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Departament d'economia de l'empresa

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INTERNAL PROMOTION VERSUS EXTERNAL RECRUITMENT: EVIDENCE IN INDUSTRIAL PLANTS[1]

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ABSTRACT

An analysis is carried out in a sample of 738 industrial plants of the determining factors in the use of internal promotion of blue-collar workers to middle managers and skilled technicians as against their external recruitment. The use of internal promotion is positively correlated with variables indicative of the efforts made by plants to measure employees' skills, and to a lesser extent, with the level of specificity of investments in human capital made by blue-collar workers. Contrary to what was expected, variables related with the use and efficiency of other incentive systems have no significant influence on the increased or decreased use of internal promotion. These results are initial evidence that internal promotions are used to protect and favour specific investments, especially those made by firms in order to discover their workers' skills.

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INTRODUCTION

This study is an initial attempt to provide empirical evidence on the main factors correlating with the use of internal promotion to a greater or lesser extent, as against the external recruitment of workers. To this end, internal promotion policies of blue-collar workers are analysed compared with external hiring of managers and skilled technicians in a wide-ranging sample of plants representative of the Spanish manufacturing sector. This involves focusing on one of the various types of promotion noted by Pergamit and Veum (1999), which involves a change in assigning tasks to workers. It is this type that has received most attention from a theoretical perspective, due to its possible interference in the process of assigning individual skills to productive tasks (Baker et al., 1988).

The use of internal promotion has been one of the basic premises of influential economic models of the firm and their internal incentive systems, as well as "tournament theory" (Lazear and Rosen, 1981), or career models in organisations (Gibbons and Waldman, 1999). Various models have also offered theoretical explanations for the use of internal promotion (Greenwald, 1979; Chan, 1996; Fairburn and Malcomson, 2001) and its consequences (Prendergrast, 1993).

This theoretical development stands in contrast to the little empirical evidence available (Pergamit and Veum, 1999, p. 82). In the economic field, most works have focused on studying the factors determining the likelihood of a worker obtaining internal promotion and the benefits of this for the worker. The evidence is taken from data from a particular organisation (Baker et al., 1994; Asch and Warner, 2001; Treble et al., 2001), data from a sample of the general population (McCue, 1996; Pergamit and Veum, 1999), a combination of both (Abraham and Medoff, 1985) and data from a particular profession (Spurr and Sueyoshi, 1994; Broder 1993). Although the external market's influence and importance is accepted (Pergamit and Veum observe approximately the same frequency of internal promotions as inter-company job changes in the population analysed), the type of data considered in these studies offers little scope for questioning the factors affecting the fact that once the vacancy arises, firms use internal promotion instead of external recruitment.

In "management" literature, there are some studies that analyse the factors determining the implantation of internal labour markets (e.g. Baron et al., 1986; Pfeffer and Cohen, 1984). In these studies, the presence of internal labour markets is measured by means of many characteristics, with no clear theoretical justification for their interrelations apart from the descriptive study by Doeringer and Piore (1971), with internal promotion being one of the dimensions that make up internal labour markets.

For this reason, a clear and isolated analysis of the determining factors in the use of internal promotion would appear to be necessary in order to establish the reliability of the assumptions made by the various theoretical models and the development of future explanations of their use. The first section of this study therefore revises the main theoretical arguments that have been used to analyse the use of internal promotion from the economic point of view. This analysis leads to a series of predictions that will guide the empirical work carried out. The test of these predictions is carried out using a sample of 738 Spanish industrial plants, which are described in greater detail in the second part of the study. The results of the empirical test of the hypothesis are presented in the third section and the work ends with a discussion of the results obtained and the final conclusions.

ECONOMIC ANALYSIS OF PROMOTIONS

The increasing and extensive application of economic models to the understanding of various problems in human resource management has led some authors (Gibbons and Waldman, 1999) to synthesise the main theoretical building blocks, upon which the construction of models or guides to reasoning are built. In a similar way, we will also use these theoretical building blocks for the analysis of the determinant factors in the level of use of internal promotions by firms. Specifically, these building blocks are productivity in hierarchical organisations (Rosen, 1982; Waldman, 1984a), human capital (Becker, 1964; Mincer, 1974), imperfect information about skills (Spence, 1976; Harris and Holmstrom, 1982) and effort (Harris and Raviv, 1979; Lazear and Rosen, 1981).

Productivity in hierarchical organisations and human capital.

The first analyses of promotions (Rosen, 1982; Waldman, 1984a) were based on the idea that the most talented workers are most productive if they are situated at the top of the hierarchy, so workers will be allocated to job positions according to their talent and their skills. This is an explanation of how people may recover their investment in training and human capital, and therefore of the incentives that they have to make these investments (Becker, 1964; Mincer, 1974). This implies finding a relationship between the volume of investments in training and the hierarchical level occupied, something for which empirical evidence already exists (Ortín-Angel and Salas-Fumás, 2002). In this context, in which skills and knowledge can supposedly be observed, administrators of human resources have only to assign workers to hierarchical levels. The worker's previous work, whether or not she previously worked in the company or in the same plant is irrelevant, providing that this has no effect on the type of knowledge or skills that she has accumulated. The opportunity to develop knowledge specific to the workplace was considered in the initial formulations of human capital theory (Becker, 1964), and subsequently studied and documented (Topel, 1991; Felli and Harris, 1996). When specific knowledge is important for carrying out management work, an increased use of internal promotion of workers as against external hiring is to be anticipated. By covering the vacancy with someone who has already previously worked in the organisation, a saving in training costs regarding specific aspects of the company thereby occurs.

HYPOTHESIS 1: the probability of using internal promotion increases in those plants where the level of specificity of the workers' knowledge is higher.

Existing empirical studies (Ortín-Ángel and Salas-Fumás, 2002), while showing a strong relationship between peoples' investments in training and the hierarchical levels that they occupy in business organisations, clearly indicate that there is still an important part of this assignment process that appears to respond to other motivations or criteria.

The main theoretical suggestions come from analysis of information asymmetries, and in particular, the difficulty of measuring or identifying workers' skills.

Difficulties in measuring skills

Another of the theoretical building blocks with the greatest impact on economic analysis of human resources is the one related to the learning process of workers' skills (see, for example, a synthesis in Gibbons and Waldman (1999)). The main idea of these models is that workers' skills are not easy for the company to observe, but may be discovered over time. This has implications in that firms may make investments to generate information regarding employees' skills or abilities. The reasons for carrying out these investments may be highly diverse, such as improving efficiency when assigning workers to hierarchical positions or avoiding information asymmetry problems, as these mechanisms may be more efficient than implementing certain signal systems (Spence, 1976). The difficulties with sharing this knowledge between firms are obvious, because as some authors (Ricart i Costa, 1988; Waldman, 1984b; Bernhardt and Scoones, 1993) have stressed, this knowledge may be used to their own benefit. The information that firms possess regarding the skills of their own workers is more precise than that available to them concerning other workers. For this reason, it should be expected that if firms are averse to risk, they will have more confidence in internal promotion systems than in systems for external recruitment (Greenwald, 1979).

HYPOTHESIS 2: the probability of using internal promotion increases in plants where investment in measuring workers' skills is greatest.

The difficulty in measuring workers' skills means that to a greater or lesser extent, there are also difficulties in measuring the effort they make in their job, which give rise to the possibility of internal promotion also being used as an incentive system (Chan, 1996).

Promotions as incentive systems

Tournament theory (Lazear and Rosen, 1981) shows that promotions may be used as a system to encourage workers' effort. The main focus for discussion is why the problem of assigning people should be mixed with that of providing incentives, or in other terms, whether or not there are other mechanisms that are more efficient than promotion to elicit effort from employees (Baker et al., 1988). Various authors argue that the main advantage of promotions is that they avoid employers from taking advantage of by not providing the resulting rewards after having made an effort or investment in specific human capital (Carmichael, 1983; Prendergast, 1993). They are also less susceptible to

the possibility that middle management may give in to pressure from their subordinates when implementing rewards (Fairburn and Malcomson, 2001). This is due to the fact that the total amount of payments can be fixed initially, as well as the choice of one or another worker for a specific hierarchical position have long-term consequences for those taking promotion decisions. As a consequence, the increased use of tournaments, i.e. internal promotion as an incentive system, is to be anticipated in those firms where the employer's or manager's credibility is lowest in terms of respect for the conditions established in the incentive systems, such as bonuses. Another positive aspect of promotions is that because they are relative evaluations, they help to eliminate risks in worker's wealth and obtaining information is less costly, as they do not require the exact quantification of the individual result obtained (Lazear and Rosen, 1981). However, it should also be remembered that as an incentive system, promotions have the disadvantage of being an individual remuneration and therefore not well suited to environments where collaboration between workers is necessary (Lazear, 1989). In these situations, group incentives seem to be more efficient.

Hypothesis 3: the probability of using internal promotion decreases in those plants with the most use and efficiency of other incentive systems.

The next sections deal with testing the hypotheses formulated. In Figure 1, the relationships between these hypotheses are synthesised.
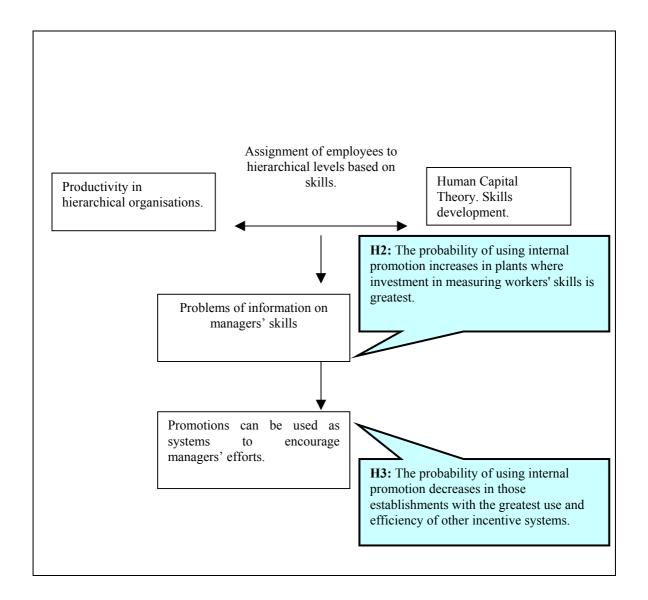
DESCRIPTION OF THE DATA

Sample

The information for carrying out this study was obtained within the framework of a wider research project, focusing on the analysis of new work and production organisation systems in Spanish manufacturing industry. The type of data is quite similar to that used by Osterman (1994, 2000) for analysing the various aspects of internal labour markets and work in North American firms.

FIGURE 1.Theoretical synthesis regarding determinants of internal promotions

H1: The probability of using internal promotion increases in those plants where the level of specificity of the workers' knowledge is higher.

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The information was gathered between March and December 1997, using a questionnaire directed to Spanish manufacturing plants with 50 or more workers. The questionnaires were completed in personal interviews, in most cases with plant directors, and operations and human resources managers. 965 valid interviews took place, accounting for 16.04% of the total target group. Due to the fact that some questionnaires were incomplete, the final number of observations used was 738, with all sectors represented (see Table 1 for details). The information gathered refers basically to the various human resource management policies applied to the blue-collar workers in the plant where the interview took place, as well as the plant's practices in the area of operations management. The lack of empirical studies on the subject clearly shows the

difficulty in gathering information and directly observing most theoretical concepts developed, such as the level of specificity, the information available regarding skills and the use of incentives programmes. As was the case in previous studies of promotions (Abraham and Medoff, 1985) and is usual in studies analysing various aspects of firms' personnel policies, (Drago and Garvey, 1998, or Levine, 1993), these concepts were measured using objective indicators and evaluations, on various scales, by the person answering the survey. The variables used in this study are described below. More detailed information on the survey and how it was obtained can be found in Bayo-Moriones and Huerta-Arribas (2002).

Measuring variables

Internal promotion. This variable shows, on a five-level ordinal scale, the extent to which the current middle managers and skilled technicians of the plant had previously been blue-collar workers on the same premises. This variable takes a value of zero when practically none of the middle managers and skilled technicians had previously been blue-collar workers at the plant, one when they are a minority, two when they are half, three when they are majority and the value of four is taken when practically all were formerly blue-collar workers[2] in the plant.

To test the hypotheses formulated in the theoretical section, we will use a series of variables related to the three factors described as determinants in internal promotion - specific knowledge (Hypothesis 1), knowledge measurement (Hypothesis 2) and the efficiency of other incentive systems (Hypothesis 3).

<u>Specific knowledge</u>

As well as variables that can capture the general level of specificity, such as the presence of *permanent contracts*, and given that various origins of specificity may coexist (Williamson, 1983), we will develop various variables in order to capture

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[2] Studies carried out at the Opel production plant in Figueruelas (Spain) show salary increases of 20% upon promotion from operative to co-ordinator of a works team (Villanueva, 1997). These increases are slightly above those noted by other studies of samples in North American companies (see Pergamit and Veum, 1999).

specificities related with location, *locational specificity*, and with technology, *continuous processes* and *technological change*.

Permanent contracts. This is measured using the percentage of non-temporary workers at the plant. The use of long-term contracts has been seen as a solution to problems related to specific investments. For this reason, it should be anticipated that problems with specific investments in knowledge are more important in those firms with a greater percentage of non-temporary workers.

Locational specificity. This is a dichotomous variable with a value of 1 when there are no other plants in the same economic sector in the area where the company is located. If there is knowledge that is specific to the plant's industrial activity, the lack of similar geographically close plants makes the threat of leaving the company more costly for the worker.

Continuous processes. This variable is binary and shows whether the company manufactures products in a continuous flow. Because continuous production implies usually the manufacturing of a single product, it is to be expected that this favours knowledge being more job-specific in comparison with processes organised around projects.

Technological change. This variable shows whether there have been significant technological changes at the plant in the last three years, on an ordinal scale of one to five. A value of one means that there has been no change, while a value of five indicates that the production system has completely changed. In sectors with the highest level of technological changes, it is to be expected that the likelihood of some of the technologies being exclusive to the company is higher, and that they therefore require specific investments, or that a priori they are highly likely to be so (Pfeffer and Cohen, 1984).

Hypothesis 1 predicts a *positive* relation between the use of internal promotion and the variables mentioned above.

Measuring skills

A series of variables related to environments in which the benefits of measuring skills and knowledge are greater are identified in this section. The questionnaire included a variable associated with plants in which *non-observable characteristics* are given priority when choosing candidates for a job, a variable that captures the effort made by

the firms to measure blue collar workers' performance, extension of *appraisal systems*, and a variable related to the competitive pressure which firms face to implement these measuring efforts, *degree of competition*. All these variables are then defined in greater detail.

Non-observable characteristics. In the questionnaire, a question concerning the factors that are usually taken into account when initially selecting and hiring blue-collar workers is included. The person interviewed had six alternatives to choose from - experience, qualifications, age, ability to acquire new knowledge, personality and ability to work in a team. When one of the three latter criteria was considered to be the most important, the variable assumes the value of one, and if not, it takes the value of zero. This variable is interpreted as an indicator of the benefits that may be gained by the plant from the efforts made in measuring skills. If technical characteristics are the most highly valued by production plants, this information regarding the qualifications held by the candidate is easy to observe and would be enough for them to be selected, meaning that internal and external candidates operate under the same conditions. In the opposite case, it is to be anticipated that plants have more information available concerning internal candidates.

Extension of *appraisal systems*. On an ordinal scale of one to five, this variable shows how many of the blue-collar workers are evaluated in the work they carry out. It has a value of one if none of the employees are evaluated and five if they all are. It is to be anticipated that those firms where the evaluation systems include a higher number of employees use internal promotion to a greater extent.

Degree of competition. This binary variable is equal to one when there are many competitors in the market in which the company works. Degree of competition may influence the need for increased control of the activities carried out in the company, and therefore encourages the obtaining of information on workers by other means as well as the use of formal evaluation systems, meaning that an increased use of internal promotion is to be anticipated.

Hypothesis 2 predicts a positive relationship between the use of internal promotion and the variables mentioned above.

The presence of alternative incentive systems

Internal promotions make up a system of individual incentives, meaning that it is to be anticipated that they are used to a lesser extent in plants where other *incentive* systems are used, *teamwork* dominates and the *intensity of supervision* of workers is lower.

Incentives is a dichotomous variable showing whether or not incentive payment plans exist. Where variable remuneration plans are implemented, it makes less sense to establish additional motivation tools, such as promotions.

Teamwork is measured using the percentage of workers that carry out their work within autonomous work teams. Organising work on the basis of teams hinders measurements of individual performance, something which is necessary for the use promotions as a means of rewarding those employees whose work merits it. It also requires continuous cooperation between employees, something which contradicts the idea of individual reward implied by promotions.

The *intensity of supervision* which employees undergo is measured by means of an ordinal variable in five categories, where a value of one shows that the workers are not supervised at all, and a value five shows that they are very intensely supervised at work. In situations in which the company supervises its workers to a greater extent, there would be less need to use motivation mechanisms such as internal promotions.

Hypothesis 3 predicts a *negative* relationship between the use of internal promotion and the variables mentioned above. Figure 2 shows the synthesis of the expected relationships between the use of internal promotion and all the explanatory variables mentioned, in line with the three hypotheses mentioned in the theoretical section.

FIGURE 2. Predictions for empirical testing of the determinant factors of internal promotion.

THEORETICAL CONCEPT	SIGN	VARIABLES USED
Specific knowledge	H1: +	Permanent contracts Locational specificity Continuous processes Technological change
Skills measurement	H2: +	Non-observable characteristics Appraisal systems Degree of competition
Presence and efficiency of other incentive systems	H3: -	Incentives Teamwork Level of supervision

Control variables

There is a range of variables that may have an influence on the type of promotion used in firms and which are not related to the hypotheses described above, such as the *Size* of the plant (number of employees at the plant divided by 1000), which may have a positive effect on the use of internal promotions. This is because in large plants, there is a large number of positions to be covered and a higher number of candidates to choose from (Pfeffer and Cohen, 1984).

In the sample used, internal promotion to middle manager only refers to those who were previously blue-collar workers in the same plant. In fact, a distinction could be made between promoting a worker from the same plant to a managerial position, promoting a worker from another plant but the same company, and hiring workers with no links to the company. This distinction is only relevant for firms with various production plants, as is usually the case with multinational companies. To this end, we define a dichotomous variable which assumes a value of one when the company is part of a foreign *Multinational* group. In these companies, some external promotions may come from blue-collar workers in the same company but from other plants being promoted,

meaning that a lesser use of internal promotions of operatives from the same plant should be anticipated[3].

Other factors beyond the management's control, such as whether the company is in the *public* sector or the influence of *Unions*, may also affect promotion decisions. As suggested in the studies by Abraham and Medoff (1985) and Pfeffer and Cohen (1984), union strength or public ownership of the company may encourage the management to give into pressure by the workers to use internal promotions, as this facilitates access by employees already working in the company to jobs with increased remuneration. The influence of *Unions* is measured by an ordinal variable in five categories which assumes a value of one when the influence of unions is very low and a value of five when this influence is very high. *Public* ownership is reflected using a dichotomous variable. Finally, a control is made using a variable linked to the labour market situation in the area, *unemployment*. This variable is defined as the unemployment rate in the industry and in the province in which the plant is located.

Table 2shows the average and the standard deviation of variables used, as well as their correlation matrix. The data clearly shows that in the sample of industrial plants available, internal promotion is used to a greater extent than external hiring (2.7 > 2, the midpoint of the scale used). Interestingly, less than half of the plants, 36.5%, state that they exclusively use a single system for covering vacancies, internal promotion or external hiring, and most of the plants analysed alternate between both hiring systems. The average plant size is 240 employees, of which 80% have stable employment contracts. As far as ownership of the plants is concerned, 26% are part of multinational companies and only 3% are publicly owned, with an average rate of union influence in the plants and the average unemployment rate being 11.83%. The organisation of production is characterised by little use of continuous production processes (19% of the plants) and an average intensity of technological change. This is despite only 17% of workers participating in work teams. 41% of plants say that they have many competitors and only 5% state that there are no other plants in the same economic sector in the area. As far as employment policies are concerned, 29% of the plants prioritise the non-observable characteristics of candidates to become part of the plant's staff as operatives. Once they have been employed, 66% of the plants use incentive plans to reward their

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[3] We also carried out the analysis exclusively in those plants that do not belong to any multinational

operatives, with medium-high levels of supervision intensity, and on average, firms evaluate the work of over half of their blue-collar workers. The hypotheses formulated are tested below.

Testing the Hypotheses

Given that the variable relating to the use of internal promotion is ordinal, test of the hypotheses set out above is carried out by estimating the ordered probit models (Maddala, 1983).

Table 3 shows the results of the ordered probit estimations carried out. Five models have been estimated. In the first of these, only the control variables have been included. In the second, the variables related to the existence of specific knowledge have been included as well as the control variables. In the third model, as well as the control variables, there are the variables referring to knowledge measurement, while in the fourth those relating to the presence and efficiency of other incentive systems appear. The fifth and final estimation includes all the independent variables defined.

Of the five models, neither the first or fourth are globally significant. The ones including knowledge specificity variables and their measurement are significant, as is the final model.

The coefficients estimated in the final model, which are related to the hypotheses defined, are quite similar to those estimated in previous models, meaning that no important collinearity problems between the independent variables have been detected. The comments focus on this last estimation.

The results clearly show that Hypothesis 2 is the one receiving the most support (1% joint significance of all variables). *Internal promotion* is most frequently used in those plants which have invested the most in measuring their workers' knowledge. The results show that with significance levels below 5%, those plants using criteria that are more closely related to *non-observable characteristics* in their new blue-collar workers selection procedures are subsequently more likely to promote these same workers to middle managers. It was also noted that the coefficient of the variable *Appraisal systems* is significant and positive. The extension of the evaluation systems to a higher number of workers in the company leads to an increased use of internal promotions. Finally,

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group and the results did not substantially change.

competitive pressure leads to an increased use of internal promotion. The coefficients associated with the variable *degree of competition* are positive and significantly different from zero at significant levels below 5%.

Hypothesis 1, in which internal promotion is favoured in those plants in which blue-collar workers have made greater specific investments, is also corroborated in the estimator models, although to a lesser extent than the previous hypothesis (5% of joint significance in all variables). Of the group of variables aimed at including the specificity of knowledge used by employees at the plants, all appear with the expected sign and three are significantly different from zero. In the case of *permanent contracts*, the results confirm what was expected, as the use of internal promotion is significantly greater (around 5% significance) in those plants with the highest percentage of workers with a permanent employment contract. *Technological change* positively (around 5% significance) affects the degree of use of internal promotions as against external hiring, and an effect of *locational specificity* is noted (only significant at levels of 10%) in management itself. However, whether or not the plant's manufacturing process is continuous was found to have no significant effect of any kind.

Hypothesis 3, relating to the use of internal promotions as incentive system, receives hardly any support. None of the variables relating to the provision of incentives was significant in the models estimated. Despite the sign of the coefficients associated with the variables *Teamwork* and *Supervision* being those anticipated by the theoretical models, neither of them, nor the one associated with the existence of *incentives* plans, is significantly different from zero.

Of the control variables, only the *Multinational* coefficient is significant, and has a negative sign. The data clearly shows that it is important to control for the presence of this type of company. As mentioned above, those promotions affecting blue-collar workers in the same company but from different plants are not considered to be internal promotions. The other control variables do not appear to be significant in any of the models estimated. It can be deduced from this that in the sample analysed, the *size* of the plant, whether or not it is *publicly* owned, the influence of *unions* at the plant and the level of *unemployment* in the area and industry have no effect on the increased use of *internal promotion*.

The influence of industrial sectors

Some of the variables analysed may be heavily influenced by the industrial sector in which the plants develop their main activities. Because of this, it is advisable to consider whether the plants have full discretion when establishing their promotion policies, or whether these are determined by the characteristics of the industrial sector in which the plant does its business. To this end, in model 4 estimated above, dummy variables have been introduced with regard to the various sectors described in Table 1, with the sector of *Various manufacturing industries* being omitted in order to avoid problems of perfect collinearity. The results obtained are shown in Table 4.

The group of variables referring to industrial sectors is significant, at the level of 5%. Once the remaining variables have been controlled for, the various manufacturing industries sector is the one in which the greatest use of internal promotion takes place. There is then a group of industrial sectors (the textile industry, dressmaking, leather and footwear; wood and cork: paper, publishing and graphic arts; metallurgy and mechanical product manufacture; transport material) in which this type of promotion is used to a lesser extent, but the differences with the above are not statistically significant. Differences with the omitted sector of around 5% significance are obtained in the industrial sectors of Food, drinks and tobacco; the Chemical industry; Rubber and plastic materials; Machinery and mechanical equipment; and Electric, electronic and optical material and equipment. Finally, the Non-metallic mineral products sector is the one that presents the least use of internal promotion, with a coefficient significance of around 1%.

These results clearly show that the other variables maintain coefficients and significance levels similar to those mentioned above. The main relationships shown in the above section explain the intra-industry variation in the use of internal promotions[4], with the exception of *locational specificity*, which is only now significant at levels of 15%.

DISCUSSION AND IMPLICATIONS

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[4] The increase in the likelihood function logarithm that takes place when the variables referring to the three hypotheses are added to a model in which only the control variables were included (model 1) and the industry variables, is significant at levels lower than 1%.

Most plants combine policies of internal promotion and external hiring to cover vacancies of managers and skilled technicians. The low explanatory capacity of the models analysed is an indication that these practices are not implemented systematically together with the other practices analysed, unlike what was supposed in previous studies on internal labour markets, such as those by Baron et al. (1986) and Pfeffer and Cohen (1984). Despite this, it was noted that specific investments, and in particular investments made by firms to discover their employees' skills, are the main explanatory factors in the use of internal promotions in the sample of plants analysed in this study.

According to learning models (Gibbons and Waldman, 1999), plants lack perfect information about the skills that their workers have for carrying out the activities pertaining to the posts that they occupy. Learning about these skills can take place by means of more or less formal evaluation processes (see for example Milbourn et al., 2001). The importance of non-objective criteria in the initial hiring of blue-collar workers has been interpreted as an indicator of the existence of less formal evaluation processes. The results show that the use of internal promotion is greater in those plants where formal and informal evaluation processes are more widespread. It can therefore be seen that the employee evaluation systems in the various phases of their relationship with the company are seen to be complementary to the use of internal promotions by firms to cover vacancies arising in the organisation.

It should also be pointed out that despite what has been suggested in other studies on the implementation of internal labour markets (Baron et al., 1986), in the sample analysed it was noted that competition favours internal promotion policies. Our interpretation of this phenomenon is that competition leads to increased supervision of blue collar workers' activities and indirectly stimulates and facilitates the processes of learning and formal (some positive correlation with the spread of evaluation systems can be seen) and informal evaluation (although the correlation above the estimated coefficient continues to be positive and significant), and as a consequence, increased use of internal promotion.

All these results are consistent with the proposals by Greenwald (1979), employers will tend to use internal promotion systems more when the difference in information that they have concerning the worker compared to that which they have on other firms'

workers is greater. These results are consistent with the assumptions of studies in which it is assumed that there are differences of information between firms regarding their workers' skills (Waldman, 1984b; Ricart i Costa, 1988; Bernhardt and Scoones, 1993). In this respect, it is important from both a theoretical and empirical point of view to extend this line of research in order to analyse the strategic behaviour of the firms with better information about their employees than other firms.

The specificity of workers' knowledge or skills, with various variables used for measurement, has also been seen to be a relevant factor in the use of internal labour markets by other authors (Baron et al. 1986; Pfeffer and Cohen 1984). Although they are apparently less significant than informational problems, the results shown confirm that specific investments have a significant influence on the use of internal promotions. The presence of technological change is especially relevant, beyond the specificities arising from the location of the plant. These results may be important for those firms who wish to encourage innovation, as they will need to develop a series of tools to guarantee workers that they are going to recuperate the specific investments that they make, and one of these is internal promotions. However, the significant influence of permanent contracts on the use of internal promotion leads internal promotion to be considered as a system to take advantage of specific investments that have already been made rather than as a mechanism for protecting new investments of those workers promoted.

Despite what was expected, the use of internal promotion is hardly influenced by the presence of alternative incentive systems. A possible reason could be that the incentive system is determined in combination with promotion decisions, meaning that the factors favouring internal promotion also affect incentives. Econometrically, we should observe that the incentive variables are significant in isolation, and lose significance when the other explanatory variables are added. The results obtained show no collinearity problems, meaning that the explanation above is to be rejected. This raises doubts regarding the use of internal promotions as incentive systems for efforts, as suggested in tournament theory (Lazear and Rosen, 1981), and existing prior evidence, where incentives are seen to be sensitive to opportunities for workers' promotion (Garen, 1995; Gibbs, 1994). Pergamit and Veum (1999) show that 30% of internal promotions do not involve changes in the tasks of the promoted employees. This can be interpreted as the

firms using tournament systems as incentive mechanisms, but trying to dissociate the assignment processes of individuals to hierarchical levels as far as possible. This would explain incentives having little interference in the process for covering vacancies together with the fact that the tournament is characterised not only by the probability of promotion, but also by the rewards, which is possibly the variable that firms adjust.

As far as control variables are concerned, union presence and public ownership of plants do not appear to have a significant influence on either means of covering vacancies. These results are consistent with those obtained by Abraham and Medoff (1985) and Pfeffer and Cohen (1984), in which managers' discretion is in practice much greater than the restrictions that unions and public ownership of plants theoretically appear to impose. Neither does the situation of the labour market, in terms of unemployment, seem to have a significant effect on this decision. Pfeffer and Cohen (1984) do not detect any relationship between recruitment difficulties and analysis of the implementation of internal labour markets. Other control variables have been used to overcome the limitations in the database. For example, the dependent variable used refers to promotion within a single plant, with promotion from other plants in the same company taken to be external promotion. This justifies the use of belonging to a multinational group as an independent variable and may explain the results obtained in our study with regard to the fact that multinational companies use internal promotion systems to a lesser extent. It is to be expected that future research will be able to use samples with more precise information (individualised information concerning each promotion, identification and characteristics of the people promoted, etc.) and that they will be able to expand on the initial results described here. One possible path is opened up by the results obtained when the variables referring to industry are used.

Except in the case of locational specificity, the effects mentioned for the other variables are maintained even in plants belonging to the same industry. Although promotion and hiring policies seem to be established basically at plant level, the industrial sector in which the company is located seems to have an influence on these decisions. The sectors in which most internal promotion takes place seem to be those where the skill level of blue-collar workers is lowest. Future studies could confirm this or suggest other alternative explanations.

CONCLUSIONS

This study, like any other empirical work, is limited, among other factors, by the limitations of the database used. More extensive samples, with more information on plants, various hierarchical positions and more precise measuring of the variables are desirable and will certainly take place in the near future. However, in comparison with the studies carried out to date, we believe that this article is a significant breakthrough as it analyses the factors determining the choice of internal promotion versus external recruitment of workers when covering vacant positions in firms, in isolation from other characteristics of internal labour markets, for the first time.

The results show that most plants do not implement strict policies of internal promotion or external hiring, but instead combine both types of procedure when covering vacancies. However, there is a series of factors, which are mainly related to the presence of specific investments by firms, which affect the implementation of either hiring system. Investments made in discovering workers' skills in firms are particularly important, and are difficult to observe in studies comparing workers who have obtained internal promotion and those who have not. In this context, the importance of problems of information about workers' skills and the efforts made to solve them seem to be the main features in the process of determining the type of promotion chosen. We must also point out that we did not find that the intensity or use of other incentive systems has an influence on the decision to use internal promotion systems. These results provide evidence that it is important not to make suppositions concerning which elements make up a system such as internal labour markets, and therefore that it is necessary to analyse the determinants of each of the elements both independently and in detail.

All the above should be interpreted with caution, as it deals with initial evidence that must be expanded to other contexts different from the one analysed here, which it is the promotion of plants operatives to positions of management or skilled technicians in Spanish industrial plants.

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Table 1. Weight of the different industrial sectors.

CNAE Code	Sector	% Plants
15, 16	Food, drink and tobacco	14.09
17-19	Textile industry, dressmaking, leather and footwear	12.87
20	Wood and cork	3.52
21-22	Paper, publishing and graphic arts	6.10
24	Chemical industry	7.32
25	Rubber and plastic materials	5.56
26	Non-metallic mineral products	6.37
27, 28	Metallurgy and mechanical product manufacture	13.55
29	Machinery and metal equipment	7.59
30-33	Electric, electronic and optical material and equipment	7.72
34, 35	Transport material	9.89
36, 37	Various manufacturing industries	5.42

Table 2. Descriptive statistics for the variables (N=738)

	Average	D.t.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Internal promotion	2.70	1.21															
2. Size	0.24	0.56	-0.01														
3. Multinational	0.26	0.44	-0.06*	0.21***													
4. Public	0.03	0.17	0.01	0.05	-0.08**												
5. Unions	2.57	1.23	0	0.15***	0.15***	0.09**											
6. Unemployment	11.83	3.61	-0.02	-0.03	-0.10***	0.01	0.03										
7. Permanent contracts	79.57	21.10	0.04	0.07**	0.18***	0.09***	0.11***	-0.17***									
8. Technological change	2.69	1.16	0.06*	0.04	0.12***	0.05	0.08**	0.02	-0.01								
9. Locational specificity	0.05	0.22	0.05	-0.02	-0.02	0.10***	-0.07*	-0.11***	0.03	0							
10. Continuous processes	0.19	0.39	0	0.01	0.02	0.03	0.08**	0.07**	-0.05	0	-0.04						
11. Non-observable characteristics	0.29	0.45	0.08**	0.03	0.05	-0.05	-0.09***	-0.04	0.04	-0.02	0.09**	-0.04					
12. Appraisal system	3.94	1.18	0.08**	-0.01	0.03	-0.06**	-0.07*	0.04	-0.08**	0.03	0.01	0.02	0.04				
13. Degree of competition	0.41	0.49	0.08**	-0.07*	-0.05	-0.04	0.01	0.01	-0.08**	0.03	-0.07**	0.03	0.03	0.04			
14. Incentives	0.66	0.47	0.04	0.03	-0.04	-0.03	0.11***	0.03	-0.03	0.07**	-0.03	0	-0.03	0.07**	-0.03		
15. Teamwork	17.29	28.93	0	0.03	0.11***	0.01	0.05	0	0.01	0.04	-0.03	-0.03	0	-0.03	-0.03	0.04	
16. Control	3.33	0.69	-0.01	0.05	0.01	-0.04	0	-0.07**	-0.07**	0.15***	-0.05	0.05	-0.01	0.19***	0.01	0.05	0

* p<0.1. **p<0.05. ***p<0.01

Table 3. Results of ordered probit model estimations
(t-statistic in brackets)

	Control variables	Model 1	Model 2	Model 3	Model 4
Constant	1.7130***	1.2152***	1.2632***	1.7632***	0.8978***
	(10.214)	(5.237)	(5.607)	(7.081)	(2.714)
Size	-0.0193	-0.0208	-0.0146	-0.0196	-0.0120
	(-0.241)	(-0.254)	(-0.185)	(-0.240)	(-0.148)
Multinational	-0.1724*	-0.2244**	-0.1902**	-0.1641*	-0.2384**
	(-1.790)	(-2.295)	(-1.986)	(-1.694)	(-2.424)
Public	0.0059	-0.1289	0.0829	0.0163	-0.0504
	(0.020)	(-0.460)	(0.277)	(0.056)	(-0.176)
Unions	0.0037	-0.0026	0.0137	-0.0010	0.0014
	(0.111)	(-0.077)	(0.410)	(-0.032)	(-0.041)
Unemployment	-0.0112	-0.0077	-0.0122	-0.0116	-0.0091
	(-1.027)	(-0.697)	(-1.120)	(-1.056)	(-0.818)
Permanent contracts		0.0031*			0.0036*
		(1.710)			(1.897)
Technological change		0.0806**			0.0789**
		(2.432)			(2.328)
Locational specificity		0.3312*			0.3148*
		(1.789)			(1.678)
Continuous processes		0.0716			0.0742
		(0.716)			(0.742)
Non-observable characteristics			0.2168**		0.2041**
			(2.471)		(2.301)
Appraisal system			0.0804**		0.0850**
			(2.459)		(2.492)
Degree of competition			0.1870**		0.2047**
			(2.320)		(2.485)
Incentives				0.1012	0.0942
				(1.206)	(1.108)
Teamwork				-0.0002	-0.0000
				(-0.156)	(-0.005)
Control				-0.0290	-0.0681
				(-0.535)	(-1.166)
μ_1	0.7070***	0.7106***	0.7099***	0.7089***	0.7162***
	(10.799)	(10.568)	(10.811)	(10.740)	(10.519)
μ_2	1.1073***	1.1120***	1.1170***	1.1096***	1.1251***
	(15.268)	(15.011)	(15.402)	(15.148)	(15.006)
μ_3	2.0599***	2.0735***	2.0865***	2.0629***	2.1047***
	(25.206)	(24.835)	(25.563)	(25.024)	(24.934)
Log L	-1063.329	-1057.695	-1054.180	-1062.506	-1047.351
Global Chi-2	4.586	15.855*	22.855***	6.232	36.543***
Chi-2 versus control variables model	-	11.268**	18.298***	1.646	31.956***
Not	738	738	738	738	738

* $p<0.1$. ** $p<0.05$. *** $p<0.01$

Table 4. Results of the estimation including the manufacturing sector variables

	Coefficient (t-statistic)		Coefficient (t-statistic)
Constant	1.2407*** (3.142)	Food, drink and tobacco	-0.5022** (-2.282)
Size	-0.0309 (-0.369)	Textile industry, dressmaking, leather and footwear	-0.2802 (-1.279)
Multinational	-0.1798* (-1.738)	Wood and cork	-0.2228 (-0.680)
Public	-0.0393 (-0.140)	Paper, publishing and graphic arts	-0.0030 (-0.012)
Unions	0.0115 (-0.326)	Chemical industry	-0.5572** (-2.207)
Unemployment	-0.0100 (-0.860)	Rubber and plastic materials	-0.4487* (-1.819)
Permanent contracts	0.0043** (2.232)	Non-metallic mineral products	-0.7460*** (-2.942)
Technological change	0.0763** (2.144)	Metallurgy and mechanical product manufacture	-0.2970 (-1.330)
Locational specificity	0.2782* (1.441)	Machinery and metal equipment	-0.5358** (-2.055)
Continuous processes	0.0952 (0.919)	Electric, electronic and optical material and equipment	-0.5916** (-2.305)
Non-observable characteristics	0.2149** (2.383)	Transport material	-0.3223 (-1.381)
Appraisal system	0.0824** (2.401)		
Degree of competition	0.2310*** (2.748)		
Incentives	0.0838 (0.952)		
Teamwork	0.0007 (0.530)		
Control	-0.0741 (-1.242)		
μ_1	0.7273*** (10.314)		
μ_2	1.1409*** (14.639)		
μ_3	2.1365*** (24.341)		
Log L	-1036.112		
Global Chi-2	54.019***		
Chi-2 & model 4	22.478**		
N	738		

* $p<0.1$. **$p<0.05$. ***$p<0.01$

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