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THE PROCESS OF WAGE ADJUSTMENT: AN ANALYSIS USING ESTABLISHMENT-LEVEL DATA

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Abstract

In this article, we use data from Spanish manufacturing plants to analyze the determinants of the importance attributed to several criteria when wages are adjusted. More specifically, the criteria we take into account in the study are the cost of living, the wages of the firm in relation to its competitors, the fulfillment of collective agreements at sector level, the need to recruit and retain employees, the performance of the organization, and the industrial relations climate. Our results show that the structural characteristics of the establishment, as well as the wage setting arrangements and trade unions, play a role in explaining the importance of the factors mentioned in shaping wage adjustments. The human resource management policies adopted by the employer seem to be less relevant.

Keywords: human resource management, structural characteristics, trade unions, wage adjustment, wage setting arrangements

Introduction

The analysis of wage determination is a topic that has received significant attention from researchers. Hence, the study of the determinants of wage levels and wage differentials has been approached from both theoretical and empirical points of view (see Werner and Ward, 2004). However, wage determination continues to attract the interest of academics as there are still unanswered questions regarding this issue.

One topic of interest in the literature on wage determination is the analysis of pay settlements. According to the terminology of collective bargaining, a pay settlement is an adjustment in the wages paid to a group of workers that is carried out with a certain periodicity (see Forth and Millward, 2000). It has been recognized that pay settlements revolve around certain variables, which are grouped into two categories: factors internal to the establishment and factors external to it. Blanchflower and Oswald (1988) introduced this baseline classification and identified several factors taken into account by employers when they adjust the wages of their employees. Subsequent studies have drawn on this work and analyzed the relevance of internal and external variables in the size of pay settlements (see Ingram et al., 1999; Forth and Millward, 2000; or Brown et al. 2004; among others)[1]. These studies provide support for the fact that wage adjustments at plant level revolve around factors such as the cost of living or the performance of the organization. But what shapes the weight given to these factors by employers when determining pay settlements?

Labor regulation concerns have been highlighted as major influences on the factors that influence pay settlements. In particular, a strong regulatory framework is associated with a high incidence of external factors, whereas low regulation is linked to a greater freedom for the employer to link wages to the internal circumstances of the organization. Ingram et al. (1999) analyze these issues in the British context and show that, despite the process of deregulation carried out by British governments in recent decades, external pressures continue to be very relevant in pay setting processes. Their results suggest that, besides labor market regulation, other circumstances could influence the weight given to internal and external factors in pay settlements. In this article, we want to shed light on this issue and analyze the circumstances that shape the importance given by employers to different factors when wages are adjusted. To do so, we use establishment data and examine the process of wage adjustment at workplace level. The relevance of the establishment component in the determination of wages has been widely acknowledged (see Groshen, 1991a and 1991b; Bronars and Famulari, 1997; Stephan, 2002; Lane et al., 2007; Gruetter and Lalive, 2009). Given the importance of the establishment features in pay determination, we want to test the significance of this component when it comes to pay settlements.

In order to carry out the analysis, we draw on the theories of pay determination and the empirical literature on employer wage differentials. This framework provides insights into employer attitudes toward pay decisions (see Forth and Millward, 2000).

On the basis of the aforementioned theories, we identify six factors that influence management decisions on pay adjustments: the cost of living, the wages of the firm in relation to its competitors, the fulfillment of sector-level collective agreements, the need to recruit and retain workers, the performance of the firm, and the need to maintain a good industrial relations climate. Then, we examine the variables that determine the importance given to these factors by employers when adjusting wages. More precisely, we include three groups of explanatory variables in the analysis: structural factors and market conditions, human resource management (from now on, HRM) policies, and wage-setting arrangements and the influence of trade unions. The study is based on a data set on HRM practices and industrial relations, which comes from a survey conducted in 2006 on a representative sample of Spanish manufacturing establishments.

The paper is structured as follows. In the following section, we examine the factors that may shape wage adjustments. Then, we make hypotheses regarding the influence of a set of explanatory variables on the importance given to these factors. Section four describes the data set and the methodology used in the analysis. In section five, we present the results of the empirical analysis. Some conclusions are outlined in the final section.

The Pressures on Wage Adjustments

From a theoretical point of view, wage determination is a complex process in which many factors play a role. In practice, wages in the workplace are frequently determined through pay settlements (see Forth and Millward, 2000). An analysis of pay settlements can help us to understand better wage determination processes within the workplace, since employers commonly adjust the wages of a whole group of employees simultaneously and with a fixed periodicity (see Brown et al., 2004). As we have already mentioned, pay settlements revolve around several factors that reflect both the internal characteristics of the organization and external circumstances (see Blanchflower and Oswald, 1988). In what follows, we offer an account of the factors considered in our study as potential influences upon wage adjustments. In order to select these factors, we draw on previous studies of pay settlement influences and theories of pay determination (see Blanchflower and Oswald, 1988; Ingram et al., 1999; Forth and Millward, 2000; and Brown et al., 2004; among others).

Regarding the factors external to the establishment, the first influence included in the analysis is the cost of living. The cost of living is a variable that both employers and employees take as a reference when negotiating and determining wage adjustments. Although the precise role of the inflation rate on pay settlements is still not completely understood, it is widely accepted that most settlements reflect this value to some extent

(see Ingram et al., 1999; and Brown et al. 2004). An aspect worth considering in relation to the importance of this criterion is the possibility that labor contracts include wage indexation clauses (see Jimenez-Martin, 1998). The existence of these clauses may reduce the uncertainty associated with the real value of wages, rendering the inflation rate more significant when pay is being set. This is well reflected in the Spanish economy, where a considerable percentage of labor contracts usually contain such clauses. According to the European Industrial Relations Observatory (EIRO), in 2005 wage revision clauses were included in 36.7 per cent of Spanish collective agreements and covered 69 per cent of workers (see EIRO, 2006).

The wages of the firm in relation to its competitors is also a significant factor when employers adjust their wages. On the one hand, comparability may be used by the employer as a standard for how wages should be settled in line with what other organizations are doing. On the other hand, employees can take the wages paid elsewhere in the market as a base from which to make demands regarding their own remuneration. From a transaction costs perspective (see Williamson, 2010), a comparison with the wages paid in other firms might reduce the costs associated with pay setting and facilitate pay decisions for both employers and employees (see Forth and Millward, 2000). Hence, this criterion may be expected to be particularly relevant for employers who want to minimize the costs of wage adjustment processes.

In some organizations, working conditions and, particularly, pay policies are the result of bargaining processes between employers and workers' representatives, resulting in the application of sector-level agreements that regulate the employment relationship. Collective bargaining at the industry level establishes the framework within which wages are determined, and it imposes restrictions on the employers' pay decisions. Hence, the fulfillment of sector collective agreements as an additional pertinent external factor in wage adjustments is also included.

As we have already mentioned, pay settlements are also dependent on the internal conditions of the plant. One such condition is the establishment's need to recruit and retain workers. The level of wages offered by the company and the wage adjustments made to existent employment contracts affect the possibility of hiring and retaining workers. According to the efficiency wages theory, wages that are above the market-clearing level can induce a positive effect as regards the effort made by workers. The implementation of a high-level wage system has additional implications for employers, such as the possibility of recruiting more qualified workers or a reduction in the turnover rate in the establishment (see Bryson and Forth, 2008). Therefore, in situations where the organization is expanding and it needs skilled workers, or when turnover costs are high, wages can be used as a tool to attract and retain employees. In addition, the influence of the need to recruit and retain workers on wages can be understood in terms of the principal-agent theory. This theory assumes that employee

and employer pursue different objectives, with the former incurring a cost in providing higher effort. As a response, the employer should design the compensation policy that deals with the contractual hazards faced by the organization and helps to implement the desired hiring and retaining policies (see Prendergast, 1999).

It should be noted that, although the need to recruit and retain workers depends on the internal conditions of the plant, this variable is also influenced by the situation of the labor market. More precisely, the importance of the need to recruit and retain workers for an establishment depends upon the supply and demand for labor in the market. As a consequence, the hiring and retaining factor reflects both the internal contingencies of the plant and the external environment in which it operates.

An organization's ability to pay is a constraint on the determination of wage outcomes by the employer. The rent-sharing model states that pay determination is the result of a distribution of workplace rents between organizational agents (see Blanchflower et al., 1990). According to this model, if an organization generates rents and its workers possess some bargaining power, they can negotiate rent sharing with their employers (see Groshen, 1991a). As a consequence, we take into account the influence of organizational performance on pay settlements as an indicator of the employer's ability to pay. The significance of organizational performance in pay settlements might also be supported from an occupational commitment perspective (see Meyer and Herscovitch, 2001). This perspective emphasizes the idea that an increase in

occupational commitment improves organizational performance. Applying this idea to the purpose of this study, linking wage increases to the performance of the organization could enhance workers' commitment to the job, thus affecting their attitudes and, by extension, improving organizational outcomes.

Finally, the industrial relations climate also has a bearing on wage determination processes. The industrial relations climate refers to the quality of the relationship between employees and employers in the workplace (see Deery et al., 1999). The existence of conflict in relationships in the establishment may impose restrictions on pay setting by employers due to the different interests pursued by each party during the bargaining process. Moreover, it is possible that a deteriorating industrial relations climate increases the threat of industrial action, and the employer may use wage increases in order to improve the working environment (see Jimenez-Martin, 2006)

Establishment Features and the Factors that Influence Pay Settlements

We have already described the factors taken into account by employers when they adjust wages. In what follows, we make hypotheses concerning the influence of a set of variables on the importance given to those factors. We group the variables into the following categories: structural characteristics and market conditions, HRM policies and human capital variables, and wage setting arrangements and the influence of trade unions.

Structural Characteristics and Market Conditions

The first category of variables included in our study represents basic features of the workplace and the market in which the company performs its activity. In particular, we take into account the size of the establishment, the issue of foreign ownership and the degree of competition.

The relationship between firm size and wages has been widely studied in the past. As a consequence, there is abundant empirical literature on this topic, revealing the existence of a positive effect of firm size on wages (see Belfield and Wei, 2004; or Lallemand et al., 2005, among others). Regarding pay settlements, we expect to find a significant incidence of size on the factors taken into account by employers when wages are adjusted. First, occupational groups become larger as the size of the establishment increases. Large occupational groups may contain workers with different characteristics, and it could be difficult to determine a general wage adjustment that precisely reflects such varied characteristics (see Forth and Millward, 2000). Therefore, large organizations probably incur higher costs when setting pay. From a transaction costs perspective (see Williamson, 2010), they might choose to externalize or "buy" the transaction of pay determination in the market. In order to do so, employers could use an external variable of reference such as the cost of living or the wages paid by other firms.

Hypothesis 1: When adjusting their wages, large establishments give more importance to the cost of living and the wages of the firm relative to its competitors.

Large organizations are thought to match workers to jobs more efficiently (see Belfield and Wei, 2004). Efficient job matching in large firms could be due to various reasons, such as the possibility of job reallocation, sorting during the selection process or the provision of higher stability within the firm. In relation to this idea, it has been shown that internal job movement is higher in large firms (see Brown and Medoff, 1989). Therefore, workers can more easily move between assignments and avoid quitting, which facilitates job matching. Consequently, the matching process suggests that, as the size of the establishment increases, employers will be less concerned about the need to recruit and retain employees.

Hypothesis 2: When adjusting their wages, large establishments give less importance to the need to recruit and retain workers.

Size and wages could also be linked by the idea of compensating wage differentials (see Brown and Medoff, 1989). The literature on the size-wage effect has pointed out that large organizations provide workers with poorer working conditions, such as an impersonal atmosphere or higher levels of bureaucracy (see Green et al., 1996). Consequently, these firms should display lower levels of job satisfaction that worsen the climate of industrial relations. If these conditions characterize large

establishments, they should give more importance to the industrial relations climate when wages are settled.

Hypothesis 3: When adjusting their wages, large establishments are more concerned about the industrial relations climate.

In some countries, the probability that a firm-specific agreement is signed increases with the size of the establishment. This is the case of Spain, among other countries, as Plasman et al. (2007) point out. According to these authors, workers tend to be better organized in large firms, which favors the establishment of a specific collective agreement. In other words, large firms in Spain have a higher probability of being managed under a firm agreement than under a sector-level agreement. Consequently, we anticipate that establishments with a high number of employees will give less importance than small establishments to sector-level agreements when setting pay.

Hypothesis 4: When adjusting their wages, large establishments are less concerned about the fulfillment of sector agreements.

The next factor of interest for pay settlements is foreign ownership. Multinational companies operate in different countries, where they may encounter different institutional settings. Due to the challenge of operating in an international environment, multinationals develop more complex HRM systems (see Bayo-Moriones and Galdon-Sanchez, 2010). As a result, we expect to find differences between

establishments that belong to a multinational group and domestic plants in relation to the formulation of compensation strategies.

Compensation policies contribute to solving agency problems through the provision of incentives to workers (see Prendergast, 1999). A possible incentive system firms can use consists in linking wages to organizational performance, which helps to align worker objectives with those of the company and enhances their effort. Regarding the particular case of multinational companies, they operate in dispersed locations, so there may be a considerable distance and a variety of goals among the different subsidiaries and the headquarters (see Gong, 2003). Because of this distance and goal-divergence, workers probably find it difficult to discern a clear impact of their effort on the performance of the organization that may motivate them to act in the firm's best interest. Consequently, linking wages to organizational performance may not be the optimal compensation strategy in such companies. From this idea, we may conclude that the provision of incentives through wages linked to organizational performance is less likely to be less prevalent in foreign-owned establishments.

Hypothesis 5: When adjusting their wages, multinationals give less importance to the performance of the organization in comparison with domestically-owned plants.

Another factor of interest in the determination of wages is the degree of competition. It has been argued that product market conditions that affect the demand for labor might have an effect on employers' decisions regarding wage adjustments (see

Forth and Millward, 2000). The degree of competition is one of these conditions, since it influences the demand for labor in the market. When employers face a high number of rival firms, they have to compete for the labor force, so they will be more conscious about hiring and firing issues. Consequently, we expect to find a correlation between the degree of competition in the product market and the importance given to recruitment and retention issues in pay settlements. In relation to this idea, Amable and Gatti (2004) described a model that emphasizes the link between competition, turnover and wages.

Hypothesis 6: When adjusting their wages, plants that face a high degree of competition will give more importance to the need to recruit and retain workers.

Human Resource Management Policies

The HRM strategies adopted by an employer are also expected to correlate with wage outcomes. In what follows, we account for several variables that reflect the HRM policies and human capital features of the establishment, and we describe their expected influence on the importance given to our factors of interest.

First, the **neo-classical model** of the labor market predicts higher wages for workers with greater education and training levels, since education and training are associated with increased productivity among employees (see Bryson and Forth, 2008). Workers with high productivity levels have a significant influence on the results of the organization, and a loss of this type of worker may be particularly harmful for the

employer (see Dearden et al., 2006). In other words, when workers have received high education or training levels, they turn into valuable assets for the firm. Consequently, it is in the employer's interest to retain them in the organization. In the case of the provision of training by the employer, there is also a training cost involved, which increases the interest in the need to retain them.

Hypothesis 7: When adjusting their wages, plants with high education and training levels will give more importance to the need to recruit and retain employees.

The literature on the provision of incentives by organizations points out that incentives are not only used to enhance worker effort, but also to influence worker self-selection in relation to the firm (see Lazear, 2000). In particular, when wages are linked to performance, there is a sorting effect and more productive workers are attracted into the organization. Dohmen and Falk (2011) use education as a proxy for productivity to provide evidence on this sorting effect. From this idea, we expect that wages are more dependent on performance in establishments with well-educated workers,

Hypothesis 8: When adjusting their wages, plants with highly educated workers will give more importance to the performance of the organization.

Many firms have **internal labor markets**, where employees' careers develop within a single organization (see Osterman, 2010). Hiring for the lower levels of the hierarchy is done at a small number of entry points, and jobs at higher levels are filled through internal promotion. Enduring employment relations, established career paths

and on-the-job training are among the most frequently cited features of these companies (see Baker et al., 1994). The existence of internal promotion as well as employment stability can be an incentive for applicants to enter the firm, as well as for workers to stay in the organization (see Lazear and Oyer, 2004). Thus, it is possible that organizations with internal labor markets need not use pay as a mechanism for hiring and retaining employees.

Hypothesis 9: When adjusting their wages, plants with internal labor markets give less importance to the need to recruit and retain employees.

The pay policy adopted by the employer is also a potential determinant of the importance given to the factors of interest in wage adjustments. One significant aspect of pay policy is the relationship between the wage level of the establishment and the remuneration of comparable workers. The **efficiency wages** approach points out that offering higher wages than those paid in other organizations is a mechanism to attract new employees and retain the ones who already work in the establishment (see Akerlof and Yellen, 1986). Hence, we expect that those employers who pay high wages will be less concerned with the need to recruit and retain workers in pay settlements.

Hypothesis 10: When adjusting their wages, employers who pay high wages will be less concerned with the need to recruit and retain workers.

Another relevant aspect of the wage policy of an establishment is the use of pay systems based on the performance of workers. As we have already mentioned, these

systems might increase worker motivation by making them benefactors of the gains obtained at individual, group or company level (see Prendergast, 1999). The use of this type of incentives reflects the employer's interest in sharing gains with employees as a means to increase their motivation and, consequently, their productivity. In other words, linking pay with performance may be part of the compensation and motivation policy adopted by the organization. Hence, it is possible that the adoption of a system of pay for performance correlates positively with the importance given to the performance of the organization in pay settlements.

Hypothesis 11: When adjusting their wages, plants that use pay for performance systems gill give more importance to the performance of the organization.

Wage-Setting Arrangements and Trade Unions

We expect that wage bargaining arrangements play a significant role in pay setting processes at establishment level. In Spain, collective bargaining is the legally recognized mechanism to set wages and, more generally, working conditions. Regarding the structure of collective bargaining, two main levels of negotiation are identified: the sector level, which includes both national and regional agreements, and the firm level (see Canal-Domiguez and Rodriguez-Gutierrez, 2004). Previous evidence has shown that the degree of centralization of collective bargaining affects wage levels (see Card and de la Rica, 2006; or Plasman et al., 2007; among others). Specifically,

these studies have found that organizations subject to firm collective agreements pay a wage premium in comparison with those companies subject to multi-employer agreements. Rent-sharing concerns, the use of efficiency wages by the employer or unmeasured ability differences have been pointed to as possible explanations of the firm-agreement wage premium. Our aim is to examine how the degree of centralization applies to the issue of wage adjustments.

In Spain, collective agreements can be extended by law to non-unionized firms or workers belonging to the area of negotiation (see Canal Dominguez and Rodriguez Gutierrez, 2004). As a result, bargaining coverage is high, affecting around 60 per cent of Spanish workers. Regional sector agreements are predominant, covering more than 50 per cent of the workers subject to collective bargaining. National sector agreements affect around 25 per cent of workers, whereas firm-level agreements only cover 10 per cent of workers (see EIRO, 2009). Regarding the manufacturing sector, in 2006 around 13 per cent of workers covered by collective agreements were subject to firm-level contracts, and bargaining at a higher level affected the remaining 87 per cent of workers, in line with the pattern of centralization that characterizes the Spanish bargaining system (see Ministerio de Empleo y Seguridad Social, 2006).

Work councils negotiate employment terms at firm level, whereas the main union confederations bargain at higher levels. These unions also take part in firm-level negotiations, as an important proportion of work councils members belong to them.

Management negotiates at firm level, whereas employer organizations participate in negotiations at higher levels. According to the Survey on Quality of Life in the Workplace (2010), 20.4 per cent of manufacturing workers were members of a trade union. Information on employer representation is scarce for Spain. However, it is believed that between 70 to 80 per cent of Spanish employers belong to the CEOE (Confederacion Española de Organizaciones Empresariales), the Spanish Confederation of Employers' Organizations, or to other organizations directly dependent on the CEOE (see European Commission, 2008).

Another aspect of the Spanish industrial relations climate worth mentioning is the quality of the relationship between employees and managers. Although industrial conflict has decreased over the last few decades, international reports still present Spain as a country with one of the worst records in Europe as far as industrial conflict is concerned (see Scheuer, 2006). This is shown, for example, in the figures regarding one form of industrial action in Spain: strikes. According to the International Labour Organization, 116.9 days were lost in Spain per 1,000 workers in manufacturing in 2006 (see International Labour Organization, 2006). This figure is significantly higher than the data for other European Union countries such as the United Kingdom (6 days lost per 100 workers), Germany (10.8 days), Portugal (26 days) or Italy (85.8 days).

We now examine the influence of wage-setting arrangements and trade unions on pay settlements. Regarding the importance given to the cost of living, we think that

this is a variable of concern to employees when negotiating wage increases. The inflation rate determines the purchasing power of wages, so employees want to obtain wage rises that at least cover the variation in the level of prices (see Forth and Millward, 2000). If wages are set through collective bargaining, either at sector or firm level, workers can express this demand through their representatives, and fight for salaries that maintain their purchasing power.

Hypothesis 12: When adjusting their wages, establishments where any type of collective agreement exists will give more importance to the cost of living.

Under collective bargaining at the firm level, the employer can adapt wages to the particular circumstances of the organization, whereas the presence of a sector agreement imposes more restrictions on pay setting processes (see Gerlach and Stephan, 2006). Moreover, several studies have found the existence of a wage premium associated with the presence of a firm-specific contract (see Card and de la Rica, 2006). On the other hand, when wage adjustments are set unilaterally by employers or negotiated on an individual worker-employer basis, the firm will have a greater ability to make wages flexible so that they are closely linked to the performance of the firm.

Hypothesis 13: When adjusting their wages, establishments where working conditions are determined at firm level, via collective agreement or another mechanism of wage determination, will give more importance to the performance of the organization.

We expect to find a positive correlation between the existence of any type of collective bargaining and the importance given to the climate of industrial relations when wages are adjusted. Two arguments can be used to support this hypothesis. First, it is possible that the employer wants to create a good working environment and uses bargaining with the employees in order to achieve harmonious industrial relations within the workplace. Second, collective bargaining may result in a deterioration of the employment relationship because the parties involved in negotiations pursue different interests. As a consequence, the employer could be more concerned about the importance of the industrial relations climate in pay settlements and use wage increases as a mechanism for restoring a good working environment (see Jimenez-Martin, 2006).

Hypothesis 14: When adjusting their wages, establishments where any type of collective agreement exists will give more importance to the industrial relations climate.

Although we expect to observe differences in the pressures on wage increases depending on the mechanism of pay setting that operates in the organization, it is also possible that the influence of the unions present in the establishment has an effect on the factors that determine pay adjustments. In other words, besides being influential in the possibility that a firm-collective agreement is reached (as Card and de la Rica (2006) point out), trade union power within the establishment can ensure that certain factors are regarded as more important than others when wages are adjusted. Union influence could

be a proxy for the share of power between the employer and the employees regarding wage setting processes. Whereas the presence of a firm contract is the result of the initiative of both employer and employees, reflecting the interests of both parties and the probability that they may reach an agreement, trade union influence only represents workers' power.

First, trade unions are concerned about the living standard of workers. If their influence in the establishment is high, they will try to obtain wage rises that reflect the expected increase in the cost of living (see Jimenez-Martin, 1998). Consequently, we expect a positive relationship between union influence and the importance given to inflation in pay settlements.

Hypothesis 15: When adjusting their wages, establishments where trade unions have a high degree of influence will give more importance to the cost of living.

In Spain, trade unions participate in negotiations in different firms, so the information on bargaining outcomes can be transferred across union members in different negotiation units (see Rigby et al., 2009). When unions have power to influence working conditions, it is more likely that they would use the information obtained from other firms to demand wages similar to those paid in other organizations.

Hypothesis 16: When adjusting their wages, establishments where trade unions have a high degree of influence will give more importance to the wages of the firm relative to its competitors.

Trade unions focus primarily on improving the contracts of existing workers, that is, those currently working in the organization (see Amuedo-Dorantes, 2000). When unions are strong in an establishment, they can exert their power to protect the interests of insiders. As a result of this protection, firing workers becomes more difficult for the employer, and the turnover rate of the establishment decreases (see Bentolila et al., 1994). Consequently, our sense is that the need to recruit and retain workers becomes less relevant to pay setting as union power in the organization increases.

Hypothesis 17: When adjusting their wages, establishments where trade unions have a high degree of influence will give less importance to the need to recruit and retain workers.

Finally, linking wages to performance introduces uncertainty in compensation. Employees may be regarded as risk averse when it comes to wages. In addition, they try to avoid wage loses that are due to mismanagement or the bad economic situation (see Kurdelbusch, 2002). When trade unions have influence in the establishment, workers can express these concerns regarding wage uncertainty. When wages depend on firm performance, differences in worker pay across firms emerge. Such differences violate the equality principle defended by trade unions. Consequently, we predict that the presence of strong unions in the establishment renders the process of trying to adjust wages to the performance of the company more difficult.

Hypothesis 18: When adjusting their wages, establishments where trade unions have a high degree of influence will give less importance to the performance of the organization.

Data and Methodology

Data and Variables

Drawing on the preliminary work of Blanchflower and Oswald (1988), our study is based on management perceptions of the factors that influence wage adjustments at establishment level. According to these authors, questionnaire information such as that used in this study can help to test the predictions of the wage determination theories. In particular, we use a data set gathered in 2006 through personal interviews with managers in Spanish manufacturing plants with fifty or more employees, which represents a unique source of information about a range of HRM practices in Spanish firms.

The data was drawn from personal interviews with one of the managers at the plant. Questions were addressed initially to the human resources manager. When there was no human resources manager in the plant, the general manager was interviewed, since this figure also has extensive knowledge of the HRM policies in an establishment. In practice the human resource manager was the figure most frequently interviewed.

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 in the existence of a variety of internal labor markets with different features within the same organization. Limiting the study to manual workers makes comparisons across establishments easier.

The range of potential respondents for the purposes of the survey comprised all Spanish manufacturing establishments which had fifty or more employees in 2005. 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 managers who agreed to answer our questionnaire were performed by specially-trained professionals in computer-assisted telephone interviews (CATI). 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[2]. Since our analysis focuses on pay settlements, we only take into account those plants in which there have been generalized wage increases for production workers in any of the three years previous to the collection of the data[3]. A total of 278 plants reported that there had not been a general wage increase for production workers in any of the previous three years. Consequently, the sample size decreases to 723 establishments. In addition, some

of the interviewees did not report information on some of the variables of interest for our analysis. Since the regressions include only the plants for which we have information on all variables, the final sub-sample used in the estimations comprises a total of 602 observations.

We consider the following pressures on wage adjustments as dependent variables in the empirical analysis: the cost of living, comparability with other firms' wages, the fulfillment of collective agreements at the sector level, the need to recruit and retain employees of the establishment, the performance of the organization, and the need to maintain a good industrial relations climate. The variables capture the importance given to each factor when wages are increased on a scale ranging from 0 (unimportant factor) to 10 (very important factor). For the purposes of our analysis, these variables are ipsatized in order to obtain homogeneous scores across the different establishments and facilitate the interpretation of the regression results.

Three groups of variables are included in the regressions as explanatory factors. The first set refers to the workplace structural factors and the conditions of the product market: the size of the plant, belonging to a multinational corporation, and the degree of competition. The second category includes variables related to the HRM strategy and the characteristics of the human capital in the organization: the provision of training, the percentage of workers with a university degree, the presence of internal promotions and the percentage of permanent workers (these two variables represent the existence of

internal labor markets), the wage level paid by the employer and the use of pay for performance systems. The last group comprises the wage-setting arrangement that operates in the establishment (i.e. plant or firm collective agreement, sector collective agreement or another mechanism of wage determination) and the influence of trade unions[4]. The definitions, means and standard deviations of all variables are included in Table 1.

Methodology

The data set contains information on the pressures that affect wage adjustments only for plants where there were general wage increases for production workers in one of the three years previous to the collection of the information. Therefore, it is possible that we face sample selection bias in the analysis. In order to account for this possibility we have proceeded as follows. As a first step, we have estimated a probit model of the determinants of the existence of wage increases, which is our selection variable, and used this estimation to calculate the inverse Mills ratio.

An issue worth mentioning regarding this sample selection correction is that we have included the same set of regressors both in the selection and the outcome equations, that is, we have no exclusion restriction. The reason for proceeding in this way is twofold. Firstly, we have examined the collinearity between the regressors (using the VIF and the condition number indicators) in order to preclude estimation problems

in addressing the sample selection issue. The results of the collinearity check reveal a VIF under 10 and a condition number under the critical value of 30 established in previous studies (see for example Leung and Yu, 1996)[5]. Secondly, we have not been able to identify an appropriate exclusion restriction supported by theoretical arguments, and the inclusion of such restrictions without having robust arguments to do so could harm the performance of the sample selection estimators (see Puhani, 2000).

Then, we have estimated the determinants of the importance attributed to each of the external and internal criteria in terms of ordinary least squares, including the inverse Mills ratio as an additional regressor in all the outcome equations. The results show that the estimated coefficients of the inverse Mills ratio are not significant in any of the outcome equations, which suggests the absence of sample selection bias in our models[6]. Consequently, we have finally estimated each of the equations of interest by ordinary least squares without including the inverse Mills ratio, since the absence of selection bias suggests that this is the correct specification for our data. The results of these latter estimations are the ones described in the following section of the paper.

Results

In this section, we report the results of our empirical analysis. Firstly, we examine the importance attributed by managers to the six factors of interest. According to the descriptive statistics reported in Table 1, the cost of living and the importance

given to the fulfillment of sector agreements are the two leading influences on wage adjustments. The importance of inflation may be related to its crucial impact on pay settlements under different regulatory conditions and economic circumstances, as pointed out in the second section of the paper above (see Ingram et al., 1999). As far as the fulfillment of sector agreement is concerned, its relevance could be due to the fact that agreements at this level are prevalent in the Spanish context, covering most workers and, therefore, acting as the baseline for further pay decisions. On the other hand, the wages of the firm relative to its competitors seems to be the least important factor for management respondents. The reason for this finding could be that competing firms are governed by the same sector collective agreement, which sets equal baseline conditions for different firms.

The findings of the regression analysis are documented in Table 2. As far as the importance given to the cost of living is concerned, we observe that establishments with 500 or more employees give more importance to this factor when adjusting wages than smaller plants. This result seems to be in line with the idea that, as the size of the establishment increases, the employer uses the cost of living as a reference variable in order to determine wage increases.

Regarding the relationship between the human resource variables and the factor of interest, we observe that both the percentage of workers with a degree and the use of pay for performance have a negative impact on the importance given to the cost of

living. A plausible explanation for the results mentioned could be the following. The cost of living is a major influence on pay settlements for establishments that are heterogeneous and that operate in very different environments. Inflation could be interpreted as the "default" variable at the time of setting pay. However, it is possible that, under some circumstances, this variable has a weaker effect on wage adjustments. This could occur when establishments adopt pay for performance systems and hire a workforce with high qualification levels. Under these conditions, the employer gives a lower weight to the cost of living variable and focuses on other factors when deciding the size of the wage adjustment. In addition, the percentage of permanent workers exerts a positive effect on the significance of the dependent variable in pay settlements. Permanent workers are commonly seen as the insiders of the organization, that is, the ones with a higher influence over the determination of working conditions. Given that workers want to maintain the purchasing power of their wages, insiders have the power to demand pay adjustments that are closely linked to the cost of living.

Finally, the results concerning the effect of the wage bargaining arrangements and the influence of trade unions provide only partial support for our predictions. Establishments under a plant or firm collective agreement are more concerned about the cost of living than plants covered by bargaining at the sector level, but we expected to observe a positive influence of any type of collective bargaining on the significance attributed to the cost of living. This result seems to reinforce the idea that inflation is a

factor of major importance for pay setting even under decentralized wage arrangements (see Ingram et al., 1999). Moreover, it reflects the problems that Spanish employers have faced when trying to moderate wages and achieve low inflation under decentralized bargaining (see Royo, 2007).

Turning to comparability with wages paid in other firms, plants with between 100 and 500 employees attribute greater importance to this factor than small establishments. However, this effect is not observed in large plants. We observe an unpredicted positive correlation between the percentage of workers with a degree and the importance given to comparability. Hence, it seems that employers need to compete with other establishments if they want to hire and retain a highly qualified workforce, so they take into account what other organization pay their employees. Another unexpected result concerns the promotion of workers from within, which correlates positively with the dependent variable. We claimed that trade unions have information on the wages paid by other firms, so they may use this information when negotiating their payment conditions. The empirical analysis shows that, contrary to this expectation, the influence of trade unions is not correlated with the importance given to the comparability factor in pay settlements.

The next dependent variable is the need to fulfill sector-level collective agreements. Firstly, employers in establishments that have between 100 and 499 workers give less importance to this factor when they adjust their wages. None of the

variables related to human resource management and human capital emerge as significant in the analysis. When we look at the results obtained for the institutional variables, we find that the presence of a collective agreement at the plant or firm level exerts a negative influence on the importance given to the fulfillment of the sector level agreement in comparison to the presence of a sector agreement. Moreover, the empirical analysis shows that trade union influence results in greater concern about the factor of interest. This finding suggests that unions act as a surveillance mechanism that controls the application of agreed working conditions at sector level.

As far as the need to recruit and retain employees is concerned, we find the following relationships for the structural variables and the market conditions. Employers in establishments with 500 or more workers give less importance to this factor when they settle their wages in comparison with plants of a small size, which confirms our previous hypothesis. In addition, multinational companies are less concerned about the need to hire and retain workers than domestic firms. Finally, we find no support for the idea that the degree of competition is a positive determinant of the importance attributed by the employer to the need to recruit and retain workers.

Regarding the HRM variables, none of them emerges as a significant determinant of the importance given to the need to recruit and retain workers. The only exception is the percentage of workers with a degree, which correlates positively with the factor of interest. As far as the institutional variables are concerned, we do not

observe any significant correlation between the mechanisms of pay determination and the importance given to recruiting and retaining workers in pay settlements. On the contrary, the influence of unions exerts a negative impact on the relevance given to the need to recruit and retain workers. This result may be related to the idea that unions protect the employment prospects of insider workers at the expense of outsiders.

Turning to the consideration of the performance of the firm in pay settlements, we observe the following results. First, we predicted a negative influence of the multinational variable on the importance given to the performance of the organization, and this is confirmed by the empirical analysis. Regarding the HRM policies, we find a positive impact of the percentage of workers with a degree and the provision of pay for performance on the importance given to our factor of interest. This factor appears to be more important in establishments that sign their own collective agreement in comparison with plants covered by agreements at the sector level. Despite the fact that they give flexibility to employers to adapt to their specific conditions, the presence of a mechanism of pay setting other than collective bargaining does not seem to affect the consideration given to the performance of the organization. Finally, the influence of trade unions does not correlate negatively with the dependent variable.

The last influence on wage increases considered in our study is the need to maintain a good industrial relations climate. According to the empirical analysis, establishments with more than 500 employees give a lower importance to this variable

when setting pay than plants of a smaller size. This is contrary to our predictions that working conditions are poorer in large firms. In fact, it is not clear that job satisfaction is higher in small firms (see Clark, 1996), and the evidence that large organizations try to compensate workers for unfavorable working conditions is still inconclusive (see Belfield and Wei, 2004). A positive relationship emerges between the provision of pay for performance and the importance given to the industrial relations climate. The use of pay for performance systems is more likely in establishments where trust, consensus and information-sharing have been established between employers and workers (see Heywood et al., 1998). Hence, the fact that performance pay is used in a workplace may be associated with interest on the part of both employers and employees in maintaining a good industrial relations climate, so that this climate is a significant variable when it comes to wage adjustments. In contrast to our expectations, the importance given to the industrial relations climate does not seem to be related to the wage-setting arrangement that operates in the establishment.

Conclusions

In this paper, we have used data from Spanish manufacturing establishments to analyze the determinants of the importance given to several factors when the wages of production workers are adjusted. Drawing on the theories of pay determination and the empirical literature on the pressures on pay settlements, we have identified six

significant factors in these processes: the cost of living, the wages of the firm relative to its competitors, the of sector-level collective agreements, the need to recruit and retain workers, the performance of the firm, and the need to maintain a good industrial relations climate.

We have grouped the explanatory variables into three categories that represent circumstances related to the establishment that, in our opinion, may be relevant to the analysis of wage adjustments. These categories are: structural characteristics and market conditions, HRM policies and human capital variables, and wage-setting arrangements and trade union influence.

Regarding the first set of explanatory variables, our results show that they influence the importance attributed by managers to some of the criteria of interest. In particular, the size of the establishment and belonging to a multinational corporation correlate significantly with the importance given to factors such as the fulfillment of sector-level agreements and the need to recruit and retain employees. As far as the third set of explanatory variables is concerned, the influence of trade unions and wage-setting arrangements also play a significant role in determining the factors that shape pay settlements for production workers.

However, when we look at the impact of the HRM variables, they do not seem to be significantly related to the influences on wage adjustments for blue-collar workers. Hence, with few exceptions, the decisions concerning the adoption of HRM practices

and the six factors considered in this study seem to be to a high degree unrelated. Although we cannot give an unequivocal argument for this result, we can think of several reasons that may explain the lack of any link between HRM decisions and wage setting.

First, it is possible that employers do not integrate pay decisions in the broader HRM policy of the organization. They may decide to manage employee payments independently from other personnel practices. Whereas the provision of training and the involvement of workers in decision-making are regarded as an investment in human capital, wage adjustments may be perceived as a cost to the organization, so the management strategy adopted in each case is different.

Second, it could be that employers want to integrate wage setting decisions in the HRM policy of the organization, but they find institutional constraints on doing so. Hence, trade unions may want to control the process of wage adjustment, but they might not limit the use of other HRM practices by the employer. If unions participate in pay setting and impose restrictions on the process, but the employer is free to adopt other HRM decisions, the two processes are driven by different forces.

Overall, our results seem to indicate that Spanish employers have some room for maneuver to link their wage adjustment decisions to workplace characteristics. Hence, significant correlations emerge between the factors of influence in pay settlements for production workers and the structural variables included in the study. In particular, there

is a relationship between the size of the establishment and its foreign ownership, and some of the factors of interest. Besides the relevance of collective bargaining as a determinant of pay settlements in Spain, and the low levels of affiliation, the influence exerted by trade unions also contributes to explaining these processes. Trade union pressure results in the lower importance of factors relating to the internal conditions of the establishment, such as the need to recruit and retain workers and the performance of the organization. These results suggest that trade unions create difficulties in trying to link wage adjustments to the particular circumstances of the plant. In contrast, however, unions serve as a surveillance mechanism that monitors the fulfillment of sector-level collective agreements.

Obviously, our work is subject to the usual limitations related to the use of cross-sectional data, since causality relationships cannot be proved. In considering the generalizability of these results, the fact that the study refers to production workers and the manufacturing sector should be taken into account. An additional limitation of the study concerns the factors included as determinants of wage adjustments. Certainly, other variables may also have an effect on pay settlements. This is the case of the previous wage level of the establishment and the going rate within the industry. Future research on the topic should account for the effect of these factors in pay settlements, and use longitudinal instead of cross-sectional data.

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Notes

1.All the studies mentioned focus on the analysis of the British context. The reason for the amount of research in relation to Britain is the existence of databases, such as the WERS (Workplace Employment Relations Survey) and the CBI (Confederation of British Industry) Pay Databank survey, which provide information on the factors behind pay settlements at the establishment level.

2.The response rate for the survey is similar or slightly higher to the response rate obtained in other surveys that explore human resource management practices and organizational characteristics (see for example Diaz-Fernandez et al., 2012; Goergen et al., 2012; or Roche and Teague, 2011).

3.The questionnaire provides information on pay settlement influences for plants that set general wage increases, but not for ones that have not changed or have decreased them. We think that this does not compromise the purposes of our study, since wage increases and wage decreases may be driven by different forces (see Ingram et al., 1999).

4.Our measure of trade union influence is based on the perceptions of the manager interviewed. Unfortunately, we do not have a more objective indicator such as union density. The main reason for not including a question about union density in the questionnaire was that, based on our previous experience, managers do not have precise information on this matter. On the other hand, the measure of trade union influence based on manager perceptions has already been used in previous research (see Bayo-Moriones and Huerta-Arribas, 2002).

5. Mean VIF = 1.08; Condition Number = 28.64

6.Besides these two-step models, we have estimated the outcome equations using the full-information maximum likelihood method (see Puhani, 2000). This full-information maximum likelihood estimator fits the model using a bivariate probit and generally displays better statistical properties than the two-step estimator. Again, the results suggest the absence of a sample selection bias. The results of the two-step and full maximum likelihood selection models are available from the authors on request.

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Table 1: Variable Definitions and Descriptive Statistics

Variable	Definition	Mean	Std. Dev.
Cost of Living	Importance given to the cost of living when wages are increased. Standard variable	0.226	0.148
Comparability	Importance given to the wages of the firm relative to its competitors when wages are increased Standard variable	0.105	0.077
Collective Agreement Fulfillment	Importance given to the fulfillment of sector agreements when wages are increased. Standard variable	0.244	0.177
Need to Recruit and Retain	Importance given to the need to recruit and retain employees when wages are increased. Standard variable	0.113	0.081
Performance of the Organization	Importance given to the economic or financial performance of the organization when wages are increased. Standard variable	0.152	0.092
Industrial Relations Climate	Importance given to the need to maintain a good climate of industrial relations when wages are increased. Standard variable	0.161	0.080
50 to 99 Employees	1 if the establishment has between 50 and 99 workers; 0 otherwise	0.484	0.500
100 to 499 Employees	1 if the establishment has between 100 and 499 workers; 0 otherwise	0.464	0.499
500 Employees or More	1 if the establishment has 500 workers or more; 0 otherwise	0.053	0.224
Multinational	1 if the establishment belongs to a multinational corporation; 0 otherwise	0.213	0.409
Competition	Hirschman-Herfindahl index of concentration using 2007 data and 12 industry categories	0.009	0.010
Training	Percentage of workers that have received off-the-job training	82.195	211.512
Workers with Degree	Percentage of workers with a university degree	33.552	27.730
Internal Promotions*	1 if external applicants are the only source (no internal recruitment); 2 if external applicants are given preference; other things being equal; over external applicants; 3 if applications from internal and external applicants are treated equally; 4 if internal applicants are given preference; other things being equal; over external applicants; 5 if internal applicants are the only source (no internal recruitment)	4.291	0.854
Permanent Workers	Percentage of permanent workers	85.986	16.264
Wage Level*	1 if wages in the establishment are far below the average in the sector and region; 2 if wages in the establishment are slightly below the average in the sector and region; 3 if wages in the establishment are similar to the average in the sector and region; 4 if wages in the establishment are slightly above the average in the sector and region; 5 if wages in the establishment are far above the average in the sector and region	3.655	0.842
Pay for Performance	1 if any compensation system that links pay to performance at the individual, group, or plant or firm level is used; 0 otherwise	0.532	0.499
Sector Agreement	1 if the establishment is covered by a collective agreement at sector level; 0 otherwise	0.487	0.500
Plant Agreement	1 if the establishment is covered by a collective agreement at plant or firm level; 0 otherwise	0.497	0.500
Other Mechanism	1 if wages are determined by a mechanism other than collective bargaining (i. e. unilateral setting by the employer or individual bargaining with employees); 0 otherwise	0.016	0.126
Union Influence*	1 if trade unions have a very low influence over production workers; 2 if trade unions have a low influence over production workers; 3 if trade unions have a medium influence over production workers; 4 if trade unions have a high influence over production workers; 5 if trade unions have a very high influence over production workers	2.910	1.151

* The distribution of the discrete variables with more than two values is the following. *Internal Promotions*: (1) =2.02%; (2) =1.42%; (3) =9.72%; (4) =39.07%; (5) =47.77%. *Wage Level*: (1) =1.13%; (2) =6.15%; (3) =33.40%; (4) =44.77%; (5) =14.55%. *Union Influence*: (1) =11.02%; (2) =30.90%; (3) =21.22%; (4) =29.76%; (5) =7. 11%.

Table 2: Determinants of the Factors Taken into Account when Wages are Increased: Multivariate Regression

	EXTERNAL FACTORS			INTERNAL FACTORS		
	Cost of Living	Comparability	Collective Agreement Fulfillment	Need to Recruit and Retain Employees	Performance of the Organization	Industrial Relations Climate
Constant	0.152***	0.116***	0.339***	0.145***	0.127***	0.121***
	(0.053)	(0.028)	(0.060)	(0.028)	(0.032)	(0.028)
100 to 499 Employees	0.018	0.011*	-0.034**	0.007	0.003	-0.005
	(0.013)	(0.007)	(0.015)	(0.007)	(0.008)	(0.007)
500 Employees or more	0.079***	0.004	-0.002	-0.026*	-0.021	-0.035**
	(0.027)	(0.014)	(0.031)	(0.015)	(0.016)	(0.015)
Multinational	0.015	0.011	0.027	-0.029***	-0.020**	-0.003
	(0.015)	(0.008)	(0.018)	(0.008)	(0.009)	(0.008)
Competition	-0.394	0.207	0.543	0.214	-0.190	0.035
	(0.588)	(0.309)	(0.674)	(0.313)	(0.353)	(0.316)
Training	-0.009	-0.002	0.003	0.002	0.010	-0.003
	(0.017)	(0.009)	(0.020)	(0.009)	(0.010)	(0.009)
Workers with Degree	-0.156***	0.061**	-0.035	0.068**	0.060*	0.001
	(0.059)	(0.030)	(0.067)	(0.031)	(0.035)	(0.031)
Internal Promotions	0.000	0.006*	-0.012	0.003	0.003	0.000
	(0.007)	(0.004)	(0.008)	(0.004)	(0.004)	(0.004)
Permanent Workers	0.067*	-0.030	-0.050	-0.012	0.020	0.005
	(0.038)	(0.020)	(0.043)	(0.020)	(0.022)	(0.020)
Wage Level	0.007	-0.005	0.001	-0.004	-0.005	0.006
	(0.008)	(0.004)	(0.009)	(0.004)	(0.005)	(0.004)
Pay for Performance	-0.027**	-0.005	-0.002	0.004	0.018**	0.011*
	(0.013)	(0.007)	(0.014)	(0.007)	(0.008)	(0.007)
Plant Agreement	0.033***	0.005	-0.068***	-0.002	0.025***	0.007
	(0.012)	(0.007)	(0.014)	(0.007)	(0.007)	(0.007)
Other Mechanism	0.093	0.001	-0.084	-0.041	0.022	0.010
	(0.057)	(0.030)	(0.065)	(0.030)	(0.034)	(0.031)
Union Influence	-0.003	-0.000	0.013**	-0.006**	-0.005	0.002
	(0.005)	(0.003)	(0.006)	(0.003)	(0.003)	(0.003)
R^2	0.058	0.026	0.066	0.065	0.054	0.020
N	602	602	602	602	602	602

*** p<0.01, ** p<0.05, * p<0.10
Note: Standard errors in parentheses