

Panel 3.5.1: Proportion of Time in Briefing Meetings Given to Employees

<i>Dep. Var.:</i> <i>PARTBRIE</i>	<u><i>Model I</i></u>	<u><i>Model II</i></u>	<u><i>Model III</i></u>	<u><i>Model IV</i></u>	<u><i>Model V</i></u>
<i>PROPFEMG</i>	0.458** (0.192)	0.435** (0.212)	0.663** (0.206)	0.646** (0.226)	0.565 (0.531)
<i>PROPWOM</i>		0.075 (0.295)		0.054 (0.295)	0.028 (0.333)
<i>FEMG×WOM</i>					0.120 (0.705)
<i>RESPFEMG</i>			-0.296** (0.107)	-0.295** (0.107)	-0.296** (0.107)
<i>NUMEMPS × 10⁻³</i>	-0.020 (0.069)	-0.020 (0.069)	-0.022 (0.069)	-0.022 (0.069)	-0.021 (0.069)
<i>AVGAGE</i>	0.005 (0.010)	0.005 (0.010)	0.006 (0.010)	0.006 (0.010)	0.006 (0.010)
<i>AVGEDU</i>	0.002 (0.035)	0.004 (0.035)	0.009 (0.035)	0.010 (0.035)	0.011 (0.035)
<i>UNION</i>	0.325** (0.128)	0.322** (0.128)	0.326** (0.128)	0.324** (0.128)	0.324** (0.128)
<i>INDEPEND</i>	-0.268** (0.132)	-0.269** (0.132)	-0.285** (0.132)	-0.285** (0.132)	-0.284** (0.132)
<i>FOREING</i>	-0.007 (0.169)	0.008 (0.169)	-0.002 (0.169)	-0.001 (0.169)	-0.002 (0.169)
<i>PUBLIC</i>	-0.358** (0.171)	-0.357** (0.171)	-0.366** (0.171)	-0.365** (0.171)	-0.365** (0.171)
<i>LONGEV</i>	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)
<i>1-digit Industry Dummies</i>	Yes	Yes	Yes	Yes	Yes
<i>Percentages of Workforce in each Occupation</i>	Yes	Yes	Yes	Yes	Yes
<i>Number of observations</i>	1580	1580	1580	1580	1580
<i>L-R test χ^2</i>	83.45**	83.51**	91.17**	91.20**	91.23**

* Significant at the 10% level. ** Significant at the 5% level

Panel 3.5.2: Whether Managers Use Performance Appraisals to Give Feedback to Employees, Discuss Career Moves and Set Personal Objectives

<i>Dep. Var.:</i>					
<i>DISCUSS</i>	<u><i>Model I</i></u>	<u><i>Model II</i></u>	<u><i>Model III</i></u>	<u><i>Model IV</i></u>	<u><i>Model V</i></u>
<i>PROPFEMG</i>	0.715** (0.263)	0.533* (0.294)	0.728** (0.281)	0.544* (0.309)	1.322* (0.725)
<i>PROPWOM</i>		0.553 (0.387)		0.553 (0.388)	0.790* (0.437)
<i>FEMG×WOM</i>					-1.135 (0.949)
<i>RESPFEMG</i>			-0.018 (0.146)	-0.017 (0.146)	-0.013 (0.147)
<i>NUMEMPS × 10⁻³</i>	0.588** (0.220)	0.590** (0.220)	0.589** (0.220)	0.591** (0.220)	0.564** (0.220)
<i>AVGAGE</i>	-0.029** (0.013)	-0.028** (0.013)	-0.029** (0.013)	-0.028** (0.013)	-0.028** (0.013)
<i>AVGEDU</i>	0.155** (0.049)	0.165** (0.049)	0.155** (0.049)	0.165** (0.050)	0.159** (0.050)
<i>UNION</i>	0.345** (0.171)	0.331* (0.171)	0.345** (0.171)	0.330* (0.171)	0.337** (0.171)
<i>INDEPEND</i>	-0.854** (0.163)	-0.858** (0.163)	-0.855** (0.163)	-0.859** (0.163)	-0.870** (0.164)
<i>FOREING</i>	0.864** (0.289)	0.871** (0.289)	0.864** (0.289)	0.871** (0.289)	0.878** (0.289)
<i>PUBLIC</i>	-0.678** (0.222)	-0.672** (0.222)	-0.678** (0.222)	-0.672** (0.222)	-0.674** (0.222)
<i>LONGEV</i>	0.001 (0.002)	0.001 (0.002)	0.001 (0.002)	0.001 (0.002)	0.001 (0.002)
<i>1-digit Industry Dummies</i>	Yes	Yes	Yes	Yes	Yes
<i>Percentages of Workforce in each Occupation</i>	Yes	Yes	Yes	Yes	Yes
<i>Number of observations</i>	1601	1601	1601	1601	1601
<i>L-R test χ^2</i>	216.00**	218.05**	216.01**	218.06**	219.50**

* Significant at the 10% level. ** Significant at the 5% level.

Table 3.6: Effect of the proportion of women at management on the application of different schemes of payment by results. Logit estimates with standard errors in parentheses.

Panel 3.6.1: Whether Employees Receive Profit-Related Payment

<i>Dep. Var.:</i>					
<i>PROFREL</i>	<u><i>Model I</i></u>	<u><i>Model II</i></u>	<u><i>Model III</i></u>	<u><i>Model IV</i></u>	<u><i>Model V</i></u>
<i>PROPFEMG</i>	0.056 (0.273)	0.266 (0.310)	-0.028 (0.287)	0.182 (0.322)	-0.753 (0.713)
<i>PROPWOM</i>		-0.557 (0.385)		-0.561 (0.386)	-0.868** (0.440)
<i>FEMG×WOM</i>					1.444 (0.985)
<i>RESPFEMG</i>			0.132 (0.142)	0.135 (0.143)	0.134 (0.142)
<i>NUMEMPS × 10⁻³</i>	0.055 (0.103)	0.054 (0.104)	0.056 (0.103)	0.055 (0.104)	0.065 (0.105)
<i>AVGAGE</i>	0.002 (0.013)	0.000 (0.013)	0.001 (0.013)	-0.00 (0.013)	-0.001 (0.013)
<i>AVGEDU</i>	0.081 (0.047)	0.072 (0.048)	0.076 (0.048)	0.067 (0.048)	0.076 (0.049)
<i>UNION</i>	0.009 (0.152)	0.029 (0.152)	0.013 (0.152)	0.032 (0.153)	0.031 (0.153)
<i>INDEPEND</i>	-0.958** (0.170)	-0.950** (0.171)	-0.949** (0.171)	-0.941** (0.171)	-0.933** (0.171)
<i>FOREING</i>	-0.493** (0.194)	-0.503** (0.194)	-0.491** (0.194)	-0.501** (0.194)	-0.509** (0.194)
<i>PUBLIC</i>	-1.731** (0.248)	-1.739** (0.248)	-1.730** (0.248)	-1.739** (0.248)	-1.747** (0.248)
<i>LONGEV</i>	-0.001 (0.002)	-0.001 (0.002)	-0.001 (0.002)	-0.001 (0.002)	-0.001 (0.002)
<i>1-digit Industry Dummies</i>	Yes	Yes	Yes	Yes	Yes
<i>Percentages of Workforce in each Occupation</i>	Yes	Yes	Yes	Yes	Yes
<i>Number of observations</i>	1603	1603	1603	1603	1603
<i>L-R test χ^2</i>	597.70**	599.80**	598.57**	600.70**	602.85**

* Significant at the 10% level. ** Significant at the 5% level

Panel 3.6.2: Whether There Exist Employee Share Ownership Plans

<i>Dep. Var.:</i>					
<i>SHAROWN</i>	<u><i>Model I</i></u>	<u><i>Model II</i></u>	<u><i>Model III</i></u>	<u><i>Model IV</i></u>	<u><i>Model V</i></u>
<i>PROPFEMG</i>	0.527 (0.337)	0.487 (0.382)	0.510 (0.354)	0.471 (0.397)	0.834 (0.908)
<i>PROPWOM</i>		0.104 (0.472)		0.103 (0.472)	0.216 (0.535)
<i>FEMG×WOM</i>					-0.578 (1.295)
<i>RESPFEMG</i>			0.027 (0.169)	0.026 (0.169)	0.025 (0.169)
<i>NUMEMPS × 10⁻³</i>	0.113 (0.111)	0.114 (0.111)	0.114 (0.111)	0.114 (0.111)	0.111 (0.111)
<i>AVGAGE</i>	0.013 (0.016)	0.014 (0.016)	0.013 (0.016)	0.013 (0.016)	0.014 (0.016)
<i>AVGEDU</i>	0.141** (0.060)	0.144** (0.061)	0.140** (0.060)	0.143** (0.062)	0.140** (0.062)
<i>UNION</i>	0.750** (0.177)	0.745** (0.179)	0.751** (0.177)	0.746** (0.179)	0.745** (0.179)
<i>INDEPEND</i>	-2.481** (0.325)	-2.484** (0.325)	-2.479** (0.325)	-2.482** (0.325)	-2.486** (0.325)
<i>FOREING</i>	-1.069** (0.217)	-1.068** (0.217)	-1.068** (0.217)	-1.067** (0.217)	-1.066** (0.217)
<i>PUBLIC</i>	-35.035 (3.35× 10 ⁶)	-37.036 (9.10× 10 ⁶)	-36.035 (5.52× 10 ⁶)	-37.036 (9.10× 10 ⁶)	-36.031 (5.52× 10 ⁶)
<i>LONGEV</i>	0.001 (0.002)	0.001 (0.002)	0.001 (0.002)	0.001 (0.002)	0.001 (0.002)
<i>1-digit Industry Dummies</i>	Yes	Yes	Yes	Yes	Yes
<i>Percentages of Workforce in each Occupation</i>	Yes	Yes	Yes	Yes	Yes
<i>Number of observations</i>	1603	1603	1603	1603	1603
<i>L-R test χ^2</i>	692.57**	692.62**	692.60**	692.64**	692.85**

*Significant at the 10% level. **Significant at the 5% level

Panel 3.6.3: Whether There Exist Pay per Performance Schemes

<i>Dep. Var.:</i>					
<i>PAYPERF</i>	<u><i>Model I</i></u>	<u><i>Model II</i></u>	<u><i>Model III</i></u>	<u><i>Model IV</i></u>	<u><i>Model V</i></u>
<i>PROPFEMG</i>	-0.219 (0.267)	0.161 (0.304)	-0.135 (0.282)	0.243 (0.317)	0.974 (0.705)
<i>PROPWOM</i>		-1.099** (0.403)		-1.097** (0.401)	-0.843* (0.455)
<i>FEMG×WOM</i>					-1.158 (1.003)
<i>RESPFEMG</i>			-0.127 (0.139)	-0.127 (0.139)	-0.126 (0.138)
<i>NUMEMPS × 10⁻³</i>	0.407** (0.114)	0.411** (0.115)	0.406** (0.114)	0.410** (0.115)	0.396** (0.115)
<i>AVGAGE</i>	0.016 (0.014)	-0.020 (0.014)	-0.016 (0.014)	-0.020 (0.014)	-0.019 (0.014)
<i>AVGEDU</i>	0.075 (0.046)	0.058 (0.047)	0.079* (0.046)	0.062 (0.047)	0.056 (0.047)
<i>UNION</i>	0.021 (0.166)	0.069 (0.168)	0.014 (0.166)	0.063 (0.168)	0.066 (0.168)
<i>INDEPEND</i>	-0.142 (0.183)	-0.120 (0.183)	-0.150 (0.183)	-0.128 (0.184)	-0.135 (0.184)
<i>FOREING</i>	0.204 (0.204)	0.186 (0.204)	0.201 (0.204)	0.183 (0.205)	0.185 (0.205)
<i>PUBLIC</i>	0.787** (0.234)	0.777** (0.233)	0.792** (0.234)	0.781* (0.234)	0.789** (0.234)
<i>LONGEV</i>	0.002 (0.002)	0.002 (0.002)	0.002 (0.002)	0.002 (0.002)	0.002 (0.002)
<i>1-digit Industry Dummies</i>	Yes	Yes	Yes	Yes	Yes
<i>Percentages of Workforce in each Occupation</i>	Yes	Yes	Yes	Yes	Yes
<i>Number of observations</i>	1603	1603	1603	1603	1603
<i>L-R test χ^2</i>	206.81**	214.48**	207.66**	215.32**	216.67**

* Significant at the 10% level. ** Significant at the 5% level.

Table 3.7: Effect of the proportion of women at the management on the degree of delegation of managerial tasks on subordinates. Logit estimates with standard errors in parentheses.

Panel 3.7.1: Proportion of Non-Managerial Workers doing Supervisory Tasks

<i>Dep. Var.:</i> <i>EMPSUPV</i>	<u><i>Model I</i></u>	<u><i>Model II</i></u>	<u><i>Model III</i></u>	<u><i>Model IV</i></u>	<u><i>Model V</i></u>
<i>PROPFEMG</i>	-0.125 (0.193)	-0.098 (0.214)	-0.154 (0.207)	-0.126 (0.227)	0.591 (0.544)
<i>PROPWOM</i>		-0.089 (0.296)		-0.087 (0.296)	0.136 (0.333)
<i>FEMG×WOM</i>					-1.037 (0.715)
<i>RESPFEMG</i>			0.040 (0.107)	0.040 (0.107)	0.045 (0.107)
<i>NUMEMPS × 10⁻³</i>	0.304** (0.077)	0.304** (0.077)	0.304** (0.077)	0.304** (0.077)	0.290** (0.076)
<i>AVGAGE</i>	-0.007 (0.010)	-0.008 (0.010)	-0.008 (0.010)	-0.007 (0.010)	-0.007 (0.010)
<i>AVGEDU</i>	0.115** (0.036)	0.113** (0.036)	0.114** (0.036)	0.113** (0.036)	0.107** (0.036)
<i>UNION</i>	0.106 (0.126)	0.109 (0.127)	0.107 (0.126)	0.109 (0.127)	0.111 (0.127)
<i>INDEPEND</i>	-0.024 (0.129)	-0.024 (0.129)	-0.022 (0.129)	-0.022 (0.129)	-0.029 (0.129)
<i>FOREING</i>	0.372** (0.165)	0.371** (0.165)	0.374** (0.165)	0.372** (0.165)	0.380** (0.165)
<i>PUBLIC</i>	-0.008 (0.165)	-0.009 (0.168)	-0.007 (0.168)	-0.008 (0.168)	-0.009 (0.168)
<i>LONGEV</i>	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)
<i>1-digit Industry Dummies</i>	Yes	Yes	Yes	Yes	Yes
<i>Percentages of Workforce in each Occupation</i>	Yes	Yes	Yes	Yes	Yes
<i>Number of observations</i>	1597	1597	1597	1597	1597
<i>L-R test χ^2</i>	115.92**	116.01**	116.06**	116.15**	118.26**

* Significant at the 10% level. ** Significant at the 5% level

Panel 3.7.2: Whether Supervisors Have the Authority to Make Hiring Decisions

<i>Dep. Var.:</i>					
<i>SUPVTAKE</i>	<u><i>Model I</i></u>	<u><i>Model II</i></u>	<u><i>Model III</i></u>	<u><i>Model IV</i></u>	<u><i>Model V</i></u>
<i>PROPFEMG</i>	-0.168 (0.244)	-0.147 (0.274)	-0.141 (0.258)	-0.120 (0.286)	1.029 (0.650)
<i>PROPWOM</i>		-0.060 (0.359)		-0.061 (0.359)	0.313 (0.404)
<i>FEMG×WOM</i>					-1.727* (0.883)
<i>RESPFEMG</i>			-0.043 (0.130)	-0.043 (0.130)	-0.037 (0.130)
<i>NUMEMPS × 10⁻³</i>	0.328** (0.110)	0.328** (0.110)	0.328** (0.110)	0.328** (0.110)	0.303** (0.111)
<i>AVGAGE</i>	0.006 (0.012)	0.006 (0.011)	0.006 (0.012)	0.006 (0.012)	0.007 (0.012)
<i>AVGEDU</i>	0.040 (0.043)	0.039 (0.044)	0.041 (0.044)	0.040 (0.044)	0.031 (0.044)
<i>UNION</i>	0.242 (0.151)	0.244 (0.151)	0.241 (0.151)	0.243 (0.151)	0.248 (0.151)
<i>INDEPEND</i>	-0.014 (0.159)	-0.014 (0.159)	-0.016 (0.159)	-0.015 (0.159)	-0.028 (0.159)
<i>FOREING</i>	0.198 (0.193)	0.197 (0.193)	0.197 (0.193)	0.196 (0.193)	0.205 (0.194)
<i>PUBLIC</i>	-0.215 (0.207)	-0.216 (0.207)	-0.216 (0.207)	-0.238 (0.207)	-0.217 (0.208)
<i>LONGEV</i>	-0.002 (0.002)	-0.002 (0.002)	-0.002 (0.002)	-0.002 (0.002)	-0.002 (0.002)
<i>1-digit Industry Dummies</i>	Yes	Yes	Yes	Yes	Yes
<i>Percentages of Workforce in each Occupation</i>	Yes	Yes	Yes	Yes	Yes
<i>Number of observations</i>	1597	1597	1597	1597	1597
<i>L-R test χ^2</i>	101.82**	101.85**	101.93**	101.96**	105.82**

* Significant at the 10% level. ** Significant at the 5% level

Panel 3.7.3: Whether Supervisors Have the Authority to Decide on Pay Rising

<i>Dep. Var.: SUPVPAY</i>	<u><i>Model I</i></u>	<u><i>Model II</i></u>	<u><i>Model III</i></u>	<u><i>Model IV</i></u>	<u><i>Model V</i></u>
<i>PROPFEMG</i>	-0.056 (0.577)	0.237 (0.658)	-0.063 (0.604)	0.229 (0.680)	1.103 (1.472)
<i>PROPWOM</i>		-0.854 (0.888)		-0.855 (0.888)	-0.505 (1.027)
<i>FEMG×WOM</i>					-1.422* (2.175)
<i>RESPFEMG</i>			0.011 (0.301)	0.014 (0.301)	0.019 (0.299)
<i>NUMEMPS × 10⁻³</i>	-0.063 (0.278)	-0.068 (0.279)	-0.063 (0.278)	-0.068 (0.279)	-0.081 (0.285)
<i>AVGAGE</i>	0.024 (0.028)	0.021 (0.028)	0.024 (0.028)	0.021 (0.028)	0.022 (0.028)
<i>AVGEDU</i>	0.001 (0.097)	-0.013 (0.098)	0.000 (0.098)	-0.014 (0.099)	-0.021 (0.100)
<i>UNION</i>	-0.278 (0.353)	-0.258 (0.355)	-0.277 (0.353)	-0.258 (0.355)	-0.248 (0.355)
<i>INDEPEND</i>	0.545 (0.359)	0.566 (0.359)	0.545 (0.359)	0.566 (0.359)	0.555 (0.359)
<i>FOREING</i>	0.579 (0.380)	0.565 (0.381)	0.579 (0.381)	0.565 (0.381)	0.569 (0.381)
<i>PUBLIC</i>	-0.324 (0.618)	-0.309 (0.618)	-0.324 (0.618)	-0.308 (0.618)	-0.309 (0.620)
<i>LONGEV</i>	-0.004 (0.004)	-0.003 (0.004)	-0.004 (0.004)	-0.004 (0.004)	-0.004 (0.004)
<i>1-digit Industry Dummies</i>	Yes	Yes	Yes	Yes	Yes
<i>Percentages of Workforce in each Occupation</i>	Yes	Yes	Yes	Yes	Yes
<i>Number of observations</i>	1597	1597	1597	1597	1597
<i>L-R test χ^2</i>	33.87	34.82	33.87	34.82	35.24

* Significant at the 10% level. ** Significant at the 5% level.

Panel 3.7.4: Whether Supervisors Have Authority on Dismissals

<i>Dep. Var.:</i> <i>SUPVDISM</i>	<u><i>Model I</i></u>	<u><i>Model II</i></u>	<u><i>Model III</i></u>	<u><i>Model IV</i></u>	<u><i>Model V</i></u>
<i>PROPFEMG</i>	-0.320 (0.465)	-0.337 (0.533)	-0.388 (0.489)	-0.260 (0.552)	0.697 (1.014)
<i>PROPWOM</i>		-1.788** (0.666)		-1.804** (0.669)	-1.552** (0.776)
<i>FEMG×WOM</i>					-0.797 (2.174)
<i>RESPFEMG</i>			0.111 (0.237)	0.130 (0.238)	0.130 (0.237)
<i>NUMEMPS × 10⁻³</i>	-0.347** (0.143)	-0.352** (0.145)	-0.349** (0.144)	-0.354** (0.145)	-0.346** (0.145)
<i>AVGAGE</i>	0.003 (0.020)	0.001 (0.020)	0.002 (0.020)	0.000 (0.020)	0.000 (0.020)
<i>AVGEDU</i>	0.042 (0.077)	0.016 (0.077)	0.037 (0.077)	0.011 (0.078)	-0.000 (0.078)
<i>UNION</i>	-0.207 (0.258)	-0.178 (0.262)	-0.204 (0.258)	0.171 (0.262)	-0.175 (0.262)
<i>INDEPEND</i>	0.882** (0.256)	0.943** (0.258)	0.892** (0.257)	0.962** (0.259)	0.954** (0.259)
<i>FOREING</i>	0.534* (0.305)	0.539* (0.304)	0.538* (0.305)	0.549* (0.305)	0.544* (0.305)
<i>PUBLIC</i>	-0.826* (0.465)	-0.847* (0.466)	-0.825* (0.465)	-0.843* (0.466)	-0.846* (0.466)
<i>LONGEV</i>	-0.001 (0.002)	0.001 (0.003)	-0.001 (0.003)	0.001 (0.003)	0.001 (0.003)
<i>1-digit Industry Dummies</i>	Yes	Yes	Yes	Yes	Yes
<i>Percentages of Workforce in each Occupation</i>	Yes	Yes	Yes	Yes	Yes
<i>Number of observations</i>	1597	1597	1597	1597	1597
<i>L-R test χ^2</i>	112.57**	120.10**	112.79**	120.39**	120.15**

* Significant at the 10% level. ** Significant at the 5% level.

Table 3.8: Correlation Between the Dependent Variables (Corresponding P-Values Below).

	DIRECONS	IMPRMGMT	DECSATOP	EMPSCHAN	EMPSNOCO	CONSTARG	PARTBRIE	DISCUSS	PROFREL	SHAROWN	PAYPERF	EMPSUPV	SUPVTAKE	SUPVPAY
DIRECONS	0.052 (0.014)													
IMPRMGMT		-0.134 (0.001)												
DECSATOP			-0.086 (0.000)											
EMPSCHAN				-0.073 (0.000)										
EMPSNOCO					-0.488 (0.000)									
CONSTARG						-0.180 (0.000)								
PARTBRIE							-0.099 (0.000)							
DISCUSS								-0.126 (0.000)						
PROFREL									-0.090 (0.000)					
SHAROWN										-0.111 (0.000)				
PAYPERF											-0.086 (0.000)			
EMPSUPV												-0.179 (0.000)		
SUPVTAKE													-0.146 (0.000)	
SUPVPAY														-0.180 (0.000)
SUPVDISM														

Table 3.9: Results from Principal Component and Maximum-Likelihood Factor Analysis of the 16 Dependent Variables Related to Hypotheses.

Panel 3.9.1: Principal Components Factor Analysis (5 Components Retained):

Component	Eigenvalue	Difference	Proportion	Cumulative
1	1.92913	0.17357	0.1206	0.1206
2	1.75556	0.27005	0.1097	0.2303
3	1.48551	0.28777	0.0928	0.3231
4	1.19774	0.09662	0.0749	0.398
5	1.10111	0.10293	0.0688	0.4668
6	0.99819	0.0434	0.0624	0.5292
7	0.95478	0.03852	0.0597	0.5889
8	0.91626	0.04842	0.0573	0.6461
9	0.86785	0.01079	0.0542	0.7004
10	0.85706	0.05616	0.0536	0.7539
11	0.8009	0.03201	0.0501	0.804
12	0.76889	0.05107	0.0481	0.8521
13	0.71782	0.06713	0.0449	0.8969
14	0.65069	0.13036	0.0407	0.9376
15	0.52033	0.04216	0.0325	0.9701
16	0.47817	.	0.0299	1

Variable	Eigenvector 1	Eigenvector 2	Eigenvector 3	Eigenvector 4	Eigenvector 5
<i>EMPSHELP</i>	0.15407	0.0847	-0.02283	0.03291	0.61518
<i>DIRECONS</i>	0.04299	0.18678	-0.04388	0.65481	-0.0209
<i>IMPRMGMT</i>	0.22028	0.07112	-0.0632	-0.55293	0.21153
<i>DECSATOP</i>	-0.28288	0.06645	0.06443	0.08714	-0.15736
<i>EMPSCHAN</i>	0.28876	-0.40633	0.10854	-0.03078	-0.36568
<i>EMPSNOCO</i>	-0.37659	0.43971	-0.06679	0.07223	0.21059
<i>CONSTARG</i>	0.21323	-0.25485	-0.00155	0.29494	0.0701
<i>PARTBRIE</i>	0.28822	-0.19706	-0.04455	0.16072	0.1582
<i>DISCUSS</i>	0.35308	-0.03547	-0.10421	0.21256	0.15724
<i>PROFREL</i>	0.28857	0.40013	-0.31789	0.09625	-0.22401
<i>SHAROWN</i>	0.31151	0.35128	-0.2864	-0.00595	-0.2547
<i>PAYPERF</i>	0.25088	0.1699	-0.18319	-0.2393	0.0789
<i>EMPSUPV</i>	0.09105	-0.01731	0.29697	0.14321	0.39496
<i>SUPVTAKE</i>	0.20153	0.24267	0.50039	-0.07377	-0.03751
<i>SUPVPAY</i>	0.26688	0.21424	0.36189	0.00102	-0.02878
<i>SUPVDISM</i>	0.06392	0.25985	0.52359	0.01133	-0.1984

Panel 3.9.2: Maximum Likelihood Factor Analysis (10 Components Obtained)

Factor	Variance	Difference	Proportion	Cumulative
1	1.07221	-0.04353	0.1619	0.1619
2	1.11574	-0.07465	0.1685	0.3305
3	1.19039	0.08078	0.1798	0.5102
4	1.1096	0.24206	0.1676	0.6778
5	0.86754	0.38321	0.131	0.8089
6	0.48433	0.20855	0.0732	0.882
7	0.27578	0.08552	0.0417	0.9237
8	0.19026	0.0195	0.0287	0.9524
9	0.17075	0.02639	0.0258	0.9782
10	0.14436	.	0.0218	1

Variable	Rotated Factor 1	Rotated Factor 2	Rotated Factor 3	Rotated Factor 4	Rotated Factor 5
<i>EMPSHELP</i>	0.0588	0.03931	0.0428	-0.00368	0.02196
<i>DIRECONS</i>	0.99816	0.00775	0.03208	0.04232	0.00848
<i>IMPRMGMT</i>	-0.12228	0.03947	0.08326	-0.03146	0.0335
<i>DECSATOP</i>	0.00538	-0.05919	-0.10777	0.15131	0.0014
<i>EMPSCHAN</i>	-0.00073	0.06622	-0.02029	-0.57696	0.0105
<i>EMPSNOCO</i>	0.07347	-0.1271	0.0086	0.8375	0.00687
<i>CONSTARG</i>	0.02872	0.12667	-0.05945	-0.18096	-0.03129
<i>PARTBRIE</i>	0.00773	0.99571	0.02373	-0.08657	-0.00376
<i>DISCUSS</i>	0.07666	0.11947	0.10532	-0.15142	0.0077
<i>PROFREL</i>	0.12366	0.00494	0.52175	0.05117	0.03054
<i>SHAROWN</i>	0.02306	0.0333	0.88147	0.00259	0.02177
<i>PAYPERF</i>	-0.01957	0.02198	0.15597	-0.02207	0.03005
<i>EMPSUPV</i>	-0.0022	0.05696	-0.04761	-0.03558	0.17021
<i>SUPVTAKE</i>	-0.01536	0.01399	0.04817	-0.01543	0.59907
<i>SUPVPAY</i>	0.08001	0.00062	0.08143	-0.05086	0.40251
<i>SUPVDISM</i>	0.03522	-0.03999	0.01423	0.05154	0.5598

Variable	Rotated Factor 6	Rotated Factor 7	Rotated Factor	Rotated Factor 9	Rotated Factor 10
<i>EMPSHELP</i>	0.0588	0.03931	0.0428	-0.00368	0.02196
<i>DIRECONS</i>	0.99816	0.00775	0.03208	0.04232	0.00848
<i>IMPRMGMT</i>	-0.12228	0.03947	0.08326	-0.03146	0.0335
<i>DECSATOP</i>	0.00538	-0.05919	-0.10777	0.15131	0.0014
<i>EMPSCHAN</i>	-0.00073	0.06622	-0.02029	-0.57696	0.0105
<i>EMPSNOCO</i>	0.07347	-0.1271	0.0086	0.8375	0.00687
<i>CONSTARG</i>	0.02872	0.12667	-0.05945	-0.18096	-0.03129
<i>PARTBRIE</i>	0.00773	0.99571	0.02373	-0.08657	-0.00376
<i>DISCUSS</i>	0.07666	0.11947	0.10532	-0.15142	0.0077
<i>PROFREL</i>	0.12366	0.00494	0.52175	0.05117	0.03054
<i>SHAROWN</i>	0.02306	0.0333	0.88147	0.00259	0.02177
<i>PAYPERF</i>	-0.01957	0.02198	0.15597	-0.02207	0.03005
<i>EMPSUPV</i>	-0.0022	0.05696	-0.04761	-0.03558	0.17021
<i>SUPVTAKE</i>	-0.01536	0.01399	0.04817	-0.01543	0.59907
<i>SUPVPAY</i>	0.08001	0.00062	0.08143	-0.05086	0.40251
<i>SUPVDISM</i>	0.03522	-0.03999	0.01423	0.05154	0.5598

Table 3.10: Effect of policies and proportion of women at management on different measures of relative performance, as measured by managers.

	<i>FULLYCOM</i>		<i>LABPROD</i>		<i>PRODQUAL</i>		<i>FINPERF</i>	
	<i>Model I</i>	<i>Model II</i>	<i>Model I</i>	<i>Model II</i>	<i>Model I</i>	<i>Model II</i>	<i>Model I</i>	<i>Model II</i>
<i>PROPFEMG</i>		-3.930* (2.218)		-0.780 (2.307)		-0.597 (2.253)		-0.604 (2.271)
<i>PROPWOM</i>		4.330* (2.259)		4.944** (2.362)		1.497 (2.313)		2.342 (2.392)
<i>EMPSHELP</i>	0.117** (0.048)	0.290** (0.109)	-0.013 (0.051)	0.130 (0.113)	-0.054 (0.049)	-0.052 (0.108)	-0.048 (0.049)	0.114 (0.109)
<i>HELP×FEMG</i>		0.712** (0.225)		0.263 (0.244)		0.289 (0.227)		0.406* (0.228)
<i>HELP×WOM</i>		-0.754** (0.248)		-0.373 (0.263)		-0.133 (0.246)		-0.518** (0.248)
<i>DIRECONS</i>	-0.021 (0.054)	-0.112 (0.108)	0.066 (0.057)	0.154 (0.114)	0.114** (0.055)	-0.101 (0.109)	0.055 (0.054)	0.021 (0.110)
<i>DCONS×FEMG</i>		-0.068 (0.246)		-0.164 (0.273)		-0.609** (0.252)		-0.637** (0.255)
<i>DCONS×WOM</i>		0.205 (0.261)		-0.191 (0.283)		0.729** (0.265)		0.420 (0.270)
<i>IMPRMGMT</i>	-0.073 (0.128)	-0.102 (0.252)	-0.370** (0.135)	-0.508* (0.270)	-0.053 (0.131)	-0.421* (0.258)	-0.230* (0.129)	-0.210 (0.257)
<i>IMGT×FEMG</i>		-1.736** (0.629)		-1.365** (0.671)		-1.609** (0.653)		-2.406** (0.636)
<i>IMGT ×WOM</i>		1.220* (0.636)		1.053 (0.686)		1.666** (0.666)		1.464** (0.653)
<i>DECSATOP</i>	0.238** (0.050)	0.385** (0.107)	0.058 (0.054)	0.073 (0.113)	0.033 (0.051)	0.107 (0.110)	0.043 (0.052)	0.242** (0.111)
<i>DTOP×FEMG</i>		-0.092 (0.238)		-0.112 (0.255)		-0.058 (0.237)		0.124 (0.245)
<i>DTOP×WOM</i>		-0.315 (0.257)		0.019 (0.269)		-0.107 (0.255)		-0.490 (0.262)
<i>EMPSCHAN</i>	0.411** (0.064)	0.310** (0.132)	0.189** (0.069)	0.279** (0.139)	0.222** (0.066)	0.345** (0.136)	0.044 (0.066)	0.101 (0.136)
<i>CHAN×FEMG</i>		0.251 (0.318)		-0.058 (0.337)		0.536* (0.312)		0.136 (0.324)
<i>CHAN×WOM</i>		0.113 (0.313)		-0.104 (0.335)		-0.496 (0.218)		-0.112 (0.331)
<i>EMPSNOCO</i>	-0.405** (0.065)	-0.188 (0.133)	-0.038** (0.069)	0.251* (0.139)	-0.054 (0.067)	-0.279** (0.138)	-0.021 (0.067)	-0.057 (0.137)

	<i>FULLYCOM</i>		<i>LABPROD</i>		<i>PRODQUAL</i>		<i>FINPERF</i>	
	<u><i>Model I</i></u>	<u><i>Model II</i></u>	<u><i>Model I</i></u>	<u><i>Model II</i></u>	<u><i>Model I</i></u>	<u><i>Model II</i></u>	<u><i>Model I</i></u>	<u><i>Model II</i></u>
<i>NOCO</i> × <i>FEMG</i>		0.197 (0.316)		0.197 (0.316)		0.209 (0.316)		0.117 (0.319)
<i>NOCO</i> × <i>WOM</i>		-0.509 (0.324)		-0.597* (0.341)		-0.715** (0.337)		0.164 (0.334)
<i>CONSTARG</i>	0.315** (0.065)	0.573** (0.231)	0.287** (0.065)	0.263 (0.241)	0.134 (0.112)	0.025 (0.234)	0.111 (0.112)	0.398* (0.235)
<i>CTAR</i> × <i>FEMG</i>		0.585 (0.521)		0.219 (0.570)		-0.091 (0.527)		0.273 (0.529)
<i>CTAR</i> × <i>WOM</i>		-0.885** (0.554)		-0.074 (0.601)		0.307 (0.561)		-0.713 (0.562)
<i>PARTBRIE</i>	0.117** (0.054)	0.009 (0.114)	0.142** (0.058)	0.168 (0.121)	0.156** (0.055)	0.113 (0.117)	0.123** (0.054)	0.080 (0.116)
<i>PBRI</i> × <i>FEMG</i>		0.219 (0.256)		0.253 (0.273)		-0.017 (0.258)		-0.181 (0.254)
<i>PBRI</i> × <i>WOM</i>		0.061 (0.275)		-0.217 (0.290)		0.057 (0.281)		0.241 (0.274)
<i>DISCUSS</i>	0.350** (0.138)	0.546** (0.268)	-0.029 (0.151)	-0.055 (0.291)	-0.176 (0.144)	-0.160 (0.281)	-0.006 (0.144)	-0.052 (0.281)
<i>DISC</i> × <i>FEMG</i>		0.548 (0.627)		0.304 (0.657)		-0.040 (0.650)		0.597 (0.649)
<i>DISC</i> × <i>WOM</i>		-0.671 (0.663)		-0.337 (0.719)		-0.272 (0.697)		-0.486 (0.693)
<i>PROFREL</i>	0.080 (0.132)	0.061 (0.250)	0.348** (0.142)	0.465* (0.263)	0.093 (0.134)	-0.197 (0.254)	0.225* (0.134)	0.286 (0.251)
<i>PREL</i> × <i>FEMG</i>		0.750 (0.643)		1.368** (0.681)		0.529 (0.656)		1.036 (0.646)
<i>PREL</i> × <i>WOM</i>		-0.449 (0.638)		-1.202* (0.676)		0.191 (0.655)		-0.886 (0.650)
<i>SHAROWN</i>	0.223 (0.153)	-0.300 (0.292)	0.492** (0.153)	0.142 (0.300)	-0.176 (0.154)	-0.416 (0.294)	0.586** (0.153)	0.284 (0.291)
<i>SHROW</i> × <i>FEMG</i>		-0.502 (0.736)		-0.620 (0.779)		0.226 (0.745)		-0.075 (0.762)
<i>SHROW</i> × <i>WOM</i>		1.492 (0.725)		1.169 (0.757)		0.758 (0.735)		0.887 (0.747)
<i>PAYPERF</i>	-0.295** (0.126)	0.085 (0.245)	0.152 (0.136)	-0.232 (0.264)	0.022 (0.130)	0.247 (0.252)	0.259** (0.129)	-0.113 (0.251)
<i>PAYP</i> × <i>FEMG</i>		0.864 (0.611)		-0.233 (0.671)		1.071* (0.623)		1.216* (0.631)

	<i>FULLYCOM</i>		<i>LABPROD</i>		<i>PRODQUAL</i>		<i>FINPERF</i>	
	<u>Model I</u>	<u>Model II</u>	<u>Model I</u>	<u>Model II</u>	<u>Model I</u>	<u>Model II</u>	<u>Model I</u>	<u>Model II</u>
<i>PAYP</i> × <i>WOM</i>		-1.348** (0.609)		1.216* (0.669)		-1.099* (0.633)		0.168 (0.630)
<i>EMPSUPV</i>	0.027 (0.043)	0.042 (0.086)	0.043 (0.045)	0.109 (0.088)	0.060 (0.043)	0.139 (0.088)	0.031 (0.044)	0.095 (0.087)
<i>ESUP</i> × <i>FEMG</i>		-0.288 (0.204)		0.185 (0.205)		0.148 (0.194)		0.371* (0.210)
<i>ESUP</i> × <i>WOM</i>		0.135 (0.208)		-0.277 (0.209)		-0.181 (0.202)		-0.375* (0.216)
<i>SUPVTAKE</i>	-0.040 (0.124)	0.156 (0.255)	-0.167 (0.133)	-0.106 (0.271)	-0.234* (0.130)	-0.176 (0.267)	0.038 (0.128)	0.139 (0.267)
<i>STKE</i> × <i>FEMG</i>		-0.738 (0.622)		0.368 (0.687)		-0.572 (0.646)		-0.315 (0.637)
<i>STKE</i> × <i>WOM</i>		0.120 (0.611)		-0.328 (0.667)		-0.278 (0.637)		0.088 (0.634)
<i>SUPVPAY</i>	0.245 (0.270)	0.023 (0.573)	0.161 (0.306)	-0.108 (0.650)	0.032 (0.283)	0.360 (0.597)	0.135 (0.291)	0.329 (0.622)
<i>SPAY</i> × <i>FEMG</i>		-0.357 (1.309)		-0.137 (1.450)		0.645 (1.317)		0.981 (1.331)
<i>SPAY</i> × <i>WOM</i>		1.050 (1.509)		1.044 (1.680)		-0.880 (1.561)		-0.678 (1.601)
<i>SUPVDISM</i>	-0.128 (0.217)	-0.656 (0.412)	0.070 (0.237)	0.837* (0.441)	0.071 (0.223)	-0.261 (0.422)	-0.145 (0.225)	-0.147 (0.429)
<i>SDISM</i> × <i>FEMG</i>		1.014 (1.219)		0.829 (1.314)		0.084 (1.250)		0.303 (1.330)
<i>SDISM</i> × <i>WOM</i>		0.680 (1.235)		-2.438* (1.335)		0.692 (1.272)		0.079 (1.292)
<i>1-digit Industry Dummies</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>Percentages of Workforce in each Occupation</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>Firm Characteristics</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>Other Policies Dummies</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>Number of observations</i>	1457	1376	1214	1376	1336	1261	1279	1211
<i>L-R test χ^2</i>	438.87**	475.05**	103.41**	475.05**	142.93**	183.52**	92.94**	144.38**

* Significant at the 10% level. ** Significant at the 5% level

3.8. Appendix: Description of the Variables Analysed

Variable Name	Variable Description	Measurement	Mean (Std. Dev.)
<i>PROPFEMG</i>	Proportion of managers who are women	<i>Continuous Variable</i>	0.319 (0.303)
<i>PROPWOM</i>	Proportion of total number of employees who are women	<i>Continuous Variable</i>	0.496 (0.285)
<i>EMPSHELP</i>	Whether managers ask employees to help them in unspecified ways	<i>Discrete scale of agreement 1 to 5</i>	3.324 (1.145)
<i>AVGEDUYR*</i>	Average years of education of employees at the workplace	<i>Continuous Variable</i>	10.661 (2.275)
<i>DIRECONS</i>	Whether managers rather consult directly with employees than with representatives	<i>Discrete scale of agreement 1 to 5</i>	3.652 (1.106)
<i>IMPRMGMT</i>	Whether managers are considered a channel through which employees can make suggestion	<i>Dummy 0 / 1</i>	0.248 (0.432)
<i>DECSATOP</i>	Whether managers consider that those at top are best placed to make decisions	<i>Discrete scale of agreement 1 to 5</i>	3.271 (1.086)
<i>EMPSCHAN</i>	Whether managers discuss with workers any change before introducing it	<i>Discrete scale of agreement 1 to 5</i>	3.740 (0.956)
<i>EMPSNOCO</i>	Whether most decisions at workplace are made without discussing them with employees	<i>Discrete scale of agreement 1 to 5</i>	2.258 (0.980)
<i>CONSTARG</i>	Whether managers set establishment targets in consultation with employees	<i>Dummy 0 / 1</i>	0.465 (0.499)
<i>PARTBRIE</i>	Proportion of time in informative briefing meetings given to employees to offer views and pose questions	<i>Discrete scale 0 to 4</i>	1.978 (1.048)
<i>DISCUSS</i>	Whether the firm uses performance appraisals to give feedback to employees, discuss their career moves and set their personal objectives	<i>Dummy 0 / 1</i>	0.762 (0.426)
<i>PROFREL</i>	Whether employees receive profit-related payment	<i>Dummy 0 / 1</i>	0.377 (0.485)
<i>SHAROWN</i>	Whether there exist employee ownership plans	<i>Dummy 0 / 1</i>	0.232 (0.422)
<i>PAYPERF</i>	Whether there exist pay per performance schemes	<i>Dummy 0 / 1</i>	0.260 (0.439)
<i>EMPSUPV</i>	Proportion of non-managerial workers doing supervisory tasks	<i>Discrete scale 0 to 6</i>	1.644 (1.244)
<i>SUPVTAKE</i>	Whether supervisors have the authority to make hiring decisions	<i>Dummy 0 / 1</i>	0.284 (0.451)

Variable Name	Variable Description	Measurement	Mean (Std. Dev.)
<i>SUPVPAY</i>	Whether supervisors have the authority to decide on pay rises	Dummy 0 / 1	0.435 (0.204)
<i>SUPVVDISM</i>	Whether supervisors have the authority to decide on dismissals for unsatisfactory performance	Dummy 0 / 1	0.076 (0.265)
<i>NUMEMPS</i>	Total number of employees at the workplace	Continuous Variable	288.743 (847.311)
<i>AVGAGE*</i>	Average age of employees at the workplace	Continuous Variable	38.970 (5.804)
<i>AVGEDUYR*</i>	Average years of education of employees at the workplace	Continuous Variable	10.661 (2.275)
<i>PROPRFS</i>	Proportion of total number of employees who are professional workers	Continuous Variable	0.150 (0.236)
<i>PROTECS</i>	Proportion of total number of employees who are technical workers	Continuous Variable	0.090 (0.170)
<i>PROCLERS</i>	Proportion of total number of employees who are clerical or secretarial workers	Continuous Variable	0.204 (0.254)
<i>PROSKILS</i>	Proportion of total number of employees who are skilled manual workers	Continuous Variable	0.108 (0.209)
<i>PROSEVCS</i>	Proportion of total number of employees who work in personal service occupations	Continuous Variable	0.087 (0.220)
<i>PROOPER</i>	Proportion of total number of employees who work in operative and assembly occupations	Continuous Variable	0.114 (0.249)
<i>PROSALES</i>	Proportion of total number of employees work in sales occupations	Continuous Variable	0.112 (0.251)
<i>INDEPEND</i>	Whether the interviewed workplace is an independent organisation	Dummy 0 / 1	0.200 (0.400)
<i>FOREING</i>	Whether the organisation is mostly owned by foreign capital	Dummy 0 / 1	0.309 (0.462)
<i>PUBLIC</i>	Whether the firm is a public sector company	Dummy 0 / 1	0.104 (0.305)
<i>LONGEV</i>	Years of longevity of the workplace	Continuous Variable	35.603 (48.269)
<i>SIC</i>	SIC 1992 Code of main activity of the establishment	12 Dummies 0 / 1	
<i>UNION</i>	Whether there any type of union or staff association at workplace	Dummy 0 / 1	0.659 (0.474)

Variable Name	Variable Description	Measurement	Mean (Std. Dev.)
LTEMPLOY	Whether employees of the organisation are lead to expect a long-term employment relationship	Discrete scale of agreement 1 to 5	3.785 (0.976)
WITHINPR	Extent to which job vacancies are covered primarily through internal application	Discrete scale 1 to 3	1.375 (0.530)
FOREQOPS	Whether the organisation has a formal written policy on equal opportunities or managing diversity	Dummy 0 / 1	0.811 (0.391)
EMPMOTH	Whether the organisation has a special policy to hire women returning to work after having children	Dummy 0 / 1	0.162 (0.368)
FULLYCOM	Whether manager considers that employees are fully committed to the values of the organisation	Discrete scale of agreement 1 to 5	3.690 (0.846)
LABPROD	Manager's assessment of workplace labour productivity compared to the rest of the industry	Discrete scale 1 to 5	3.574 (0.778)
PRODQUAL	Manager's assessment of workplace's quality of product/service compared to the rest of the industry	Discrete scale 1 to 5	3.916 (0.754)
FINPERF	Manager's assessment of workplace's financial performance compared to the rest of the industry	Discrete scale 1 to 5	3.674 (0.847)
CHPROFMG	Evolution of the proportion of women in managerial posts in the last 5 years	Discrete scale -2 to 2	0.556 (0.784)
CHLABPRO	Evolution of labour productivity at the workplace in the last 5 years	Discrete scale -2 to 2	0.319 (0.303)
CHLABCST	Evolution of labour costs at the workplace in the last 5 years	Discrete scale -2 to 2	0.665 (1.100)
CHDECMAC	Evolution of employees' influence on managerial decision-making in the last 5 years	Discrete scale -2 to 2	0.593 (0.712)
CHEMPREL	Evolution of importance of employee relations in the last 5 years	Discrete scale -2 to 2	1.051 (0.848)
CHPBR	Evolution of the number of non-managers paid by results in the last 5 years	Discrete scale -2 to 2	0.432 (0.737)
CHEMPINF	Evolution of employees' autonomy at their jobs in the last 5 years	Discrete scale -2 to 2	0.749 (0.797)

*Obtained from the employee survey records carried out by the WERS 98.