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Internal Promotion Versus External Recruitment: Industrial Plants in Spain

Alberto Bayo-Moriones*

Pedro Ortín-Ángel†

*Universitat Autònoma de Barcelona,

†Universitat Autònoma de Barcelona,

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Alberto Bayo-Moriones and Pedro Ortín-Ángel

Abstract

Analyzing data obtained from interviews at 653 Spanish industrial plants in 1997, the authors investigate factors affecting the choice between two ways of filling supervisory and skilled technician positions: internal promotion of bluecollar workers, and external recruitment. The use of internal promotion was positively correlated with efforts by plants to measure employees' skills, as well as with the specificity of blue-collar workers' human capital investment at the plant. Contrary to expectations, no evidence is found that the use or efficiency of other incentive systems, such as variable pay, had a significant influence on the degree to which internal promotion was used. The authors interpret their results as preliminary evidence that internal promotions are used to protect and favor specific investments, especially those made by firms to assess their workers' skills.

KEYWORDS: internal promotion, external recruitment, Spain

INTERNAL PROMOTION VERSUS EXTERNAL RECRUITMENT IN INDUSTRIAL PLANTS IN SPAIN

ALBERTO BAYO-MORIONES and PEDRO ORTÍN-ÁNGEL*

Analyzing data obtained from interviews at 653 Spanish industrial plants in 1997, the authors investigate factors affecting the choice between two ways of filling supervisory and skilled technician positions: internal promotion of blue-collar workers, and external recruitment. The use of internal promotion was positively correlated with efforts by plants to measure employees' skills, as well as with the specificity of blue-collar workers' human capital investment at the plant. Contrary to expectations, no evidence is found that the use or efficiency of other incentive systems, such as variable pay, had a significant influence on the degree to which internal promotion was used. The authors interpret their results as preliminary evidence that internal promotions are used to protect and favor specific investments, especially those made by firms to assess their workers' skills.

A basic premise of influential economic models of the firm and of firms' internal incentive systems, such as tournament theory (Lazear and Rosen 1981) and models of careers in organizations (Gibbons and Waldman 1999), is that internal promotion is a widespread practice. Various models have also provided theoretical explanations for the use of internal promotion (Chan 1996; Fairburn and Malcomson

2001; Waldman 2003) and its consequences (Prendergast 1993).

The empirical evidence underpinning this theoretical development, however, is surprisingly meager (Pergamit and Veum 1999:82). In economics, most research has focused on factors affecting a worker's chances of obtaining internal promotion and the benefits such promotion provides. The evidence has been taken from various sources: data from a particular organization (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

*Alberto Bayo-Moriones and Pedro Ortín-Ángel are Profesores Titulares (Associate Professors) in the Departamento de Gestión de Empresas de la Universidad Pública de Navarra and the Departament d'Economia de l'Empresa of the Universitat Autònoma de Barcelona, respectively. This study began when Alberto Bayo was a visiting researcher at the Departament d'Economia de l'Empresa of the Universitat Autònoma de Barcelona. The authors thank Vicente Salas and Emilio Huerta for their comments, and the BBVA Foundation and the BEC2001-2552-C03-01 project for financial assistance.

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data from a particular profession (Broder 1993; Spurr and Sueyoshi 1994). Although the external market's influence and importance are accepted,¹ data of the type examined in these studies offer little scope for questioning the factors affecting whether, once a vacancy arises, firms decide to use internal promotion instead of external recruitment.

In the management literature, some studies have analyzed the factors determining the implementation of internal labor markets (for example, Baron et al. 1986; Pfeffer and Cohen 1984). In these studies, the presence of internal labor markets is measured using many different features. No clear theoretical justification for assuming these features are interrelated is offered, except for the influential descriptive study by Doeringer and Piore (1971). In that study, internal promotion is posited as one of the dimensions of internal labor markets.

A clear, focused analysis of the factors related to the use of internal promotion is thus needed to establish the reliability of the assumptions made by the theoretical models, as well as to guide the development of future models. The present study is an initial attempt to provide empirical evidence on the main factors correlated with the use of internal promotion as opposed to external recruitment. The setting for our examination is Spanish manufacturing plants. Analyzing data from interviews conducted in 1997 at a broad sample of these plants, we closely examine the influences on managers' choice between (a) internal promotion of blue-collar workers and (b) external hiring when they filled supervisory and skilled technician vacancies. Thus, of the various types of promotions noted by Pergamit and Veum (1999), the category on which we focus is promotions involving a change in the worker's tasks. This type of promotion has received the most theoretic-

cal attention, due to its potential for tension between provision of incentives and optimal allocation of individual skills to productive tasks (Baker et al. 1988; Waldman 2003).

We begin by reviewing the main theoretical arguments used to explain the implementation of internal promotions from an economic point of view. This analysis enables us to develop a series of hypotheses to guide the subsequent empirical work. The hypotheses are tested using a sample of 653 Spanish manufacturing plants.

The Economic Analysis of Promotions

Previously published analyses of hierarchical organizations (Rosen 1982; Waldman 1984) have emphasized the idea that talented workers tend to be most productive if they are at the top of the hierarchy; thus, workers will be assigned to job positions according to their talent and skills.² This is an explanation of how people may recover their investment in training and human capital, and therefore of their incentives for making these investments. Thus, internal and external candidates with the same level of human capital, talent, or skills will have the same likelihood of filling a vacancy in a firm.

Doeringer and Piore's (1971) earlier descriptions of internal labor markets, however, are at odds with that picture. Over the last decades, several economists have developed models to explain why internal candidates are often chosen even when they have a lesser human capital endowment than external candidates. Chan (1996) and Waldman (2003) distinguished three main explanations posited in this literature: internal candidates have high specific human capital; employers possess less information on outside candidates than on internal candidates; and employers use internal promotions as a mechanism to reward prior performance.

¹Pergamit and Veum observed approximately the same frequency of internal promotions as of inter-company job changes.

²A basic assumption in these models is that workers' skills are perfectly observable.

Specific Human Capital

The opportunity to develop knowledge or abilities specific to the workplace was taken into account in the initial formulations of human capital theory (Becker 1964) and subsequently studied and documented for blue-collar workers (Topel 1991; Felli and Harris 1996). In the case of blue-collar workers, a greater use of internal promotions is expected when part of the human capital needed to perform the work can be acquired only inside the firm (Becker 1964). Filling the vacancy with someone who already works in the organization realizes savings in the training costs associated with company-specific functions. Consequently, in those plants where specific human capital is important for carrying out tasks, greater use of internal promotion of blue-collar workers, relative to external hiring, is to be expected.

An argument reversing that hypothesized causality was made by Kahn and Huberman (1988) and Prendergast (1993). Commitment to promoting internal candidates, they said, acts as a mechanism for enhancing workers' specific investments when those investments are difficult to verify, and consequently difficult to directly compensate for their acquisition. Whereas in human capital models internal promotion is a mechanism for taking advantage of those specific investments already made, in these models (Kahn and Huberman 1988; Prendergast 1993) internal promotion is a commitment made by the firm before the specific investment takes place, precisely in order to encourage such investment. However, despite these differences, both arguments predict a positive relationship between internal promotion and specific investment.

Hypothesis 1. The likelihood of internal promotion will be greater in those plants requiring greater plant-specific human capital.

By definition, the existence of specific human capital implies that there is "a wedge between the lowest wage for which an employee will work and the highest wage the employer will pay.... the boundaries of the wedge ... depend on what alternative mar-

ket opportunities are available to the employer and employee" (Malcomson 1997:1916). Of the five causes of specific investments generally identified in the literature—specialized physical assets, specialized human assets, site specificity, dedicated assets, and brand-name capital (Williamson 2002:176)—two seem to be especially key in the case of employment relationships: site specificity, related to the location of the plants, and specialized human assets, mostly related to technological differences across plants.

Plant location has been one of the main factors invoked in the literature to explain the existence of specific investments (Joskow 1985). Applied to the case of human capital, workers make investments in abilities and knowledge related to the activities of the plant. The farther a worker would have to travel to use this knowledge in some other plant (another plant in which, for example, similar technology is employed) and the greater the costs of displacement, the higher the degree of specificity of these investments. From the perspective of the firm, high specific investment requirements also complicate efforts to attract workers from the outside. The pool of external applicants is made up of workers who live far from the workplace and will thus require high economic compensation to be willing to move.

In a world where knowledge usually spreads quickly, it might be supposed that technological differences between competing firms would be low. However, several authors (Pfeffer and Cohen 1984; Osterman 1987; Morita 2001) have suggested that continuous process improvements and technological changes result in the opposite pattern. Doeringer and Piore (1971) already argued that "Line supervision, and sometimes operatives and maintenance crews as well, are forever modifying equipment in order to improve its efficiency. Such changes accumulate quickly and can produce considerable movement toward specificity" (p. 17).

Specific investments generate a rent for continued employment. If the division of the rent depends on the return on an in-

vestment undertaken by the employee, bargaining may result in the firm capturing some of that return—an action Oliver Williamson (1985) termed a *hold-up*. As a result, the employee may invest less than would be efficient. If hold-up problems are important, one would expect to see the use of contracts mitigating them. Malcomson (1997), reviewing the contributions of this literature to the understanding of labor markets, characterized the main idea as being that contracts can protect investors from possible expropriations. As Joskow (1987) empirically showed, under these circumstances the length of the contract will be related to the size of those possible expropriations and consequently the magnitude of the specific investments. In the case of the employment relationship, a permanent labor contract is more appropriate than temporary contracts for promoting specific investments.

Hypothesis 1 thus implies that three factors will be positively correlated with the use of internal promotions: lack of nearby plants with similar technologies, technological change, and the presence of permanent employment relationships.

Private Information and Adverse Selection

The second theoretical explanation provided by economic analysis for the use of internal promotions instead of external recruitment (see Novos 1992) is based on learning models (Harris and Holmstrom 1982; Farber and Gibbons 1996) and adverse selection (Spence 1973). The basic idea is that workers' skills are not easy for firms to observe, but may be discovered over time. In this process, the firms where workers are currently working can more easily learn about these workers' abilities than can potential alternative employers. At this point, adverse selection problems like those analyzed by Greenwald (1986) appear in the labor market. The consequence is a reduction in inter-firm mobility, given that firms have an interest in retaining more capable workers. A corollary is that firms will tend to offer very low

wages to movers, since the presumption will be that workers who are encouraged to leave by the current employer are of low productivity. A corollary is that firms will tend to offer very low wages to movers, since the presumption will be that workers who leave the current employer are less productive.

Hypothesis 2. The probability of internal promotions is greater in those plants with better information about their workers' skills.

Most of the literature related to human resource management (see, for example, Milkovich and Boudreau 1996) characterizes the mechanisms firms use to gather information about workers at the different stages in the employment relationship. During the selection process, a well established practice is the use of curricula vitae, whereby workers disclose to all firms information relevant to their abilities. Psychological tests are also frequently used, in which firms gather private information about workers' abilities that are more difficult to observe, such as personality or teamwork skills or the ability to acquire new knowledge. Moreover, while a firm's employees are working, the firm can have in place different mechanisms not available to alternative employers for gathering information about the employees' workplace performance. As these psychological tests and appraisal systems are implemented by firms, current firms tend to have an informational advantage over other firms, and consequently more internal promotions, in accordance with Hypothesis 2.

Moral Hazard

The third explanation for the use of internal promotions is related to tournament theory, in which promotions are understood as mechanisms to encourage workers' efforts through competition (Lazear and Rosen 1981). Waldman (2003) formalized the idea that firms can take advantage of self-commitment to promote internal candidates over outsiders, even though at the time of promotion external recruitment might be chosen. In this context, the firms' self-commitment to promote inter-

nal candidates has the advantage of eliciting effort from workers (Chan 1996) and the disadvantage of promoting workers less capable than external candidates. This leads to the following hypothesis.

Hypothesis 3. The use of internal promotion will be greater in those plants where the profits from the incentives provided to current blue-collar workers are higher.

Obviously, in contexts in which workers' behavior can be perfectly monitored, there is no place for incentive mechanisms, so in this case internal promotions will not be used as a motivational device. Therefore, the more closely workers are supervised, the lower the profits from the incentives generated by internal promotion or other mechanisms.

Another consideration is that because promotions are individual rewards, they are not an effective incentive system in environments where collaboration between workers is necessary (Lazear 1989). Since employees can work to sabotage their rivals' performance (Chen 2003), in manufacturing environments in which collaboration among employees is important, systems rewarding individual performance do not seem to be the most appropriate (Drago and Garvey 1997). We therefore expect that profits from internal promotions as incentive mechanisms will be lower in plants with a greater need for collaboration or teamwork.

In the theoretical arena, the most fruitful debate has surrounded the question of how internal promotion can be the most efficient mechanism when there are other devices, such as variable pay, to reward individual performance. Various authors have argued that the main advantage of a promotion system is that it prevents employers from withholding rewards after workers have made an unobservable effort (Carmichael 1983; Prendergast 1993). The reason is that under the promotion system, the sum of monetary compensation across the firm's workers is pre-fixed and does not change with promotion decisions. In contrast, a firm that relies on bonuses has an incentive to "stiff" workers by claiming they

have not performed adequately, whether or not that claim is true.

Another advantage of internal promotions over external promotions is that they are less susceptible to the tendency of supervisors to give in to pressure from their subordinates when allocating rewards. This is because the choice of which worker to promote has long-term consequences for those making promotion decisions (Fairburn and Malcomson 2001).

As a corollary, we expect the use of tournaments, that is, internal promotion as an incentive system, to be more common in firms where the employer or manager has low credibility as an administrator of alternative incentive systems such as bonuses (Malcomson 1984). Another positive aspect of promotions is that since they are relative evaluations, they help to eliminate risks to workers' wealth (Green and Stokey 1983). Moreover, obtaining information about relative workers' performance is less costly, as it does not require an exact quantification of the individual result obtained (Lazear and Rosen 1981). Gibbs (1995) modeled the optimal pay-for-performance scheme when promotion premiums exist, emphasizing the idea of substitutability. The greater the promotion premiums, the less necessary are other incentives. At the theoretical level, all these studies have viewed the use of other incentive mechanisms as reducing the profits from incentives generated by internal promotions.

Consequently, based on Hypothesis 3, we can expect that the use of internal promotion will decrease with the degree of worker supervision, the need for workers to collaborate, and the presence of alternative incentive mechanisms.

Each of the theoretical arguments above rests on a particular set of assumptions about the presence of specific knowledge and the availability of information about workers' abilities and efforts. Figure 1 summarizes these arguments.

Other Considerations

In traditional tournament models (Lazear and Rosen 1981), the efficient level

Figure 1. Summary of the Theorized Relationships.

	<i>Basic Assumptions</i>	<i>Causes of the Greater Use of Promotions</i>	<i>Observable Implications</i>
HYPOTHESIS 1	Specific investments: Yes. Abilities: Observable. Effort: Observable.	Specific investments Positively related to:	-Distances from similar plants. -Technological change -Long-term relationships
HYPOTHESIS 2	Specific investments: No. Abilities: Unobservable. Effort: Observable.	Better Information Positively related to:	-Entry tests for unobserved abilities -Appraisal systems for worker performance
HYPOTHESIS 3	Specific investments: No. Abilities: Observable. Effort: Unobservable.	Low Incentives Negatively related to:	-Degree of supervision -Teamwork -Other incentives

of effort can be obtained with the appropriate combination of wage differences (winner prizes) and number of candidates for the prize, that is, span of control. Zábajnik and Bernhardt (2001) suggested that firms, in most cases, cannot make binding long-term employment contracts, so the wages are determined by spot markets. Thus, the span of control will be the main incentive mechanism for firms using internal promotion. Firms with less competitive product markets, in general, enjoy greater profit margins than do other firms. Under such conditions of relatively elastic profits, the benefit to the firm of greater effort by workers is plain. This effort can be obtained with greater span of control or with larger firm size, given that in larger firms, more candidates will go after the same prize.

Pfeffer and Cohen (1984), in an empirical study of the implementation of internal labor markets in a sample of industrial establishments, argued that external pressures like those borne by state-owned or unionized firms can favor certain incentive systems, such as the use of internal promo-

tions, even though in some cases the chosen systems are not the most efficient. Empirical estimates should control for these external pressures.

On the other hand, other studies propose relationships different from those postulated here. Osterman (1994, 2000) argued that there could be a positive relationship between the use of high-performance work practices and internal promotions. High-performance work systems comprise alternative work design practices, such as broad job definitions, and formal participatory practices, such as employee problem-solving groups, aimed at attaining a more flexible organization by encouraging worker commitment (Osterman 1994; Godard 2004). To the extent that internal promotions, in conjunction with other human resource practices such as incentive payment, help foster a stable, motivated, and skilled work force (Lepak and Snell 2002), they could also help enable the firm to implement successful high-performance work practices (Barnard and Rogers 2000). These arguments seem to suggest that incentives and internal promotions are

Table 1. Weight of the Different Industrial Sectors.

<i>NACE Code</i>	<i>Sector</i>	<i>% Plants</i>
15, 16	Food, drink, and tobacco	12.25
17–19	Textile industry, dressmaking, leather, and footwear	12.71
20	Wood and cork	3.52
21–22	Paper, publishing, and graphic arts	6.58
24	Chemical industry	7.19
25	Rubber and plastic materials	5.97
26	Non-metallic mineral products	6.12
27, 28	Metallurgy and mechanical product manufacturing	14.85
29	Machinery and metal equipment	7.50
30–33	Electric, electronic, and optical supplies and equipment	7.04
34, 35	Transport supplies	10.10
36, 37	Various manufacturing industries	6.12

complementary, not—as Hypothesis 3 implies—substitutes. It is certainly reasonable to suppose that in plants where the level of worker effort needed is greater, above-average use of both incentives and internal promotions might occur.

In the following sections, we empirically test all of these arguments.

Methods

Data

The information for testing the hypotheses was obtained by including specific questions in a broader questionnaire focused on the analysis of new work and production organization systems in Spanish manufacturing. The type of questionnaire is quite similar to that used by Osterman (1994, 2000) for analyzing the various aspects of internal labor markets and work organization in American firms.

The information was gathered between March and December 1997 from a representative sample of Spanish manufacturing plants with 50 or more workers. The questionnaire forms were filled out in the course of personal interviews at the factories, in most cases with plant directors or operations and human resource managers. A total of 965 valid interviews took place, accounting for 16.04% of the total target group. Because some questionnaires were

incomplete, the final number of observations used in this article was 653, with all manufacturing sectors represented (see Table 1 for details). More detailed information on the survey and how it was obtained can be found in the Appendix and in Bayo-Moriones and Huerta-Arribas (2002).

Measures and Variables

The dearth of empirical studies on the subject clearly reflects the difficulty of gathering information and directly observing most of the theoretical concepts examined above. As was the case in previous studies on promotions (Abraham and Medoff 1985), and as is common in studies analyzing various aspects of firms' personnel policies (Levine 1993; Drago and Garvey 1998), in the present study many of the concepts were measured using subjective assessments by the interviewee on various scales. This kind of question, by ensuring an answer when objective information is not easily available from the head of the plant, makes possible a wider sample of plants.

Dependent Variable

To determine the extent of use of internal promotions, questions were asked about the source of the current supervisors and skilled technicians at the plant. On the question of the proportion of supervisors

and skilled technicians³ who had previously been blue-collar workers at the plant, interviewees were presented with five choices: practically none (the answer indicated by 5.83% of the sample); less than half (15.16%); approximately half (12.55%); more than half (35.68%); and practically all (30.78%). The variable finally used in all the empirical analyses, *Internal Promotions*, is an ordinal variable with values from 0 to 4, corresponding to the foregoing five responses.

Independent Variables

Concerning the presence of knowledge specificity (Hypothesis 1), the theoretical section above predicted that three main observable factors would be positively correlated with the use of internal promotions: the cost of finding alternative plants with similar technologies, the extent of technological change, and the presence of permanent employment relationships.

The cost of finding alternative plants to work at is basically related to physical distances, mostly within Spain, where these movements seem to be more costly than in other countries, as indicated by the extremely low propensity of workers to move geographically⁴ (Antolin and Bover 1997; Devillanova and García-Fontes 2004). We gathered information on the existence of any plants falling within the same two-digit National Classification of Economic Activities (CNAE) group within the same province. The variable *Locational Specificity* equals 1 when there were no other plants in the same economic sector in the geographical area (province) where the plant was located, and 0 otherwise.

³From the pretest prior to the fieldwork we identified the promotion to supervisor or skilled technician as the main path of promotion for blue-collar workers in manufacturing plants in our population.

⁴The main explanations given by the cited authors for Spanish workers' low mobility are related to housing expenditures and to institutional factors such as registration-system procedures at the Spanish Office of Employment.

The extent of technological change at the plant was evaluated by the interviewee. Respondents indicated whether, based on events during the past three years, (1) there were no changes, (2) the changes were minor, (3) they were fairly significant, (4) they were major, or (5) the production system changed completely. The variable *Technological Changes* is thus an ordinal-scale variable ranging from 1 (no changes) to 5 (a complete change in the production system).

Finally, the variable *Permanent Contracts* is defined as the percentage of non-temporary workers at the plant.

Summing up the three predictions from Hypothesis 1, we expect a positive relationship between the use of internal promotions and *Locational Specificity*, *Technological Changes*, and *Permanent Contracts*.

Two questionnaire items were included to evaluate the degree to which firms attempted to gather information about workers' skills in order to use it for internal purposes (Hypothesis 2). The two questions examine, respectively, information-gathering efforts during the hiring process and during workers' employment at the firm.

Related to the efforts made during the hiring process, we asked interviewees which of six factors—experience, qualifications, age, ability to acquire new knowledge, personality, and ability to work in a team—was the one most consistently taken into account when a company first selected and hired blue-collar workers. When one of the last three criteria was indicated, the variable *Unobservable Characteristics* assumes the value of 1; otherwise it takes the value 0.

Finally, the questionnaire solicits information on the system for appraising current workers in the plant. Respondents assessed how many of the plant's blue-collar workers were subject to a performance *Appraisal System*, on a scale from 1 (no workers) to 5 (all workers). The intermediate values correspond to a few (2), approximately half (3), and most (4) of the blue-collar workers.

From Hypothesis 2 we expect *Unobservable Characteristics* and *Appraisal Systems* to

have a positive influence on internal promotions.

To evaluate the role of internal promotions as an incentive mechanism to elicit unobservable effort (Hypothesis 3), we used three different variables. The first is related to the size of the problem, *Degree of Supervision*; the second to the need for collaboration among workers, *Teamwork*; and the last to the existence of alternative mechanisms to solve this moral hazard problem, *Incentives*.

With respect to the degree of supervision, interviewees indicated whether blue-collar workers were (1) not supervised, (2) barely supervised, (3) moderately supervised, (4) quite supervised, or (5) very closely supervised. An ordinal variable, *Degree of Supervision*, was created based on these five categories, with 1 indicating no supervision and 5 indicating very close supervision. The questionnaire also gathered information about the percentage of workers who carried out their work within autonomous work teams, *Teamwork*. We use a dummy variable, *Incentives*,⁵ with a value of 1 when the firm had incentive payment plans and 0 otherwise.

From Hypothesis 3 we expect a negative relationship between the use of internal promotions and the variables *Degree of Supervision*, *Teamwork*, and *Incentives*.

Control Variables

Following the arguments of Zábajnik and Bernhardt (2001), Pfeffer and Cohen (1984), and Osterman (2000) (all discussed in the theoretical section), the following set of control variables was used.

Degree of Competition is a binary variable equal to 1 when there were many competitors in the market in which the plant sold its

products, and 0 otherwise. *Size* is the plant size, measured by number of employees. *Span of Control* is defined as the average number of blue-collar workers under the control of the same supervisor. A dichotomous variable, *State-Owned*, equals 1 if the state owned more than 50% of the firm's shares, and 0 otherwise. *Unions*, for union influence in the plant, is a five-scale ordinal variable with a value of 1 for very slight influence and 5 for very strong influence.

The use of high-performance work practices is represented by the *HPWP* index. This variable, which ranges from 0 to 4 in value, indicates how many of the following practices had been implemented by the firm for blue-collar workers: improvement groups, job rotation, suggestion systems, and meetings with plant executives. These practices are representative of those examined in the literature on high-performance work systems (see, for example, Osterman 1994; MacDuffie 1995; Handel and Gittleman 2004).

We also included other control variables related to certain characteristics of the data that can distort the interpretation of some of the results. First, in the early years of a company, supervisors and skilled technicians have to be externally recruited. In order to control for these cases, we use a dummy variable, *Recently Founded*, that has a value of 1 if the plant had been founded less than five years⁶ before the interview took place, and 0 otherwise. Second, in the sample used, internal promotion to supervisor only refers to people who were previously blue-collar workers at the same plant. In fact, one could differentiate three classes of workers who are promoted to managerial positions: workers within the same plant, workers from other plants but the same company,

⁵The questionnaire also contains information about the intensity of those incentives, defined as the percentage of worker compensation that is variable. The inclusion of this variable does not lead to important changes in the results obtained but reduces the number of observations. The estimations are available upon request.

⁶Following Pergamit and Veum (1999), if around 20% of the workers obtain a promotion with an increase in job responsibilities each year, five years is the time needed to replace all the supervisors at least once.

Table 2. Descriptive Statistics.
(N = 653)

	Mean	S.d.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. Internal Promotion	2.70	1.21																	
2. Log (Size)	4.87	0.82	0.03																
3. State-Owned	0.03	0.17	0.01	0.16 [‡]															
4. Multinational	0.24	0.43	-0.06*	0.29 [‡]	-0.08 [†]														
5. Other Plants in Spain	1.76	2.97	0	0.22 [‡]	0.20 [‡]	0.06*													
6. Unions	2.53	1.22	-0.01	0.29 [‡]	0.09 [†]	0.14 [‡]	0.04												
7. Recently Founded	0.06	0.23	-0.02	0.02	0.03	0.01	0	0											
8. Degree of Competition	0.41	0.49	0.10 [‡]	-0.05	-0.04	-0.07*	0.03	0.01	-0.03										
9. Log (Span of Control)	2.60	0.54	-0.03	0.37 [‡]	0	0.15 [‡]	-0.01	0.15 [‡]	0.01	-0.03									
10. HPWP	2.02	1.24	0.05	0.20 [‡]	-0.03	0.28 [‡]	0.10 [‡]	0.07*	0.04	-0.02	0.05								
11. Log (Permanent Contracts)	4.32	0.41	0.08 [†]	0.04	0.08 [†]	0.17 [‡]	0.02	0.10 [‡]	-0.03	-0.06*	-0.04	0.10 [‡]							
12. Technological Change	2.67	1.15	0.07 [†]	0.11 [‡]	0.05	0.11 [‡]	0.09 [†]	0.04	-0.03	0.04	0.01	0.20 [‡]	-0.01						
13. Locational Specificity	0.05	0.22	0.05	0	0.11 [‡]	-0.02	0.07*	-0.08 [†]	0	-0.07 [†]	-0.05	0.01	0.05	0					
14. Unobservable Characteristics	0.28	0.45	0.10 [‡]	-0.01	-0.05	0.04	0.04	-0.09 [†]	-0.04	0.06*	0.05	0.02	0.07*	-0.02	0.06				
15. Appraisal System	3.92	1.17	0.08 [†]	-0.06*	-0.07*	0.03	0	-0.07*	0.01	0.06	0.01	0.05	-0.10 [‡]	0.01	0.02	0.02			
16. Incentives	0.66	0.47	0.02	0.09 [†]	-0.04	-0.04	-0.04	0.11 [‡]	-0.11 [‡]	-0.01	0.11 [‡]	0.06	-0.04	0.07	-0.04	-0.03	0.06*		
17. Degree of Supervision	3.33	0.66	-0.04	0	-0.06	-0.02	0	-0.07*	0.02	0.03	-0.01	0	-0.07*	0.11 [‡]	-0.04	0	0.17 [‡]	0.04	
18. Teamwork	17.11	28.6	-0.03	0.02	0	0.10 [‡]	0.04	0.06	-0.04	-0.03	-0.07*	0.14 [‡]	0	0.04	-0.03	0.01	-0.06	0.06	0

*Statistically significant at the .10 level; †at the .05 level; ‡at the .01 level.

and workers with no links to the company. These distinctions are only relevant for firms with various manufacturing plants. Toward making that determination, we include a variable for the number of other plants that the firm had in Spain (*Other Plants in Spain*). A problem with this variable is that it does not take into account the existence of other plants *outside* Spain. For this reason, and also taking into account the possible influence of cultural factors, we introduced a binary variable, *Multinational*, that assumes a value of 1 when the plant was part of a multinational group and 0 otherwise.

Table 2 shows the means and standard deviations of the variables used, as well as their correlation matrix. The data clearly show that in this sample of industrial plants, internal promotion was used more than external hiring ($2.70 > 2$, the midpoint of the scale used). Six percent of the plants were less than 5 years old; the plants' average size was 226 employees; and the average percentage of long-term employment contracts was 80%. As to firm characteristics, 24% of plants were part of multinational companies, only around 3% were state-owned, and union influence was moderate. In 54% of the cases, this was not the firm's only plant in Spain; on average, these firms had 3.26 plants. With respect to work organization, the average span of control was 16 blue-collar workers, and there was a moderate degree of technological change. Only 17% of workers were members of work teams, and on average, two high-performance practices had been put into place. Interviewees at 41% of the plants said that the plant had many competitors, and only 5% stated that there were no other plants in the same manufacturing sector in the area. At 28% of the plants, the factor given the greatest emphasis when hiring for blue-collar jobs was the applicants' unobservable characteristics. Once workers were employed at the firm, 66% of the plants used incentive plans to reward them, with medium-to-high levels of supervision. On average, firms regularly conducted formal work evaluations of over half of their blue-collar employees.

Results

Because the variable relating to the use of internal promotion versus external recruitment is ordinal,⁷ we have estimated the ordered probit models (Maddala 1983) that are shown in Table 3. There are four models. In the first, only the variables related to the existence of specific knowledge have been included. The second model includes variables clustered according to firms' private information about workers' abilities; the third, those relating to the presence and efficiency of other incentive systems. The fourth and final estimate includes all the independent and control variables defined.

The coefficients estimated in the final model, which are related to the hypotheses set forth, are quite similar to those estimated in previous models. Collinearity between the independent variables thus does not seem to be a problem.

The variables related to Hypothesis 1 are jointly statistically significant at the 1% level. All of them appear with the expected sign, and in two cases the coefficients are significantly different from zero. The logarithmic value of *Permanent Contracts*⁸ has a positive impact that is significant at the 1% level in this last model. *Technological Change* positively affected the degree of use of internal promotions as opposed to external

⁷The main results of the paper are maintained with different specifications of the dependent variable, such as a dummy variable taking a value of 1 when the majority or all of the technicians and supervisors had previously been blue-collar workers in the plant. These estimations are available from the authors upon request.

⁸The number of employees appears in two variables, *Permanent Contracts* and *Size*. In order to avoid this problem, we will work with the logarithm of *Permanent Contracts* and *Size*. Take note that since $\text{Log}(\text{permanent workers} / \text{number of employees}) = \text{Log}(\text{permanent workers}) - \text{Log}(\text{number of employees})$, we are in fact estimating the effect of two variables, permanent workers and number of employees. When the variable *Size* is not included in the estimates (Model 1), we are assuming that both variables, $\text{Log}(\text{number of employees})$ and $\text{Log}(\text{permanent workers})$, have the same coefficient but different signs. When *Size* is included (Model 4), we make no assumptions related to either coefficient.

Table 3. Results of Ordered Probit Model Estimations.
(t-Statistics in Parentheses)

Variable	Model 1	Model 2	Model 3	Model 4
Constant	0.3878 (0.869)	1.2287*** (8.290)	1.7438*** (7.834)	-0.2575 (-0.412)
Log (Permanent Contracts)	0.2243** (2.239)			0.2911*** (2.762)
Technological Change	0.0793** (2.167)			0.0863** (2.257)
Locational Specificity	0.2994 (1.562)			0.2868 (1.451)
Unobservable Characteristics		0.2487*** (2.642)		0.2370** (2.461)
Appraisal System		0.0727** (2.036)		0.0877** (2.369)
Incentives			0.0600 (0.679)	0.0448 (0.488)
Intensity of Supervision			-0.0572 (-0.906)	-0.0977 (-1.495)
Teamwork			-0.0011 (-0.775)	-0.0009 (-0.651)
Log (Size)				0.1040* (1.686)
State-Owned				-0.1851 (-0.726)
Multinational				-0.2975** (-2.728)
Other Plants in Spain				-0.0070 (-0.467)
Unions				-0.0103 (-0.280)
Recently Founded				-0.0158 (-0.086)
Degree of Competition				0.2434*** (2.788)
Log (Span of Control)				-0.1013 (-1.190)
HPWP				0.03014 (0.820)
μ_1	0.7697*** (15.533)	0.7655*** (15.475)	0.7650*** (15.503)	0.7882*** (15.618)
μ_2	1.1534*** (24.060)	1.1526*** (24.066)	1.1480*** (24.061)	1.1853*** (24.317)
μ_3	2.0909*** (36.048)	2.091*** (36.069)	2.0764*** (36.085)	2.1519*** (36.274)
Log L	-935.752	-936.196	-941.0295	-919.447
Chi ²	12.330***	11.441***	1.775	44.939***
N	653	653	653	653

*Statistically significant at the .10 level; **at the .05 level; ***at the .01 level.

hiring (statistically significant at around the 5% level), but we find no effect for *Locational Specificity*.

The results presented in Table 3 clearly show that the variables we derived from Hypothesis 2 are jointly significant at the 1% level. Individually, as well, each of the two variables has the expected sign and is statistically significant ($p < .05$). Those plants that placed more reliance on *unobservable characteristics* when hiring blue-collar workers were subsequently more likely to promote these same workers to supervisory positions. Also, the proportion of workers in the plant who received formal evaluations through an *appraisal system* was positively associated with the use of internal promotions.

None of the relationships derived from Hypothesis 3 are supported. The coefficients on *Teamwork* and *Degree of Supervision* are of the predicted sign, but neither those coefficients, nor the coefficient on *Incentive Plans*, differs from zero at a statistically significant level.

Of the control variables, that with the most statistically significant effect is *Degree of Competition*, which has a positive impact on the dependent variable. The coefficient on *Multinational* and the logarithm of *Size* are also statistically significant in model 4. Two variables having a negative influence on the use of internal promotion are being part of a multinational firm and *Other Plants in Spain*, although in the latter case the effect is not statistically significant. In contrast, a positive and statistically significant effect is associated with the logarithm for the number of employees. The other control variables are not statistically significant. Therefore, it can be concluded that in the sample analyzed, the use of internal promotions was unaffected by whether the plant had been recently founded, whether or not it was state-owned, the influence of unions at the plant, the logarithm of span of control,⁹ and the adoption of high-performance work practices.

⁹As span of control is made up of the division of two variables (number of blue-collar workers / number of supervisors), for the reasons given in footnote 8, we include it in the estimations in logarithmic form.

The Influence of Industrial Sectors

Some of the variables analyzed may be heavily influenced by the manufacturing industry within which the plant operates. For this reason, it is advisable to consider the extent to which promotion policy determination was in a plant's control and the extent to which it was conditioned by the characteristics of the industrial sector. To this end, we introduced dummy variables for the various sectors described in Table 1, with *Various Manufacturing Industries* as the omitted variable. The results are shown in Table 4.¹⁰

The group of variables referring to industrial sectors is significant at the 1% level. Once the remaining variables have been controlled for, *Various Manufacturing Industries* is the sector in which the greatest use of internal promotion appears to have taken place. The second-highest levels of use (which are not statistically different from the level of use of internal promotion in *Various Manufacturing Industries*) are found for the textile industry, dressmaking, leather, and footwear; wood and cork; paper, publishing, and graphic arts; and metallurgy and mechanical product manufacturing. Differences with respect to the omitted sector are found at the 10% level of statistical significance for transport supplies, and at the 5% level for food, drinks, and tobacco; rubber and plastic materials; and electric, electronic, and optical supplies and equipment. Finally, the sectors most clearly differing from the omitted sector (with significance at the 1% level) are chemicals, machinery and mechanical equipment, and non-metallic mineral products, which have the lowest use of internal promotion.

The coefficients and significance levels of the other variables are very little changed in this estimation, with one exception: the coefficient on *Size* loses its statistical significance. The main relationships shown in the above section explain the intra-

¹⁰We also attempted an intra-industry analysis, but the number of variables was too high for the small number of cases in each industry.

Table 4. Results of the Estimation Including the Manufacturing Sector Variables.

<i>Variable</i>	<i>Coefficient (t-statistic)</i>	<i>Variable</i>	<i>Coefficient (t-statistic)</i>
Constant	0.2637 (0.041)	Teamwork	-0.0001 (-0.065)
Log (Size)	0.0999 (1.549)	Food, Drink, and Tobacco	-0.4969** (-2.207)
State-Owned	-0.2069 (-0.802)	Textile Industry, Dressmaking, Leather, and Footwear	-0.2169 (-0.994)
Multinational	-0.2155* (-1.891)	Wood and Cork	-0.1675 (-0.578)
Other Plants in Spain	-0.0038 (-0.240)	Paper, Publishing, and Graphic Arts	0.1421 (0.553)
Unions	-0.0076 (-0.204)	Chemical Industry	-0.6880*** (-2.755)
Recently Founded	-0.0227 (-0.122)	Rubber and Plastic Materials	-0.5078** (-1.993)
Degree of Competition	0.2706*** (3.034)	Non-Metallic Mineral Products	-0.7629*** (-3.047)
Log (Span of Control)	-0.1121 (-1.280)	Metallurgy and Mechanical Product Manufacturing	-0.3176 (-1.496)
HPWP	0.0359 (0.949)	Machinery and Metal Equipment	-0.6432*** (-2.691)
Log (Permanent Contracts)	0.3273*** (3.062)	Electric, Electronic, and Optical Supplies and Equipment	-0.5219** (-2.100)
Technological Change	0.0816** (2.101)	Transport Supplies	-0.3990* (-1.705)
Locational Specificity	0.2538 (1.246)	μ_1	0.8070*** (15.746)
Unobservable Characteristics	0.2581*** (2.631)	μ_2	1.2112*** (24.508)
Appraisal System	0.0885** (2.359)	μ_3	2.2006*** (36.411)
Incentives	0.0283 (0.303)	Log L	-905.032
Intensity of Supervision	-0.1160* (-1.745)	Chi ²	73.769***
		N	653

*Statistically significant at the .10 level; **at the .05 level; ***at the .01 level.

industry variation in the use of internal promotions.

Discussion

Some previous empirical studies of the determinants of internal labor markets, such as Baron et al. (1986) and Pfeffer and Cohen (1984), have implicitly assumed that internal promotion is part of a system of efficient managerial practices. But the low

explanatory power of the models we have analyzed seems, on the contrary, a clear indication that no combination of internal promotion practices and other managerial practices analyzed in this study is optimal for all plants. Each plant adapts its promotion policies to its particular circumstances. Furthermore, most plants combine both policies—internal promotion and external hiring. Thus, the study of those factors related to the greater use of internal pro-

motions than external recruitment is important in and of itself.

This evidence reinforces the importance of the theoretical research conducted to date along these lines, most of it described in the theoretical section of this paper. From a theoretical perspective, three explanations as to why firms might make greater use of internal promotion than external recruitment have been postulated: specific human capital; private information and adverse selection; and moral hazard problems. Empirical research is needed to determine the relative importance of each of these explanations.

The evidence we have presented highlights the importance of specific investments, and in particular those investments made by firms to evaluate their employees' skills, which are the main factors related to the use of internal promotions in the sample of plants analyzed in this study. Contrary to our expectation, the use of internal promotion was influenced scarcely at all by the presence of alternative incentive systems, teamwork, or different degrees of supervision.

As discussed earlier, also cited by previous authors as a relevant factor in the use of internal labor markets has been the specificity of workers' skills (Baron et al. 1986; Pfeffer and Cohen 1984). From a theoretical standpoint, site specificity and specialized human assets have been postulated as the main causes of human capital specificity. We have found support only for the latter explanation, human capital specificity. Our results indicate that the presence of similar plants in the same province has a statistically insignificant impact on the use of internal promotions.

The results above seem quite robust. The evidence comes from consolidated manufacturing plants, practically all of them more than five years old. The results are consistent with several different definitions of the dependent and independent variables¹¹ and with the introduction of industry dummies,

so they are good predictors of intra-industry variation in the use of internal promotions. We find that multinational companies made less use of internal promotion systems than did other companies. This difference could reflect not only cultural differences between the two classes of firms, but also a higher incidence in the multinationals of promotions of blue-collar workers in the same company but from other plants.¹² When we carried out the same analyses for plants belonging to no multinational group, the results did not substantially change.¹³ It therefore seems unlikely that the problem of identifying which plants belong to the same firm had much impact on our main conclusions.

Notwithstanding the robustness of the results for all the issues discussed above, the evidence obtained in this empirical study, as in any other, must be interpreted taking into account the characteristics of the sample. Clearly relevant features of our database are its cross-sectional nature and the fact that it is limited to promotion policies governing the lowest hierarchical level in manufacturing plants.

Due to the cross-sectional nature of the data, we have not been able to explore why a given plant changes its policies. As a consequence, the empirical results describe the existing correlations between variables and do not establish the direction of causality. For example, from the positive relationship between internal promotions and the variables related to the presence of specific investments, we cannot determine whether internal promotions favor the accumulation of specific investments in human capital (Kahn and Huberman 1988; Prendergast 1993), or whether internal promotions are favored by the presence of such investments (Becker 1964). However, given that games equilibria theory is at the heart of most of the theoretical work, the

¹¹See footnotes 5 and 7.

¹²The negative sign for the number of *Other Plants in Spain* reinforces this explanation, although in this case the coefficient is not statistically significant.

¹³These results do not appear in the text but are available upon request to the authors.

empirical results obtained are at least useful for illustrating the main characteristics of the existing equilibrium.

The empirical evidence also suggests a positive correlation between the use of internal promotion and the extent of firms' private information about their workers' abilities, an instance of adverse labor market selection. Again, we cannot establish the direction of causality—whether firms' special knowledge about workers stimulates use of internal promotion (Novos 1992) or, conversely, whether a greater use of internal promotion stimulates higher investments in information acquisition.

However, if the use of internal promotion were the cause, rather than the effect, in all or some of the theoretical relationships set forth, we would expect statistically significant correlations among the independent variables. This does not seem to be the case in our data: the magnitude and significance level of the coefficients associated with the different variables do not undergo important changes when other sets of variables are included. Thus, it seems that internal promotions are more the consequence than the cause in the proposed relationships. Future panel data studies should help to resolve all of these questions.

The data refer to the lowest hierarchical level in the organizational chart of different Spanish industrial plants. At least at this level, the correlations between the use of internal promotion and the degree of supervision, the existence of incentives, and the presence of teamwork are statistically insignificant.

One possible explanation for the observed pattern is that the negative effect proposed in Hypothesis 3 is neutralized by the positive effect suggested by Osterman's (1994, 2000) arguments; however, we do not believe that this is the case. Our empirical context is one in which workers' productivity could seem to be very similar, and if that is so, Osterman's arguments would not apply. Moreover, we have introduced in the estimates an index related to the use of high-performance work practices, and its coefficient is statistically insignificant.

Therefore, the most plausible explanation is that firms do not use internal promotions to obtain the unobservable effort usually elicited by incentives. Gibbs (1995), using data on workers in a single firm, reached similar conclusions.

We cannot interpret our results as evidence against the tournament theory, tested before in a broad set of more appropriate settings,¹⁴ nor the use of tournaments or promotions as incentive mechanisms firms employ¹⁵ to stimulate investment in human capital or for other purposes.¹⁶ The evidence is against the specific use of internal promotions as a mechanism for eliciting the same kind of unobservable effort that has usually been attributed to short-term incentives. This can be interpreted as implying that the plants are near the ideal situation in which incentives have little bearing on the process of filling vacancies. Promotions are mechanisms to encourage human capital investment, but firms try to dissociate, to the extent possible, the processes for assigning individuals to hierarchical levels from the provision of effort incentives. Further research will show whether our results can be generalized to other contexts, such as other levels in the hierarchy or other occupations.

Finally, Zábajnik and Bernhardt's (2001) predictions find little support in our results. In most of the estimates, the span of control and the size of the plant are not statistically significant predictors of the use of internal promotion. The degree of competition has a highly statistically significant impact—but with a sign opposite that proposed by the authors. Further theoretical research is needed to understand why product market competition so strongly enhances the use of internal promotions.

¹⁴See, for example, Ehrenberg and Bognanno (1990) or Eriksson (1999).

¹⁵For example, Pergamit and Veum (1999) showed that 30% of internal promotions do not involve changes in the tasks of the promoted employees.

¹⁶See, for example, Gibbs (1995) for further details.

Neither the presence of unions nor state ownership of plants appears to have had a statistically 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 managerial discretion, in practice, usually overrides the restrictions that unions and state ownership of plants theoretically appear to impose on the internal organization of manufacturing plants.

Conclusions

In an analysis that abstracts from other characteristics of internal labor markets, we have examined the factors influencing whether a firm chooses internal promotion or external recruitment of workers when filling vacancies. The evidence suggests that it is important not to make assumptions concerning which elements make up

a system such as an internal labor market; it is necessary, rather, to analyze the determinants of each of the elements independently and in detail. This evidence confirms the appropriateness of the direction taken in most of the theoretical work conducted to date by economists in the field.

Furthermore, we have presented evidence relevant to the three main explanations given by those theorists to explain why firms favor internal promotions over external hiring: specific human capital, private information and adverse selection, and moral hazard problems. We find support for the two first explanations, but not for the third.

The focus of our study—promotion of blue-collar workers to positions as supervisors or skilled technicians in Spanish manufacturing plants—obviously is a narrow one. Further work will be needed to test the generality of the results.

Appendix

Definition of Variables from the Questionnaire

Internal Promotions:

Referring to employee promotion processes at the plant, could you tell me whether the current supervisors and qualified technicians are former manual workers at this same plant?

1. Practically all; 2. Most; 3. Half; 4. A few; 5. Hardly any

Size:

What is the total work force of the plant?

State-Owned:

Can you give an approximate estimate of the percentage of state-owned shares in the ownership structure of your company? [State-Owned takes a value of 1 if this percentage is greater than 50%, 0 otherwise.]

Multinational:

Does your company belong (totally or partially) to a multinational group?

[Multinational takes a value of 1 if yes, 0 otherwise.]

Other Plants in Spain:

How many plants does your company have in Spain, in addition to this one?

Unions:

How would you assess the influence of unions on the workers?

1. Very slight; 2. Slight; 3. Average; 4. Strong; 5. Very strong

Recently Founded:

When was this plant founded?

[Recently Founded takes a value of 1 if the plant was founded in 1993 or later, 0 otherwise.]

Degree of Competition:

In the market in which this firm operates (regional, national, European, and so on), would you estimate the number of competing firms to be

1. None, 2. Few, 3. A fair number, 4. Many

[*Degree of Competition* is a binary variable equal to 1 when the answer is (4), 0 otherwise.]

Span of Control:

How many manual workers on average have the same supervisor?

HPWP:

Which of the following phrases best describes the situation at this plant with regard to task rotation among direct manual workers?

1. Manual workers are trained to do one job and virtually never change tasks; 2. Manual workers are trained for different jobs within the plant, but actually rarely change tasks; 3. Manual workers change tasks quite frequently but always within the same section; 4. Manual workers change from one section to another fairly regularly.

[*Rotation* equals one if the answer is (3) or (4).]

Are any of the practices I am about to mention currently in use in order to involve workers or gain their commitment in the running and performance of this plant?

1. Suggestion systems from individuals; 2. Improvement groups; 3. Regular meetings to inform workers about company matters.

[*HPWP* is the sum of rotation, suggestion systems, improvement groups, and meetings.]

Permanent Contracts:

Number of permanent workers.

[*Permanent Contracts* is defined as (number of permanent contracts)/(size)]

Technological Change:

Have there been any significant technological changes over the last three years in your plant? In this respect, would you say that

1. There has been no change; 2. There have been some minor changes; 3. There have been some fairly significant changes; 4. There have been some major changes; 5. The whole production system has been changed.

Locational Specificity:

Are there any other plants belonging to the same sector in this province?

[*Locational Specificity* takes a value of 1 if yes, 0 otherwise.]

Unobservable Characteristics:

I am now going to list some of the factors that are usually taken into account when recruiting and hiring new workers. In such circumstances, which of these factors is considered most important at this plant?

1. Previous experience; 2. Training; 3. Age; 4. Ability to acquire new skills; 5. Personality; 6. Teamwork skills

[*Unobservable Characteristics* takes a value of 1 if the answer is (4), (5), or (6), 0 otherwise.]

Appraisal System:

How many manual workers have their performance assessed?

1. None; 2. A few; 3. About half; 4. Most; 5. All

Incentives

Do the manual workers at this plant receive any type of incentive payment?

[*Incentives* takes a value of 1 if yes, 0 otherwise.]

Degree of Supervision:

Which of the following statements best describes the degree of supervision to which your employees are subject?

1. No supervision at all; 2. Hardly any supervision; 3. Moderate supervision; 4. Quite close supervision; 5. Close supervision

Teamwork:

What percentage of the blue-collar workers are members of autonomous work teams?

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