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The Effect of Firm-Level Contracts on the Structure of Wages: Evidence from Matched Employer-Employee Data

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ABSTRACT

In many European countries firms can either pay wages according to an industry-wide contract, or negotiate a firm-specific contract. Using a large matched employer-employee data set from Spain, we find that wages set under firm-specific contracting are about 10 percent higher than under industry-level contracts. At the employee level, the premium is similar for men and women, but is higher for more highly skilled workers. At the establishment level, we compare average wages under firm-level and industry-wide contracting, controlling for the propensity to negotiate a firm-specific contract. Again, the premium is higher at workplaces with higher average wages. Although we cannot decisively test between alternative explanations, workers with firm-specific contracts have significantly longer job tenure, suggesting that the premium is at least partially a non-competitive phenomenon.

JEL: J31, J51

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In Spain, as in many other European Union countries, wages are regulated by legally binding contracts that are periodically renegotiated through collective bargaining.[1] There are three levels of contracts: national contracts covering specific industries, regional industry-wide contracts, and firm-specific contracts. Following the general pattern throughout continental Europe, the national or regional contract applies by default. Alternatively, firms and workers can negotiate a firm-specific contract. Despite the extensive literature linking macroeconomic performance to differences in the fraction of workers covered by national or sectoral contracts (e.g., Calmfors and Driffill, 1988; Calmfors, 1993; Calmfors, 2002; Nickell and Layard, 1999; Blanchard and Wolfers, 2000) there is surprisingly little direct microeconometric evidence on whether the level of contracting exerts a systematic effect on wages.

In this paper we use a matched employer-employee data set from Spain to analyze the effect of contractual choice on the structure of wages. Our sample includes detailed information for up to 25 workers per firm at a random sample of workplaces.[2] We use these data to estimate standard micro-level models for individual wages, and a parallel set of models for average wages at the firm level, focusing on the impacts of firm-level contracts. Comparisons of wages earned by workers covered by different types of agreements suggest that wages under national and regional agreements are very similar, while wages under firm-specific agreements are about 10 percent higher. The wage premium for firm-specific contracts is broadly similar for men and women. Unlike the pattern of union wage differentials in the U.S. and U.K. (e.g., Gosling and Lemieux, 2004; Card, Lemieux, and Riddell, 2003), there is no tendency for firm-level contracts to "flatten" the wage structure across skill groups. To the contrary, we find that firm-level contracting in Spain has a bigger effect on more highly workers. This may be evidence that

[1]The legal framework for labor relations in Spain is set out in the Workers' Statute of 1980. OECD (1994) presents a detailed description of the extent and structure of collective bargaining in all OECD countries.

[2]The Workplace Industrial Relations Surveys conducted in Australia and the UK share a similar design, although these surveys have relatively small sample sizes compared to the Spanish survey.

firm-level contracts are associated with a more "flexible" wage structure.

As noted in a recent study by Dinardo and Lee (2004), microeconometric studies of collective bargaining based on samples of workers may potentially confound bargaining status with other unobserved firm-level characteristics.[3] Since contracts are negotiated at the establishment level, a better approach may be to compare wages at similar establishments that offer different types of contracts. In the absence of a research design for isolating exogenous changes in contract status, we implement a propensity score matching method (Rosenbaum and Rubin, 1983). Comparing firms with similar values for the predicted probability of adopting a firm-specific contract , we find a 5-10 percent premium over most of the range of predicted probabilities, with smaller effects at firms with the lowest probabilities of adopting firm-level contracts.

There are several alternative explanations for the positive wage premium we observe for firm-level contracts. Perhaps the simplest is rent-sharing (e.g., Krueger and Summers, 1988; Blanchflower, Oswald, and Sanfey, 1996). More sophisticated interpretations are offered by gift-exchange models (Akerlof, 1982; Akerlof and Yellen, 1988; Mahuteau, 2002) and effort-based efficiency wage models (e.g., Weiss, 1990). A third possibility is that the wage premium reflects unmeasured ability differences. These models differ in the extent to which workers' utilities are higher under firm-specific contracting than alternative pay arrangements, leading to different predictions about the relationship between firm-specific contracting and voluntary turnover. We therefore examine the differences in job tenure associated with firm specific contracts, and find substantially longer tenures (controlling for age and other factors).[4] Though far from decisive, this evidence suggests there is a rent component in the firm-specific contract premium.

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[3] Using a U.S. sample of establishments that change union status as a result of a union certification election, DiNardo and Lee (2004) find no effect of union coverage on wages, contrary to the huge body of work based on individual level wages that finds a sizeable union premium..

[4]This idea was used by Krueger and Summers (1988) to try to distinguish alternative interpretations of observed industry wage premiums.

I. Institutional Setting

During the Franco era wage setting in Spain was centralized and highly regulated. Legally-recognized trade unions and employer groups negotiated contracts covering most jobs in the economy, subject to final approval by the state (Milner and Metcalf, 1994). The post-Franco constitution established a system for the election of worker representatives to regional or industry level bargaining units, organized along the lines of the earlier regime.[5] The terms of the agreements reached at the industry and regional level between workers and employer groups are legally binding on all employees within the scope of the agreement. Thus, despite a relatively low rate of union membership (10 percent or less), collective bargaining coverage in Spain is very high (on the order of 80 percent).[6]

At the firm level, worker representatives form works councils that negotiate over issues like staffing and absenteeism policies. They can also bargain over wages, and employees have the right to strike in support of demands for a firm-specific contract with wages above the default scale.[7] According to Milnor and Metcalf (1994, Figure 1) roughly 15 percent of Spanish workers were covered by firm-level contracts in the 1980s, and the rate has remained roughly constant in the 1990s. We are unaware of any estimates of the rates that firm-specific contracts are established or dissolved, but we believe the transition rates are low, so that contract status at a workplace remains relatively stable over time.

The institutional structure of firm-specific bargaining in Spain suggests a number of similarities and differences with the process of collective bargaining in the U.S. and other "Anglo Saxon" countries with decentralized unionization. On one hand, agreeing to a firm-specific contract is similar to the process of union recognition in the U.S. The structure of wages under firm-specific contracting also

[5]The elections are in principle regulated by the state but *de facto* run by national unions. Most of the elected representatives are affiliated with one of the two major trade union organizations (the socialist UGT and the former communist CC.OO). We have been unable to find a precise description of how these regional and sectoral units are defined, but according to Milnor and Metcalf (1994) the coverage of different agreements was largely inherited from the earlier regime.

[6] Agriculture, food services, and household services industries have relatively low coverage.

[7]In principle, a firm contract can also specify wages *below* the prevailing sectoral level, although this is thought to be very rare

presumably reflects the same combination of political and economic forces as collective bargaining in the Anglo Saxon setting, with workers trying to extract and redistribute rents, and firms trying to offset increased labor costs though hiring and management practices. On the other hand, unlike the situation in the U.S. where wages in the nonunion sector are highly variable, the default wage in the Spanish context is itself the outcome of centralized collective bargaining. These considerations suggest that firm-level bargaining in Spain may raise wages but doesn't necessarily reduce wage inequality. Indeed, to the extent that national or regional wage scales are perceived as "too rigid", one might even hypothesize that firm level bargaining **increases** wage inequality.

II. Data Description

Our analysis of the effects of firm-level contracting is based on data from the 1995 Spanish Wage Structure Survey (ESS95). This survey was drawn using a two-stage sampling procedure, first selecting a stratified random sample of establishments in the manufacturing, construction and trade and service industries, and then collecting detailed salary and job information for up to 25 workers in each selected workplace.[8] The main advantages of the ESS95 data set are its sample design (allowing us to control for co-worker characteristics), its relatively large size, and the availability of detailed demographic, job, and employer information. Its main disadvantage is coverage: agriculture, mining, and household services are missing from the sample, as are employees at small firms (under 10 workers) and workers in the relatively large "underground" sector of Spanish economy who do not pay Social Insurance taxes (see Lemieux and de la Rica, 1994).[9]

[8]Establishments with at least 10 workers in the General Registry of Payments to Social Security were stratified by autonomous community and size. 5 workers were selected at firms with 10-20 workers, 7 at firms with 21-50 workers, 12 at firms with 51-100 workers, 20 or 25 at firms with 100-200 workers, and 25 at employers with more than 200 workers. Establishments with 10 or more workers accounted for just over 70 percent of the total working population in Spain in 1995.

[9]Sisson et al. (1991) report that Spain has the highest fraction of workers at small establishments among EU countries, so the omission of small workplaces is a serious concern.

Throughout this paper we focus on the subsample of workers in the ESS95 with non-missing data on individual, job, and firm characteristics. We exclude the relatively small fraction (under 5 percent) of part time workers, yielding an analysis sample of about 130,000 workers at 13,700 establishments. Table 1 presents descriptive statistics for the overall sample and for the subsamples of employees covered by the three different kinds of contracts. Overall, 23 percent of the sample work under firm-specific contracts, 42 percent are covered by regional contracts, and 35 percent are covered by national contracts. The coverage of firm specific contracts is higher in the ESS95 than the estimated 15 percent for the overall workforce, reflecting the exclusion of small establishments and sectors like agriculture and household services where firm level contracts are rare.

Comparisons across the columns of Table 1 show that workers covered by different types of contracts have different skill characteristics. For example, employees covered by firm-specific contracts are older, have a higher probability of holding a university education, and are a little less likely to be female. Two other key differences are temporary contract status and job tenure. Temporary contracts were introduced in Spain in 1984 as a way to encourage employers to hire new workers, and by 1991 accounted for about one-third of total employment.[10] Although the law requires equal pay for temporary and permanent workers, temporary workers earn less (controlling for observed skills and the employer characteristics), perhaps reflecting differences in unobserved skills (de la Rica, 2004). In any case, workers covered by a firm-level contract are much less likely to be employed under a temporary contract. Since temporary contracts can only last for up to three years, there is a strong mechanical connection between the fraction of temporary contracts at a workplace and the distribution of job tenure. Consistent with this fact, mean job tenure is much longer among workers covered by firm contracts.

[10]See Guell and Petrongolo (2003) and de la Rica (2004). Employees hired under temporary (or fixed term) contracts can be terminated at low cost, relative to workers on regular (indefinite) contracts. Temporary contracts cannot be renewed: at the end of the contract period the employee must be either terminated or offered a regular contract. Firms are formally prohibited from filling jobs by cycling temporary workers. Nevertheless, the size of the temporary contract workforce suggests that most young workers hold more than one temporary contract position before obtaining a indefinite term contract.

The middle rows of Table 1 show that establishment characteristics also vary by contract type. Larger establishments, manufacturing plants, and plants that supply a regional or international market are more likely to offer firm-specific contracts. The firm size differential is particularly important: nearly one-half of the workers covered by firm-level contracts work at establishments with 200 or more workers, compared with only 10 percent of workers covered by regional contracts and 22 percent of those covered by national agreements. Finally, the bottom rows of Table 1 show that occupational distributions are different in the three contracting groups, with more managers and fewer service workers covered by firm-level contracts.

Employee compensation in Spain consists of "base wages" and "wage complements". Base wages are determined from the appropriate contract by occupation and grade within a firm, while wage complements include factors like seniority and shift premiums, as well as discretionary supplements awarded to individual employees. The ESS95 collected information from company records on both components, and we use the sum of these two, expressed in pesatas per hour, as our measure of compensation. Table 2 presents means and standard deviations of log hourly wages for men and women in the overall sample and in the three different contract sectors. The first two columns show the (unweighted) sample moments, while columns 3 and 4 show adjusted moments, obtained using the reweighting technique of DiNardo, Fortin, and Lemieux (1996) to adjust the distribution of observed characteristics for each contract sector back to the overall distribution. We calculated the weights for this procedure using separate probit models for the probability of employment in each of the three sectors. The explanatory variables for these models included age, education, industry (6 dummies), occupation (4 dummies), market orientation (2 dummies), and firm size (5 dummies).

Without adjusting for differences in characteristics, wages are about lower under regional contracts than national contracts, and higher under firm-level contracting. Standardizing for the observed characteristics, however, mean wages in regional and national contracts are nearly identical, while for

both men and women wages under firm-level contracts are 10-12 percent higher. The dispersion in wages is a little higher in national contracts than firm-specific contracts, and substantially lower in regional contracts. Again, however, standardizing for the observed skill characteristics brings the regional and national sectors into close alignment. Based on the evidence in Table 2 we conclude that the structure of pay is very similar under regional and national contracts in Spain, and for the remainder of this paper we group the two together and focus on the contrast between firm-specific and industry-level contracts.

Figures 1 and 2 show the densities of log wages for men and women with firm-level contracts and other contracts, while Figures 3 and 4 show the corresponding standardized densities, reweighting the samples in the two sectors to have representative distributions of characteristics. The standardized densities for men in the two sectors have about the same dispersion, consistent with the finding from Table 2 that male wage inequality is about the same under firm-specific contracts and industry contracts. For women, however, the standardized distribution of wages under firm-level contracts appears to be a little more disperse, consistent with the data in Table 2 showing about a 15-20 percent higher standard deviation of log wages for workers with firm contracts.

To further examine the impact of contract type on the level and structure of pay we estimated mean log wages by age and education for workers with firm-specific contracts and other contracts. Specifically, we divided men and women into 56 cells, using 8 age groups (under 25, 26-30, 31-35, 36-40, 41-45, 46-50, 51-55 and over 55), and 7 education ranges (based on years of completed schooling). We then plotted mean wages for workers with firm-level contracts in each skill group against mean wages for workers with the same age and education in the other sector.

Figures 4 and 5 show the results for men and women, respectively. For reference, each graph also shows the 45 degree line. If mean wages were the same in the two sectors for each narrowly defined age/education group the points would lie along this line. Examination of the graph shows that the points

actually lie above the 45 degree line, with a slope of about 1.0 for men and 1.2 for women. These simple graphs suggest that relative to the structure of pay for workers covered by national or regional contracts, men with firm-specific contracts earn a constant wage premium, while women earn a premium that rises with education and age. By comparison, similar graphical comparisons of union and nonunion wages in the U.S., Britain, and Canada show that in these countries unions tend to raise wages more for less-skilled workers (Card, Lemieux, and Riddell, 2003), leading to scatters of points that is flatter than the 45 degree line for both men and women.

As a final descriptive exercise, Table 3 presents some simple probit models for the probability that a given employer has a firm-specific contract. (We show the estimated probit coefficients: the derivative of the probability is approximately 0.23 times the coefficient) A key determinant is firm size: the coefficients associated with the size class dummies in the table rise monotonically, and imply a 35 percentage point rise in the probability of firm-level contracting for employers with 200 or more workers, relative to those with 10-20 workers.[11] The age, education, and gender mix of the workforce also matter, with higher probabilities of firm contracting at workplaces with older, better educated, and male workers. These characteristics are all associated with higher wages, suggesting that firm-level contracting is more likely for highly paid workers. Finally, establishments with a higher fraction of temporary-contract workers are less likely to have firm-level contracts. Since most new employees are hired under temporary contracts, the relative fraction of temporary workers is strongly related to the recent growth rate of the firm. The negative correlation between temporary contracts and firm-level bargaining therefore suggests that employers with firm-level bargaining had slower growth rates in the early 1990s.

[11]Unfortunately, firm size is only reported in broad categories, and the top category (200 or more workers) is very wide. Based on informal evidence we believe that most very large firms have firm-level contracts.

III. Regression Analysis of Individual Wage Data

We begin a more formal analysis of the impact of firm-level bargaining by presenting a series of regression models for individual wages. Tables 4 and 5 show parallel sets of models for men and women. Specification [1] in each table includes only a dummy for firm-level contracting. This has an estimated coefficient of about 30 percent in each case. Specification [2] adds age, education, a dummy for working under a temporary contract, and occupation and region dummies. Consistent with the fact that firm-level contracting is more prevalent among highly skilled workers, the addition of these controls reduces the premium to around 14 percent for men and 18 percent for women. Specification [3] adds employer characteristics, including market orientation, public ownership, and firm size. As is usually found in other contexts (Idson and Oi, 1999) firm size is a strong predictor of wages, and since firm size is also correlated with the incidence of firm contracting, controls for firm size reduce the premium to around 12 percent.

The models in columns [4] and [5] add mean co-worker characteristics, averaged over all employees at the same establishment in the same broad occupational group.[12] These specifications are motivated by a concern that establishments with a firm level contract may recruit or retain workers with higher unobserved skills, leading to an upward bias in the estimated effect of firm-level contracts. For example if observed education contains a classical measurement error component, and the mean level of true education is positively correlated with the presence of a firm contract, specifications like [2] or [3] in Tables 4 and 5 will overstate the effect of a firm contract.[13] Adding the mean education of co-workers will reduce or eliminate this bias. A similar argument applies if co-workers share a common unobserved productivity component that is correlated with the presence of a firm contract. In this case, adding the

[12]We divide employees into 4 occupation groups and construct averages within each class.

[13]Formally assume $y_{ij} = x^*_{ij}\, b + F_j c + e_{ij}$, where y_{ij} is the wage of person i in firm/occupation group j, x^*_{ij} is true education, F_j is a dummy for a firm contract and e_{ij} is a residual. Consider the projection of true education on measured education and F_j: $x^*_{ij} = x_{ij}\, d_1 + F_j\, d_2 + v_{ij}$. With classical measurement error in x_{ij} and x^*_{ij} correlated with F_j the coefficient $d_2 > 0$, leading to an upward bias in the estimated effect of F.

means of co-worker characteristics may reduce the bias in the estimated firm contract effect.

Comparisons of the models with and without the co-worker variables suggest that controlling for the age, education, and gender characteristics of co-workers leads to a 10-20 percent reduction in the effect of firm-level contracting. The addition of these variables also reduces the measured impacts of the corresponding individual variables. For example, comparing columns 3 and 5, the addition of co-worker characteristics reduces the coefficient of individual education by about 75% and the coefficient of individual age by about 50%.[14] As has been found in other countries, the fraction of female co-workers has a negative impact on wages in Spain.[15] According to the models in column 5, for example, a switch from a nearly all male workforce to a nearly all female workforce is associated with a 12.5 percent reduction in wages for men and 15.5 percent reduction for women.

Analysis by Predicted Wage Quintile

The analysis in Tables 4 and 5 is incomplete if firm-level contracting has different effects on different subgroups of workers. To allow for such differences, we fit a series of separate models by predicted wage quintile. We began by calculating the 20th, 40th, 60th and 80th percentiles of the wage distributions of men and women. We then estimated ordered probit models, separately by gender, to predict the probability that a person would earn a wage in one of the five quintile ranges. The prediction models include age and education, temporary contract status, and occupation dummies (see Appendix Table A1). We then use the predicted probabilities as weights and estimated 5 separate models for each gender, in each case weighting an individual observation by his or her predicted probability of earning a

[14]The causal interpretation of the coefficients of the individual and co-worker characteristics in the models in columns 4 and 5 is problematic, since the subsets of individuals of a given age and education who work with different co-workers are highly selected.

[15]There is an extensive North American literature relating wages to the fraction of women in the occupation or job classification – see e.g. Johnson and Solon (1986) and Baker and Fortin (2001). De la Rica (2003) conducts an extensive analysis of the gender wage gap in the ESS95, focusing on the effects of gender composition.

wage in the given quintile range.[16]

Table 6 summarizes the estimated firm-level contract effects from five different versions of these quintile-specific wage models. These models correspond to the specifications in Tables 4 and 5: model [1] includes only a firm-contract dummy; model [2] adds individual characteristics; model [3] adds firm characteristics; model [4] drops the firm characteristics but adds mean characteristics of co-workers; and model [5] includes person, firm, and co-worker characteristics. For men, the estimated effects of working under a firm level contract are broadly similar across quintiles, though in the richer specifications (particularly model [5]) there is a smaller effect of firm-level contracting for the lowest two quintiles. This tendency is even more pronounced for women: the estimates from model [5] for the upper two quintiles are roughly twice as big as the estimates for the lower quintile.

Consistent with the findings in Tables 4 and 5, the estimates in Table 6 show that firm-level contracting is associated with higher wages, with a premium on the order of 10 percent. The estimated premium is about the same for the top three skill quintiles, but is lower in the bottom two quintiles, suggesting that firm-level contracting raises between-group wage inequality relative to industry-level contracting. This is consistent with the hypothesis that firm-level bargaining "undoes" some of the between-group equalization in the industry-wide contracts, though it must be noted that the effect is relatively small.

[16]A similar method is used by Card (2001) to estimate models for different occupations. The advantage of this method, over alternative deterministic classification methods, is that it takes into account the uncertainty in predicting wage outcomes.

IV. Analysis of Establishment-Level Data

The decision to adopt firm-level contracting is made at the firm level, rather than by individual workers. Thus it may be more appropriate to compare average wages at similar establishments that have adopted different contracting arrangements than to compare wages of similar workers who are covered by different kinds of contracts. Ideally, it would be possible to use institutional features of the contracting process to develop a research design for studying the causal effect of firm-level bargaining.[17] In the absence of a compelling research design, this section reports establishment level comparisons based on OLS regressions and propensity score matching.

We begin in Table 7 by reporting results from regression models in which the unit of observation is an establishment in the ESS95, and the dependent variable is the mean log wage of the sampled workers. Specification [1] includes only a single dummy variable indicating that the establishment is covered by a firm-level contract. Although larger establishments are implicitly down-weighted in this model relative to an employee-level analysis, the coefficient estimate is very similar to the estimates from the corresponding model [1] in Tables 4 and 5. Specification [2] includes the mean characteristics of workers (mean age, education, the fractions in four occupation groups, and the fraction paid by fixed term contracts), as well as controls for region and industry. This specification is similar to specification [4] in Tables 4 and 5, and yields a very similar estimate of the effect of firm-level contracting.[18] Specification [3] resembles the models that are typically estimated on establishment-level data, with firm-level controls but no information on the mean characteristics of the workforce. This model yields a larger estimate of the effect of firm-level contracting, reflecting the omitted variable bias arising from the positive correlation between workers' skills and the incidence of firm level contracting. Finally,

[17]For example, DiNardo and Lee (2004) use the fact that collective bargaining status in the U.S. is determined by an employee election to develop a regression discontinuity research design based on the comparison of close winners and close losers.

[18]Note that an individual level model that includes mean co-worker characteristics aggregates up to a model with the same coefficients for the establishment data, whereas a standard individual-level model does not unless the effects of the worker characteristics are the same within and between firms.

specification [4] includes both worker and firm characteristics, and is therefore analogous to specification [5] in Tables 4 and 5. Perhaps surprisingly, the estimated effect of firm level contracts on average wages (9 percent) is almost exactly equal to the weighted average of the effects for male and female workers from the corresponding worker-level models.[19]

To test whether firm-level contracting exerts a differential effect on the average wages of different types of firms we fit the models in Table 8, which include interactions of the market orientation variables and the firm size categories with the firm-level contracting dummy. Both specifications include the mean age and education of sampled workers, and the fraction of workers with fixed term contracts. The model in column [2] also includes the fraction of workers in different occupations, the fraction of female employees, and dummies for region and industry. Both models suggest that firm-level contracting moderates the effect of the market orientation variables. Indeed, in the richer specification (model [2]) the interactions of indicators for a national or international market with the firm-level contracting dummy are roughly equal and opposite to the corresponding main effects, implying that once the firm has negotiated a firm-specific contract, there is no additional wage advantage associated with having a wider product market. By comparison, the interactions with firm size are uniformly small in magnitude, suggesting that firm level contracting has about the same effect on wages at larger and smaller firms.[20]

A Matching Estimator

Some further insights into the differential impacts of firm-level contracting on wages can be obtained from a propensity score matching approach (Rosenbaum and Rubin, 1983; Dehejia and Wahba, 1999). Propensity score matching is an appropriate method for causal analysis if the the "treatment" (in this case, the presence of a firm-level contract) is as good as randomly assigned conditional on the

[19]The worker sample is 77 percent male: $0.77 \times 0.087 + 0.23 \times 0.100 = .090$.
[20]The relative stability of the firm-level contracting effect by firm size explains why worker-level and firm-level models give similar estimates, despite the implicit downweighting of larger firms in the firm-level models.

observed covariates. Even when this "ignorability" assumption is false, the method provides a parsimonious way to control for the observed covariates, and sheds some light on the comparability of different subgroups of the treatment and comparison groups (Heckman et al, 1998).

We began by estimating a probit model for the incidence of firm-level contracting, using as covariates the mean age and education of the workforce, the fractions of workers in different occupation groups, the fraction of female workers and workers with a temporary contract, dummies for the market orientation of the firm and the size of the establishment, and controls for industry and region. We then assigned each establishment a propensity score (predicted probability of having a firm-level contract) and constructed the smoothed histograms in Table 7.[21] The distributions of estimated propensity scores for establishments that have or do not have firm-level contracting are quite different. In particular, the relative frequency distribution is nearly flat for establishments with national or regional contracts, but is highly skewed to the right for those with firm-level contracts. Nevertheless, there is substantial overlap in the two distributions, suggesting that comparisons conditional on the value of the propensity score can be carried out over most of the range of the scores, apart from the very left tail (i.e., with propensity scores of under 1.5 percent).

We then used a local linear regression method to estimate the regression functions of mean log wages on the estimated propensity score for establishments with and without firm-level contracts. These regression functions are plotted in Figure 8, and show three interesting properties. First, consistent with our earlier descriptive analysis, mean wages are rising with the estimated probability of having a firm level contract. Second, across the range of propensity scores the mean wage for establishments with a firm level contract is uniformly higher than the mean wage for establishments with alternative contracts. Third, the vertical distance between the lines in Figure 8 – which is a simple estimate of the wage premium for firm-level contracting – rises from 2 percent at the lowest values of the propensity score to

[21]The densities were constructed using a kernal density estimation method.

about 10 percent in the the middle range of scores (propensity of 0.10) then stabilizes. This general pattern is similar to the pattern we observed for different groups of workers. On balance, it appears that firm-level contracting raises wages somewhat more at establishments with a higher likelihood of having a firm-level contract. Since these establishments have higher wages, firm-level contracting raises between-establishment inequality.

To complete our matching analysis we conducted the "subclassification" analysis (Rosenbaum and Rubin, 1983) in Table 9. We first calculated the deciles of the distribution of estimated propensity scores (for all establishments). Then, for each decile we estimated a regression of mean log wages on the same control variables used in model [4] of Table 7. The results are presented in Table 9. We also show the mean log wage at establishments without a firm-level contract in each decile, and the number of establishments with a firm-level contract. As suggested by the histograms in Figure 8, the number of "treated" establishments (with firm-level contracts) is extremely low in the bottom 4 deciles, and the wage gap between establishments with firm-level and regional/national contracts is imprecisely estimated. Consistent with the results in Figure 9, however, the estimated gaps in these deciles are quite small. From the fifth decile onward, the regression-adjusted impacts are larger, ranging from 5 to 10 percent, and tend to rise with the propensity of having a firm-level contract. Overall, we conclude that the wage advantage for firm level contracting is small (or even negligible) for establishments that have characteristics associated with a low probability of firm-level contracting, but larger – on the order of 8-10 percent – for larger establishments with more highly skilled workers that have a higher probability of firm-level contracting. The weighted average of the firm-contracting effects across the 10 deciles (the estimated "treatment on the treated" effect) is 7.7 percent.

V. Analysis of Job Tenure

The evidence we have assembled so far suggests there is a positive wage premium associated

with firm-level contracting. As is the case with other sectoral wage differentials (e.g., industry or firm size differentials) the measured wage gap for firm-level contracting could represent a rent, a compensating wage premium, an unmeasured ability difference, or some combination of these factors. One way to partially evaluate these alternative explanations is to examine differences in job tenure by contracting status. If the entire wage premium is a compensating wage differential, or a return to unmeasured ability, it should not necessarily lead to longer job tenures. If the premium includes a rent component, however, then it should reduce voluntary turnover, leading to longer job durations at establishments with firm-specific contracts. Of course differences in observed tenure may reflect many other factors, including differences in firm growth rates and retirement patterns, so the power of the evidence is limited.

Table 10 presents a series of regression models for observed job tenure, fit to the subsample of workers age 24 to 65. In an attempt to control as precisely as possible for differences in the relative numbers of young and old workers in the different contract sectors, all the models include a full set of age dummies. The even-numbed specifications also include controls for education, region, occupation, industry, firm market orientation, and firm size. The simpler specifications imply that workers covered by firm-level contracts have just under 4 years of additional job tenure, relative to those of the same age in the other sector. Some of this is clearly attributable to firm size and the other control variables. Nevertheless, even the richer specifications point to a tenure gap of about 2 years for both men and women working under firm-level contracts. This gap is smaller than the 3.2 year difference in tenure for unionized U.S. workers measured by Krueger and Summers (1988, Table IX), though it should be noted that the wage and non-wage benefits of union membership in the U.S. probably exceed the 10 percent premium observed for firm-level contracting in Spain.

VI. Interpretation and Conclusions

Because of the multiple levels of contracting, Spanish wage-setting institutions are often classified as midway between the highly centralized systems in Scandinavia, Austria and Germany, and the highly decentralized systems in the U.S. and Canada (Layard, Nickell, and Jackman, 1991; Nickell, 1997). In this paper we use a matched worker-firm data set to examine the impact of firm-level contracting on the level and structure of wages. We find that wages set by firm-level contracting are about 10 percent higher than wages governed by industry-wide or national contracts. We also find that firm- level contracts tend to raise wages more for more highly skilled workers, and at higher-wage establishments with a higher propensity to negotiate firm-level contracts. The wage premium for firm-level bargaining is associated with longer job tenures, suggesting that at least some of the premium is a non-competitive rent.

The tendency for firm-level contracting to raise wages **more** for higher skill groups is the opposite of the pattern observed in establishment-level collective bargaining in the U.S. or the U.K. There, bargaining tends to flatten wages across skill groups relative to the non-union sector, contributing to a reduction in overall wage inequality. In Spain, however, the alternative to an establishment-level agreement is a regional or national agreement, which may itself impose a relatively flat wage structure. Thus, there is some indication that firm-level bargaining leads to a more "flexible" wage structure, in the sense of increaseing skill differentials relative to the regional and national agreements.

An unresolved question is whether employers reap any benefits from firm-level bargaining, or whether the observed wage premium is entirely rent. Answering this question will require richer data – either on employer profitability, or on longer term growth rates for establishments covered by alternative contracting arrangements.

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Table 1: Employee Characteristics by Type of Contract

Variables:	All N=130,170	Firm Contract N=29,599	Industry-Regional N=55,155	Industry-National N=45,456
Age:				
Under 30	0.25	0.15	0.28	0.27
30-44	0.44	0.43	0.44	0.46
45-55	0.23	0.33	0.21	0.20
Over 55	0.08	0.09	0.08	0.06
Education:				
Primary Education	0.34	0.35	0.38	0.29
Secondary Education	0.55	0.51	0.55	0.59
University Education	0.10	0.14	0.07	0.12
Male	0.77	0.83	0.78	0.72
Fixed-term contracts	0.34	0.11	0.34	0.25
Mean Tenure (years)	10.67	15.36	8.73	9.98
Firm Size:				
11-20 workers	0.20	0.05	0.27	0.22
21-50 workers	0.26	0.12	0.32	0.27
51-100 workers	0.17	0.15	0.18	0.16
101-200 workers	0.15	0.21	0.13	0.13
Over 200 workers	0.22	0.46	0.10	0.22
Industry:				
Manufacturing	0.65	0.84	0.56	0.63
Construction	0.07	0.01	0.12	0.04
Trade	0.09	0.04	0.13	0.08
Hotels	0.05	0.01	0.10	0.01
Transportation	0.04	0.05	0.05	0.01
Financial Services	0.06	0.03	0.00	0.16
Other Services	0.04	0.02	0.04	0.06
Market Orientation:				
Local Market	0.32	0.18	0.43	0.28
Regional Market	0.54	0.60	0.44	0.62
International Market	0.14	0.23	0.13	0.10
Occupations:				
Managers and Technicians	0.15	0.21	0.10	0.17
Clerical workers	0.14	0.12	0.12	0.18
Service workers	0.07	0.02	0.10	0.06
Qualified Manual	0.48	0.53	0.50	0.43
Non-Qualified Manual	0.12	0.08	0.15	0.11

Note: Sample excludes part-time workers. All means are unweighted.

Table 2: Mean Log Wages by Type of Contract

	Mean Log Wage	Standard Deviation Log Wages	Standardized Mean Log Wage	Standardized Standard Deviation
All workers (N=130,170)				
Overall	6.771	0.503		
Firm Contract	7.025	0.490	6.889	0.507
Regional Contract	6.667	0.446	6.778	0.465
National Contract	6.747	0.513	6.757	0.493
Males (N=99,315)				
Overall	6.843	0.492		
Firm Contract	7.065	0.481	6.947	0.499
Regional Contract	6.717	0.446	6.833	0.479
National Contract	6.824	0.520	6.817	0.493
Females (N=29,356)				
Overall	6.572	0.441		
Firm Contract	6.832	0.484	6.687	0.488
Regional Contract	6.485	0.391	6.588	0.415
National Contract	6.552	0.435	6.561	0.430

Notes: Standardized means and standard deviations are calculated using a reweighted sample. Relative weight is inverse of the probability that the observation has the given contract type.

Table 3: Estimated Probability of Having a Firm Contract
(Probit estimation)

Variables:	[1]	[2]	[3]
Firm Size (ref: 10-20 workers):			
21-50	0.34		0.36
	(0.04)		(0.04)
51-100	0.77		0.77
	(0.05)		(0.05)
101-200	1.11		1.07
	(0.05)		(0.06)
Over 200	1.49		1.44
	(0.05)		(0.05)
Market orientation:			
National	0.09		0.07
	(0.04)		(0.04)
International	0.08		0.02
	(0.05)		(0.05)
Average Workers' Characteristics:			
Age		0.055	0.008
		(0.020)	(0.023)
Age^2		-0.0002	0.0002
		(0.0002)	(0.0002)
Education		0.063	0.047
		(0.007)	(0.008)
Proportion of Fixed-term		-0.764	-0.539
contracts		(0.065)	(0.076)
Proportion Female		-0.049	-0.263
		(0.064)	(0.072)
Occupations:			
Managers and Technicians		0.695	0.842
		(0.100)	(0.113)
Clerical		-0.089	0.475
		(0.115)	(0.132)
Services		-0.35	0.007
		(0.130)	(0.152)
Qualified Manual		0.427	0.150
		(0.132)	(0.080)
Pseudo-R^2	0.190	0.097	0.241
Number of Observations		13,740	

Note: Standard errors in parentheses. All models also control for 6 industry dummies and 16 regional dummies.

Table 4: Log Wage Regressions – Men

Variables	[1]	[2] [1]	[3] [2]	[4] [1]	[5] [2]
Firm contract	0.300	0.143	0.100	0.130	0.087
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Worker's skills:					
Education		0.040	0.038	0.010	0.010
		(0.0004)	(0.0003)	(0.0007)	(0.0007)
Age		0.014	0.013	0.007	0.007
		(0.0001)	(0.0001)	(0.0001)	(0.0002)
Fixed-term contract		-0.220	-0.214	-0.181	-0.177
		(0.003)	(0.003)	(0.003)	(0.003)
Firm's characteristics (ref: Local market orientation, private firm,10-20 workers):					
National Market			0.019		0.016
orientation			(0.003)		(0.003)
International Market			0.039		0.033
orientation			(0.004)		(0.004)
Public enterprise			0.106		0.101
			(0.010)		(0.010)
20-50 workers			0.052		0.053
			(0.003)		(0.003)
51-100 workers			0.100		0.100
			(0.004)		(0.004)
101-200 workers			0.126		0.128
			(0.004)		(0.004)
Over 200 workers			0.167		0.168
			(0.004)		(0.004)
Average characteristics of co-workers of the same firm-occupation cell:					
Education				0.039	0.036
				(0.0008)	(0.0008)
Age				0.011	0.010
				(0.0003)	(0.0004)
Proportion workers				-0.126	-0.124
younger 30				(0.006)	(0.006)
Proportion workers				-0.145	-0.120
Older 50				(0.007)	(0.007)
Proportion females				-0.057	-0.125
				(0.008)	(0.008)
Intercept	6.763	6.01	5.95	5.81	5.79
	(0.002)	(0.008)	(0.008)	(0.015)	(0.014)
Adjusted R-squared	0.067	0.432	0.458	0.459	0.483
No. observations			100,533		

Notes: Standard errors in parentheses.

[1] Models also include indicators for region (16 dummies) and occupation (4 dummies).

[2] Models also include indicators for region (16 dummies), occupation (4 dummies) and industry (6 dummies).

Table 5: Log Wage Regressions – Women

Variables	[1]	[2] [1]	[3] [2]	[4] [1]	[5] [2]
Firm contract	0.311	0.184	0.121	0.142	0.100
	(0.006)	(0.005)	(0.006)	(0.005)	(0.005)
Worker's skills:					
Education		0.029	0.027	0.008	0.007
		(0.0007)	(0.0007)	(0.001)	(0.001)
Age		0.012	0.011	0.005	0.005
		(0.0002)	(0.0002)	(0.0003)	(0.0003)
Fixed-term contract		-0.179	-0.166	-0.149	-0.142
		(0.005)	(0.004)	(0.005)	(0.004)
Firm's characteristics (ref: Local market orientation, private firm,10-20 workers)					
National Market			0.027		0.024
orientation			(0.005)		(0.005)
International Market			0.037		0.031
orientation			(0.007)		(0.007)
Public enterprise			0.171		0.180
			(0.020)		(0.020)
20-50 workers			0.036		0.032
			(0.006)		(0.006)
51-100 workers			0.080		0.069
			(0.007)		(0.006)
101-200 workers			0.122		0.099
			(0.007)		(0.007)
Over 200 workers			0.172		0.147
			(0.007)		(0.006)
Average characteristics of co-workers of the same firm-occupation cell:					
Education				0.027	0.026
				(0.001)	(0.001)
Age				0.010	0.008
				(0.0007)	(0.0007)
Proportion workers				-0.080	-0.076
younger 30				(0.010)	(0.009)
Proportion workers				-0.146	-0.123
Older 50				(0.014)	(0.014)
Proportion females				-0.202	-0.155
				(0.007)	(0.007)
Intercept	6.52	5.82	5.78	5.84	5.80
	(0.003)	(0.014)	(0.015)	(0.027)	(0.027)
Adjusted R-squared	0.069	0.425	0.462	0.461	0.486
No. observations			29,637		

Notes: Standard errors in parentheses.

[1] Models also include indicators for region (16 dummies) and occupation (4 dummies).

[2] Models also include indicators for region (16 dummies), occupation (4 dummies) and industry (6 dummies).

Table 6: Estimates of Firm-Level Contracting Effect by Skill Group

	Men (N=100,533) – Log Wage Quintiles				
	Quintile 1	Quintile2	Quintile 3	Quintile 4	Quintile 5
Model [1]	0.256	0.267	0.258	0.243	0.223
	(0.004)	(0.003)	(0.003)	(0.003)	(0.005)
Model [2]	0.124	0.144	0.149	0.151	0.150
	(0.004)	(0.003)	(0.003)	(0.003)	(0.004)
Model [3]	0.077	0.095	0.103	0.107	0.107
	(0.004)	(0.003)	(0.003)	(0.004)	(0.005)
Model [4]	0.111	0.129	0.135	0.138	0.142
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Model [5]	0.069	0.085	0.092	0.095	0.098
	(0.004)	(0.003)	(0.003	(0.004)	(0.005)
	Women (N=29,637) – Log Wage Quintiles				
	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
Model [1]	0.172	0.243	0.277	0.295	0.288
	(0.009)	(0.007)	(0.007)	(0.007)	(0.009)
Model [2]	0.099	0.155	0.180	0.193	0.187
	(0.007)	(0.006)	(0.006)	(0.006)	(0.008)
Model [3]	0.060	0.106	0.127	0.139	0.135
	(0.007)	(0.006)	(0.006)	(0.006)	(0.009)
Model [4]	0.092	0.142	0.166	0.178	0.178
	(0.006)	(0.006)	(0.006)	(0.006)	(0.009)
Model [5]	0.056	0.097	0.116	0.127	0.126
	(0.007)	(0.006)	(0.006)	(0.006)	(0.008)

Notes: Standard errors in parentheses.
Model [1]: No controls.
Model [2]: Controls are education, age, type of contract, 16 region dummies and 4 occupation dummies.
Model [3]: Controls are education, age, type of contract, 16 region dummies, 4 occupation dummies, and firm characteristics.
Model [4]: Controls are same as model [2] plus mean characteristics of co-workers.
Model [5]: Controls are same as model [3] plus mean characteristics of co-workers.

Table 7: Regression Models for Mean Log Wages at Workplace

Variables	[1]	[2]	[3]	[4]
Firm contract	0.295	0.137	0.182	0.090
	(0.008)	(0.006)	(0.008)	(0.006)
Average Workers' skills:				
Education		0.036		0.033
		(0.001)		(0.001)
Age		0.071		0.059
		(0.003)		(0.003)
Age-squared		-0.0006		-0.0006
		(0.00004)		(0.00004)
Fixed-term contract		-0.118		-0.122
		(0.009)		(0.009)
Firm characteristics (ref: Local market orientation, 10-20 workers)				
National Market			0.123	0.020
orientation			(0.006)	(0.005)
International Market			0.114	0.043
orientation			(0.010)	(0.008)
20-50 workers			0.045	0.048
			(0.006)	(0.005)
51-100 workers			0.112	0.092
			(0.009)	(0.007)
101-200 workers			0.163	0.119
			(0.011)	(0.009)
Over 200 workers			0.282	0.152
			(0.011)	(0.009)
Proportion females			-0.353	-0.272
			(0.011)	(0.009)
Intercept	6.66	4.70	6.61	4.97
	(0.003)	(0.03)	(0.006)	(0.056)
Adjusted R-squared	0.080	0.509	0.21	0.551
No. observations		13,740		

Notes: Notes: Standard errors in parentheses. Models [2] and [4] also include controls for region (16 dummies), occupation (4 dummies), and industry (6 dummies).

Table 8: Regression Models for Mean Log Wages, with Interactions Between Firm-level Contract and Workplace Characteristics

Variables	[1][1]	[2][2]
Firm Contract	0.101	0.123
	(0.019)	(0.017)
Market Orientation of firm:		
National Market orientation	0.059	0.022
	(0.005)	(0.005)
International Market orientation	0.079	0.056
	(0.010)	(0.009)
National Market*Firm contract	-0.010	-0.020
	(0.015)	(0.015)
International Market*Firm contract	-0.036	-0.065
	(0.022)	(0.020)
Firm size (ref: 10-20 workers):		
21-50 workers	0.047	0.048
	(0.006)	(0.005)
51-100 workers	0.097	0.097
	(0.008)	(0.007)
101-200 workers	0.129	0.116
	(0.011)	(0.010)
Over 200 workers	0.209	0.154
	(0.011)	(0.010)
(21-50)*Firm contract	-0.009	-0.014
	(0.021)	(0.019)
(51-100)*Firm contract	-0.013	-0.027
	(0.023)	(0.021)
(101-200)*Firm contract	-0.010	0.0006
	(0.025)	(0.023)
(Over 200)*Firm contract	-0.038	-0.008
	(0.023)	(0.022)
Intercept	4.54	4.96
	(0.062)	(0.060)
Adjusted R-squared	0.268	0.248
No. observations	13,740	

Notes: Standard errors in parentheses.

[1] Models also control for average age and education and proportion of fixed term contracts.

[2] Models also control for average age and education, proportion of fixed term contracts, occupational mix, fraction of female workers, region and industry.

Table 9: Estimates of Firm-Contract Effect for Firm-Average Log Wage

Estimates by Decile of Predicted Probability of Having a Firm Contract	Mean Wage in Firms with Nat./Regional Contract	Number of Workplaces with Firm Contract	Estimated effect of Firm Contract	
			Coefficient	St.error
Decile 1	6.506	9	0.022	0.073
Decile 2	6.527	40	-0.077	0.038
Decile 3	6.556	45	0.034	0.037
Decile 4	6.603	74	0.025	0.029
Decile 5	6.632	114	0.062	0.025
Decile 6	6.670	132	0.046	0.022
Decile 7	6.717	157	0.066	0.020
Decile 8	6.777	225	0.083	0.022
Decile 9	6.887	411	0.070	0.018
Decile 10	7.032	839	0.104	0.017

Notes: Total number of workplaces is 13,740. Each decile has 1374 workplaces.
Models also control for mean characteristics of workers, industry, region, proportion of female workers firm´s market orientation, and firm size. Deciles are defined by predicted probability of having a firm-level contract. Cutoffs are decile 1: 0.00656; decile 2: 0.02105; decile 3: 0.03873; decile 4: 0.0605; decile 5: 0.0878; decile 6: 0.1243; decile 7: 0.1732; decile 8: 0.2524; decile 9: 0.4010.

Table 10: Firm-level contract effect on Worker's Tenure
Dependent Variable: Tenure (measured in years) – OLS estimation

	All		Men		Women	
Variables	[1]	[2]	[1]	[2]	[1]	[2]
Firm contract	3.89	2.15	3.93	2.18	3.56	2.02
	(0.05)	(0.06)	(0.06)	(0.06)	(0.12)	(0.12)
Education		-0.17		-0.16		-0.23
		(0.07)		(0.007)		(0.015)
Type of Firm's Market orientation (ref: local market orientation)						
National Market		0.70		0.59		0.95
		(0.05)		(0.06)		(0.117)
International Market		0.57		0.53		0.51
		(0.07)		(0.09)		(0.16)
Size of firm (ref: 10-20 workers)						
21-50 workers		0.65		0.61		0.75
		(0.06)		(0.074)		(0.14)
51-100 workers		1.79		1.73		1.89
		(0.07)		(0.08)		(0.15)
101-200 workers		2.50		2.46		2.45
		(0.08)		(0.09)		(1.15)
> 200 workers		3.56		3.59		3.31
		(0.08)		(0.09)		(0.15)
R-squared	0.38	0.44	0.39	0.45	0.34	0.42
N.observations	118,085		92,841		25,244	

Notes: Standard errors in parentheses.
[1] Models also include unrestricted dummies for each year of age (from 25 to 65 years).
[2] Models also include unrestricted dummies for each year of age (from 25 to 65 years), 16 region dummies, 4 occupation dummies and 6 industry dummies.

Table A1: Ordered Probit model for the Probability of Being in Different Wage Quintiles

Variables	Men	Women
Age	0.038	0.038
	(0.0003)	(0.0007)
Education	0.102	0.083
	(0.001)	(0.002)
Fixed-term contract	-0.780	-0.695
	(0.009)	(0.015)
Occupations (reference: Non-Qualified Manual)		
Managers and	0.655	1.152
Technicians	(0.013)	(0.027)
Clerical	0.100	0.434
	(0.014)	(0.021)
Service	-0.386	0.023
	(0.017)	(0.024)
Qualified Manual	-0.010	0.059
	(0.010)	(0.019)
Pseudo-R^2	0.144	0.142
No. observations	100,533	29,637

Note: Standard errors in parentheses.

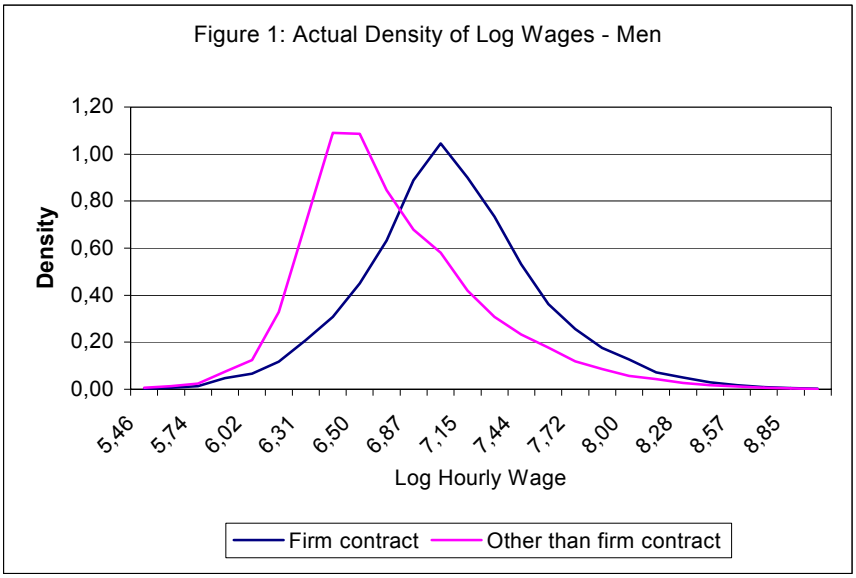


Figure 1: Actual Density of Log Wages - Men
Density
1,20
1,00
0,80
0,60
0,40
0,20
0,00
5,46
5,74
6,02
6,31
6,50
6,87
7,15
7,44
7,72
8,00
8,28
8,57
8,85
Log Hourly Wage
Firm contract
Other than firm contract

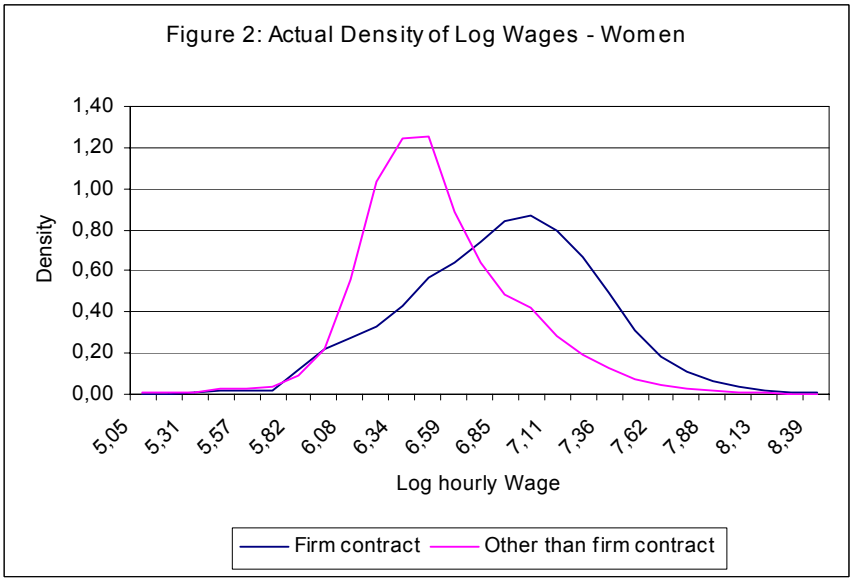


Figure 2: Actual Density of Log Wages - Women
Density
1,40
1,20
1,00
0,80
0,60
0,40
0,20
0,00
5,05
5,31
5,57
5,82
6,08
6,34
6,59
6,85
7,11
7,36
7,62
7,88
8,13
8,39
Log hourly Wage
Firm contract
Other than firm contract

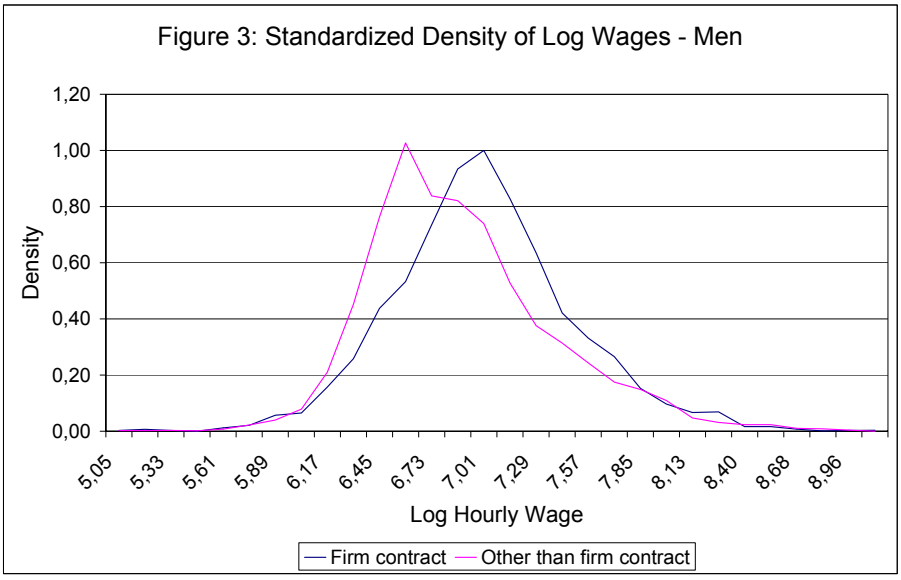


Figure 3: Standardized Density of Log Wages - Men
1,20
1,00
0,80
0,60
0,40
0,20
0,00
Density
5,05
5,33
5,61
5,89
6,17
6,45
6,73
7,01
7,29
7,57
7,85
8,13
8,40
8,68
8,96
Log Hourly Wage
Firm contract
Other than firm contract

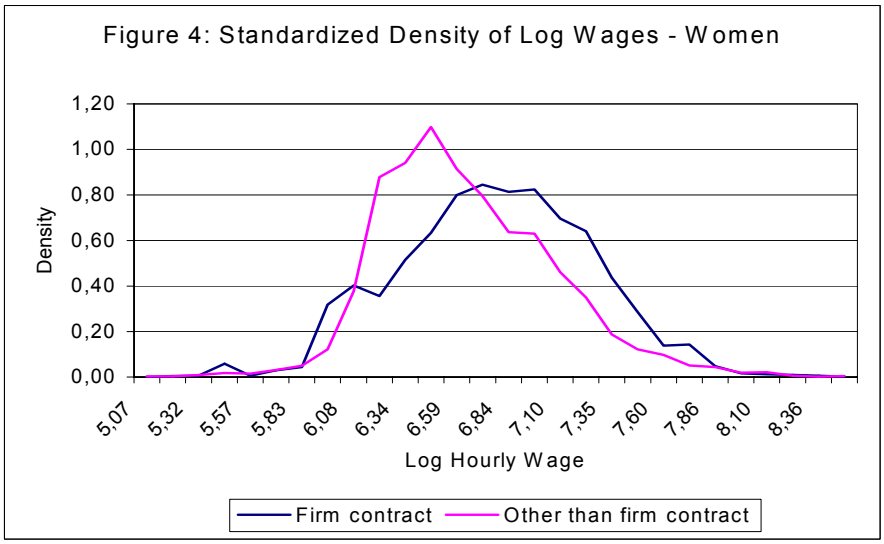


Figure 4: Standardized Density of Log Wages - Women
1,20
1,00
0,80
0,60
0,40
0,20
0,00
Density
5,07
5,32
5,57
5,83
6,08
6,34
6,59
6,84
7,10
7,35
7,60
7,86
8,10
8,36
Log Hourly Wage
Firm contract
Other than firm contract

Figure 5: Mean Log Wages - Firm vs Other than Firm contracts - Males

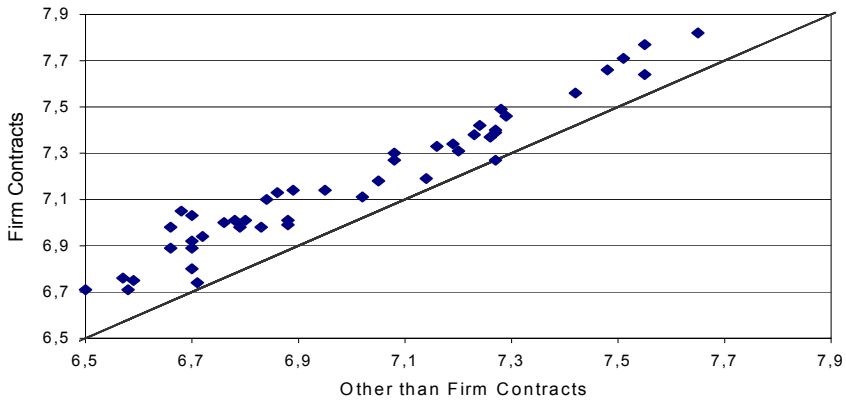
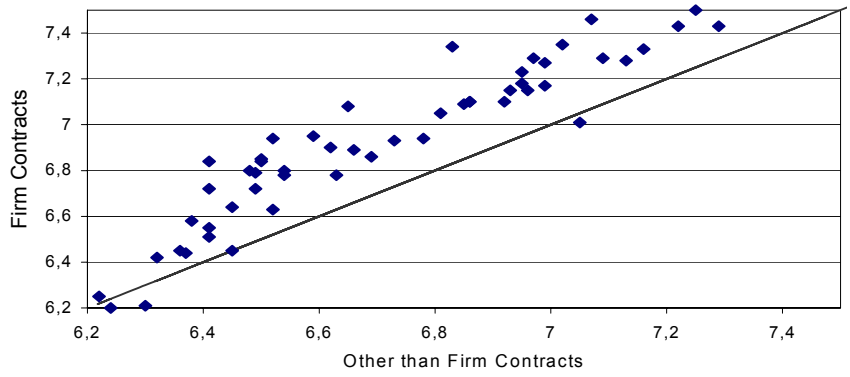


Figure 6: Mean Log Wages - Firm vs Other than Firm Contracts - Females



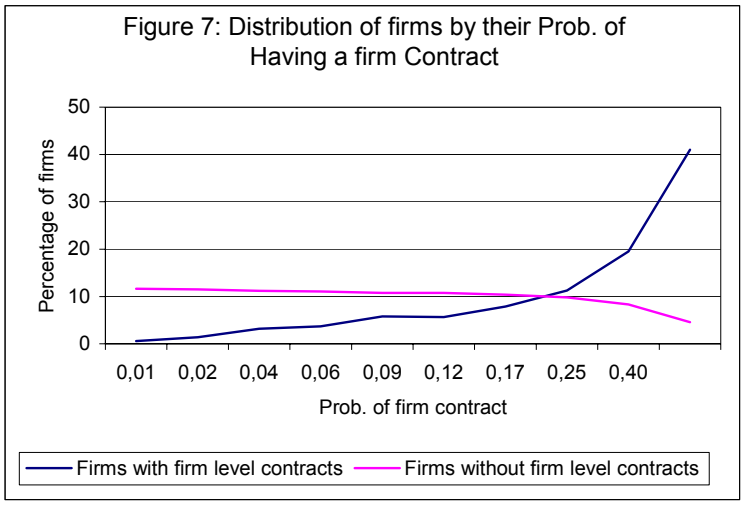


Figure 7: Distribution of firms by their Prob. of Having a firm Contract
Percentage of firms
50
40
30
20
10
0
0,01 0,02 0,04 0,06 0,09 0,12 0,17 0,25 0,40
Prob. of firm contract
Firms with firm level contracts
Firms without firm level contracts

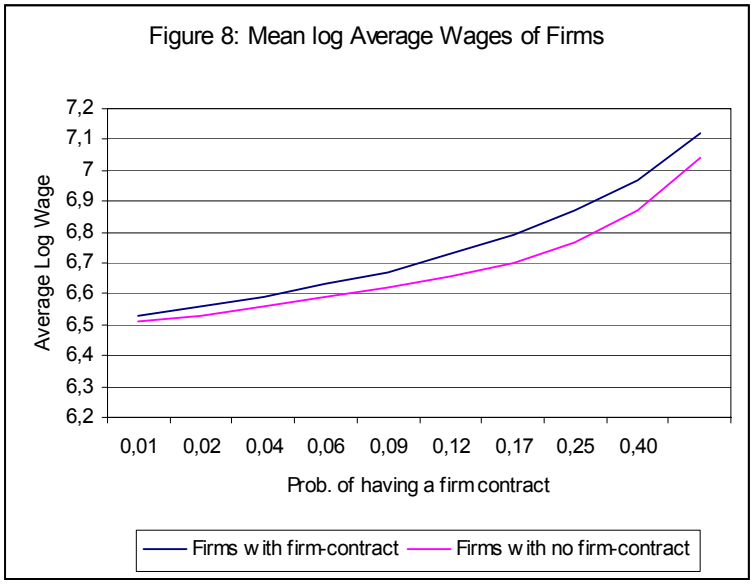


Figure 8: Mean log Average Wages of Firms
Average Log Wage
7,2
7,1
7
6,9
6,8
6,7
6,6
6,5
6,4
6,3
6,2
0,01 0,02 0,04 0,06 0,09 0,12 0,17 0,25 0,40
Prob. of having a firm contract
Firms with firm-contract
Firms with no firm-contract