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The Impact of Firm Level Contracting on Wage Levels and Inequality: Spain 1995-2002

THE IMPACT OF FIRM-LEVEL CONTRACTING ON WAGE LEVELS AND INEQUALITY: SPAIN 1995-2002

by
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Abstract

This paper provides microeconomic evidence on the variation over time of the firm-specific wage premium in Spain from 1995 to 2002, and its impact on wage inequality. We make use of two waves of a detailed linked employer-employee data set. In addition, a new data set with financial information on firms is used for 2002 to control as flexibly as possible for differences in the performance of firms (aggregated at industry level). To our knowledge, there is no microeconomic evidence on the dynamics of the firm-specific wage premium for Spain or for any other country with a similar institutional setting. Our results suggest that there is a clear tendency towards centralization in the collective bargaining process in Spain over this seven-year period, that the firm-level contract wage premium undergoes a substantial decrease, particularly for women, and finally that the "centralization" observed in the collective bargaining process has resulted in a slight decrease in wage inequality.

Keywords: Firm-level contracts, Matched employer-employee data, wage inequality.

1 Introduction

Several recent papers have analized the effects of unions on the wage structure by comparing wages in unionized and non-unionized labor markets. Most of the empirical evidence refers to Anglo-Saxon countries[1] because there the non-unionized sector represents a suitable counterfactual. However, most European countries are not characterized by "closed shop" labor markets and collective bargaining agreements extend rather to unionized and non-unionized workers. Furthermore in some European countries, such as Spain, Italy and the Netherlands, collective bargaining takes place simultaneously at firm level and sectoral level (on regional and national scales). Firm-specific contracts usually override the prevailing sectoral agreements and provide an opportunity for workers to improve the labor conditions attained at more centralized levels. Thus, the relevant question in these European countries is not how unionized and non-unionized labor markets compare, but rather how more and less centralized collective bargaining systems compare.

In this setting, there are many macroeconometric studies that analyze the effect of wage contracting centralization on the economic performance of a country, though no clear conclusion has been reached. For instance, Bruno and Sachs (1985) and Jimeno (1992) support the hypothesis of a linear relationship between centralization and macro results while Calmfors and Driffil (1988) defend the inverted-U shape with centralized and decentralized economies both performing better than their intermediate competitors. However, there is much less microeconometric evidence on how the level of contracting affects the structure of wages, due in part to the lack of suitable data. Several authors have found a statistically significant premium associated with firm-level contracting. Dell'Aringa and Lucifora (1994) find a positive effect of this type of contracting on wages for a sample of manufacturing plants in Italy. Card and de la Rica (2006) find that firm-level contracting is associated in Spain with a 5-10% wage premium. On the other hand, Hartog, Leuven and Teulings (2002) find no premium for the Netherlands.

This paper provides microeconomic evidence on the variation over time of the firm-specific wage premium in Spain from 1995 to 2002, and its impact on wage inequality.

[1] See for instance, Lewis (1986) who concludes that the average union effect on wages is positive in the US. See Card, Lemieux and Riddell (2002) for a study of the effect of unions on the wage structure of Canada, the UK and the US. Hirsch (2003) also finds higher premiums after correcting for estimation biases.

We make use of two waves of a detailed linked employer-employee data set. In addition, a new data set with financial information on firms is used for 2002 to control as flexibly as possible for differences in the performance of firms (aggregated at industry level). To our knowledge, there is no microeconomic evidence on the dynamics of the firm-specific wage premium for Spain or for any other country with a similar institutional setting. Our results suggest that there is a clear tendency towards centralization in the collective bargaining process in Spain over this seven-year period, that the firm-level contract wage premium undergoes a substantial decrease, particularly for women, and finally that the "centralization" observed in the collective bargaining process contributes significantly to the change in wage inequality.

The rest of the paper is organized as follows. Section 2 provides a description of the major institutional aspects of the Spanish labor market in recent years. Section 3 briefly describes the data used in the empirical analysis, presents some descriptives and carries out a semiparametric procedure to analyze the impact of firm-level contracting on the distribution of wages as a whole. Section 4 describes the model of earnings used to carry out the analysis. Section 5 presents the empirical findings from the estimation of the different regression models, with sub-sections on changes in the premium by types of worker, and compares OLS estimates with different propensity score estimates. Section 6 analyzes how the centralization in collective agreements affects wage dispersion. Section 7 concludes the study with a summary of our findings.

2 Institutional Framework

During the Franco dictatorship the Spanish labor market was centralized and highly regulated. Collective bargaining was already established through the old labor laws (*Ordenanzas Laborales*). Legal trade unions and employers' organizations negotiated contracts but the State intervened directly to determine the outcomes of the negotiation (Milner and Metcalf 1994). The post-Franco Spanish collective bargaining system is based on principles resulting from the 1980 Workers' Statute (*Estatuto de los Trabajadores*), which was the result of a consensus between unions and employers' organizations[2]. A

[2] See Bentolila and Jimeno (2002) for a description of the evolution of the legislation on collective bargaining in Spain since the eighties and Valdés dal Ré (2006) for a review of the 25 years of the Workers' Statute.

system for the election of workers' representatives was established in order to form workers' councils and negotiate issues such as productivity, wages and working hours. In this context, the terms of the agreements reached were and still are legally binding on all workers within the scope of the agreement. Thus, bargaining coverage is very high in Spain, especially relative to the low union density. In 1995 union density was 19% but 81% of the work-force was covered. Both rates have decreased over time; in 2002 union density was 14.9% and the agreements reached covered 72% of workers.

From a macroeconomic perspective, the slow economic growth of Spain since 1990 demonstrates the limits and the negative effects of the political measures on employment taken during the eighties. The worldwide recession that began in the early nineties hit Spain around 1993. Unemployment increased considerably to 25% of working-age population. Inflation also rose to the highest level of the decade. At that time, it became necessary to encourage employment and promote collective bargaining, requiring the attribution to the unions of a genuine function as a regulator of labor relations. The reform of 1994 repealed the old labor laws, encouraging the use of contractual instruments such as firm-level contracts in order to decentralize bargaining (Toharia and Malo 1997). In both 1997 and 2001 social actors (*employers and union representatives*) signed the Interconfederal Agreements on Collective Bargaining (*Acuerdo Interconfederal de la Negociación Colectiva*), which were focused on increasing coordination in the collective bargaining mechanism.

As from 1996 the economy started to recover, with the best period of expansion being 2000, when 5.0% growth was achieved. Employment started to increase and the inflation rate was stabilized[3]. After that a decreasing trend set in for the annual growth rate until 2002, when growth (2.7%) was basically the same as in 1995. Therefore, 1995 and 2002 are characterized by the same GDP growth rate but not by the same expectations; in 2002 the trend and the future prospects were clearly better than 7 years earlier.

An additional feature that must be noted regarding the general dynamics of the Spanish Labour market is the significant increase in the Female Labour Force Participation from mid eighties onwards. The FLFP of women from 25 to 54 years old increased from 35% in 1985 to 63% by 2002 (for comparison, Male Participation rate at that age

[3]In spite of the economic expansion in recent years Spain has not undergone a significant increase in workers' purchasing power, due in part to political measures to encourage employment but at the same time restrain wages.

range remained roughly constant at around 90%). The labour market could not absorb this enormous increase in participation immediately and many women, particularly the youngest ones, experienced very high unemployment rates until the end of the nineties. Figure 1 describes the dynamics of unemployment rates by gender and age during the period under study. As can be seen from this figure, female unemployment rate of women between 25-54 years decreased from 29% in 1995 to 15% in 2002. This led to an important increase in female employment rates, which in turn implied changes in total composition of the labour force, as it will be seen later.

For our analysis, in addition to a knowledge of the macroeconomic situation in Spain we also need to analyze the dynamics of wage contracts from 1995 to 2002. Does the labor market in Spain tend towards a decentralized wage setting or a centralized one? The level of firm collective bargaining measured as the number of workers affected by firm-level contracting as a percentage of the total number of affected workers was stable in the eighties (Milner and Metcalf 1994) but declined slightly at the beginning of the nineties[4].

Table 1 presents for 1995 and 2002 the total number of affected workers in total agreements and in firm-collective agreements by industry. Total number of affected workers in total agreements increases in the three activities (industry, construction and services); however, the percentage of workers affected by firm-agreements decreases on average in almost three percentage points. Firm-collective agreements coverage is highest in industry followed by services, and coverage of firm-level agreements in the construction sector is almost negligible. However, the percentage of workers covered by firm agreements in industry falls 3 percentage points in industry and more than 4 percentage points in services. This feature reveals a clear tendency towards a more centralized wage setting scheme over the seven year period.

As Disney, Gosling and Machin (1996) point out, an employer's decision to accept a firm-specific contract is comparable to the voluntary union recognition process in the United Kingdom. The decline in the percentage of workers covered by firm-specific agreements could be compared with the decrease in the unionization rate in the Anglo-Saxon countries. For instance, Dinardo, Fortin and Lemieux (1996) find de-unionization in the US to be an important factor in explaining the rise in wage inequality during

[4]For a detailed description of collective bargaining in Spain, see Card and De la Rica (2006).

the eighties. Related to this study, Gosling and Lemieux (2001) argue that the steeper decline in unionization in the UK explains why wage inequality increased faster than in the US. In section 6 we analyze how the decrease in the number of workers covered by firm collective agreements affects wage inequality.

3 Data and Descriptives

The primary source of data for our analysis lies in the Spanish Structure of Earnings Surveys (SES) of 1995 and 2002, large-sample surveys of wages, job information and worker characteristics. These datasets consist of random samples of workers from establishments with 10 or more employees in the private sector, which accounted for approximately 70 percent of the working population in Spain in both 1995 and 2002 in the manufacturing, construction, trade and service industries[5]. They are sampled in two stages. In the first stage, establishments are selected randomly and stratified by region and size. In the second stage, a sample of workers from each of the selected establishments is also randomly selected[6]. Moreover, in order to add financial information on the establishments we use the Spanish Structural Business Statistics (SBS) survey and match SES and SBS at the level of the 2-digit NACE industry because there is no information available at establishment level. We add this information only for 2002 due to the lack of financial data for 1995.

We focus on the subsample of full-time workers to ensure that our findings are comparable to those of other studies in the relevant literature. This gives a sample of 130,170 workers and 14,347 establishments for 1995 and a sample of 129,378 workers and 14,778 establishments for 2002. There is almost the same number of total observations in both years but the percentage of firm-specific contracts is much lower in 2002, as mentioned before (dropping from 23% to 10%). Since the structure of pay in Spain is similar under regional and national contracts, as Card and de la Rica (2006) show using the EES-95, we group the two together and concentrate on the difference between firm-specific and

[5] In 2002 there are also establishments in the fields of education, health and social work, but we exclude these from the sample for comparability reasons.

[6] An average of 5 workers are interviewed in establishments with 10-20 employees, 7 workers in establishments with 21-50 employees, 12 workers in establishments with 51-100 employees, 20 workers in establishments with 100-200 employees, and 25 workers in establishments with more than 200 employees.

sectoral contracts. Tables 2A, 2B and 2C present overall and gender weighted[7] descriptive statistics for the overall sample and for workers covered by the two different levels of contracts for each year.

The main features described in tables 2A-2C can be summarized as follows: Regarding workers' characteristics, we can see that in 2002 workers are younger and more educated, and this change is stronger in workers covered by firm-level contracts compared to workers covered by other contracts. When average workers' characteristics are dissagregated by gender (tables 2B and 2C), it can can observed that this compositional change is mainly driven by the sample of women covered by firm-level contracts: Whereas in 1995 24% of women covered by firm-level contracts were under 30 years old, by 2002 this percentage rises in 10 percentage points (whereas the proportion of women with other than firm contracts that are under 30 years decreases in 4 percentage points). The increase in female educational level can be observed not only for those women with firm level contracts (the percentage of women with university studies rises from 15% to 23%) but also for women covered by other contracts (from 9% to 15%). The increase in the proportion of women with university studies more than doubles the one observed for males.

If we look at the types of firms that workers belong to by contract status, some interesting features arise. On the one hand, workers with firm-level contract work in the largest establishments. This is particularly so in 2002, where 80% of women and 75% of men with firm-level contract belong to firms that have over 200 workers (compared to 45% and 46% in 1995). Second, there is an overall change in the industry distribution of firms included in the sample. Whereas in 1995 65% of firms in the sample belong to manufacturing, by 2002 this percentage decreases to 48%. This decrease is compensated with an increase of firms that belong to services (mainly, trade, hotels and other services). This change in industry distribution is particularly pronounced in firms with firm-level contract.

The dependent variable for this analysis is the logarithm of the gross wage expressed in euros per hour. Gross wage is defined as the sum of the gross base wage and gross wage complements. Base wages are determined from the corresponding contract by

[7] In our analysis we use sampling weights for each worker that reflect the relative probabilities of sample selection for different establishments.

occupation and category within a firm, while wage complements are defined as the set of payments above the base wage, and include factors such as seniority as well as more discretionary suplements such as incentives for productivity, attendance and punctuality awarded to individual employees. Our measure does not include bonuses for nightshifts or extraordinary payments[8].

Tables 3 and 4 present the mean and standard deviation of log hourly wages for 1995 and 2002. Table 3 describes mean log wages and the standard deviation dissagregated by gender, which shows the raw wage premium and its dynamics over this seven year period. Table 4, on the other hand, describes average wages by workers' characteristics and type of contract, which allows us to better understand the dynamics of the wage premium. The first two columns of table 3 show the unadjusted sample moments, while columns (3) and (4) show adjusted moments obtained using the re-weighting technique of DiNardo, Fortin and Lemieux (1996), which adjusts the sample for differences in observed characteristics in such a way that the weighted distribution of skill characteristics is the same in each sector as in the overall sample[9]. In order to measure wages in real terms, 2002 wages are deflated to their 1995 value.

The information in table 3 gives us some indication of how mean wages and dispersion vary from one contracting level to another over time. Regarding mean wages, we observe that unadjusted mean wages are systematically higher in 2002, except for women covered by firm-specific contracts. Average wages for women with firm-level contracts decrease in real terms over this seven year period. Furthermore, the raw firm-specific wage premium increases from .32 to .34 for men, but it decreases by around 30% for women (from .34 to .23) over the seven-year period. Looking at the adjusted moments, we find that the standardized wage premium decreases in 1 percentage point for men (from 0.11 to 0.10) but it decreases in 6 percentage points for women (from 0.12 to 0.06). This difference in the raw and standardized wage premium for men and women has to do with the change in the composition of women belonging to firms with firm-level contracts. As we saw before, comparing the sample of female workers with firm-level contracts in 1995 and in 2002, the latter women are much younger, their mean tenure has decreased to a great extent

[8] Generally, young men are more likely to have this kind of complement, so by including them in the hourly wage we are making a distintion between groups of workers.

[9] The idea behind this semiparametric procedure is to allocate a lower weight to individuals who are overrepresented in the subsample of workers covered by non firm-specific contracts and viceversa.

(compared to men mean tenure), are working mainly in firms with over 200 workers and many of them work in trade and other services in detriment of manufacturing.

Table 4 presents mean wages by workers' characteristics and type of contract to help us understand the relationship between the change in the composition of women with firm-level contracts and their decrease in real wages. It reveals, in the first place, that wages of workers under 30 years old are the lowest ones and the ones that have experienced the smallest increase. Second, wages of workers with university education are highest, but on average their increase over this seven year period is almost negliglible. Third, average wages of firms with over 200 workers are the highest, but the wage increase is lower than in other firms for the period under study. Finally, wages in trade, hotels and other services (where the proportion of women with firm-level contracts has increased considerably) are the lowest and have decreased over this period.

What about wage dispersion? Various issues emerge in regard to wage dispersion from table 3: First, looking at all workers in 1995, it can be seen that wage variance associated with firm-specific contracts is lower than variance of wages for workers with other contracts. However, when we dissagregate by gender, we observe that this feature arises as a result of a higher compression of wages of men with firm-contracts relative to other contracts. On the contrary, wages of women with firm-specific contracts are more disperse than those of women with other contracts. If we look at the dynamics of wage dispersion over this seven year period, we can see that (i) the overall variance for all workers remains almost the same as in 1995, if anything, there is a very slight decrease, (ii) wages of male workers with firm contracts are, as in 1995, more compressed than those with other contracts (although their dispersion has increased slightly), and (iii) the dispersion of wages of women with firm contracts has increased to a great extent, whereas those of women with other contracts have remained at its 1995 level. This has led to a significant increase in the dispersion of wages of women with firm-level contracts relative to women with other contracts. This result is similar to the findings of Card (2001) for US women, when the dispersion of unionized and not unionized women is compared.

To give a better picture of the relationship between contract type and wages for different types of workers, Figures 2 and 3 plot mean log wages for men and women for workers in different age-education cells[10] for the two periods. In doing this, we restrict

[10] Specifically, workers are divided into 56 cells using eight age categories and seven education ranges.

individual heterogeneity in observed skills (age and education) of workers covered by different types of contracts. If mean wages were the same in the two sectors for workers with similar observed skills, the points would lie along the reference 45 degree line. Examination of the graphs shows that wages are higher under firm-level contracts than under sectoral contracting in both periods for both men and women (as we saw in Table 3). Furthermore, the difference in average wages between workers with and without firm contracts is more disperse for more highly-skilled workers, particularly for highly-skilled women.

Finally, to offer a broader view of the dynamics of wage dispersion over the seven year period by type of contract, Figures 4 and 5 plot the whole distribution of wages for both periods by gender[11]. The two figures plot both the actual and counterfactual distributions. The latter is the distribution that would prevail in the absence of firm-level contracts. It is obtained using a procedure developed by Dinardo, Fortin and Lemieux (1996) and consists of a reweighting of the distribution of wages of workers covered by non firm-level contracts (See Appendix for further details). To carry out the analysis, we focus on a general method for describing changes in the whole distribution of wages such as kernel density estimates.

From the graphs it can be seen that firm-level contracts tend to move the distribution of wages rightwards for both men and women, particularly in 1995. This is consistent with the higher average wage premium associated with firm-level contracts in that year. In fact, for 2002, the actual and counterfactual distributions of wages are almost identical. To conclude, from this visual inspection, (i) there is a clear positive relationship between firm-specific contracts and wage levels in 1995, which decreases over the seven year period, and (ii) there is no clear relationship between firm-specific contracts and wage dispersion in any of the two periods under analysis.

Next, we look at wage estimation models to quantify the effect of firm-specific contracts on wages and their dynamics over this seven year period. In the next section we describe the econometric model used here to explain the wage determination process and test the descriptive facts previously observed.

[11] Previous studies for the Anglo-Saxon countries, such as Dinardo, Fortin and Lemieux (1996) have shown that the effect of unions is best captured by modelling the whole distribution of wages.

4 The model

To quantify collective bargaining wage premiums, we consider a wage equation for worker i at establishment j of the following form,

$$w_{ij} = \beta X_i + \delta_j + \mu_i + \varepsilon_{ij} \tag{1}$$

where w_{ij} is the log hourly wage of individual i, X_i is a set of observed characteristics of workers (such as age, education, job tenure and contract status) associated with a vector of coefficients β, δ_j represents the wage premium earned by workers due to their belonging to establishment j, μ_i represents the unobserved characteristics of individual i, such as ability. Finally, ε_{ij} is the error term, which is assumed to follow a normal distribution. To model the effect of firm-level contracting it is assumed that the wage premium earned by workers at establishment j, that is, δ_j, depends on four factors: a dummy variable for the presence of a firm-specific contract at the workplace (F_j), the average characteristics of the workforce at the establishment (X_j), a vector of observed chacacteristics of firms (Z_j) such as size and market orientation of products, and the unobserved component of firms (v_j), e.g. their profitability.

These assumptions lead to a model for individual wages of the following form,

$$w_{ij} = \beta X_i + \alpha F_j + \eta X_j + \gamma Z_j + \mu_i + v_j + \varepsilon_{ij} \tag{2}$$

The main focus of this paper is on estimating the impact of firm-level contracting on wages, α. Is OLS the most appropriate way to estimate that coefficient in this context? If μ_i and v_j are uncorrelated with F_j, conditional on the observed worker and firm characteristics, α can be consistently estimated by OLS applied to equation (2). But generally, as pointed out by Lewis (1986), such estimates suffer from upward bias resulting from the omission of unobserved variables correlated with contract status. If this is the case, the estimation of α by OLS will include the true effect as well as the bias factors arising from both worker and firm unobserved heterogeneity.

Therefore, the relevant question when estimating the firm-level contract effect is how to eliminate these biases. This would be easier if we had longitudinal data[12], but alternative solutions can be found that exploit the advantages of our data, such as the availability

[12] See Blanchflower (1999) for an estimation of the fixed effects of the union premium on wages.

of information on the characteristics of co-workers (meaning workers in the same firm with the same occupation). If we assume that workers with higher unobserved ability tend to have co-workers with higher average skill levels, some of the effects of unobserved ability can be eliminated by controlling for average characteristics of co-workers.

In order to deal with the unobserved heterogeneity of firms, we control for the full set of observed firm-level characteristics that determine the level of bargaining[13]. As shown by Imbens (2004), if contract status is ignorable conditional on the observed control variables, then conditioning on the probability that establishment j has a firm-level contract will eliminate any bias in the estimation of α arising from the correlation of contract status with firm characteristics. To implement this idea, a probit model for the probability of a firm-level contract is fitted, the predicted probability is estimated and then included as a polynomial function in the individual earnings equation. Using this predicted probability all the relevant information is condensed into the one dimensional propensity score.

5 Empirical estimation of the Firm-level contract premium

5.1 Standard regression models

Tables 4 and 5 present a series of individual regression models for men and women respectively for the two years. The first model includes only a dummy variable which takes value one if the worker is covered by a firm-specific contract. Column (2) incorporates observed worker and firm characteristics such as age, education, contract status, market orientation, firm size and public ownership status of the firm. Finally, the third model also includes the average characteristics of co-workers at the same establishment in the same one-digit occupational group[14].

From column (1), it can be seen that over the seven-year period the unadjusted firm-specific wage premium remains stable for men (around 32%) but decreases by almost 30% for women (from 34% to 24%). Adding together individual and firm characteristics

[13] For 1995 the same information used by Card and De la Rica (2006) is included, but for 2002 we also add financial information at the industry level.

[14] Columns (1), (2) and (3) for 1995 were reported in Card and De la Rica (2006), but we show them here for the sake of comparability. Models which include mean co-worker characteristics in narrower occupational subgroups were fitted by Card and de la Rica (2006) for the EES-95 and no significant differences were found.

(column 2) increases the explanatory power of the model considerably and reduces the coefficients, suggesting that a striking proportion of the correlation between firm-level contracts and wages is due to systematic sorting of workers across firms. For men the adjusted premium is still positive and significant in both periods, but for women the average firm contract wage premium decreases from 0.12 in 1995 to zero in 2002. Adding in co-worker characteristics (column 3) decreases the premium slightly for men but the main features remain.

Several additional features arise from Tables 4 and 5. Belonging to a firm with an international product orientation increases wages particularly in 2002. The penalty for holding a fixed-term contract decreases by 5-10% over this seven-year period for both men and women. This could be one of the results of the reforms that took place in Spain during the nineties, which tried to reduce the amount of this kind of contracting but also to improve the conditions of those workers who had a fixed-term contract[15]. Co-worker average characteristics have a significant, positive effect on individual wages. However, the proportion of female co-workers affects wages differently depending on gender and period. For men, working in women's jobs decreased wages in 1995 by around 4 percent, but this penalty had dissappeared by 2002. However, for women, working in women's jobs poses a big, increasing penalty (15 percent in 1995 and 18 percent in 2002).

5.2 Adding the Propensity Score

Our earlier considerations (in Section 3) suggested that the estimated wage effects might be biased due to a non-random selection of firms with unobservable characteristics in the different contracting regimes. Thus, in this paper one of the principal goals is to control for unobserved heterogeneity arising from the side of the firm. Since we have no financial information at establishment level which could give us an idea about the rents of firms in each reference year, we will try to find an alternative solution for this source of heterogeneity. As in Card and de la Rica, following Imbens (2004) this problem can be solved in two steps. First, we estimate the probability of a firm offering a firm-level contract using a discrete choice model. This estimated probability for each establishment is asigned to all individuals working at the same firm. In the second step, we introduce this variable as an additional regressor in the individual earnings equation.

[15] See de la Rica (2004) for a detailed analysis of the wage gap between workers with indefinite and fixed-term contracts.

Table 6 shows the results of adding a third order polynomial function of the estimated propensity score to the more general wage determination model covered in the previous subsection. Although not reported, due to the similarity of the coefficients, estimations also include all covariates included in model (3) of Tables 4-5, that is, individual observable skills, job characteristics, average skills of co-workers, and indicators for region, occupation and industry. If we compare Tables 4-5 and 6, adding the estimated probability of a firm-level contract decreases the premium associated to this kind of contracting for both men and women, due in part to the fact that establishments offering firm-level contracts tend to have higher propensities. In 1995 the premium is still lower for men than for women (5-7% respectively). In 2002 the coefficient is lower but significant for men (around 5%) and insignificant for women. The propensity score is statistically significant in all cases. Summarizing, from 1995 to 2002, on average the premium decreases for men and drops to zero for women

5.3 Analysis by Skill Group

In this section we try to determine whether the effect associated with firm-level contracting is different for different skill groups and whether it depends on the period under study. This issue is even more relevant for the 2002 group of females, because we find that on average there is no significant effect of firm-level contracting on women's wages. To adress these questions we first divide the wage distributions for men and women into percentiles (the 20th, 40th, 60th and 80th) for each year. Ordered probit models (See Appendix Table A1) are then estimated separately by gender and period to predict the probability of a given person being in any one of the five quintiles. These predicted probabilities are used as weights and five separate models for each gender and year are estimated.

Table 7 summarizes the estimated firm-level contract premiums from four different wage determination models for 1995 and 2002. These different models correspond to the specifications in Tables 4, 5 and 6, with model (4) being the most accurate specification, adding in co-worker characteristics and a cubic in the estimated propensity score. Several points common to 1995 and 2002 can be adressed from Table 7. For men, the estimated effect of working under firm-level contracts is roughly constant across wage groups when we exclude any other observed covariates. But in specifications (2)-(4) we find a tendency for a higher premium among higher paid workers. The results for women are similar to those for men, although among women there is an even stronger tendency for the firm-level contracting premium to increase across the wage distribution.

A comparison of the two years, looking at the more general specification, shows that premiums in 2002 are in general below those obtained 7 years earlier. For men, the premium ranges from 5% to 9% between the lowest and highest wage quintiles in 1995, whereas in 2002 it goes from 5% to 8%. The premium for the lowest-paid women is almost zero in both periods, but in the top quintile of the wage distribution is nearly 10% in 1995 and 6% in 2002. In addition, while all premiums are statistically significant for the 1995 sample, regardless of gender, after 7 years premium for women are only found to be significant at the upper end of the distribution (quintiles 4 and 5), i.e. for the highest paid females. This is consistent with the preliminary analysis carried out at the beginning of the paper, where we found the highest wage dispersion in the 2002 sample of women, and higher premiums for older and more highly educated women.

In order to understand the higher drop in the adjusted premium for women compared with that for men, we must take into account, as we mentioned above, that the sample of women with firm-contracts has gone through a significant compositional change over this seven year period - in 2002, women with firm-level contracts are much younger, with a lower tenure, the percentage of them who in firms with over 200 workers has increased significantly and their presence in trade and other services has increased in detriment of manufacturing. Our conjecture is that the difference in the adjusted wage premium between men and women is partly capturing the unobservable compositional change in the sample of women with firm contracts. Otherwise the drop in the adjusted premium should be similar for both genders.

Summarizing, two important conclusions can be drawn. The premium found for firm-specific contracting is higher for more highly paid workers in both periods. This result contrasts with the union wage premium in the United States and United Kingdom, which is generally found to be lower for highly paid workers. In addition, firm-level contracting matters for all skill groups in 1995, but in 2002 it is not significant for less skilled women. In the next section we extend this analysis using the new source of financial data available for 2002.

5.4 Adding in firm-performance information for 2002

5.4.1 Does the premium change when financial information is included?

The wage premium could still be reflecting, at least partly, unobservable differences among firms. We have very little information about their economic performance, and these unobserved differences might well be correlated with the firm-specific wage premium. In order to take into account this possible bias, we use a new source of data, the Structural Statistics Business Survey, which allows us to introduce financial information on some industries, although this information is only available for 2002. Thus, in this section we test the sensitivity of the premium estimated to the new data and estimation methods available. We construct some measures of economic performance in line with the relevant literature and then choose the most suitable variables to include in the above estimation of the propensity score[16].

For a preliminary descriptive approach, Figure 6 shows the average log hourly wage by type of contract and economic performance of industry for 2002. Industries are sorted by volume of business (from lowest to highest -see Appendix for a list of industries). It is revealed that mean wages fluctuate considerably from one industry to another.[17] The figure suggests a positive correlation between workers' wages and firms' ability to pay. Dissagregation of Figure 6 by gender (not reported) reveals that this positive relationship is very similar for both men and women. In addition, as seen above, wages are greater on average when bargaining takes place at firm level, regardless of the industry.

Since the raw data suggest a positive relationship between wages and profits, we set out to check whether the premium associated with firm-level contracting varies when this financial information is included. For our purpose, the most useful variables from this survey are volume of business and the investment rate, per employee in both cases, in logarithms and measured in 1995 euros for the sake of comparability. Volume of business is defined as the amounts invoiced by a company during the reference year in return for the provision of services and sale of goods that are the object of its trading. Investment

[16]Instead of including them in the regression directly, we add them to the propensity score because in that way we eliminate the bias arising from firms' unobserved heterogeneity. (Imbens 2004)

[17]The best paying industry is the electricity, gas and hot water supply sector. The results regarding high and low paying industries are similar to those obtained by Plasman et al. (2006) for Belgium.

can be described as the transfers carried out during the reference year to obtain goods to be used in the long run in the company's activity.[18]

These variables do not exactly measure the economic performance of industry, but they may be considered as good proxies for it, and from an econometric perspective the use of proxies enables us to avoid the endogeneity problem between profits and wages, which are determined simultaneously in the wage equation. Other variables such as gross operating surplus and a productivity indicator are available, but they are highly correlated with investment and give the same estimate of the propensity score. Table 8 presents the results of the estimation when we include these variables together in the propensity score.

The first point to be mentioned is that both variables are significant and both increase the probability of having a firm-level contract when they are included in the probit model (See Appendix Table A2). As can be seen from table 8, the earnings regression coefficient associated with firm-level contracting is still significant for men, and it is significantly higher. For women, the premium was not significant before and including profitability of firms does not change that result. Therefore, the main conclusion of this robustness test is that the estimate of the propensity score has improved but the premium has not changed substantially.

The next question to be answered in this section is whether the premium is still higher for highly paid workers with the improvement in the estimation of the propensity score. We carry out the analysis by quintile group for the more general specification (model 4) substituting the new estimate of the p-score. Table 9 shows the results of this estimation. We find no significant differences when comparing Table 9 with the corresponding rows for 2002 in Table 7. Only the premium for women in the top quintile is significantly higher (up from 5.5% to 6.6%) when the estimate of the propensity score that includes financial information at the industry level is used.

[18] The variable used as a proxy of economic performance by some studies in Belgium and England is the investment rate. Other authors such as Abowd, Kramarz and Troske (2001) and Marsden (2005) use the per capita value added as an instrument for dealing with the problem of endogeneity of profits in the earnings equation.

5.4.2 Is there a rent component behind this premium?

There are several possible explanations for the positive wage premium associated with firm-level contracts. Workers covered by firm-level contracts could be required to work harder, raising the possibiltiy of the efficiency wage premium explanation (Akerlof 1982; Weiss 1990). On the other hand, there is a growing literature in favour of the rent-sharing hypothesis, showing that firms share rents with their employees. Some findings from the Anglo-Saxon countries suggest that profitable firms tend to pay higher wages to their workers. For instance, Blanchflower et al. (1996) using data for the US manufacturing sector, shows that an increase in the industry's ablility to pay rises the long run level of wages. Abowd and Lemieux (1993) find the profit per employee elasticity of wages for the US to be around 0.3. Studies for European countries, such as the analysis by Goos and Konings (2001) also support a positive correlation, finding a profit per worker elasticity of wages of 0.1 for Belgium.

The availability of financial variables for 2002 may help us to test the hypothesis of rent-sharing at least for this period. The rent sharing hypothesis in our framework suggests that, through collective bargaining agreements, unions could be forcing large firms with positive financial results to share the rents obtained during the economic year with their employees. To test for this, we add the two possible measures of economic performance separately to the more general specification of the wage equation used in previous sections, in order to analize the profit per employee elasticity of wages. Interaction terms between profitability and contract status are also included to see whether the elasticity is greater under firm-level contracting. The results are shown in table 10.

We find a positive profit per employee elasticity of wages of around 4-5% for men and 3-4% for women. Moreover, the positive and significant coefficient of the interaction terms (using both measures) reveals a greater elasticity in those establishments that offer firm-level contracts for both men and women. This result is consistent with the existence of a rent-sharing component in the firm contract wage premium in 2002[19]. Card and de la Rica (2006) support the rent-based explanation for the firm contract wage premium for 1995 for men, but not for women.

[19] Nevertheless, we advise some caution with this interpretation given that we cannot control perfectly for firm size (the firm size variable is in intervals only), and firm size is usually correlated with monitoring costs. If monitoring costs are not adequately controlled for, we might not be able to disregard the efficiency wages explanation.

6 The impact of "centralization" on wage inequality

The last issue that we want to address is whether centralization in the wage bargaining process has had any effect on wage inequality. Table 1 reveals that in this seven-year period there has been a clear tendency towards centralization in the collective bargaining process, illustrated by the decline in the fraction of workers covered by firm-specific contracts compared to those covered by sectoral contracts. Regarding wage inequality, table 3 reveals that (i) the overall dispersion of wages has decreased slightly for both men and women, (ii) the variance of wages for both men and women with firm-specific contracts has increased significantly, particularly for women, and (iii) the change in wage dispersion for both men and women with other than firm contracts is negligible. These three facts lead us naturally to conclude that in the absence of centralization, the overall wage dispersion in 2002 would have increased. We can try to assess the magnitude of the impact of centralization on the decrease in wage dispersion over this seven-year period. Following Gosling and Lemieux (2001) we show the effect of firm contracts on wage inequality by performing a simple variance decomposition. One way of decomposing the variance of wages is the following,

$$Var(w) = \hat{F}Var(w \mid F_j = 1) + (1 - \hat{F})Var(w \mid F_j = 0) + \hat{F}(1 - \hat{F})\Delta^2 \tag{3}$$

where $\hat{F}$ is the fraction of firm-level contracts and Δ is the wage premium associated with firm-level contracting, that is, $E(w \mid F_j = 1) - E(w \mid F_j = 0)$.

Table 11 shows the different elements of this variance decomposition. We have computed two counterfactual variances: The first one is shown in the 6th row, and presents the variance that would prevail with the 2002 sample if the fraction of firm agreements remained at the 1995 level . The second counterfactual variance is constructed under the assumption of no firm-contracts in 2002. Such variance is presented in row 8.

From table 11 a clear conclusion emerges: If a centralization process of wage bargaining had not taken place in Spain over this seven year period, the overall variance of wages would have increased in almost two percent. Instead, the observed overall variance has actually decreased in around one percent. Hence, centralization has led to a decrease in overall wage variance of around three percent, and the magnitude is similar for men and women. This result is in line with the findings of Teulings and Hartog (1998) or Blau and Kahn (2002), who show that the more centralized wage setting, the more compressed the wage distribution is. In order to compare our results with those of the Anglo-Saxon countries, we would have to accept, as Disney, Gosling and Machin (1996) point out, that an employer's decision to accept a firm-specific contract is comparable to the voluntary union recognition process. They find de-unionization in the US and in the UK to be an important factor in explaining the rise in wage inequality during the eighties in the two countries. If firm-contracts are comparable to unionization, then our results clearly contrast with their findings. However, it is not clear that the process of firm-contracting is comparable to a union recognition process.

Section 5 lead us to conclude that the premium for firm-specific contracting is higher for more highly paid workers, contrary to the union wage premium in the United States and United Kingdom, which is generally found to be lower for highly paid workers. Therefore, although there may be similarities between firm-contracting and union recognition process, we must be cautious when comparing the Anglo-Saxon deunionization with the centralization process of wage bargaining.

7 Conclusions

This paper provides microeconomic evidence on the changes over time in the firm-specific wage premium in Spain from 1995 to 2002, and on its impact on wage inequality. We make use of two waves of a detailed linked employer-employee data set. In addition, a new dataset with financial information on firms is used for 2002 to control as flexibly as possible for differences in firm performance (aggregated at industry level).

Descriptive comparisons across workers suggest that workers covered by firm-level contracts are older, more highly educated and tend to be working in the largest establishments. Looking at the descriptives, wages under firm-specific agreements are systematically higher for both periods. Using different age-education cells, we see that the premium associated with firm contracts is a little higher for older and more highly educated women, particularly in 2002. Stylized facts also reveal a clear tendency towards centralization in the collective bargaining process in Spain over this seven-year period.

Our results conclude that for men the adjusted firm-level contract wage premium has slightly decreased over this seven-year period (from 5.4 percent to 4.6 percent). In addition, there is a significant drop in the adjusted average firm-level contract wage premium for women: in 1995 the average premium for women was around 7 percent, but on average it drops to zero by 2002. In order to understand the higher drop in the adjusted premium for women compared with that for men, we must take into account, as we mentioned above, that the sample of women with firm-contracts has gone through a significant compositional change over this seven year period - in 2002, women with firm-level contracts are much younger, with a lower tenure, the percentage of them who work in firms with over 200 workers has increased significantly and their presence in trade and other services has increased in detriment of manufacturing. Our conjecture is that the difference in the adjusted wage premium between men and women is partly capturing the unobservable compositional change in the sample of women with firm contracts. Otherwise the drop in the adjusted premium should be similar for both genders.

When we look at the overall wage distribution, it can be seen that for both men and women in both periods, firm-level contracts tend to raise wages more for more highly paid workers, although for women in 2002, the firm contract wage premium is only significantly positive for women in the 4th and 5th quantiles of the wage distribution.

Finally, we measure the impact of wage centralization on wage inequality. As of 2002, wage dispersion of workers, both men and women, covered by firm-contracts is higher than those covered by other contracts. Therefore, centralization in terms of a decrease of firm-contracts in favour of other contracts must naturally lead to a decrease in the overall wage variance. We find that centralization of wage bargaining in Spain has led to a decrease in wage variance of around 3 percent, similar for both men and women. This result is in line with the findings of Teulings and Hartog (1998) or Blau and Kahn (2002), who show that the more centralized wage setting, the more compressed the wage distribution is.

APPENDIX

Table A1
Models for the Probability of Being in Different Wage Quintiles

	Men		*Women*	
Variable	**1995**	**2002**	**1995**	**2002**
Age	0.038	0.034	0.041	0.027
	(0.0006)	(0.0006)	(0.001)	(0.001)
Education	0.101	0.099	0.092	0.091
	(0.002)	(0.002)	(0.004)	(0.003)
Temporary Contract	-0.839	-0.469	-0.721	-0.452
	(0.014)	(0.013)	(0.022)	(0.019)
Occupations				
Managers and Technicians	0.601	0.787	1.075	1.133
	(0.023)	(0.024)	(0.044)	(0.033)
Clerical Workers	0.061	0.069	0.368	0.261
	(0.023)	(0.027)	(0.032)	(0.028)
Service Workers	-0.409	-0.236	-0.016	0.243
	(0.029)	(0.028)	(0.037)	(0.029)
Qualified Manual Workers	-0.004	0.204	0.091	0.223
	(0.016)	(0.017)	(0.029)	(0.025)
Pseudo-R^2	0.150	0.124	0.148	0.116
Number of Observations	100.533	89.320	29.637	40.056

Notes: Models are ordered probit models with five ranges based on unconditional quintiles of gender specific wage distribution. Robust standard errors in parentheses.

Industries according to NACE rev.1

A: Agriculture, hunting and forestry.

B: Fishing.

C: Mining and quarrying.

D: Manufacturing

- DA: Manufacture of food products, beverages and tobacco.
- DD: Manufacture of wood and wood products.
- DE: Manufacture of pulp, paper and paper products: publishing and printing.
- DH: Manufacture of rubber and plastic products.
- DJ: Manufacture of basic metals and fabricated metal products.
- DK: Manufature of machinery and equipment, n.e.c.
- DL: Manufacture of electrical and optical equipment.
- DM: Manufacture of transport equipment.
- DN: Manufacturing n.e.c.

E: Electricity, gas and water supply.

F: Construction.

G: Wholesale and retail trade; repair of motor vehicles and personal goods.

H: Hotels and Restaurants.

I: Transport, Storage and Communication.

K: Real Estate, Renting and Business Activities.

Table A2

Probit Model for the Probability of having a firm level contract

Variable	**1995**	**2002**	
Average characteristics of the workforce			
Age	0.162	0.065	0.121
	(0.042)	(0.060)	(0.063)
Squared Age	-0.001	0.001	0.002
	(0.0005)	(0.0007)	(0.0008)
Education	0.065	0.036	0.032
	(0.015)	(0.017)	(0.019)
Occupational distribution by firm			
Managers and Technicians	0.928	1.122	0.693
	(0.215)	(0.266)	(0.272)
Clerical Workers	0.487	0.322	0.933
	(0.222)	(0.315)	(0.273)
Service Workers	-0.428	0.833	0.910
	(0.279)	(0.285)	(0.269)
Qualified Manual Workers	0.521	0.843	0.503
	(0.153)	(0.237)	(0.233)
Product Market Orientation			
International market	0.151	0.252	0.038
	(0.078)	(0.122)	(0.108)
Establishment Size Distribution			
21-50	0.248	0.515	0.606
	(0.114)	(0.078)	(0.088)
51-100	0.912	0.484	0.615
	(0.132)	(0.096)	(0.104)
101-200	1.049	0.499	0.521
	(0.130)	(0.162)	(0.188)
Over 200	2.114	1.788	1.902
	(0.146)	(0.079)	(0.087)
Financial Variables at the Industry Level			
Business Volume per employee			0.344
			(0.085)
Investment per employee			0.541
			(0.075)
Pseudo R^2	0.389	0.336	0.425
Number of establishments	14.347	14.768	14.768

Notes: The individual explanatory variables are averaged over the characteristics of the workforce at each establishment. Financial variables at the 2-digit industry level. Robust standard errors in parentheses.

Re-weighting procedure

Following the notation of the model presented in Section 4, the observed density of wages in the subsample of workers covered by other contracts is given by

$$f(w \mid F_j = 0) = \int f^{oc}(w \mid x) f(x \mid F_j = 0) dx \tag{4}$$

where $f^{oc}(w \mid x) = f(w \mid x, F_j = 0)$. The distribution that would prevail if all workers were paid under the wage structure of workers covered by other contracts would be,

$$f^{oc}(w) = \int f^{oc}(w \mid x) f(x) dx \tag{5}$$

As shown in full detail by Dinardo, Fortin and Lemieux (1996) this last equation can be written as follows,

$$f^{oc}(w) = \int \lambda(x) f^{oc}(w \mid x) f(x \mid F_j = 0) dx \tag{6}$$

A comparison of equations (4) and (6) indicates that the counterfactual density is simply the "reweighted" version of the actual density of wages in the subsample of workers covered by other contracts, where the sample weights are replaced by the weighting factor $\lambda(x)$, which is shown to be equal to $\lambda(x) = \Pr(F_j = 0) / \Pr(F_j = 0 \mid x)$. The numerator is just the proportion of workers covered by non firm-level contracts in the sample and the denominator is the probability of belonging to this subsample of workers conditional on the covariates, which is estimated using a probit model. The covariates used to estimate the probit model consist basically of a flexible functional form of human capital variables. Once the weighting factor is constructed each worker i is weighted by $\lambda_i = \lambda(x_i)$.

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Table 1. Evolution of Collective Bargaining in Spain 1995-2002

	Total Agreements		**Firm Collective Agreements**			
	Affected Workers (thousands)		Affected Workers (thousands)		Affected Workers (%)	
	1995	2002	1995	2002	1995	2002
Total	7.605,1	9.696,5	1.043,7	1.025,9	13,72	10,58
Industry	2.525,0	2.751,9	451,1	409,8	17,9	14,9
Construction	821,7	1.117,1	8,224	6,84	1,0	0,6
Services	3.528,7	5.044,0	582,5	605,95	16,5	12,01

Source: Boletín de Estadísticas Laborales

Table 2A. Workers' Characteristics by Type of Contract 1995-2002 - All Workers

	All Contracts		*Firm-Specific*		*Other Contract*	
Independent variable	**1995**	**2002**	**1995**	**2002**	**1995**	**2002**
Fraction Male	0.77	0.69	0.83	0.76	0.76	0.68
Age Distribution						
Under 30	0.25	0.29	0.15	0.21	0.27	0.30
30-44	0.44	0.44	0.43	0.42	0.45	0.45
45-55	0.23	0.20	0.33	0.28	0.20	0.19
Over 55	0.08	0.06	0.09	0.09	0.07	0.06
Education Distribution						
Primary	0.34	0.30	0.35	0.21	0.34	0.31
Secondary	0.55	0.57	0.51	0.61	0.57	0.57
University	0.10	0.13	0.14	0.18	0.09	0.13
Fraction Temporary Contracts	0.27	0.27	0.10	0.11	0.32	0.29
Mean Tenure (years)	10.68	7.18	15.36	13.24	9.30	6.54
Establishment Size Distribution						
11-20	0.20	0.44	0.05	0.08	0.24	0.48
21-50	0.26	0.15	0.12	0.08	0.30	0.16
51-100	0.17	0.09	0.15	0.06	0.17	0.09
101-200	0.15	0.03	0.21	0.02	0.13	0.03
Over 200	0.22	0.28	0.46	0.75	0.16	0.23
Industry Distribution						
Manufacturing	0.65	0.48	0.84	0.59	0.59	0.47
Construction	0.07	0.10	0.01	0.01	0.08	0.11
Trade	0.09	0.12	0.04	0.10	0.11	0.12
Hotels	0.05	0.07	0.01	0.02	0.06	0.08
Transportation	0.04	0.06	0.05	0.17	0.03	0.05
Financial Services	0.06	0.06	0.03	0.04	0.07	0.06
Other Services	0.04	0.11	0.02	0.07	0.05	0.11
Product Market Orientation						
Local-Regional	0.86	0.88	0.77	0.75	0.88	0.89
International	0.14	0.12	0.23	0.25	0.12	0.11
Occupational Distribution						
Managers and Technicians	0.15	0.19	0.21	0.31	0.13	0.18
Clerical Workers	0.14	0.12	0.12	0.10	0.15	0.12
Service Workers	0.07	0.11	0.02	0.08	0.08	0.11
Qualified Manual Workers	0.48	0.42	0.53	0.42	0.47	0.42
Non-qualified Manual Workers	0.12	0.14	0.08	0.05	0.13	0.15
Number of Observations	130,170	129,377	29,599	12,512	100,571	116,866

Notes: Samples are weighted and include all full time workers with valid information on key variables in EES-95 and EES-02 for each year respectively.

Table 2B. Women' Characteristics by Type of Contract 1995-2002

	All contracts		*Firm-Specific*		*Other Contract*	
Independent variable	**1995**	**2002**	**1995**	**2002**	**1995**	**2002**
Age Distribution						
Under 30	0.36	0.35	0.24	0.34	0.39	0.35
30-44	0.47	0.45	0.54	0.44	0.45	0.45
45-55	0.13	0.16	0.18	0.19	0.12	0.16
Over 55	0.03	0.04	0.03	0.03	0.03	0.04
Education Distribution						
Primary	0.26	0.26	0.26	0.13	0.26	0.27
Secondary	0.64	0.58	0.60	0.64	0.65	0.58
University	0.10	0.15	0.15	0.23	0.09	0.15
Fraction Temporary Contracts	0.31	0.26	0.17	0.16	0.33	0.27
Mean Tenure (years)	8.69	5.59	13.01	8.86	7.81	5.33
Establishment Size Distribution						
11-20	0.18	0.39	0.06	0.07	0.21	0.41
21-50	0.23	0.14	0.14	0.07	0.25	0.15
51-100	0.17	0.09	0.15	0.05	0.17	0.10
101-200	0.16	0.03	0.20	0.01	0.16	0.03
Over 200	0.25	0.35	0.45	0.80	0.21	0.32
Industry Distribution						
Manufacturing	0.59	0.38	0.75	0.42	0.55	0.38
Construction	0.02	0.02	0.01	0.01	0.02	0.02
Trade	0.15	0.18	0.07	0.24	0.16	0.17
Hotels	0.09	0.13	0.02	0.04	0.11	0.13
Transportation	0.03	0.04	0.06	0.13	0.02	0.04
Financial Services	0.07	0.06	0.06	0.07	0.07	0.06
Other Services	0.06	0.19	0.05	0.10	0.06	0.20
Product Market Orientation						
Local-Regional	0.86	0.88	0.83	0.86	0.87	0.88
International	0.14	0.12	0.17	0.14	0.13	0.12
Occupational Distribution						
Managers and Technicians	0.13	0.20	0.22	0.37	0.11	0.19
Clerical Workers	0.31	0.22	0.33	0.19	0.30	0.22
Service Workers	0.11	0.18	0.03	0.19	0.13	0.17
Qualified Manual Workers	0.29	0.19	0.31	0.16	0.29	0.19
Non-qualified Manual Workers	0.15	0.21	0.09	0.07	0.16	0.22
Number of Observations	29,637	40,056	5,033	3,001	24,604	37,055

Notes: Samples are weighted and include all full time workers with valid information on key variables in EES-95 and EES-02 for each year respectively.

Table 2C. Men' Characteristics by Type of Contract 1995-2002

	All		*Firm-Specific*		*Other Contract*	
Independent variable	**1995**	**2002**	**1995**	**2002**	**1995**	**2002**
Age Distribution						
Under 30	0.21	0.26	0.13	0.17	0.24	0.27
30-44	0.44	0.44	0.40	0.41	0.45	0.45
45-55	0.26	0.22	0.36	0.31	0.23	0.21
Over 55	0.09	0.08	0.10	0.12	0.09	0.07
Education Distribution						
Primary	0.37	0.31	0.37	0.23	0.37	0.32
Secondary	0.53	0.57	0.50	0.60	0.54	0.56
University	0.10	0.12	0.13	0.17	0.09	0.12
Fraction Temporary Contracts	0.26	0.28	0.08	0.10	0.31	0.30
Mean Tenure (years)	11.26	7.90	15.84	14.62	9.77	7.10
Establishment Size Distribution						
11-20	0.21	0.47	0.05	0.09	0.25	0.51
21-50	0.26	0.16	0.12	0.09	0.31	0.17
51-100	0.17	0.09	0.15	0.07	0.17	0.09
101-200	0.15	0.03	0.22	0.02	0.13	0.03
Over 200	0.22	0.25	0.46	0.74	0.14	0.20
Industry Distribution						
Manufacturing	0.67	0.53	0.86	0.64	0.61	0.51
Construction	0.08	0.14	0.01	0.01	0.10	0.15
Trade	0.08	0.09	0.04	0.06	0.09	0.10
Hotels	0.04	0.05	0.01	0.01	0.05	0.05
Transportation	0.04	0.07	0.05	0.19	0.07	0.06
Financial Services	0.06	0.05	0.03	0.03	0.04	0.06
Other Services	0.04	0.07	0.02	0.06	0.07	0.07
Product Market Orientation						
Local-Regional	0.86	0.87	0.76	0.72	0.89	0.89
International	0.14	0.13	0.24	0.28	0.11	0.11
Occupational Distribution						
Managers and Technicians	0.15	0.19	0.21	0.29	0.14	0.17
Clerical Workers	0.09	0.08	0.08	0.08	0.10	0.08
Service Workers	0.05	0.07	0.01	0.05	0.06	0.08
Qualified Manual Workers	0.54	0.53	0.58	0.51	0.53	0.53
Non-qualified Manual Workers	0.11	0.11	0.08	0.05	0.13	0.11
Number of Observations	100,533	89,322	24,566	9,511	75,967	79,811

Notes: Samples are weighted and include all full time workers with valid information on key variables in EES-95 and EES-02 for each year respectively.

Table 3. Mean Log Wages by Type of Contract 1995-2002

	Mean Log Wage	*Standard Deviation*	*Standarized Mean Log Wage*	*Standarized Standard Deviation*
Group		**1995**		
All Workers				
Overall	1.680	0.511		
Firm Contract	1.951	0.471	1.837	0.498
Other Contract	1.608	0.496	1.727	0.501
Men				
Overall	1.745	0.509		
Firm Contract	1.989	0.457	1.885	0.489
Other Contract	1.672	0.502	1.781	0.502
Women				
Overall	1.472	0.454		
Firm Contract	1.763	0.489	1.643	0.488
Other Contract	1.419	0.427	1.522	0.441
Group		**2002**		
All Workers				
Overall	1.695	0.502		
Firm Contract	1.987	0.524	1.945	0.524
Other Contract	1.661	0.487	1.856	0.541
Men				
Overall	1.774	0.507		
Firm Contract	2.070	0.487	2.032	0.498
Other Contract	1.735	0.497	1.932	0.543
Women				
Overall	1.531	0.456		
Firm Contract	1.748	0.552	1.715	0.522
Other Contract	1.511	0.429	1.658	0.481

Notes: For 1995, samples are 130.170 for all workers,100.533 for men and 29.637 for women. For 2002, samples are 129.377 for all workers, 89.320 for men and 40.056 for women.

Table 4. Log Wage Regressions for MEN

	1995			**2002**		
Independent Variable	*(1)*	*(2)*	*(3)*	*(1)*	*(2)*	*(3)*
Firm Contract	0.317	0.082	0.075	0.335	0.072	0.069
	(0.013)	(0.012)	(0.009)	(0.022)	(0.018)	(0.016)
Worker´s Characteristics						
Education		0.026	0.024		0.023	0.021
		(0.001)	(0.001)		(0.001)	(0.001)
Age		0.011	0.010		0.011	0.010
		(0.0002)	(0.0002)		(0.0002)	(0.0002)
Temporary Contract		-0.199	-0.184		-0.106	-0.102
		(0.006)	(0.006)		(0.007)	(0.006)
Firm´s Characteristics						
International Market		0.025	0.022		0.076	0.076
		(0.013)	(0.010)		(0.013)	(0.011)
Publicly Owned		0.054	0.054		0.039	0.034
		(0.055)	(0.035)		(0.030)	(0.024)
20-50 Workers		0.070	0.070		0.086	0.085
		(0.009)	(0.008)		(0.009)	(0.008)
51-100 Workers		0.134	0.134		0.102	0.102
		(0.012)	(0.009)		(0.015)	(0.013)
101-200 Workers		0.149	0.151		0.149	0.151
		(0.013)	(0.010)		(0.022)	(0.019)
Over 200 Workers		0.219	0.220		0.156	0.156
		(0.013)	(0.011)		(0.017)	(0.014)
Average Characteristics of Coworkers						
Education			0.004			0.003
			(0.002)			(0.002)
Age			0.003			0.003
			(0.0009)			(0.001)
Proportion under 30			-0.088			-0.035
			(0.017)			(0.019)
Proportion over 50			-0.111			-0.052
			(0.020)			(0.024)
Proportion Female			-0.045			0.008
			(0.016)			0.021
Intercept	1.672	1.244	0.743	1.735	1.372	0.809
	(0.007)	(0.022)	(0.039)	(0.007)	(0.023)	(0.046)
R-Squared	0.068	0.506	0.509	0.045	0.474	0.477

Notes: Sampling weights used for estimation. For 1995, samples are 100.533 for men. For 2002, samples are 89.320 for men. Standard errors are calculated with clustering by firms. All models except (1) also include controls for occupation, industry and region.

Table 5. Log Wage Regressions for WOMEN

	1995			**2002**		
Independent Variable	*(1)*	*(2)*	*(3)*	*(1)*	*(2)*	*(3)*
Firm Contract	0.343	0.126	0.108	0.238	0.043	0.026
	(0.024)	(0.015)	(0.012)	(0.048)	(0.030)	(0.026)
Worker´s Characteristics						
Education		0.022	0.017		0.024	0.016
		(0.001)	(0.001)		(0.002)	(0.003)
Age		0.010	0.009		0.010	0.007
		(0.0004)	(0.0004)		(0.0005)	(0.0004)
Temporary Contract		-0.173	-0.157		-0.109	-0.105
		(0.011)	(0.012)		(0.007)	(0.007)
Firm´s Characteristics						
International Market		0.033	0.026		0.124	0.113
		(0.016)	(0.015)		(0.020)	(0.019)
Publicly Owned		0.124	0.137		0.012	-0.0097
		(0.041)	(0.033)		(0.043)	(0.039)
20-50 Workers		0.029	0.025		0.071	0.061
		(0.011)	(0.011)		(0.011)	(0.009)
51-100 Workers		0.081	0.067		0.064	0.052
		(0.014)	(0.013)		(0.014)	(0.013)
101-200 Workers		0.120	0.096		0.129	0.110
		(0.017)	(0.015)		(0.019)	(0.018)
Over 200 Workers		0.177	0.149		0.131	0.113
		(0.014)	(0.013)		(0.018)	(0.014)
Average Characteristics of Coworkers						
Education			0.008			0.012
			(0.002)			(0.003)
Age			0.005			0.005
			(0.001)			(0.002)
Proportion under 30			-0.036			-0.060
			(0.021)			(0.024)
Proportion over 50			-0.153			-0.104
			(0.031)			(0.036)
Proportion Female			-0.156			-0.182
			(0.015)			(0.022)
Intercept	1.419	1.11	0.684	1.51	1.182	0.806
	(0.007)	(0.034)	(0.060)	(0.008)	(0.045)	(0.079)
R-Squared	0.074	0.494	0.506	0.022	0.432	0.447

Notes: Sampling weights used for estimation. For 1995, samples are 29.637 for women. For 2002, samples are 40.056 for women. Standard errors are calculated with clustering by firms. All models except (1) also include controls for occupation, industry and region.

Table 6. Log Wage Regressions. p-score Added as a Regressor

	1995		**2002**	
Description	*Men*	*Women*	*Men*	*Women*
Firm Contract	0.054	0.067	0.046	0.007
	(0.010)	(0.013)	(0.016)	(0.022)
Propensity Score	0.663	0.019	0.967	0.901
	(0.114)	(0.146)	(0.223)	(0.372)
Squared Propensity Score	-1.269	0.597	-0.736	0.720
	(0.316)	(0.413)	(0.625)	(0.986)
Cubed Propensity Score	0.847	-0.277	-0.019	-1.591
	(0.242)	(0.288)	(0.548)	(0.969)
R-Squared	0.512	0.514	0.480	0.461

Notes: Sampling weights used for estimation. For 1995, samples are 130.170 for all workers, 100.533 for men and 29.637 for women. For 2002, samples are 129.377 for all workers, 89.320 for men and 40.056 for women. Standard errors are calculated clustering by firms.

Table 7. Estimation of Firm-Contract Impact by Wage Quintile

	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
Model			**1995**		
Men					
Model (1)	0.253	0.267	0.257	0.241	0.222
	(0.009)	(0.007)	(0.007)	(0.008)	(0.010)
Model (2)	0.075	0.095	0.103	0.105	0.102
	(0.008)	(0.007)	(0.007)	(0.007)	(0.009)
Model (3)	0.064	0.085	0.094	0.098	0.098
	(0.008)	(0.007)	(0.007)	(0.007)	(0.009)
Model (4)	0.051	0.072	0.082	0.088	0.088
	(0.009)	(0.007)	(0.007)	(0.008)	(0.011)
Women					
Model (1)	0.168	0.242	0.276	0.294	0.288
	(0.019)	(0.015)	(0.013)	(0.012)	(0.015)
Model (2)	0.056	0.101	0.123	0.134	0.131
	(0.014)	(0.012)	(0.011)	(0.010)	(0.013)
Model (3)	0.037	0.077	0.098	0.112	0.113
	(0.013)	(0.011)	(0.011)	(0.010)	(0.013)
Model (4)	0.003	0.044	0.068	0.086	0.097
	(0.013)	(0.012)	(0.011)	(0.011)	(0.014)
			2002		
Men					
Model (1)	0.244	0.293	0.309	0.310	0.291
	(0.016)	(0.013)	(0.011)	(0.011)	(0.014)
Model (2)	0.077	0.097	0.101	0.098	0.084
	(0.014)	(0.011)	(0.010)	(0.009)	(0.011)
Model (3)	0.068	0.088	0.094	0.094	0.084
	(0.014)	(0.011)	(0.009)	(0.009)	(0.011)
Model (4)	0.051	0.071	0.078	0.081	0.080
	(0.015)	(0.012)	(0.010)	(0.009)	(0.011)
Women					
Model (1)	0.122	0.172	0.219	0.274	0.316
	(0.020)	(0.020)	(0.021)	(0.022)	(0.024)
Model (2)	0.037	0.056	0.070	0.083	0.095
	(0.018)	(0.017)	(0.016)	(0.016)	(0.020)
Model (3)	0.022	0.039	0.052	0.063	0.075
	(0.017)	(0.016)	(0.015)	(0.015)	(0.019)
Model (4)	0.002	0.011	0.023	0.037	0.055
	(0.017)	(0.016)	(0.015)	(0.015)	(0.018)

Notes: Models (1)-(3) corresponds to specifications in Tables 4-5. Model (4) corresponds to specifications in Table 6. Sampling weights used for estimation. Standard errors are calculated with clustering by firms.

Table 8. Turnover and Investment added to the former p-score 2002

Description	*Men*	*Women*
Firm Contract	0.055	0.009
	(0.017)	(0.024)
Propensity Score	0.825	0.679
	(0.162)	(0.322)
Squared Propensity Score	-1.751	-0.181
	(0.473)	(0.844)
Cubed Propensity Score	1.190	-0.072
	(0.375)	(0.617)
R-Squared	0.482	0.447

Notes: Sampling weights used for estimation.Financial variables at the 2-digit industry level. Estimation also includes all covariates of model (3) of Tables 4-5 Standard errors are calculated with clustering by firms.

Table 9. Estimation of Firm-Contract Impact by Wage Quintile for 2002

Model (4)	*Quintile 1*	*Quintile 2*	*Quintile 3*	*Quintile 4*	*Quintile 5*
Men	0.050	0.071	0.078	0.082	0.074
	(0.015)	(0.013)	(0.011)	(0.010)	(0.011)
Women	0.004	0.012	0.024	0.041	0.066
	(0.018)	(0.016)	(0.016)	(0.016)	(0.017)

Note: Sampling weights used for estimation. Specification (4) is estimated with the new propensity score. Standard errors are calculated with clustering by firms.

Table 10. Log Wage Regressions adding profitability and the interactions 2002

Variable	*Men*				*Women*			
F. Contract	0.055	0.055	-0.347	0.003	0.009	0.009	-0.513	-0.158
	(0.017)	(0.017)	(0.128)	(0.038)	(0.024)	(0.024)	(0.145)	(0.068)
Financial var.								
B. Volume	0.054		0.042		0.034		0.023	
(per employee)	(0.013)		(0.013)		(0.016)		(0.016)	
Investment		0.045		0.041		0.027		0.024
(per employee)		(0.009)		(0.009)		(0.012)		(0.012)
Interactions								
F.Contract * BV			0.088				0.116	
			(0.026)				(0.030)	
F.Contract * Inv.				0.028				0.082
				(0.016)				(0.038)
Propensity	0.878	0.837	0.855	0.826	0.705	0.679	0.657	0.647
	(0.187)	(0.189)	(0.185)	(0.189)	(0.319)	(0.323)	(0.316)	(0.321)
Squared Prop.	-1.887	-1.759	-1.774	-1.698	-0.267	-0.178	-0.094	-0.045
	(0.463)	(0.472)	(0.457)	(0.474)	(0.832)	(0.844)	(0.820)	(0.845)
Cubed Prop.	1.307	1.187	1.112	1.101	0.011	-0.075	-0.303	-0.331
	(0.348)	(0.358)	(0.352)	(0.365)	(0.603)	(0.615)	(0.586)	(0.064)

Notes:Sampling weights used for estimation.Samples are 89.320 for men and 40.056 for women Models used the covariates of specification (4), and include controls for occupation and region. Financial variables at the 2-digit industry level.

Table 11. Variance decomposition of log wages 1995-2002

	Men			*Women*		
	1995	**2002**	**Change**	**1995**	**2002**	**Change**
1. Variance firm-contract	0.209	0.237	0.028	0.239	0.305	0.066
2. Variance other contract	0.252	0.247	-0.005	0.182	0.184	0.002
3. Firm-contract wage differential	0.317	0.336	0.019	0.344	0.238	-0.106
4. Fraction with firm level contracts	0.228	0.116	-0.112	0.152	0.084	-0.068
5. Overall variance	0.260	0.257	-0.003	0.206	0.199	-0.007
6. Variance with 1995 firm contracts	0.260	0.265	0.005	0.206	0.218	0.012
7. "Centralization" effect			**-0.008**			**-0.019**
8. Variance without firm contracts	0.260	0.247	-0.013	0.206	0.184	-0.022

Notes: For 1995, samples are 130.170 for all workers, 100.533 for men and 29.637 for women. For 2002, samples are 129.377 for all workers,89.320 for men and 40.056 for women. The "centralization" effect is computed as the difference between the change in rows 5 and 6.

Figure 1. Unemployment Rate by Gender and Age group

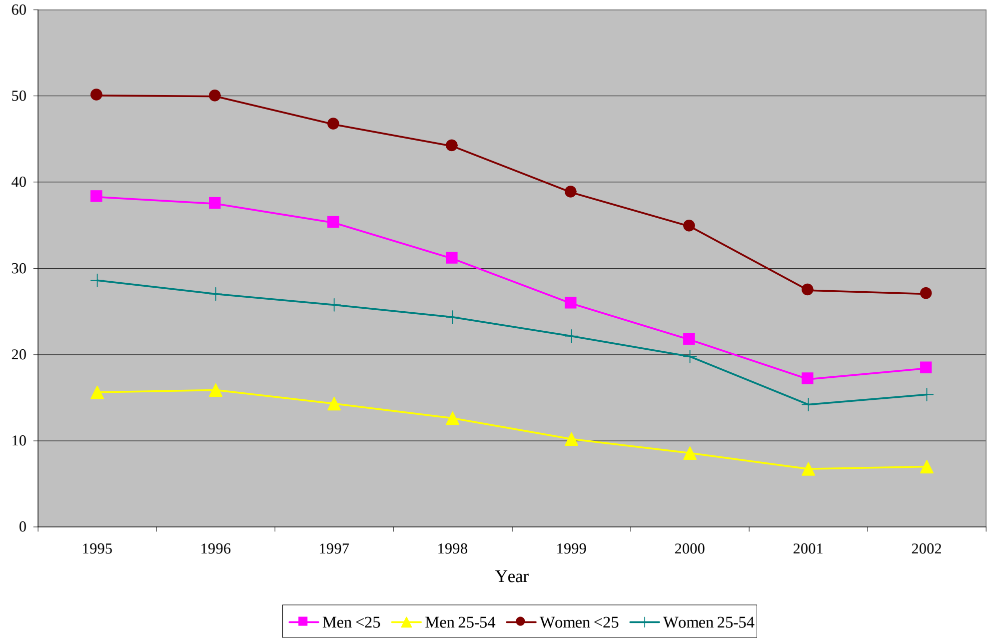
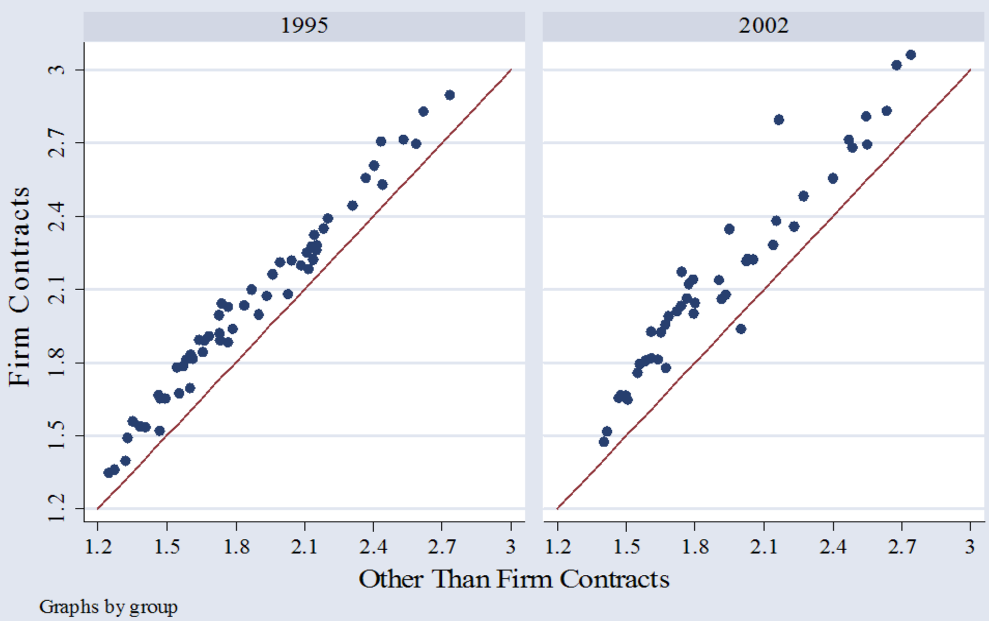


Figure 2. Mean Wages Firm Contracts vs. Other Contracts 1995-2002: Men



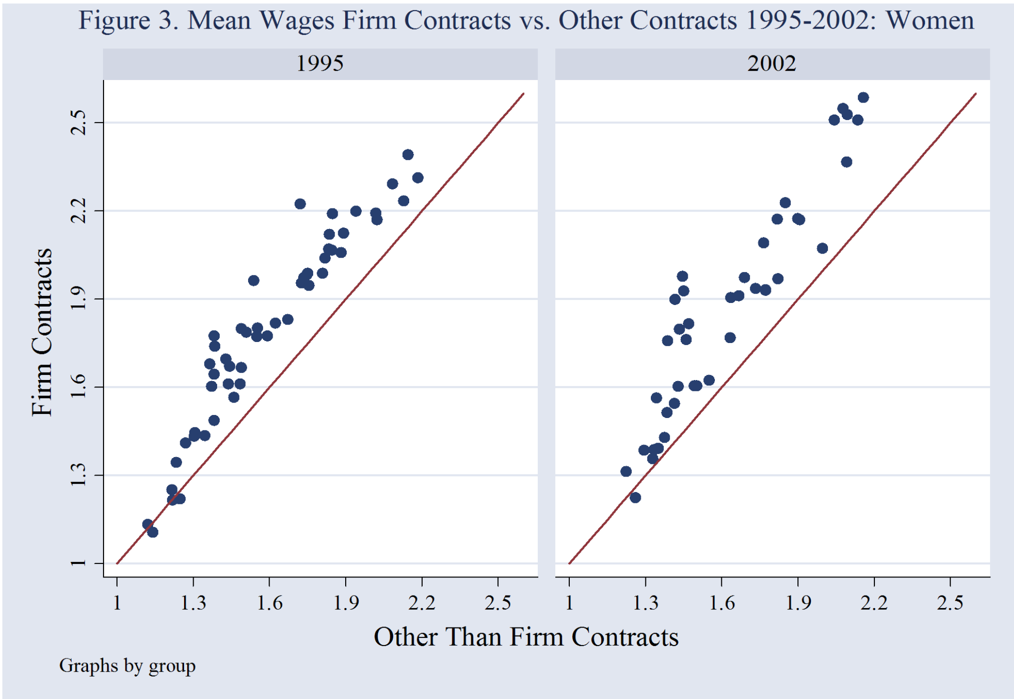


Figure 3. Mean Wages Firm Contracts vs. Other Contracts 1995-2002: Women
1995
2002
Firm Contracts
Other Than Firm Contracts
Graphs by group

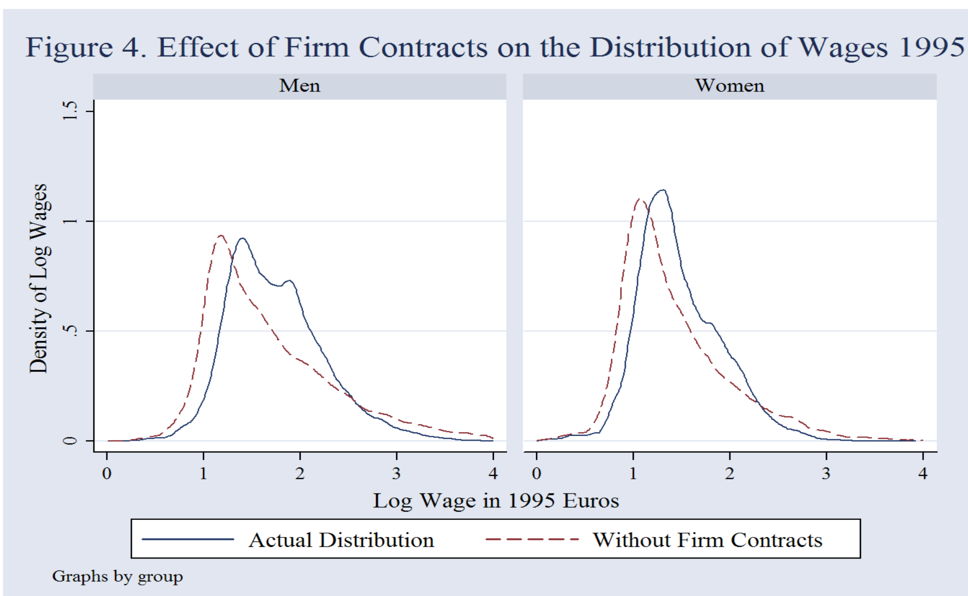


Figure 4. Effect of Firm Contracts on the Distribution of Wages 1995
Men
Women
Density of Log Wages
Log Wage in 1995 Euros
Actual Distribution
Without Firm Contracts
Graphs by group

Figure 5. Effect of Firm Contracts on the Distribution of Wages 2002

Figure 6. Mean Log Wages by economic performance of the industry and type of contract