

A STUDY OF PERFORMANCE APPRAISAL USING SPANISH DATA*

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ABSTRACT

We study the determinants of the implementation of a formal system of performance appraisal using a Spanish sample of manufacturing establishments. Besides analysing the variables that influence the probability that an employer adopts such system, we take into account certain relevant dimensions of the process of appraisal. In particular, we analyse the determinants of the use of evaluation based on objective and subjective measures of performance, the person who carries out the appraisal and the frequency of the practice. We find that the use of pay based on individual results, the provision of training, the presence of a HR department and the size of the establishment are significantly correlated with the probability of implementing performance appraisal. Moreover, our results highlight the importance of studying performance appraisal from a multidimensional perspective.

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INTRODUCTION

Until the moment, performance evaluation has been the subject of substantial research. Discussion on this topic has emerged from a wide range of perspectives, such as the purposes served by performance assessment, the design of appropriate mechanisms of appraisal, or the consequences brought by the implementation of these mechanisms for employers and employees (see Levy and Williams, 2004).

As Brown and Heywood (2005) clearly state, there are still certain dimensions of greater importance to the understanding of performance evaluation that have not been dealt with. Hence, the authors examine the determinants of the adoption of formal performance appraisal systems in Australian establishments, finding significant correlation between establishment features and the variable of interest. Using British data, Addison and Belfield (2008) replicate Brown and Heywood's study to conclude that, whereas some of the results match the ones obtained for the Australian case, certain differences emerge between the two national settings. A recent investigation by Grund and Sliwka (2009) also stresses the lack of studies addressed to the examination of the determinants of formal appraisal. They devote this study to the analysis of the influence of individual features on performance evaluation, accounting for some firm characteristics such as firm size and industry.

Building on the work of Brown and Heywood (2005) and Addison and Belfield (2008), we analyse the establishment-level determinants of the adoption of a formal system of performance appraisal. Our aim is to provide additional evidence on the relationship between establishment characteristics and performance evaluation, as well as on the influence of the national context on this relationship. In addition, we go a step further in the study of performance appraisal at the establishment level and investigate certain dimensions of this practice that have not been treated before. The assessment of worker performance is a multidimensional issue and, as such, it is difficult to make an exhaustive analysis of its various features (see Baron and Kreps, 1999). Thanks to the information at our disposal, we are able to simultaneously analyse various dimensions of a system of performance appraisal.

The analysis is based on a Spanish data set on human resource management practices which has its origin on a survey conducted in 2006 for a representative sample of Spanish manufacturing establishments. The data was gathered through personal interviews with managers in manufacturing plants with fifty or more employees, and represents a unique source of information about diverse employment practices, and performance appraisal in particular, in Spanish organisations. Information was collected at the plant level, the unit at which decisions about the implementation of the practices of interest are taken. A major advantage of using this data set is that it contains comprehensive information on the process of performance appraisal at the establishment level. This thorough approach to performance appraisal makes it possible to analyse various dimensions of the practice of interest that, to our knowledge, have not been empirically studied using establishment-level data.

Our empirical strategy starts with the examination of the influence of a set of factors on the adoption of a formal system of performance appraisal in Spanish establishments. We include the following variables as explanatory factors in our regression equation: *percentage of casual workers, percentage of women, percentage of workers over 50, turnover rate, workers' autonomy over their work, number of supervisors per worker, pay for individual performance, percentage of workers that receive training, presence of a human resource department, establishment size, percentage of labour costs on total production costs, union influence and industrial sector*. Then, we empirically study various dimensions of the performance appraisal process. First, we estimate and compare the influence of our set of explanatory variables on the adoption of appraisal based on subjective criteria and of appraisal based on objective criteria. Next, we analyse the establishment attributes that determine the person who carries out the evaluation, as well as the frequency of the process.

The paper is organised as follows. In the following section we make a brief description of the dimensions of a system of performance appraisal accounted for in this study. Then, we review the theoretical insights into the factors that may influence the use of performance appraisal as well as the different dimensions of the process. The next section refers to the methodology used in our empirical exercise. Then, we describe and discuss the findings of the study and present the main conclusions.

DIMENSIONS OF A FORMAL SYSTEM OF PERFORMANCE APPRAISAL

When designing a system of performance evaluation, different factors ought to be considered. In what follows, we concentrate on three dimensions that we think should be carefully examined at the time of implementing performance appraisal.

Measures of Performance

Worker performance can be evaluated using different criteria. On the one hand, performance may be determined according to objective measures such as the number of pieces produced, the value of sales or the quality of the output. These measures are directly observed both by the person who performs the evaluation and the person being evaluated. As a consequence, the use of objective measures might simplify appraisal through a standardisation of processes. Moreover, it could generate perceptions of equity since the parameters that are evaluated are fixed and well-known by employees. On the other hand, evaluation may be determined according to subjective measures of performance, which are based upon the perceptions or judgements of the evaluator. The use of subjective measures provides flexibility to the appraisal system, since it is possible to adapt the evaluation process to the particular circumstances of a worker's job. However, it may enhance perceptions of inequity among workers (see Baron and Kreps, 1999). These concerns draw attention to the importance of determining the parameters on which a system of performance appraisal is based, and the need to look into the variables that influence the choice of these parameters.

Who Evaluates Performance

When designing a system of appraisal, an issue of concern is who will perform the evaluation. This person is frequently an employee's immediate superior (see Murphy and Cleveland, 1995), but a manager at a different level or a person from the human resource department (from now on, HR department) may deploy this task as well. In some contexts, subordinates, peers or even customers provide useful information on certain aspects of workers' performance. Hence, subordinates are in a good position to observe leadership abilities, peers may be able to evaluate interpersonal relationships and customers can assess the quality of service. Appraisal is often aimed at rating various attributes of a worker's performance, so evaluation from different sources is commonly required (see Bohlander and Snell, 2009). The performance attributes that will be evaluated depend on the purposes that the appraisal systems serves, which in turn are linked to establishment features. Different evaluation sources provide information on different attributes of an employee's work. Then, a thorough examination of relevant establishment factors could help us to better understand how the person that carries out the performance appraisal is determined.

Frequency of Appraisal

Another relevant feature concerning performance appraisal is the frequency of the assessment. Formal performance appraisal is commonly carried out on a regular basis. Thus, employees' performance may be assessed quarterly, twice a year, annually or with a different time fame. There are also organisations in which the frequency of performance

evaluation does not follow a fixed pattern. The aim pursued by the performance assessment process may influence its timing (see Murphy and Cleveland, 1995). Hence, evaluations that have the objective of providing feedback to employees will be performed more often than those aimed at taking administrative decisions. According to Lazear (1998), if the output obtained by a worker is easy to measure, evaluations will be more frequent. Frequency can also be contingent on workforce characteristics such as tenure or market demand (see Mathis and Jackson, 2005), and on structural factors such as workplace size or union influence. All these facts put the emphasis on the relevance of studying the influence of establishment-level factors on the frequency of the performance appraisal.

THEORETICAL FRAMEWORK

Following Brown and Heywood (2005) and Addison and Belfield (2008), we identify a number of variables that may contribute to explaining the implementation of performance appraisal systems. These variables can be classified into four categories: workforce characteristics, the level of job control, related human resource management practices (from now on, HRM practices) and the structural features of the establishment. In what follows, we describe the variables included in each of these four groups as well as their expected influence on the decision of adopting a system of performance evaluation. Moreover, we elaborate hypotheses concerning the expected effect of the explanatory variables on the different dimensions of the performance evaluation process taken into account.

Workforce Characteristics

As we have noticed in the previous section, performance appraisal may serve various purposes in an organisation. One of these purposes consists of monitoring workers' effort when alternative motivational strategies are considered not effective. According to this line of reasoning, we expect that the proportion of casual workers, women and long-tenured employees, as well as the turnover rate of the establishment are related to the probability of adopting a formal system of performance appraisal.

Short tenure workers are thought to be less engaged in organisational objectives as well as less motivated by deferred compensation than workers with longer tenure. The same occurs with women, who are commonly found in conjunction with short-term incentive schemes such as piece rates (see Jirjahn, 2002). These arguments make us think that performance evaluation will be more likely in those establishments with a high turnover rate and a high number of women, and less frequent when the proportion of experienced employees is significant. Moreover, women might sort into establishments adopting employment practices that leave less scope for discrimination. Using German data, Jirjahn and Stephan (2004) found support for the hypothesis that women prefer piece-rate remuneration schemes because the use of objective measures of performance avoids wage discrimination. We argue that, in those establishments where the proportion of women is significant, it will be more likely that a system of performance appraisal based on objective measures is adopted. The proportion of casual workers may be associated with a higher expected tenure for core employees (see Brown and Heywood, 2005). As a consequence, we expect that the percentage of casuals is negatively related to the use of performance appraisal.

The adoption of a system of performance evaluation may also pursue objectives different than the monitoring approach, such as the improvement of job matching or the identification of training needs. If this is the case, it is likely that appraisal is conducted by an immediate superior in order to observe directly and accurately workers' strengths and weaknesses. As pointed out by Murphy and Cleveland (1995), "a manager that is several levels above the target employee may receive only occasional information about the results of tasks performed". Performance evaluation will pursue these objectives in those organisations that rely on the establishment of long-lasting relationships with employees or, in other words, in organisations that have a low turnover rate. Consequently, we hypothesise

that the turnover rate of an establishment will be negatively related to the probability that the performance appraisal is carried out by an immediate superior.

In those establishments in which a formal system of appraisal is carried out, the tenure of the workforce can also influence the timing of the evaluation process. Hence, employees that are early in their career may be subjected to more frequent evaluations in order to assess if they fit a concrete job position (see Lazear, 1998). On the contrary, as a worker's career develops, evaluations become less common and usually stabilise. Then, it could be the case that the percentage of high-tenured workers within an establishment is negatively related to the frequency of the evaluation.

Job Control

As Brown and Heywood (2005) point out, it is more likely that an establishment implements a system of performance evaluation when workers have control over their work and, consequently, when they can alter their performance according to the results that the appraisal yields. At the same time, if performance is measured according to an objective formula, the feedback provided to workers can be more easily interpreted and put into practice. In light of these arguments, we predict that the degree of autonomy that employees have over their work will be positively related to the use of formal appraisal based on objective criteria. Moreover, in order to take full advantage of a system of performance evaluation, an establishment requires a considerable amount of supervisory force. We expect, then, that a high proportion of supervisors favours the operation of performance appraisal.

The implementation of a formal system of performance appraisal implies the assumption of important costs as well as the use of a significant amount of resources. Once an appraisal system has been adopted in an establishment, a high number of supervisors may be indicative of the fact that a significant amount of resources has been invested in the process of evaluation. This investment means that there is concern on the employer side about the benefits of workers' appraisal. As a consequence, we think that if the number of supervisors per worker in the establishment is high evaluation will be performed with a higher frequency.

HRM Practices

Certain HRM practices are considered to be implemented in conjunction with performance appraisal. One of these practices is the provision of training. According to Brown and Heywood (2005), monitoring workers' effort may be particularly desirable when training is provided since employers want to obtain benefits from their investments in human capital. Another complimentary practice considered in the literature is the use of pay related to individual performance. One of the main purposes of a system of appraisal is to measure worker performance, which in turns is essential to establish an incentive system based on individual output. In light of these arguments, we predict a positive influence of the provision of training and the use of pay for individual performance on the adoption of a formal system of performance appraisal.

Moreover, the frequency of appraisal may be influenced by the aim of the evaluation. According to Murphy and Cleveland (1995), if the information provided by performance appraisal is used for developmental purposes, this information needs to be gathered and returned to employees with a high frequency. The provision of training may be related to a developmental approach to performance appraisal, since training constitutes a tool to achieve the professional development of employees. Consequently, we expect that worker training is positively related to the frequency of performance appraisal.

Structural Factors

Brown and Heywood (2005) point to a correlation between some structural factors and the use of performance appraisal. First, they predict a positive influence of the size of the establishment due to economies of scale and the difficulty of monitoring workers' effort that exists in large organisations. Second, labour costs are also appointed as a potential positive influence in the use of a formal system of evaluation. According to Brown and Heywood (2005), this influence is due to the fact that "the scale economies are more likely to be overcome when labour cost is important for firms of the same size". The presence of human resource professionals may also favour the adoption of performance appraisal since their presence is indicative of a formalisation of human resource management. The formalisation of human resource management implies the adoption of more sophisticated employment practices. As a result, measuring employee performance may be more complicated, since evaluators need to account for many dimensions. In these cases, subjective criteria could be more appropriate to evaluate workers' performance. Finally, Brown and Heywood (2005) make reference to union influence as a circumstance that can impose difficulties when trying to implement a system of appraisal. Following these arguments, we expect to find a positive influence of the size of the establishment, the presence of a HR department and the proportion of labour costs in total production costs on the use of performance appraisal, and a negative effect of the influence exerted by unions in the establishment. We also expect that the presence of a HR department favours the adoption of performance appraisal based on subjective measures.

We think that, when formal appraisal is adopted by an employer, unions will promote that evaluations are carried out with fairness and objectivity. The employee's immediate superior is a figure that can directly observe worker performance and, as a consequence, it is the person who can rate more accurately this performance. Then, we hypothesise that union influence is positively associated with the probability that the appraisal is carried out by an immediate superior.

Regarding the frequency of appraisal, the existence of a HR department within the establishment means that human resources are assumed to be key to business success. This approach to human resource management indicates that performance appraisal is focused on the development of human capital. As we have already mentioned, information used for developmental purposes is gathered and returned to employees with a high frequency. Consequently, we expect that the presence of a HR department is positively related to the frequency of performance appraisal. From an economies of scale point of view, we have hypothesised that the size of the establishment and the proportion of labour costs will contribute to overcoming the fixed costs of implementing performance appraisal. However, the periodic observation of workers' output is more complicated in establishments of a large size. Consequently, we think that the frequency of appraisal will be lower as the size of the establishment increases.

Finally, we include four industry dummies in the analysis as controls for technological requirements.

METHODOLOGY

Data and Variable Description

The data was gathered in 2006 through personal interviews with managers in Spanish manufacturing plants with fifty or more employees, and represents a unique source of information about a range of human resource practices in Spanish firms. Information was collected at the plant level, as this is the unit at which decisions about the implementation of the practices of interest are taken. Furthermore, knowledge of the issues included in the questionnaire is expected to be greater at plant level and, as a consequence, the data obtained should be more reliable.

The process of development of the data base was as follows. Once the objectives and scope of our study were defined, and in order to properly design the questionnaire, a thorough examination of the literature related to the purpose of the project was carried out. With the information gathered, a first draft of the questionnaire was drawn up jointly by the members of the research group and the firm in charge of the fieldwork. The questionnaire was pre-tested in nine plants and then modified in several ways to come up with its final version.

The final version of the questionnaire consists of 152 questions grouped in the following eight sections: General Characteristics of the Plant and the Firm, Human Resource Management, Payment Systems, Work Organisation, Human Resource Outcomes, Human Resource Function, Other Groups of Workers and Characteristics of the Plant Manager. Most of the information on HRM refers exclusively to blue-collar workers, that is, those workers involved directly in the production process. The reason for restricting the analysis to this category of employees lies on the existence of diverse internal labour markets with different features within the same organisation. Limiting the study to manual workers facilitates comparisons across establishments. The data was drawn from personal interviews with one of the managers at the plant. It was thought that questions should be addressed to the general manager or to the human resource manager. In practice the human resource manager was the figure most frequently interviewed.

The range of potential respondents for the purposes of the survey comprised all Spanish manufacturing establishments which had fifty or more employees in 2005. The aim was to obtain a sample of one thousand units, in order to arrive at conclusions that could be extrapolated to the entire Spanish manufacturing industry. After stratification by sector, size and location, a random selection of workplaces was obtained from the Spanish Central Directory of Firms (Directorio Central de Empresas, DIRCE) of the Spanish National Statistics Institute (Instituto Nacional de Estadística, INE), using data from 2005.

The interviews with those managers that agreed to answer our questionnaire were performed by specially-trained professionals in computer-assisted telephone interviews (CATI). The establishments were first approached by letter or email, indicating the goals of the survey and including a copy of the questionnaire. The final sample comprises 1,001 establishments, which matches expectations regarding the size of the data set and yields a response rate of 34.1 per cent. The distribution of the establishments sampled across industrial sectors and size intervals is described in Table 1.

TABLE 1: Size and Sector Distribution of the Establishments in the Sample

MANUFACTURING SECTOR	50 to 99 workers	100 to 499 workers	500 workers or more	TOTAL
Food, Beverages and Tobacco	75	70	11	156
Textile Industry, Wearing Apparel, Leather and Footwear	44	24	1	69
Wood and Cork	14	20	0	34
Paper, Editing and Graphic Design	32	31	6	69
Chemical Industry	29	47	4	80
Rubber and Plastic Products	29	34	5	68
Non-metallic Mineral Products	53	50	5	108
Metallurgy and Fabricated Mechanical Products	85	63	6	154
Machinery and Mechanical Equipment	39	34	2	75
Electrical, Electronic and Optical Products and Equipment	31	36	4	71
Transport Equipment	15	37	8	60
Other Manufacturing Industries	38	18	1	57
TOTAL	484	464	53	1001

The data set contains information on various dimensions of the process of performance appraisal, which makes it possible to carry out an exhaustive analysis of the practice of interest. Hence, questionnaire respondents were enquired about the presence of a formal system of performance evaluation within for production workers, about the presence of a system based on objective criteria and a system based on subjective criteria. In addition, the survey includes questions relative to the person that carries out the appraisal and the frequency of the evaluation. The sample means, standard deviations and definitions of the variables concerning the process of appraisal as well as the explanatory variables used in the analysis are presented in Table 2.

Estimation Procedure

The first step in our empirical analysis consists of analysing the determinants of the use of a formal system of performance appraisal for production workers. Then, we discern between the use of an appraisal system based on objective criteria and a system based on subjective criteria. Since the dependent variables are dichotomous, we use probit models in our estimations.

Second, we analyse the attributes that exert an influence on the person who carries out the performance evaluation. At this point, a potential sample selection bias emerges, known as incidental truncation (see Wooldridge, 2003). The incidental truncation is due to the fact that we only have data on the dependent variable for those establishments in which a formal evaluation system exist. Consequently, we account for this fact when estimating our equation of interest. In order to do that, we need a sample selection equation. We have already constructed a model representing the determinants of the presence of a performance appraisal system as a first step in our analysis, so we use this model as our selection equation. Evaluation may be carried out by a worker's immediate superior, another line manager or a person from the HR department, so three sample selection models are estimated. Since the dependent variables are binary, we perform the regressions using the heckprob module of the Stata software (see Van den Ven and Van den Praag, 1981).

Finally, we study the determinants of the frequency of the performance appraisal. Only those establishments that have adopted a formal system of evaluation provide information on the frequency of appraisal. Consequently, we account for the potential selection bias and estimate a sample selection model using our first model as the selection equation. Since *Frequency* is an ordered variable (see Table 2), we use the oheckman module in Stata to perform our estimation (see Chiburis and Lokshin, 2007).

RESULTS AND DISCUSSION

The results of the estimated models regarding the use of a formal system of performance appraisal as well as the different dimensions of the process are depicted in Tables 3, 4 and 5.

Regarding the characteristics of the workforce, none of the variables considered emerge as significant in the analysis of the use of any system of performance appraisal (see Table 3). This is contrary to the expectation that workers' tenure influences the probability of adopting a formal system of evaluation. Moreover, the proportion of females does not exert any significant effect on the use of appraisal based on objective measures, which is contrary to our idea that women sort into those establishments that base evaluation on objective criteria in order to avoid discrimination. The turnover variable exerts a negative effect on the probability that the evaluation is carried out by an immediate superior (see Table 4), supporting the idea that in those organisations relying on the establishment of stable relationships with their employees appraisal is used with developmental purposes. We

TABLE 2. Variable Definition and Descriptive Statistics

Variable	Definition	Mean	Standard Deviation
<i>Performance appraisal</i>	1 if any formal system of performance appraisal is used for production workers; 0 otherwise.	0.448	0.498
<i>Objective criteria</i>	1 if a formal performance appraisal system based of objective criteria is used for production workers; 0 otherwise.	0.416	0.493
<i>Subjective criteria</i>	1 if a formal performance appraisal system based on subjective criteria is used for production workers; 0 otherwise.	0.280	0.449
<i>Immediate superior</i>	1 if the process of appraisal is carried out by an immediate superior; 0 otherwise.	0.523	0.500
<i>Another line manager</i>	1 if the process of appraisal is carried out by another line manager; 0 otherwise	0.370	0.483
<i>Person from HR department</i>	1 if the process of appraisal is carried out by a person from the HR department; 0 otherwise	0.273	0.446
<i>Frequency</i>	1 if appraisal is carried out quarterly or with a higher frequency; 2 if appraisal is carried out biannually; 3 if appraisal is carried out annually; 4 if appraisal is carried out biennially.	2.090	1.052
<i>Percent casuals</i>	Percentage of production workers that are casual workers.	14.014	16.264
<i>Percent female</i>	Percentage of production workers that are female.	22.465	25.715
<i>Percent over 50</i>	Percentage of production workers that are over 50.	17.025	16.989
<i>Turnover</i>	Percentage of production workers that stopped working in the establishment in 2005.	9.967	13.417
<i>Autonomy</i>	Degree of autonomy of production workers over their work.	0.036	0.920
<i>Supervisors per worker</i>	Average number of supervisors per production worker.		
<i>Individual pay for performance</i>	1 if pay based on individual performance is used for production workers; 0 otherwise.	0.348	0.477
<i>Training</i>	Percentage of production workers that received off-the-job training in 2005.	37.825	35.834
<i>HR department</i>	1 if there is a department at the establishment or firm that deals with human resource issues; 0 otherwise.	0.712	0.453
<i>Labour costs</i>	Percentage of labour costs over total production costs.		
<i>Size</i>	Number of workers at the establishment (logarithm).	4.780	0.787
<i>Union influence</i>	Employer's perception of union influence over production workers: 1 if very low influence; 2 if low influence; 3 if medium influence; 4 if high influence; 5 if very high influence.	2.910	1.151
<i>Low technological intensity</i>	1 if the establishment belongs to an industry of low technological intensity; 0 otherwise.	0.385	0.487
<i>Medium-low technological intensity</i>	1 if the establishment belongs to an industry of medium-low technological intensity; 0 otherwise.	0.329	0.470
<i>Medium-high technological intensity</i>	1 if the establishment belongs to an industry of medium-high technological intensity; 0 otherwise.	0.215	0.411
<i>High technological intensity</i>	1 if the establishment belongs to an industry of high technological intensity; 0 otherwise.	0.071	0.257

predicted that the proportion of high tenure workers would be negatively related to the frequency of appraisal because evaluation is more necessary at the beginning of a worker's career. However, this idea is not supported by the empirical findings (see Table 5).

As far as the variables related with job control are concerned, the degree of autonomy that employees have over their work seems to exert no influence on the use of appraisal (see Table 3). We find that the number of supervisors per worker is negatively correlated with the use of a system of performance appraisal. This result contradicts the hypothesis that a high percentage of supervisors contributes to the adoption of such system. Since our study contemplates the use of formal evaluation, it is possible that in those establishments with an important supervisory force evaluation is carried out in a more informal way. When each supervisor is responsible for a small number of workers, appraisal could be performed on a day-to day basis and without the need of establishing standardised procedures. Finally, there is no observable effect of the number of supervisors on the frequency of evaluation (see Table 5).

Turning to the use of complimentary practices, we observe that those establishments in which production workers receive off-the-job training are more likely to use an appraisal procedure (see Table 3). As stated in the theoretical framework section, this correlation points to the employers' interest in obtaining benefits from their investment in human capital. The results also confirm the idea that the provision of pay for individual performance exerts a positive influence on the probability of using performance appraisal. It is worth mentioning that the two explanatory variables correlate positively with the use of a formal system of performance appraisal but also with the use of a system based on objective measures and the use of a system based on subjective measures. Our intuition here is that, used in conjunction with training or pay for performance, performance appraisal is part of a bundle of human resource practices aimed at managing people from a commitment perspective. The commitment approach implies that the process of appraisal will be more exhaustive and, consequently, both objective and subjective measures of performance will be taken into account. Regarding the person who carries out the performance appraisal, we find a negative impact of the use of pay for individual performance on the *Immediate superior* and *person from HR department* variables (see Table 4). However, the explanatory variable correlates positively with the probability that performance is conducted by another line manager. Training has also a positive influence on the probability that another line manager performs the evaluation, whereas it exerts a negative impact on the likelihood that a person from the HR department accomplishes the appraisal.

Finally, the analysis of the structural factors displays some interesting results. The presence of a HR department exerts a positive influence on the use of any performance appraisal as well as on the use of appraisal based on subjective measures, matching our expectations concerning the effect of this variable (see Table 3). The size of the establishment is also positively related with the use of any performance appraisal, with appraisal based on objective criteria and with appraisal based on subjective criteria. These results point to the fact that, as the size of the establishment increases, economies of scale in the implementation of any system of formal performance appraisal emerge. According to the significance of the coefficient for the size variable, the economies of scale argument is particularly relevant in the case of objective evaluation. Contrary to expected, we do not find a statistically significant effect of labour costs and union influence on the variables of interest. Our intuition that unions seem to promote that the worker's immediate superior conducts the evaluation is supported by the results (see Table 4). We also find that the size of the establishment is negatively related to the probability that a person from the HR department carries out the evaluation. According to the results displayed in Table 5, the structural factors are crucial in explaining the frequency of the appraisal. First, we observe that the existence of a HR department within the organisation makes that appraisal is carried out with a lower frequency. This outcome contradicts our claim that the presence of a department dealing with human resource issues indicates that appraisal is conducted for developmental purposes and, consequently, it will be carried out with a higher frequency. The size variable emerges as a negative influence on the frequency of appraisal which, as

TABLE 3. Determinants of the Use of a Formal System of Performance Appraisal

Variable	Use of a formal performance appraisal system	Use of a formal performance appraisal system based on objective criteria	Use of a formal performance appraisal system based on subjective criteria
Constant	-1.136*** (0.358)	-1.364*** (0.358)	-1.263*** (0.374)
Percent casuals	-0.005 (0.004)	-0.006 (0.004)	-0.005 (0.004)
Percent female	-0.001 (0.002)	-0.002 (0.002)	-0.002 (0.002)
Percent over 50	-0.004 (0.003)	-0.004 (0.003)	-0.004 (0.003)
Turnover	0.005 (0.004)	0.006 (0.004)	0.002 (0.004)
Autonomy	0.042 (0.075)	0.074 (0.076)	0.148* (0.078)
Supervisors per worker	-1.103* (0.620)	-0.941 (0.617)	-0.100 (0.601)
Individual pay for performance	0.541*** (0.107)	0.486*** (0.107)	0.414*** (0.112)
Training	0.003** (0.002)	0.003** (0.002)	0.004** (0.002)
HR Department	0.259** (0.210)	0.193 (0.125)	0.276* (0.136)
Size	0.182** (0.071)	0.210*** (0.071)	0.137* (0.075)
Union Influence	-0.031 (0.047)	-0.007 (0.047)	-0.059 (0.050)
Labour Costs	0.001 (0.003)	0.001 (0.003)	-0.001 (0.003)
Medium-Low Technological Intensity	-0.051 (0.125)	-0.049 (0.126)	-0.262* (0.134)
Medium-High Technological Intensity	-0.048 (0.145)	-0.050 (0.145)	-0.063 (0.150)
High Technological Intensity	0.025 (0.202)	-0.083 (0.203)	-0.194 (0.215)
Chi-squared	61.41***	57.11***	45.04***
Log likelihood	-423.86	-421.59	-368.86
N	657	657	657

*** p<0.01, ** p<0.05, * p<0.10

Note: Standard errors in parentheses

stated in the theoretical section, may be due to the fact that determining worker's effort becomes more difficult as the size of the establishment increases. Performance evaluation is more frequent as the union influence and the labour costs increase. Overall, the results concerning the effect of union influence on the dependent variables suggest that, contrary to our expectation, unions do not oppose the use of performance appraisal, neither do they favour the use of this practice. But when a system of evaluation is implemented, unions exert its influence over the process by promoting that the immediate superior assesses workers' performance and that the assessment is made with a high frequency. These findings may be

TABLE 4. Determinants of Who Carries Out the Appraisal

Variable	Immediate superior	Another line manager	Person from HR department
Constant	0.703* (0.400)	-1.250 (0.428)	1.497*** (0.399)
Percent casuals	0.007 (0.004)	-0.004 (0.005)	-0.003 (0.006)
Percent female	0.002 (0.002)	0.001 (0.002)	-0.001 (0.002)
Percent over 50	0.001 (0.003)	0.001 (0.004)	0.004 (0.003)
Turnover	-0.010** (0.005)	0.007 (0.005)	0.001 (0.005)
Autonomy	-0.044 (0.081)	-0.090 (0.110)	0.051 (0.084)
Supervisors per worker	0.970 (0.864)	-0.369 (0.945)	0.108 (0.877)
Individual pay for performance	-0.421*** (0.117)	0.213* (0.123)	-0.261* (0.135)
Training	-0.002 (0.002)	0.004** (0.002)	-0.004** (0.002)
HR department	-0.160 (0.141)	0.025 (0.148)	0.013 (0.180)
Size	0.001 (0.082)	0.032 (0.086)	-0.169** (0.079)
Union influence	0.099* (0.052)	-0.041 (0.055)	-0.012 (0.053)
Labour costs	-0.001 (0.003)	-0.000 (0.003)	-0.003 (0.003)
Chi-squared	23.92**	12.17	22.89**
Log likelihood	-628.08	-618.35	-587.23
N	653	653	653

*** p<0.01, ** p<0.05, * p<0.10

Note: Standard errors in parentheses

related to the fact that unions are contrary to the application of discriminatory practices, so they secure that the process of appraisal avoids an unfair treatment of employees.

CONCLUSIONS

In this study, we have drawn upon the work of Brown and Heywood (2005) and Addison and Belfield (2008) to analyse the implementation of performance appraisal systems in the Spanish manufacturing industry. One of our interests was to provide additional evidence on the relationship between establishment characteristics and the use of performance evaluation. Moreover, we have aimed at complementing previous work paying attention to certain dimensions of a formal appraisal system that have not been analysed from an establishment-level point of view.

We have found that pay based on individual results, the provision of training, the presence of a HR department and the size of the establishment exert a positive

TABLE 5. Determinants of the Frequency of the Appraisal

Variable	Frequency of formal appraisal system
Constant	0.925 (0.819)
Percent casuals	0.001 (0.005)
Percent female	0.001 (0.002)
Percent over 50	-0.002 (0.004)
Turnover	-0.007 (0.005)
Autonomy	0.052 (0.081)
Supervisors per worker	-0.553 (1.037)
Individual pay for performance	0.181 (0.193)
Training	0.002 (0.002)
HR department	-0.325* (0.171)
Size	-0.255*** (0.096)
Union influence	0.113** (0.054)
Labour costs	0.008** (0.003)
Chi-squared	34.48***
Log likelihood	-390.85
N	657

*** p<0.01, ** p<0.05, * p<0.10

Note: Standard errors in parentheses

and significant influence on the probability of adopting performance appraisal. Worker autonomy and the number of supervisors per worker also exert a relevant although less significant influence on the variable of interest. Our results regarding the use of appraisal based on subjective and objective criteria show that the two types of evaluation are dependent on similar factors. However, the use of subjective performance measures seems to be related to a more formal approach to human resource management where a specific department dealing with personnel issues exists in the establishment and employees have more autonomy over their own work. Regarding the person who evaluates performance, our estimations show that the turnover rate of the establishment exerts a negative influence on the probability that the appraisal is conducted by the employees' immediate superior. On the contrary, unions seem to favour the fact that evaluation is carried out by the person who observes workers' performance more directly. In addition, the use of pay linked to individual results and the size of the establishment are closely related to the figure assessing employees' performance. Our findings reveal that the frequency of appraisal is dependent on the structural characteristics on an establishment. Hence, we observe that the presence of a HR department correlates negatively with the frequency variable. There is also a negative association between the size of the establishment and the frequency of appraisal. On the

contrary, union influence and the percentage of labour costs over total production costs emerge as positive and statistically significant determinants of the frequency of evaluation.

Besides the results mentioned in the previous paragraph, we think that an important contribution of this work concerns the possibility of comparing our findings with the ones referred to the British and the Australian cases. Both studies point to a significant correlation between the workforce characteristics and the use of performance appraisal, supporting the argument that the expected tenure of employees is a crucial determinant of the adoption of this form of monitoring. On the contrary, the tenure hypothesis does not find support in our data base. As far as the job control is concerned, the variables included in our study only partially back up Brown and Heywood (2005) results (the *Autonomy* variable is only related to the probability of using performance appraisal based on subjective criteria) or show an opposite influence (the number of supervisors per worker). The role of the complimentary practices seems to be more in line with the conclusions of our study of reference. According to our estimations, the provision of pay based on individual results and off-the-job training are strong determinants of the adoption of performance appraisal systems in the Spanish context. Finally, the size of the establishment exerts a significant and positive influence on performance appraisal use, matching the Australian results. But in contrast to these findings, the presence of a HR department is also a positive and significant determinant of the dependent variable.

In general, we obtain significant differences with respect to the two comparable studies. These differences may point to a different understanding of the process of formal performance appraisal in the Spanish case. Our idea is that the importance displayed by the presence of a HR department, jointly with the relevance shown by certain complimentary practices, may be indicative of an approach to performance appraisal as part of a particular configuration of human resource management. However, understanding the implications on institutions on the adoption of human resource practices is a complex issue. Despite the fact that the two contexts share certain common features, Addison and Belfield (2008) also find significant differences in the factors that determine performance appraisal in Australia and Great Britain. These differences, jointly with the results of the present study, suggest that further research is needed regarding the use of performance appraisal systems and the influence of the institutional framework. Moreover, this future research should account for the various dimensions that make up a formal system of performance appraisal such as the ones considered in this work.

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