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The Determination of Wages of Newly Hired Employees: Survey Evidence on Internal versus External Factors

Kamil Galuščák, Mary Keeney, Daphne Nicolitsas, Frank Smets, Pawel Strzelecki, Matija Vodopivec*

Abstract

This paper uses information from a rich firm-level survey on wage and price-setting procedures, in around 15,000 firms in 15 European Union countries, to investigate the relative importance of internal versus external factors in the setting of wages of newly hired workers. The evidence suggests that external labour market conditions are less important than internal pay structures in determining hiring pay, with internal pay structures binding even more often when there is labour market slack. When explaining their choice firms allude to fairness considerations and the need to prevent a potential negative impact on effort. Despite the lower importance of external factors in all countries there is significant cross-country variation in this respect. Cross-country differences are found to depend on institutional factors (bargaining structures); countries in which collective agreements are more prevalent and collective agreement coverage is higher report to a greater extent internal pay structures as the main determinant of hiring pay. Within-country differences are found to depend on firm and workforce characteristics; there is a strong association between the use of external factors in hiring pay, on the one hand, and skills (positive) and tenure (negative) on the other.

JEL Codes: J31, J41.
Keywords: Wage rigidity, newly hired workers, internal pay structure, employee turnover, business cycle, survey data.

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Nontechnical Summary

Using information from a rich firm-level survey on wage and price setting practices in 15 European Union countries, we investigate the determinants of the wages of newly hired workers. The evidence collected contributes to the debate on the flexibility of wages of new hires (see, *inter alia*, Haefke *et al.*,2008; Gertler and Trigari, 2009; Pissarides, 2009) an issue of great importance for job creation and for the behavior of employment and wages over the business cycle.

We find that external factors, such as the wages of similar workers in terms of qualifications and experience outside the firm and the availability of similar workers in the labour market, receive less attention in setting wages of new hires compared to internal pay structures or collective agreements. Furthermore, the extent to which employers are reluctant to differentiate the wages of newly hired workers from those paid to incumbents varies depending on labour market conditions; with more firms prepared to pay a higher than a lower wage. When explaining their reluctance to deviate from the going wage in hiring pay, employers refer to fairness considerations and the possible negative impact of such a decision on worker effort confirming the importance attributed to such considerations by *inter alia* Bewley (1999).

However, this average sample behaviour masks differences in hiring pay practices between as well as within countries. Cross-country differences are strongly correlated with institutional factors such as bargaining structures, while within-country variation appears to be correlated with firm, workforce and product market characteristics. The skill and tenure composition of the workforce appear to be associated with hiring pay determination. Firms in which the workforce is more skilled are more likely to use external labour market conditions in hiring pay determination since the wage paid in such firms is likely to be higher than the going wage. Firms with a long-tenured workforce are less likely to deviate from the going wage since internal pay structures are very important. External labour market conditions are also important for firms facing a higher degree of competition, while they are less important for firms with high collective agreement coverage since in the latter type of firms collective agreements prevent the payment of a lower wage.

This being a survey, and despite the fact that employers were asked hypothetical questions about what they would do when faced with high unemployment or short labour supply, the results cannot be generalised. The survey was conducted at a time when labour markets were in general tight. The economic and financial crisis that has started to unfold since the second half of 2008 could prove that employers behave differently.

1. Introduction

Micro studies of the degree of wage rigidity usually focus on the wages of employees in ongoing employment relationships. The degree of rigidity of the wages of newly hired workers — with rigidity in this context referring to the absence of deviations of the wage paid to new hires from that paid to incumbent employees with similar qualifications and experience —has been investigated less. This is so despite the importance of the matter for job creation and for the behaviour of employment and wages over the business cycle (see *inter alia* Pissarides, 2009 and Haefke *et al.*, 2008). For example, using a macro-economic model that allows for different degrees of rigidity in the wages of new hires versus incumbents, de Walque *et al.* (2009) show that higher stickiness of wages of new hires leads firms to respond to shocks by adjusting employment. As a result, the response of nominal wages and inflation to shocks is subdued.

Empirical research on the degree of rigidity in the wages of newly hired workers relies, in most instances, on earnings data for individuals moving between jobs with rigidity being measured by the extent to which macroeconomic conditions impact on the wages of job changers. Most studies find that hiring pay is considerably more procyclical than the pay of incumbents (see, *inter alia*, Vroman, 1977 and Vroman, 1978; Bils, 1985; Carneiro *et al.*, 2008 and Pissarides, 2009, for an overview). In order to find out, however, whether the apparent responsiveness of wages is capturing compositional effects (e.g. due to the procyclicality in the share of quality jobs) rather than true flexibility in hiring pay, one should control for firm, individual and job characteristics. While the use of data on individuals moving between jobs controls for individual characteristics, it does not permit conditioning on firm and job features unless this information is also available. Gertler and Trigari (2009) argue that the use of matched employer-employee datasets with information about the job is important in testing for such wage rigidity. Alternatively, one could use qualitative firm-level survey data to address the issue of wage rigidity of newly hired employees, since in that case the employer directly reports on the practices followed (see, *inter alia*, Bewley, 1999; Agell and Lundborg, 2003; Hall and Krueger, 2008). The results from studies using these last two types of data — matched employer-employee datasets with information about the job and direct survey data — are not conclusive.

This paper adds to the empirical literature on the wages of newly hired workers by using a rich firm-level survey dataset to investigate the extent to which pay of new hires in a large number of firms located in 15 European Union (EU) countries is rigid. More specifically, the following five questions can be addressed with the available data:

a. What is the relative importance of external labour market conditions compared to internal pay structures in the determination of the wages of newly hired workers?

b. Does the relative importance of external labour market conditions in the determination of the wages of newly hired workers vary according to the prevailing labour market conditions?

c. What reasons do firms report for being reluctant to deviate from the going wage?

d. Is there cross-country variation in the relative importance of external labour market conditions in determining hiring pay, and is this related to differences in institutions?

e. Which type of firm is more likely to be influenced significantly by external labour market conditions in determining the pay of new workers?

The results suggest that external labour market conditions are relatively less important than internal pay structures in determining hiring pay. When explaining their choice firms allude to fairness considerations and the need to prevent a potential negative impact on effort. Cross-country differences are found to depend on institutional factors (bargaining structures) while within-country differences are found to depend on firm and workforce characteristics; a skilled workforce and a short-tenured workforce increase the probability of using external factors in hiring pay determination.

The paper is organised as follows. Section 2 sets out the framework within which we analyse the determination of pay of newly hired employees. Section 3 starts off with a brief presentation of the data set used and proceeds to address questions (a)-(c) set out above. Section 4 looks at cross-country differences in the practices determining hiring pay and investigates the role of institutional factors in explaining these differences (question (d) of the above). Section 5 focuses on the associations of firm and workforce characteristics with cross-firm differences in the use of external factors (question (e) of the above). Finally, Section 6 summarises and concludes.

2. A Framework for Analysing the Determination of Pay of Newly Hired Workers

In a schematic way, and borrowing from Hall and Krueger (2008), employers can either offer new employees a predetermined (posted) wage or they can bargain with them over the wage. In the former case, the predetermined wage could be either the wage paid to existing employees with the same qualifications, as in Gertler and Trigari (2009), or some other wage.

Gertler and Trigari argue that, for reasons of economies of scale in bargaining, the posted wage is likely to be the contract wage. By implication, the extent to which wages are posted depends on the prevailing institutional setting in which bargaining takes place. In countries or sectors in which collective bargaining is common, the posted wage is likely to be the contract wage. In contrast, economies of scale are unlikely to be reaped if individual-level bargaining is the norm. Hall and Krueger (2008) find some evidence that sectoral and institutional features determine the extent of wage posting; 'Union members and those who took government jobs report knowing the wage exactly with substantially higher frequency.'(p.12)

Firms might not be willing to deviate from an established internal pay structure if such a deviation impacts negatively on workers' effort. As Bewley (1999) explains at length, firms are conscious of negatively affecting worker motivation since this shapes the extent to which workers cooperate, share information and take initiatives. Differences between firms in the extent to which worker cooperation, information sharing and development of initiatives is important, explains why the adoption of and abidance by an internal pay structure is not universal. Accordingly, Bewley distinguishes between *primary* and *secondary* jobs. *Primary* jobs are usually long-term and full-time, whereas *secondary* jobs are often short-term and part-time.[1] Primary-job employers are concerned with the impact of pay on employee turnover, on their ability to hire in the future, on the quality of job applicants, and on worker morale. Secondary-job employers, on the other hand, are predominantly interested in being able to hire since they know

[1] A similar distinction was made by Okun (1981) between career jobs and casual jobs. Okun states 'One would expect wages for casual jobs to respond much more to cyclical weakness of the labour market than wages for career jobs' (Okun, 1981; p.106).

that this will be a recurring event. Each business activity sector can contain both primary and secondary jobs although in certain sectors one type of job dominates. For example, manufacturing companies have in general a larger share of primary-type jobs, while most jobs in retail trade and hotels and restaurants are more likely to be of the secondary type.[2]

Firm-level characteristics which may influence the likelihood of having an internal pay structure include the line of business, as already mentioned, the age of the firm and whether the firm is expanding or not.

Workforce characteristics determining hiring pay flexibility include workforce tenure and turnover, the use of variable pay, type of working contract (indefinite or fixed), number of working hours (part-time vs full-time), and the skill composition of the workforce. Internal equity considerations are linked to long tenure and low employee turnover. Since employees on fixed-term contracts and those working part-time are less likely to engage in pay comparisons within the firm, employers have less reason to link their pay to that of full-time employees on permanent contracts. However, firms with a high share of employees either on fixed-term contracts or working part-time are more likely to follow a collective agreement in order to avoid frequent bargaining. Furthermore, it is likely that employers when setting the pay of specialised and managerial jobs pay more attention, than when setting the wages of semi-skilled or skilled workers, to external labour market conditions. Bewley finds that wages of newly hired skilled and semi-skilled workers are more rigid than those of employees in managerial jobs since the latter kind of jobs are more difficult to define and to compare across individuals.

Finally, *product market* characteristics such as the structure of the product market in which the firm operates can also impact on the flexibility or otherwise of hiring pay. Conditional on labour costs being an important share of total costs, lower hiring pay which leads to a decrease in prices, could be to the advantage of firms facing more intense competition and high demand elasticity.

The above suggest that the probability of wage rigidity in the wages of new hires depends both on institutional features (bargaining structures) and on workforce, firm and product market characteristics.

3. The Importance of External Factors in the Determination of Pay of Newly Hired Workers

3.1 The Data

The data used in this paper are drawn from the replies of Chief Executive Officers or Human Resource Managers of around 15,000 firms to a firm-level survey on wage and price-setting procedures conducted in 15 EU countries using a more or less harmonised questionnaire.[3] The survey was conducted in each country once at some point between Summer 2007 and Spring 2008. The questionnaire was developed by the survey group of the Wage Dynamics Network (WDN), a European System of Central Banks (ESCB) Research Network studying wage and

[2] Foster *et al.* (2002) compare job flows between manufacturing and retail trade in the US and conclude that job flows are around 50% higher in retail trade compared to manufacturing.

[3] The 15 countries are: Austria, Belgium, Czech Republic, Estonia, France, Greece, Hungary, Ireland, Italy, Lithuania, Netherlands, Poland, Portugal, Slovenia and Spain. More information on the survey questionnaire and the sample can be found in Druant *et al.* (2009).

labour cost dynamics in the euro area (EA) and the EU and the implications of these dynamics for monetary policy. The survey collects information on wage and price-setting practices; wage-setting practices refer to those followed by the largest occupational group within the firm, while information on price-setting practices is drawn with reference to the firm's main product. The dataset is not fully balanced in two respects: first, although a core set of sectors (manufacturing, trade, transport & communication) is covered in all countries, certain sectors (utilities, construction, financial intermediation, non-market services, hotels & restaurants and business services) are not sampled in all countries.[4] Second, although the vast majority of variables is available for all countries, some variables are missing from a number of countries.[5]

The main value added of this paper is that instead of trying to infer the degree of rigidity of the wages of new hires through employees' wages, managers themselves *reveal* the main determining factor of new hires' pay and, in some countries, also provide their reasoning behind their behaviour.[6] The pitfall, on the other hand, is the absence of actual wage data. The principal variables of interest for this paper arise from the following three questions:[7]

Q.I Considering the main occupational group in your firm please choose a single option to indicate the most relevant factor in determining the entry wage of newly hired employees:

a. The collective pay agreement (independently of the level at which this is signed)
b. The wages of similar employees in the firm
c. The wages of similar employees outside the firm
d. The availability of workers with similar characteristics in the labour market
e. Other reasons

Q.II If there is abundance in the labour market in terms of the workers you are seeking to hire, do you pay newly hired employees a significantly lower wage than that paid to individuals with similar qualifications and experience already employed in the firm?

a. Yes
b. No, because

i. This would be perceived as unfair and earn the firm a bad reputation
ii. This would impact negatively on the work effort of new employees
iii. This is prevented by labour regulation or the collective pay agreement
iv. Unions would contest such action
v. Due to other reasons

Q.III If there is a shortage in the labour market in the workers you need to hire, and you have difficulty in attracting new workers, do you give newly hired employees a significantly higher wage than that paid to similarly qualified employees already in the firm?

[4] Some sectors are missing from just a handful of countries (e.g. business services are covered in all countries bar Spain, hotels and restaurants are also covered in all countries with the exception of Belgium). Other sectors, however, are only sampled in a few countries (e.g. utilities, construction, financial intermediation and non-market services).

[5] A minor asymmetry also exists with respect to firm size; while in all countries the sample includes firms with over 5 employees, for the Czech Republic only firms with over 20 employees are included in the sample.

[6] Blinder (1990) and Bewley (1999) discuss the value of survey data in economic analysis.

[7] Details of differences in the formulation of the questions in a few countries, as well as the way these were dealt with, can be found in the Appendix.

a. Yes
b. No, because
    i. This would be perceived as unfair by existing employees
    ii. This would have a negative effect on the work effort of existing employees
    iii. This is prevented by labour regulation or the collective pay agreement
    iv. This would generate pressure by existing employees for wage increases
    v. Due to other reasons

In what follows, we assume that external (internal) labour market conditions are the most important determinant of hiring pay if firms choose options c or d (a or b) in Q.I.

3.2 Do the Wages of Newly Hired Workers Follow the Internal Pay Structure or the Labour Market?

Table 3.1 summarises the replies to the first question (Q.I). Information is presented for the full sample and for three subsamples which arise from the differences in the formulation of Q.I and the availability of information on the second and third questions (Q.II and Q.III). Column (1) refers to the full sample, the second column (Sample A) presents data for a sample of the 12 countries which asked for a single option in Q.I (all countries except for France, Italy and Poland), and the third column (Sample B) shows the information for three countries, excluded from Sample A, in which firms *ranked* the options in Q.I.[8] The fourth column (Sample C) refers to the sample of eight countries (Czech Republic, Estonia, Greece, Hungary, Italy, Lithuania, Poland and Slovenia), in which firms were also asked Q.II and Q.III.

The fact that stands out from all samples is the lower importance given to external factors in the determination of the wages of newly hired workers.[9] Column 1, which reports the results for the full sample, shows that only about a fifth (21.7%) of all firms report that external labour market conditions are the most important determinant of hiring pay. The breakdown between the two internal and the two external factors is best judged from column 2 which includes only the replies from firms in countries which asked for a single option; the support for each of the two internal sub-factors (collective pay agreement, wages in the firm) and the two external sub-factors (wages outside the firm, available labour supply) is similar further justifying the decision to group the two internal and the two external factors together. As the results presented in column 3 suggest, the firms scoring options also ranked internal factors higher than external factors. Finally, internal factors also dominate in the determination of wages of new hires in Sample C—the subsample of countries which provide answers to Q.II and Q.III. (column 4).

Since the four sub-factors are exhaustive, external and internal factors are complementary. The rest of the paper is couched in terms of external factors.

3.3 Does the Relative Importance Given to External Factors Vary According to Labour Market Conditions?

The reluctance of firms to follow labour market conditions as signaled in their responses to Q.I. is confirmed through their positive replies to the second and third questions (Q.II and Q.III)

[8] The Appendix outlines the transformation followed to make the replies of Sample B countries consistent with those of Sample A.
[9] A two-sided t-test cannot, at the 1% level, reject the hypothesis that the proportions arising from the different subsamples are equal.

Table 3.1: Importance of Internal and External Labour Market Conditions in Hiring Pay Determination (% of firms)

Factor[a]	Full sample	Sample A[b]	Sample B[c]	Sample C[d]
	(1)	(2)	(3)	(4)
Collective pay agreement	N/A	40.5	N/A (2.7)	N/A
Wages in the firm	N/A	46.0	N/A (3.1)	N/A
Internal factors	78.3	86.5	70.6 (2.9)	74.2
Wages outside the firm	N/A	6.5	N/A (2.2)	N/A
Labour supply	N/A	7.0	N/A (2.6)	N/A
External factors	21.7	13.5	29.4 (2.4)	25.8
Total	100.0	100.0	100.0	100.0

Source*:* Survey database

[a] Employment weighted averages
[b] Sample A includes the 12 countries (AT, BE, CZ, EE, GR, HU, IE, LT, NL, PT, SI, SP) in which firms selected a single option in Q.I.
[c] Sample B represents the three countries (FR, IT and PL) which ranked options (a)-(d) in Q.I. on a 1-4 scale increasing in relevance (not relevant-1, of little relevance-2, relevant-3, very relevant-4). The average score is presented in brackets.
[d] Sample C includes the eight countries (CZ, EE, GR, HU, IT, LT, PL, SI) in which Q.II and Q.III were also asked.

for the sample of eight countries (Sample C in Table 3.1) which asked these questions (Table 3.2). While the information presented in Table 3.2 is consistent with the figures in Table 3.1, in that it confirms the reluctance of firms to deviate from the going wage, it seems that even fewer firms are willing to deviate from the going wage when the issue is posed more directly. The gap is not due to differences in sample composition; to the contrary the support for external factors in column 4 of Table 3.1 which looks only at the subsample of eight countries for which information on Q.II is available (25.8%) is higher than for the whole sample (21.7%).

The information presented in Table 3.2, although not direct since it refers to a hypothetical situation, suggests that hiring pay policy may vary depending on whether the labour market is loose or tight. A little over 13% of firms report they would pay new hires a wage lower than the going wage in a loose labour market, while 16% of firms are prepared to pay a wage higher than the going wage in a tight labour market. A one-sided t-test shows that the difference is significant at the 1% level. Finally, a mere 5% of firms are prepared to be flexible in both loose and tight labour markets.

3.4 What Prevents Firms from Deviating from the Going Wage?

A value added of surveys is that one can also ask firms for the *reasons* behind certain behaviour. Firms were asked to explain *why* they were reluctant to deviate from the wage paid to incumbent workers when setting the wages of new hires. Table 3.3 reports the distribution of firms across the different reasons given. The point that stands out is the importance attributed by firms to *fairness* considerations and to the *possible negative impact on effort*.

These findings are consistent with the conclusion reached by Bewley (1999, 2007) who reports that firms are especially wary of the negative impact that a deviation from the going wage, even

Table 3.2: Deviation of Hiring Pay from the Going Wage Depending on Labour Market Conditions (% of firms)

Direction of deviation and labour market conditions	%[a,b]
Lower wage in loose labour market	13.4
Higher wage in tight labour market	16.0
Deviation in both loose and tight labour markets	5.3

Source: Survey database

[a] Refers to the sample of eight countries (CZ, EE, GR, HU, IT, LT, PL and SI) which asked Q.II and Q.III.
[b] Employment weighted averages

for newcomers, could have on the morale of the workforce.[10] In addition, there is a significant role for labour regulations and collective agreements in preventing the offer of a wage lower than that paid to incumbents in a weak labour market.

Next we explore some of the cross-country differences in the replies given to Q.I-Q.III.

Table 3.3: Reasons Preventing Deviation from the Going Wage for New Hires (% of firms amongst those replying they would not deviate)

Reasons preventing the payment of:[a,b]	Lower wage	Higher wage
Unfair/bad reputation	32.9	39.2
Negative impact on effort	36.2	35.3
Labour regulation/Collective agreement	28.1	11.7
Unions would contest such action	1.6	—
Possible pressure for wage increases	—	13.0
Other	2.9	2.6

Source: Survey database

[a] See notes a and b to Table 3.2
[b] Each column sums to a little over 100 since some firms selected more than one reason.

4. Cross-country Differences in Hiring Pay Determination and the Role of Bargaining Structures

Simple averages as those in Tables 3.1-3.3 might hide substantial heterogeneity not least between countries. This section addresses two questions. First, do the summary statistics in the tables above vary across countries? Second, is this cross-country variation linked to differences in bargaining structures?

[10] Fehr *et al.* (2009) take a slightly different view claiming that fairness considerations are only important for incumbent workers.

4.1 Cross-country differences in the rigidity of hiring pay

The data in Table 4.1 below suggest substantial cross-country variation in the relative importance of external factors. In Spain, Austria and Slovenia less than 10% of firms reply that external factors are the main factor determining hiring pay, while in Lithuania and Poland this is true for over 40% of firms. Table 4.2 presents the percentage of firms in each country prepared to pay a lower (higher) wage in a loose (tight) labour market. The variation here is not as large as that in Table 4.1—as evidenced also by the significantly lower coefficient of variation of the figures—a result no doubt also due to the smaller number of countries for which this additional information is available. A fact that stands out, however, is that countries differ in the extent to which their behaviour is symmetric in the two distinct labour market states. While in Estonia, Greece and Slovenia the percentage of firms willing to pay a lower wage in a loose labour market does not differ considerably from that prepared to pay a higher wage in a tight labour market, the same is not true in other countries. In the Czech Republic, Hungary and Italy substantially more firms are prepared to pay a higher wage in a tight labour market than to pay a lower wage in a loose labour market.[11] A formal test of the equality of the two proportions within countries is rejected (at the 1% level) in all countries except in Estonia and Slovenia.

Table 4.1: Importance of External Labour Market Conditions in Hiring Pay Determination: Individual Country Evidence (% of firms in each country)

Country[a,b]	% firms	Country	% firms
Austria (AT)	7.3	Italy (IT)	13.1
Belgium (BE)	14.0	Lithuania (LT)	41.6
Czech Republic (CZ)	13.0	Netherlands (NL)	12.3
Estonia (EE)	32.0	Poland (PL)	50.5
France (FR)	32.5	Portugal (PT)	23.3
Greece (GR)	26.5	Slovenia (SI)	8.3
Hungary (HU)	11.6	Spain (ES)	4.4
Ireland (IE)	26.9	**Total**	21.7

Source: Survey database

[a] Employment weighted averages.
[b] The coefficient of variation of the above figures is 64.2%.

4.2 The Role of Bargaining Structures in Explaining Cross-Country Differences in Hiring Pay Determination

This section tests whether cross-country differences in bargaining structures can explain cross-country differences in the relative support for external factors. The arguments in the literature presented in Section 2 suggest hiring pay might depend on the prevailing institutional setting.[12]

[11] We do not investigate here at length the reasons behind this asymmetry. However, from preliminary work in this direction, we are not able to find evidence to support the Gertler, Huckfeldt and Trigari (2008) hypothesis that the asymmetry in hiring pay procedures reflects composition bias; the asymmetry is also observed within sectors. Babecký *et al.* (2008) attribute the asymmetry in the Czech Republic to collective bargaining agreements which prevent underbidding.

[12] In the context of a single country, Bewley (1999), in his survey of US firms, finds that both union and non-union firms set the pay of new hires so as to be comparable with that of incumbents with similar skills suggesting that institutional differences are not important.

Table 4.2: Deviation of Hiring Pay from the Going Wage Depending on Labour Market Conditions (% of firms in each country)

Country[a,b]	Loose labour market	Tight labour market	In both conditions
Czech Republic (CZ)	10.4	16.2	4.1
Estonia (EE)	18.1	17.9	5.3
Greece (GR)	15.5	15.1	2.9
Hungary (HU)	11.8	17.3	6.3
Italy (IT)	12.5	23.5	7.6
Lithuania (LT)	18.4	12.4	6.1
Poland (PL)	15.7	5.8	2.9
Slovenia (SI)	4.4	4.0	1.0
Total	13.4	16.0	5.3

Source: Survey database

[a] Employment weighted averages.
[b] The coefficient of variation of the figures in each of the above three columns are 34.7%, 46.1% and 48.4% respectively.

We focus on two dimensions of bargaining structures: (a) the enforcement or otherwise of a collective agreement—independently of the level this agreement is signed at, and (b) collective agreement coverage. Cross-country differences across these dimensions are significant as widely documented (see, *inter alia*, Du Caju *et. al.*, 2008; OECD, 2004) and as revealed by evidence from the survey used in this paper. In some countries — such as Austria, Belgium, France, Italy, Slovenia and Spain—nearly all firms enforce a collective agreement, while in others—such as Hungary, Estonia and Poland—less than 20% of firms enforce a collective agreement. Figure 4.1 suggests that there is in fact a negative association between the percentage of firms signing a collective agreement and the percentage of firms reporting external factors as the main determinant of hiring pay. Estimates of this relationship using a generalised linear model confirm this relationship which given a pseudo-R^2 of 0.40 is quite strong. As expected a negative association is also found between collective agreement coverage and the percentage of firms reporting external factors as the main determinant in hiring pay (see Figure 4.2). Estimates suggest that this relationship is somewhat stronger with a pseudo-R^2 of around 0.50.

Two further bargaining structure dimensions we looked at are: first, the level of centralisation at which bargaining takes place, and second, the degree of coordination between firms in each country. Using data from OECD(2004) and Du Caju *et al.* (2008) we find that centralised bargaining is associated with low relative importance of external factors conditional, however, on low inter-firm coordination.

The above suggest that institutional differences between countries regarding bargaining structures can go some way towards explaining cross-country differences. The next section explores the role of firm, workforce and product market characteristics in explaining both within-country and cross-country differences in the importance assigned to external factors.

Figure 4.1: Percentage of Firms Enforcing Collective Agreements and Support for External Factors

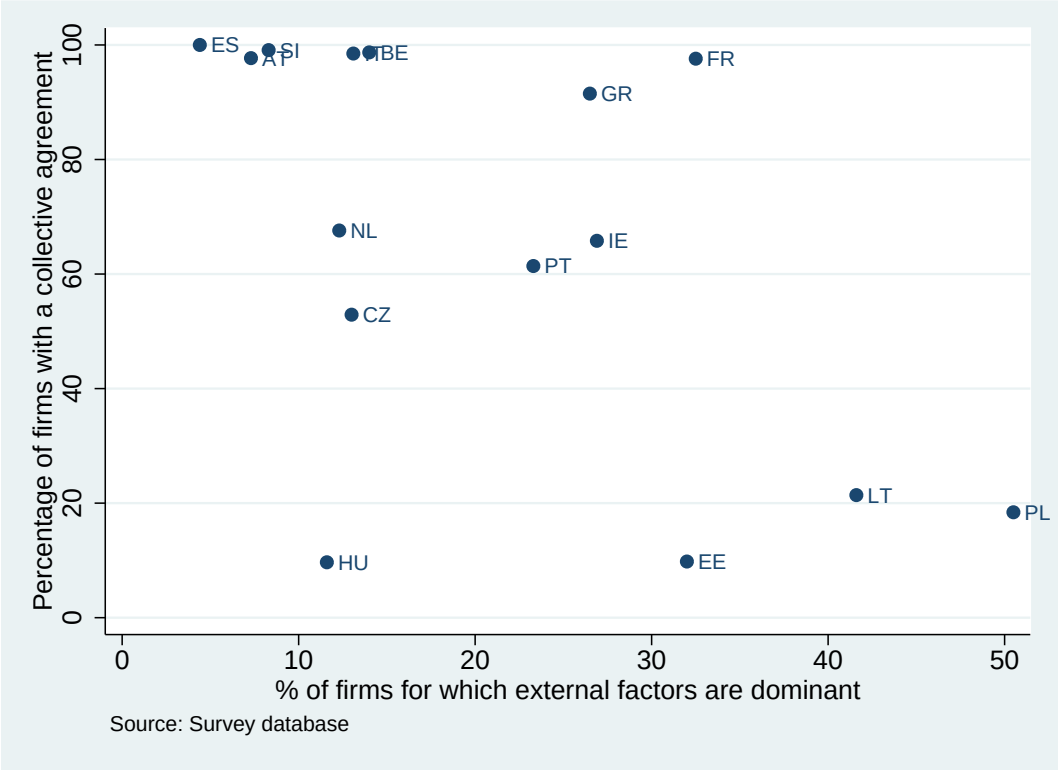
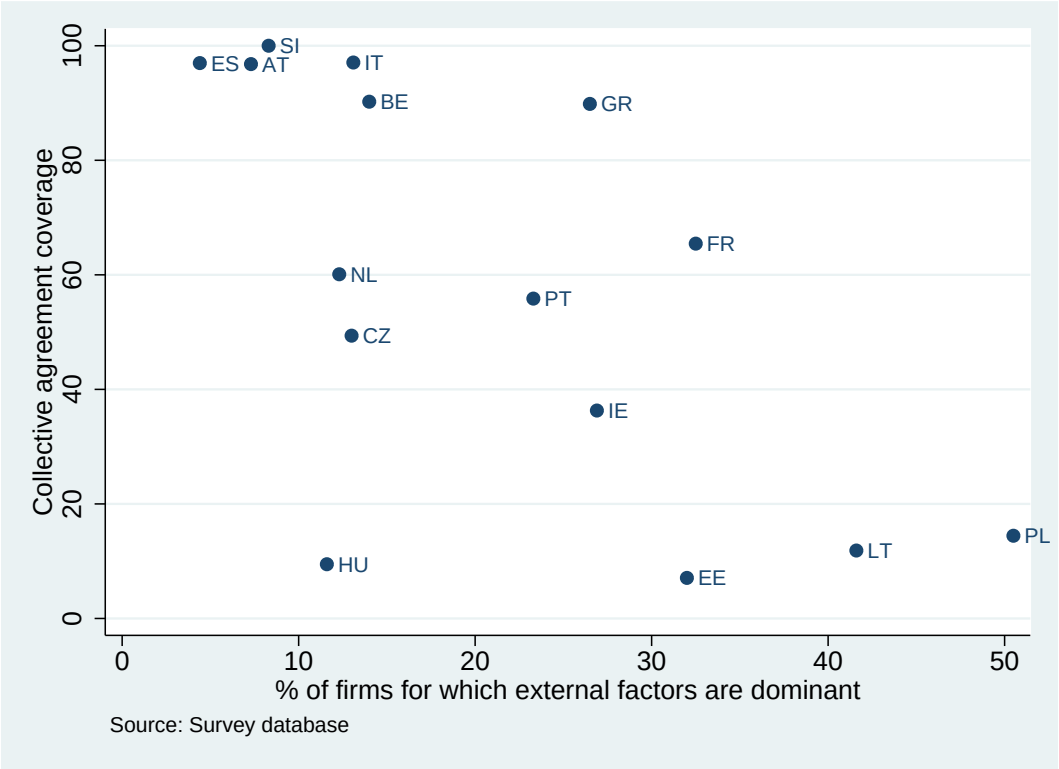


Figure 4.2: Collective Agreement Coverage and Support for External Factors



5. The Role of Firm, Workforce and Product Market Characteristics in Determining Hiring Pay

Notwithstanding cross-country differences, the evidence presented in Tables 4.1 and 4.2 suggests that even within countries there is substantial variation in the degree to which external factors are important in determining hiring pay. This section proceeds with an empirical formulation of the framework outlined in Section 2 focusing on the potential role of firm, workforce and product market characteristics in explaining differences between firms in the use of external labour market conditions in determining the pay of new hires.

The probability that external labour market conditions determine hiring pay is assumed to be correlated with three types of information giving the model the following general form:

$$Pr(E_i = 1) = \Phi(F_i, W_i, P_i) \tag{5.1}$$

where $Pr(E_i)$ is the probability that firm i reports external factors as the most important determinant of hiring pay for the largest occupational group in the firm. In the empirical formulation, Φ denotes the normal distribution function and the equation is estimated as a Probit, F represents factors relating to firm characteristics (e.g. line of business, size, age of the firm etc.), W contains workforce characteristics (e.g. skill composition of the workforce, percentage of temporary or part-time workers, extent of variable pay etc.) and P captures characteristics relating to the structure of the product market in which the firm operates. Similarly, the following two equations, (5.2) and (5.3), are used to model the probability that firms pay a lower or a higher wage respectively.

$$Pr(L_i = 1) = \Phi(F_i, W_i, P_i) \tag{5.2}$$

$$Pr(H_i = 1) = \Phi(F_i, W_i, P_i) \tag{5.3}$$

In Table 5.1 we report pooled, across countries, estimates of specifications describing the use of external factors. These equations relate the use of external factors to variables proxying the characteristics of secondary-sector firms as identified by Bewley (1999). The results presented are of a descriptive nature and do not constitute an attempt to construct a structural model since the dataset does not permit us to address issues of potential endogeneity. All estimated equations include country dummies to account for the cross-country differences identified in the previous section.

Column 1 includes only sectoral and country dummies. According to Bewley primary and secondary type jobs can be found in all lines of business. However, some lines of business include more jobs of one or the other type. The sample used in this section includes only the three lines of business sampled in all countries: manufacturing, distribution (trade), and business services. The marginal effects reported in column 1 suggest that firms in distribution and business services use external factors to a greater extent than manufacturing firms; compared to manufacturing firms the probability of using external factors is 3.2 percentage points higher for firms active in trade and 7.8 percentage points higher for business service providers. However, once firm and workforce characteristics are included (as in columns 2–4), the sector dummies are no

Table 5.1: Marginal Effects from a Probit Regression of $Pr(E_i = 1)$

Variables	Only sector dummies	Basic	Use tenure	Restricted sample
	(1)	(2)	(3)	(4)
Manufacturing (Reference group)				
Trade	0.032***	0.004	-0.001	0.004
	[0.000784]	[0.778]	[0.956]	[0.826]
Business services	0.078***	0.017	0.011	0.025
	[0]	[0.254]	[0.538]	[0.202]
5-19 employees		0.033**	0.046**	0.053***
		[0.0288]	[0.0111]	[0.00756]
20-49 employees		0.007	0.020	0.010
		[0.610]	[0.260]	[0.580]
50-199 employees (Reference group)				
>200 employees		0.011	0.005	-0.003
		[0.407]	[0.804]	[0.892]
Coverage		-0.081***	-0.076***	-0.090***
		[0]	[0]	[0]
Low-skilled BC (Reference group)				
High-skilled BC		0.051***	0.050***	0.038*
		[0.000251]	[0.00444]	[0.0395]
Low-skilled WC		0.073***	0.048**	0.042*
		[0]	[0.0333]	[0.0830]
High-skilled WC		0.138***	0.107***	0.096***
		[0]	[0]	[0]
Log of gross flows		0.012**		0.011
		[0.0149]		[0.118]
Proportion of employees with over 5 years tenure			-0.091***	
			[0]	
Competition intensity		0.028**	0.031**	0.025*
		[0.0113]	[0.0191]	[0.0848]
Country dummies	Yes	Yes	Yes	Yes
F-test—country dummies	$\chi^2(14)$=833.6	$\chi^2(13)$=493.2	$\chi^2(9)$=312.7	$\chi^2(9)$=274.3
Observations	10,624	6,992	4,638	4,073
Observed prob.	0.198	0.209	0.229	0.231
Pseudo R^2	0.0934	0.124	0.113	0.112

Robust p-values in brackets
*** p<0.01, ** p<0.05, * p<0.1

longer jointly significant. This suggests the sector dummies capture some of the variation in the incidence of collective agreements and other firm-specific characteristics. Size dummies are also not jointly significant, in any of the specifications presented, although small firms appear to be more likely than medium-sized (firms with 50-199 employees) to use external factors. Country dummies continue to be jointly significant (see F-test at the bottom of Table 5.1) but their contribution to explaining the overall variation of the dependent variable drops substantially once firm, workforce and product market characteristics are introduced in column 2.

In general, the results in columns 2–4 support the Bewley hypothesis that external factors are used in the determination of the pay of new hires in secondary-sector/jobs. Four results stand out. First, employee turnover—measured either by the size of gross flows in the firm (column 2) or by the proportion of employees with tenure over 5 years (column 3)—is correlated with the

relative importance of external factors. More specifically, a change in the ratio of gross flows (employees entering and exiting the firm as a percentage of the workforce) from 25% to 80%, is associated with an increase in the probability of using external factors by over one percentage point (from 21% to 22.2%). The impact from the change in tenure is, as expected, in the same direction. However, given that the tenure variable is less noisy than the flows variable the impact from tenure is more sizeable. The tenure composition variable is unfortunately missing for five countries (BE, ES, FR, IT, NL). The results, however, from this more restricted sample of 10 countries (AT, CZ, EE, GR, HU, IE, LT, PL, PT, SI), show that an increase in the percentage of employees with over 5 years tenure from 10% to 70% decreases the probability of using external factors by 6 percentage points (from 27% to 21%). To make sure that the change in the sample does not affect the overall estimates, column 4 reports the results from estimating the specification in column 2 using the restricted sample of 10 countries i.e. excluding the five countries for which the tenure variable is missing. The coefficients on most variables do not differ much from those reported in columns 2 or 3. The size of the coefficient on the log of gross flows remains the same, although this is no longer significant.

The second result is the positive association between the skill level of the workforce and the use of external factors. Firms are classified into four groups depending on whether the dominant group in the firm is blue-collar low-skilled (production), blue-collar high-skilled (technical), white-collar low-skilled (clerical) or white-collar high-skilled (professional/managerial). The results show that, *ceteris paribus*, in firms in which skilled white-collar workers are the dominant group, the likelihood that external factors are more important is higher (by 13.7 percentage points) compared to what happens in firms in which low-skilled blue-collar workers are the dominant group.

The third result is the higher use of external factors in firms facing more competitive product market conditions.[13] More specifically, firms which are more likely to follow competitors in lowering prices have a higher probability (by 2.5 percentage points) of using external factors. An alternative test for the impact of product market competition on hiring pay procedures was conducted for the subsample of manufacturing firms for which we have information on the export share in sales. These results confirm the results reported in column 2; companies with a high export share–i.e. facing more intense international competition – are more likely (coefficient significant at the 10% level) to report that external factors are the main determinant of hiring pay.

Finally, and in line with the results of Section 4, it turns out that firms with high collective agreement coverage have a substantially lower probability of reporting external factors as the main determinant of hiring pay. For a firm with full coverage, this probability is around 3.7 percentage points lower compared to a firm in which only half the workforce is covered.

Along the lines suggested in Section 2 we tried a number of other variables capturing workforce characteristics: the percentage of pay linked to performance, the percentage of part-time employees and the percentage of employees on fixed-term contracts. While the percentage of pay linked to performance enters positively in a non-linear fashion — indicating that performance-related pay is related to overall flexibility—the variable is missing for a number of observations thus restricting the sample further. The proportion of part-time and fixed-term employees enter with a coefficient different to that expected; more part-time (fixed-term) employment is found to be associated negatively with the use of external factors. In the first instance, this would suggest

[13] The competition dummy is missing for the Netherlands, hence only 14 countries are used in column 2.

that the hypothesis that part-time and fixed-term employment is associated with more restricted use of internal pay structures (or alternatively more extensive use of external factors)—because these workers are by definition not in the job for long — cannot be accepted. A possible interpretation of the negative coefficient is that firms which depend more on part-time or fixed-term contracts sign collective agreements more extensively in order to avoid frequent bargaining.[14]

Our next step is to find out whether coefficient estimates are robust across countries and more specifically whether the variables of interest are picking up cross-country rather than within-country effects. We break up the full sample into two groups of countries according to coverage. The first group of countries includes the 10 countries (AT, BE, GR, FR, IE, IT, NL, PT, ES and SI)—all of which belong to the euro area—in which collective agreement coverage is high, and the second group includes the remaining five countries—all of which are not part of the euro area—in which collective agreement coverage is low (CZ, HU, EE, LT, PL). The two groups differ, however, not only with respect to the average collective agreement coverage but also with respect to the degree of within-group homogeneity in this respect; the coefficient of variation of coverage for the first group of countries is only 50%, while for the second group of countries it is over 200%.

Table 5.2 presents coefficient estimates from estimating the same equation as in column 3 of Table 5.1 for the two groups of countries: high and low coverage.[15] The results suggest that with the exception of the coverage variable the other variables are picking up within-country rather than cross-country effects. Coefficient estimates on all variables do not differ either between the two groups presented in Table 5.2 or from the results presented in column 3 of Table 5.1. Given the relative low variation of the coverage variable in the high-coverage group of countries, this variable is not significant in column 1 of Table 5.2. Another fact which stands out is the much greater homogeneity of the countries in the high-coverage sample as evidenced by the much lower significance of the country dummies compared to the countries in the low-coverage sample.

A further robustness check on the results reported in Table 5.1 was done by estimating the specification in column 3 separately for each of the three sectors (manufacturing, trade and business services). The results, not reported here, show that the association with the tenure variable is stronger in trade and business services than in manufacturing.

[14] The data do in fact show such a positive correlation.

[15] The number of countries used in the estimation of column 1 of Table5.2 is just five since for the rest (BE, ES, FR, IT and NL) of the high coverage countries, the tenure variable is missing, while this variable is available for all 5 countries in the low coverage sample.

Table 5.2: Marginal Effects from a Probit Regression of $Pr(E_i = 1)$

Variables	High coverage	Low coverage
Manufacturing (Reference group)		
Trade	0.018	-0.018
	[0.430]	[0.387]
Business services	0.052*	-0.022
	[0.0529]	[0.367]
5-19 employees	0.043*	0.046*
	[0.0963]	[0.0754]
20-49 employees	-0.001	0.036
	[0.973]	[0.128]
50-199 employees (Reference group)		
>200 employees	-0.004	0.022
	[0.870]	[0.452]
Coverage	-0.034	-0.142***
	[0.141]	[0]
Low-skilled BC (Reference group)		
High-skilled BC	0.036	0.069***
	[0.145]	[0.00585]
Low-skilled WC	0.065*	0.039
	[0.0698]	[0.185]
High-skilled WC	0.089***	0.129***
	[0.00148]	[0]
Proportion of employees with over 5 years tenure	-0.066**	-0.092***
	[0.0485]	[0.00157]
Competition intensity	0.014	0.047***
	[0.472]	[0.00950]
Country dummies	Yes	Yes
F-test—country dummies	$\chi^2(4)$=50.5	$\chi^2(4)$=237.6
Observations	2,105	2,533
Observed prob.	0.212	0.242
Pseudo R^2	0.0585	0.159

Robust p-values in brackets

*** p<0.01, ** p<0.05, * p<0.1

Finally, some insight into the *reasons* behind the use or otherwise of external factors in hiring pay can be gauged from estimates of equations 5.2 and 5.3 presented in Table 5.3 for the seven countries that asked Q.II and Q.III and for which the tenure variable is available.[16] High

[16] The sample consists of seven out of the eight countries listed in Tables 4.1 and 4.2 since the tenure variable is missing for Italy.

Table 5.3: Marginal Effects from a Probit Regression of $Pr(L_i = 1)$ **&** $Pr(H_i = 1)$

Variables	Payment of a lower wage	Payment of a higher wage
Manufacturing (Reference group)		
Trade	0.007	-0.014
	[0.631]	[0.295]
Business services	0.009	0.003
	[0.584]	[0.825]
5-19 employees	0.013	-0.032*
	[0.451]	[0.0560]
20-49 employees	0.027*	-0.008
	[0.0882]	[0.597]
50-199 employees (Reference group)		
>200 employees	0.010	0.040**
	[0.603]	[0.0245]
Coverage	-0.084***	-0.012
	[0.000385]	[0.554]
Low-skilled BC (Reference group)		
High-skilled BC	0.018	0.009
	[0.288]	[0.590]
Low-skilled WC	0.020	0.013
	[0.287]	[0.470]
High-skilled WC	0.004	0.068***
	[0.843]	[0.000576]
Proportion of employees with over 5 years tenure	-0.025	-0.036*
	[0.209]	[0.0712]
Competition intensity	0.002	0.018
	[0.878]	[0.145]
Country dummies	Yes	Yes
F-test - country dummies	$\chi^2(6)$=20.7	$\chi^2(6)$=62.2
Observations	3259	3258
Observed prob.	0.126	0.126
Pseudo R^2	0.0351	0.0513

Robust p-values in brackets

*** p<0.01, ** p<0.05, * p<0.1

collective agreement coverage prevents the payment of a lower wage, high-skilled white-collar workers are positively associated with the payment of a higher wage, and long tenure decreases the probability of payment of a higher wage.

6. Summary and Conclusions

We have undertaken an investigation into the use of external labour market conditions in hiring pay. Employers' replies to a firm-level survey on the procedures followed in determining hiring pay suggest that external labour market conditions are not the main determinant of hiring pay, especially in a slack labour market. Despite this overall picture, however, the data show variation in hiring procedures both between as well as within countries. We find that the cross-country variation is strongly correlated with institutional factors (bargaining structures). Within-country variation, on the other hand, appears to be correlated with workforce, firm and product market characteristics. The skill and the tenure composition of the workforce, the collective agreement coverage and product market competition appear to be associated with the flexibility or otherwise of new hires' pay.

One of the main advantages of having survey data is that one can ask about the reasons behind the actions. Employers were asked about the reasons behind their reluctance to deviate from the going wage; fairness considerations together with the potential negative impact on effort are the main explanations given. A question of potential interest to investigate next is the link between the flexibility of wages of incumbent employees and the flexibility of wages of new hires.

This being a survey, and despite the fact that employers were asked hypothetical questions about what they would do when faced with high unemployment or short labour supply, it is not clear whether the results can be generalised. The surveys were conducted at time when labour markets were in general tight; the economic and financial crisis that has become more apparent since the second half of 2008 might prove that employers behave differently.

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Appendix

A. Differences Between Countries in the Survey Questions of Interest and the Harmonisation Process Followed

The main differences between countries in the formulation of the three main questions of interest (Q.I-Q.III in the main text) are the following:

Austria The Austrian questionnaire distinguishes the second option of Q.I. "Wage of similar employees in the firm" into two further options: "Entry wage of similar employees" and Current wage of similar employees". Around 22% of Austrian firms that replied to this question selected the first option, and around 25% of firms selected the second. For harmonisation purposes, replies to the more refined options have been added together and treated similarly to the replies to the second option by firms in other countries.

France, Italy, and Poland In the French, Italian and Polish survey firms were not asked to select one of the four options provided in Q.I but to rank, on a 4-point scale, each option according to its importance for the firm. The ranking of the options in terms of relevance extends from 1 to 4, where 1 denotes "not relevant" and 4 denotes "very relevant".

In order to systematically incorporate these three countries into the analysis, we applied the following procedure to map the responses. The goal was to compile a binary variable which would indicate, for a particular firm, whether internal or external factors are the most important in determining the wages of new hires. The mapping proceeded in three stages. First, if an internal factor was given a higher relevance score than either of the external factors, then internal factors were considered dominant (conversely, if an external factor was given higher relevance than either of the internal factors, then external factors were considered dominant). The majority of responses for the three countries, 60.4%, were mapped at this stage. For observations not mapped in the first stage, we compared the average relevance score (based on non-missing observations) for internal and external factors, and assigned observations to the appropriate group where one average was higher. At this stage, an additional 20.6% of the observations were mapped. Finally, for the remaining unmapped observations, we counted whether one set of factors had fewer refusals than the other, and assumed that fewer denials to respond meant that that set of factors was more relevant. At this stage, a further 7.9% of responses were classified. At the end, 11% of responses could not be mapped, and as such were excluded from the analysis for Question I.

Greece In Greece, Q.I was asked slightly differently: "Besides the collective pay agreement enforced in your company which of the following factors is the most relevant in determining the entry wage of newly hired employees?" Options b–e of the standardised questionnaire followed. For harmonisation purposes option a of the standardised questionnaire was reconstructed using the replies to the Questions II and III which considers the possibility that collective agreement prevents payment of a lower or a higher wage.

B. Definitions of the Variables Used in the Analysis

A description of the full survey questionnaire can be found in Druant *et al.*, 2009. Here we present the definitions of the right-hand side variables used in Tables 5.1-5.3.

Sectors of economic activity: Manufacturing (NACE rev.1.1 sectors 15-37), Distribution (NACE rev.1.1 50-52), Business Services (NACE rev.1.1 70-74 92-93)

Collective agreement coverage: Proportion of employees covered by the collective agreement enforced in the firm

Dominant skill group: Firms have been classified in four groups: according to which one of the following skill/occupational groups is dominant: blue-collar low-skilled workers (reference group), blue-collar high-skilled workers, white-collar low-skilled workers and white-collar high-skilled workers.

Log of gross flows: Log of the percentage of employees leaving and joining the firm during the last year over firm total employment at the end of the year (with the implication that firms for which the percentage of employees leaving and joining the firm is zero are excluded from the analysis).

Employee tenure: Proportion of employees with over 5 years tenure in the firm

Competition intensity: 0,1 dummy to indicate whether the firm is likely or very likely to follow its competitors in lowering prices (1) or not likely (0).

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