

# **Rent-sharing under Different Bargaining Regimes: Evidence from Linked Employer-Employee Data**

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## **Abstract**

The majority of workers in Belgium, as in most western European countries, have their wages directly defined by multi-employer (ME) agreements. In addition, for some workers, ME agreements are improved by single-employer (SE) agreements at the firm or establishment level. Yet, the relative importance of SE and ME agreements differs drastically across sectors. The degree of wage bargaining centralisation thus varies across industries. The purpose of this paper is to analyse the impact of these bargaining features on rent-sharing in Belgium using unique linked employer-employee data. Empirical findings show that there is substantially more rent-sharing in decentralised than in centralised industries, even when controlling for the endogeneity of profits and adopting a propensity score matching method. Moreover, in centralised industries, rent-sharing is found only for workers that are covered by a firm-specific agreement. This is not surprising as ME agreements do not take into account firm-specific characteristics. Finally, results indicate that within decentralised industries, both SE and ME bargaining generate rent-sharing to the same extent. This implies that workers in decentralised industries, who are not covered by SE bargaining, receive wage supplements paid unilaterally by their employer.

Keywords: Rent-sharing, Collective Bargaining, Propensity Score Matching.

JEL-Classification: J31, J51.

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## 1. Introduction

It is often recommended to decentralise wage bargaining so that firms can better align their pay policies with their specific needs. However, as noted by some analysts (OECD 2004, Teulings 1998), wage setting decentralisation also broadens the scope for local rent seeking. Indeed, if wage bargaining takes place at the firm level, workers (possibly represented by trade unions) may be able to extract a larger part of the rents generated by their firms. This could have important economic consequences, as it may prevent an efficient allocation of labour across firms, increase wage inequality, lead to smaller employment adjustments, and affect the division of surplus between capital and labour (Bryson *et al.* 2006). Surprisingly, there is almost no empirical evidence regarding the impact of wage bargaining structures on rent-sharing. A growing body of literature does examine the micro-economic effects of wage bargaining institutions on wages (Checchi and Pagani 2004, Card and de la Rica 2006, Cardoso and Portugal 2003, Dell’Aringa and Lucifora 1994, Dell’Aringa *et al.* 2004, Dell’Aringa and Pagani 2007, Dominguez and Rodriguez-Gutiérrez 2004, Gerlash and Stephan 2005, Plasman *et al.* 2007, Rycx 2003). Moreover, a large number of papers document the existence of rent-sharing (Abowd and Lemieux 1993, Arai 2003, Blanchflower *et al.* 1996, Bronars and Famulari 2001, Estevão and Tevlin 2003, Hildreth and Oswald 1997, Kramarz 2003, Margolis and Salvanes 2001, Martins 2004, Rycx and Tojerow 2004, Van Reenen 1996). Yet, as far as we know, only one paper (Gürtzgen, 2005) has focused on the impact of the bargaining regime on rent-sharing. Based on German micro-data for the mining and manufacturing sector, it is found that individual wages are positively related to firm-specific quasi-rents in the non-union sector and under firm-specific contracts. Industry-wide contracts, however, seem to suppress firm-level rent-sharing.

In this paper, we add to this literature by examining whether rent-sharing is affected by the structure of collective bargaining in Belgium. The majority of workers in Belgium, as in most western European countries, have their wages directly defined by multi-employer (ME) agreements. In addition, for some workers, ME agreements are improved by single-employer (SE) agreements at the firm and/or establishment level. A point that has often been neglected in the literature is that the relative importance of SE and ME agreements differs radically across industries. In sectors composed of a large number of small and labour-intensive firms, wages are essentially set by ME agreements. On the other hand, wages are mainly determined

at the firm level in industries composed of a small number of large and capital-intensive firms. The degree of wage bargaining centralisation thus varies across industries. So far, the literature on the wage effects of bargaining institutions has focused solely on the impact of the presence of a SE agreement in addition to a ME agreement, without considering the centralisation dimension. In this paper, we investigate the effects of both dimensions by addressing the following questions:

1. Is there more rent-sharing in decentralised than in centralised industries?
2. Does the presence of a SE agreement (in addition to a ME agreement) similarly affect the amount of rent-sharing in centralised and decentralised industries?

To do so, we rely on a very detailed matched worker-firm data set. This data set derives from a combination of the *Structure of Earnings Survey* for 2003 and the *Structure of Business Survey* for 2001 and 2003. It provides two interesting variables regarding wage bargaining institutions. The first one indicates whether workers in a firm are covered only by a ME wage agreement or whether their wages are additionally covered by a SE wage agreement. This information is available separately for white- and blue-collar workers. Hence, it enables us to overcome a serious misclassification problem encountered in most recent papers on the wage effects of collective bargaining systems. The point is that in many firms, blue- and white-collar workers are not covered by the same type of collective wage agreement (ME vs. SE) but such information is often not available in surveys. The second variable related to collective bargaining in our survey indicates to which joint committee (JC) each firm belongs. This variable, generally not reported in matched worker-firm data sets, makes it possible to identify the precise industry agreement by which each firm is covered. Thanks to these two variables, we are able to construct a quantitative indicator of centralisation, based on the percentage of workers covered by a SE agreement within each JC.

Two endogeneity problems may arise when estimating a rent-sharing equation. First, there is an accounting relationship between wages and current profits so that profits decrease when wages increase. This leads to a downward bias in the coefficient of profits. Second, according to efficiency wage theories, an increase in wages may provide incentives to workers to step up their efforts. This may lead to an upward bias in the coefficient of profits. To correct these endogeneity problems, we applied 2SLS, using 2001 profits as instruments for 2003 profits. Another issue, raised by Card and de la Rica (2006), is that micro-econometric studies of

bargaining institutions based on samples of workers may potentially confound bargaining status with other firm-level characteristics. We try to solve this problem by using a propensity score matching (PSM) method. This boils down to comparing a sample of “treated” workers with a sample of “non-treated” workers who have similar observed characteristics. For the first question addressed in this paper, we consider “treated” workers to be those who are employed in a decentralised industry, and for the second question, those covered by a SE agreement in addition to the ME agreement.

## **2. Literature Review**

The impact of wage bargaining institutions on wages has been widely studied in Anglo-Saxon countries through the comparisons between the union and the non-union sectors (see Bryson 2007 for a review of the literature). The distinction according to union status has less meaning for most European countries because collective agreements are generally extended to non-union members. Another particularity of European countries is that collective bargaining occurs at multiple levels: at the ME level, union federations and employer associations set the wages for all workplaces that fall under the scope of the agreement. In addition, SE agreements may be concluded at the company level generally to complement the ME agreement<sup>1</sup>. Since the mid-1990s, a growing literature has analysed the impact of the bargaining level on wages. While all studies (except Kohn and Lembcke (2007) for Germany) show that SE agreements increase the mean wages (Card and de la Rica 2006 for Spain; Cardoso and Portugal 2003 for Portugal; Dell’Aringa and Lucifora 1994a for Italy; Gerlach and Stephan 2006 for Germany; Gürtzgen 2006 for Germany; Hartog et al. 2002 for the Netherlands; Palenzuela and Jimeno 1996 for Spain; Rycx 2003 for Belgium), evidence is more mixed concerning the impact on the dispersion of wages. In principle, SE agreements are expected to increase wage dispersion because, contrary to ME agreements, they can take into account firm-specific characteristics in the determination of wages. These are the results found in most papers (Card and de la Rica 2006 for Spain; Cardoso and Portugal 2003 for Portugal; Hibbs and Locking 1996 for Sweden; Rycx 2003 for Belgium) but there are exceptions (Dell’Aringa and Lucifora (1994b) and Checchi and Pagani (2004) for Italy). The differences between the studies may be due to differences in national wage setting, sample

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<sup>1</sup> Exceptions are e.g. Germany and Spain where SE and ME agreements tend to be alternatives to one another.

coverage or methodology. As an illustration, two recent cross-country comparisons show different results although they are based on the same data set (the 1995 European Structure of Earnings Survey). Dell'Aringa and Pagani (2007) find that the wages of workers covered only by ME contracts are no more compressed than those of workers covered by both ME and SE contracts in Italy, Belgium and Spain. They attribute this finding to the fact that workers not covered by SE bargaining receive wage supplements paid unilaterally by their employers outside of collective agreements. Plasman *et al.* (2007), focusing on the manufacturing sector, find that, compared to a ME agreement only, the additional presence of a SE agreement increases wage dispersion in Belgium and Denmark, and reduces it in Spain. The authors conclude that, in the former countries, SE bargaining is used to adapt pay to the specific needs of the firm, while in the latter it is mainly used by trade unions in order to compress the wage distribution. One explanation for the divergence in results between the two studies may be the difference in economic coverage<sup>2</sup>. Since pay determination outside of collective agreements is more widespread in services than in the manufacturing sector, the results of Plasman *et al.* (2007) are probably less affected by this phenomenon than those of Dell'Aringa and Pagani (2007) which cover the entire private sector<sup>3</sup>. Taken altogether, these results tend to show that the level at which bargaining occurs seems to affect the way wages are determined.

One question about wage determination that has attracted particular interest in the literature concerns the role of the firms in which workers are employed and, in particular, the role of a firm's profitability. According to union bargaining models (McDonald and Solow 1981; Nickell and Andrews 1983), wages are the outcome of a bargaining process between a group of workers (not necessarily a union) and the employer. Ultimately, wages depend on the size of the rents generated by the firm and on the relative bargaining power of workers within the firm. This phenomenon is called rent-sharing. According to Martins (2007), one can identify three main strands in the empirical literature that test the existence of rent-sharing. The first includes papers that exploit the longitudinal nature of their data to control for firm and/or worker fixed effects (Blanchflower *et al.* 1996; Hildreth and Oswald 1997 and Bronars and

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<sup>2</sup> Other explanations are the different methodologies used and the fact that Dell'Aringa and Pagani (2007) focus on male workers while Plasman *et al.* (2007) covers both genders.

<sup>3</sup> Other studies focus on the impact of the bargaining level on intra-firm wage dispersion. Dominguez and Rodriguez (2004) found that company bargaining reduces the wage dispersion within firms in Spain while Dell'Aringa and Lucifora (1994b) and Dell'Aringa *et al.* (2004) found no effect.

Famulari 2001). The second focuses on the endogeneity of profits and the role of instruments in achieving identification of rent-sharing (Abowd and Lemieux 1993; Teal 1996 Van Reenen 1996 and Estevao and Tevlin 2003). A third and more recent strand combines controls for unobserved variables and the instrumentation of profits (Margolis and Salvanes 2001; Arai 2003; Kramarz 2003 and Martins 2004). The estimates of rent-sharing obtained from this last strand are either smaller than or similar to those of the two other streams of the literature. However, except for France in Margolis and Salvanes (2001), all papers document the existence of rent-sharing.

The link between rent-sharing and wage bargaining institutions has mainly been analysed in the Anglo-American literature through the comparison of the union and non-union sectors. A very standard result is that rent-sharing is not a particularity of the unionised sector (Blanchflower *et al.* 1990; Nickell and Wadhvani 1990; Blanchflower *et al.* 1996; Van Reenen 1996; Hildreth and Oswald 1997; Bronars and Famulari 2001; Estevao and Tevlin 2003). The impact of bargaining institutions in more centralised countries has been studied only by Gürtzgen (2005)<sup>4</sup>. Based on German micro-data for the mining and manufacturing sector, she found that individual wages are positively related to firm-specific quasi-rents in the non-union sector and under firm-specific contracts. Industry-wide contracts, however, seem to suppress firm-level rent-sharing. Collective bargaining in Germany is different from most other European countries where firm contracts are generally constrained by industry contracts. In Germany a firm may choose to be covered by either a firm or an industry contract.

The aim of this paper is to complement this literature by analysing the impact of wage bargaining institutions in a western European country (Belgium) where the different levels are hierarchically coordinated. Moreover, we do not focus exclusively on the impact of the bargaining level, but we also analyse the impact of the degree of centralisation.

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<sup>4</sup> Pistoresi and Strozzi (2001) study the relationship between rent-sharing and bargaining levels in the metal-mechanical industry in Italy. Using longitudinal data, they attribute aggregate changes to industry level bargaining and idiosyncratic changes to firm level bargaining (Their data contains no information on the bargaining structure). They find no evidence of rent-sharing at the company level.

### 3. Wage formation in Belgium

As in many European countries, wage formation in Belgium occurs at three levels (inter-sectoral, sectoral and company) in a hierarchical way, so that an agreement concluded at one level cannot be less favourable than the upper level agreements. Each level deals, with more or less intensity, with wage levels (i.e. job classification and the setting of regular wage premiums) and wage rises. Concerning wage rises, the Belgian wage setting system can be considered fairly centralised. First, Belgium is one of the few countries which has not abandoned the automatic indexation of wages to prices. Second, since 1996, the inter-sectoral level lays down a maximum for wage rises (the so-called wage norm) based on the increases in France, Germany and Netherlands. Therefore, wage rises at the sectoral and company levels can only be within the margin defined by the indexation and the wage norm. In general, a large part of this margin is used at the sectoral level, so not much room is left for wage rises at company level, but the situation may vary across sectors. There is much more sectoral heterogeneity concerning the definition of wage levels. Verly (2003) has constructed a typology of Belgian industries based on the level where job classifications and regular wage premiums are defined. He identifies three groups of sectors:

- 1) Sectors where those norms are mostly defined at the industry level and directly applied in companies. These are mainly manufacturing industries such as textiles, food, construction, timber and transport.
- 2) Sectors where those norms exist at the industry level but are often considered as a minimum that has to be adapted at firm level. This is mostly the case for white collar workers.
- 3) Sectors where those norms are mostly defined at the company level. These are mainly industries consisting of large firms: steel, non ferrous metals, glass, chemicals, paper and electricity.

It is interesting to note that the factors that seem to influence the bargaining structure in Belgium are very similar to those that affect the bargaining structure in other countries. According to the literature (Booth 1989; Deaton and Beaumont 1980; Heikkilä and Piekkola 2005; Hendricks and Kahn 1982; Katz 1993; Schnabel *et al.* 2006), the main reason for having centralised wage bargaining is to keep wages out of competition. It is less likely to happen in industries composed of a small number of large and capital intensive firms. The

reason is that larger firms more often have specific problems to solve (Schnabel *et al.* 2006), and it is less costly to have specific pay policies because of economies of scale. Moreover, while trade unions generally prefer industry-wide bargaining for solidarity purposes, they would be less resistant to decentralised wage bargaining in larger firms because their representation is generally stronger. In addition, their potential gains from decentralised wage bargaining are larger in more capital intensive firms because the elasticity of demand for labour is negatively related to capital intensity.

How does the bargaining structure influence rent-sharing at the firm-level? Because multi-employer bargaining cannot take into account firm-specific characteristics, the more wages are bargained at the company level, the greater is the scope for rent-sharing. Thus one would expect to find more rent-sharing in decentralised than in centralised industries and, within centralised and decentralised industries, when a SE employer is complementing the ME agreement. This is, however, not obvious for several reasons. First, there can be mechanisms of pattern setting across firms as in Switzerland or Japan. In other words, the impact of decentralisation can be offset by coordination. Second, it is not certain that, even in decentralised bargaining, wages will depend on firm-level profits. For example, Levine (1993) showed that, in the US, pay policies were more influenced by the wages of other workers, within other firms, than by the firm's profits. Finally, according to Hartog *et al.* (2002), unions in corporatist countries do not operate as aggressive local rent seekers because they are part of a corporatist structure that provides many countervailing incentives to discourage this type of behaviour. They illustrate this case by analysing wage differentials by bargaining regime in the Netherlands, where there is a wage setting system very similar to the Belgian one (for a comparison, see Van Ruysseveldt and Visser 1996).

#### **4. Data**

We rely on a very detailed matched worker-firm data set which derives from the combination of the *Structure of Earnings Survey* for 2003 and the *Structure of Business Survey* for 2001 and 2003. The former contains valuable information on firm characteristics (e.g. industry, size of firm, region, and level of wage bargaining) and on individual workers (e.g. gross hourly wages, age, education, sex, and occupation). The latter provides firm-level information on financial variables (e.g. gross operating surplus, value-added, and value of production).



In addition, it provides two interesting variables regarding wage bargaining institutions. The first one indicates whether workers in a firm are covered only by a ME wage agreement or whether their wages are additionally covered by a SE wage agreement. This information is available separately for white- and blue-collar workers. Hence, it enables us to overcome a serious misclassification problem encountered in most recent papers on the wage effects of collective bargaining systems. The point is that in many firms, blue- and white-collar workers are not covered by the same type of collective wage agreement (ME vs. SE) but such information is often not available in surveys. In this paper, we restrict our analysis to blue-collar workers because their wages are much less affected by individual bargaining than those of white-collar workers. The second variable related to collective bargaining in our survey indicates to which joint committee (JC) each firm belongs. This variable, generally not reported in matched worker-firm data sets, makes it possible to identify precisely by which industry agreement each firm is covered. Thanks to these two variables, we are able to construct a quantitative indicator of centralisation, based on the percentage of workers covered by a SE agreement within each JC.

After eliminating observations with missing variables, firms with negative profits (log profits are used in the estimations) and white collar workers, our final sample covers 26,249 blue collar workers working in 2,012 establishments. Table 1 presents some selected sample statistics broken down in centralised and decentralised industries. We consider that an industry is decentralised if more than 50% of employees are covered by a firm-specific agreement.

**Table 1: Means of selected characteristics**

	Centralised industries	Decentralised industries
Gross hourly wages (EUR)	11.62	13.60
Profits per employee (EUR)	16526	27373
Firm's labour share in value added	76%	68%
Establishment size (number of employees)	55	120
Working in shift or team, during night or weekend	18%	50%
Variable pay	12%	30%
Female workers	20%	14%

*Highest level of education*

Primary level	15%	9%
Lower secondary level	45%	43%
Upper secondary level, general	13%	17%
Upper secondary level, technical	25%	29%
Non-university tertiary level	1%	2%
Full time workers	85%	91%
Seniority in the company (years)	8	11
<i>Occupation</i>		
Craft and related trade workers	46%	12%
Plant and machine operators and assemblers	30%	69%
Elementary occupations	24%	18%
<i>Industrial classification</i>		
Manufacturing	45%	73%
Construction	18%	0%
Wholesale and retail trade	12%	5%
Hotels and restaurants	2%	0%
Transport, storage and communication	11%	22%
Real estate, renting and business activities	13%	1%
# workers	21348	4901
# establishments	1669	343

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Source: SES 2003 and SBS 2003

The comparison of the statistics between the two sub-samples is in line with previous literature on the collective bargaining structure. Decentralisation of wage bargaining seems to be associated with lower labour intensity (the share of labour in value added is 68% vs 76% in centralised industries) and a higher establishment size (120 vs 55 employees in centralised industries). Profits are 66% higher in decentralised industries, which may be a sign of lower product market competition, which itself may be caused by the fact that firms are more concentrated in decentralised industries. According to Katz (1993), work organisation is another factor of decentralisation of collective bargaining. We indeed observe that the percentage of employees doing team, shift, night or weekend work is much larger in decentralised industries (50%) than in centralised industries (18%). The same observation can be made for the percentage of employees with variable pay (30% vs 12% in centralised industries). Finally, we can observe that the percentage of female workers is lower (14% vs 20%), seniority in the firm is longer (11 years vs 8 years), the percentage of full time workers

is higher (91% vs 85%), and the education level is higher in decentralised industries. All those characteristics are generally associated with high employee bargaining power. This seems to illustrate the fact that unions are accepting forms of decentralisation based on a loosening of sectoral agreements only if workplace representation is strong (Visser, 2005).

## 5. Results

### *Empirical specification*

Two models have become standard in the literature for the analysis of the impact of profits-per-employee on wages in a bargaining framework. These are the right-to-manage and the efficient bargaining models, so-named respectively by Nickell and Andrews (1983) and McDonald and Solow (1981). In the right-to-manage model, firms unilaterally determine employment, while wages are the result of a confrontation between the objectives of the firm and of the employees. In the efficient bargaining model, bargaining takes place with respect to both employment and wages. While both models yield identical wage equations, they differ fundamentally in that in the former employment is endogenous with respect to wages whereas in the latter it is exogenous. Nevertheless, they both suggest that wages are related to the firm's ability to pay, i.e. to the firm's profitability<sup>5</sup>.

In this paper, we rely on the right-to-manage model<sup>6</sup>. Hence, suppose a bargaining situation where a firm's real profit function is given by:

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<sup>5</sup> See e.g. Pencavel (1991).

<sup>6</sup> Using Belgian aggregate data from 1957 to 1988, Vannetelbosch (1996) has shown that both the right-to-manage and the efficient bargaining models can be rejected in favour of the general bargaining model, developed by Manning (1987). This means that the outcome of the bargaining process is located somewhere between the labour demand curve and the contract curve. Nevertheless, this result must be considered with caution for at least two reasons. First, the estimates are very sensitive to the specification of the reservation wage, and second, the trade union density and the number of strikes are far from ideal as a surrogate for the relative bargaining power of unions. This uncertainty is not very surprising since "the empirical literature has not yet been able to find an appropriate test to distinguish between the principal models" (Booth, 1995, pp. 141). Also noteworthy is that, while these models have different implications for unemployment and economic welfare, they generate identical wage equations. Hence, for the sake of simplicity, we have chosen to rely on the right-to-manage model.

$$\Pi = R(L) - W L \quad (1)$$

with  $\Pi$  the real profits,  $R(L)$  the real revenue,  $W$  the real wage and  $L$  the employment level. Also consider a risk-neutral group of workers, not necessarily a union, which attempts to maximise the expected utility of a representative member, defined as:

$$U = \frac{L}{N} W + \left(1 - \frac{L}{N}\right) A \quad (2)$$

with  $N$  the number of members in the group ( $0 < L \leq N$ ) and  $A$  the outside option ( $W > A$ ). The outside option is the expected value of real revenue perceived by an individual in the event of redundancy. It depends positively on the unemployment benefit and on the expected real wage that a worker would obtain elsewhere, and negatively on the unemployment rate.

The model is solved backwards: the profit-maximising firm determines the employment level, given the bargained wage in the first stage of the game. The resulting deal is represented by the maximisation of the generalised Nash bargain. This approach boils down to maximising the weighted product of both parties' net gain, i.e. the difference between levels of utility in the event of an agreement and in the event of no agreement. For a company, without fixed costs, the level of utility reached when bargaining fails equals zero. Indeed, since we assume that all workers are affiliated to the group, the company will have to cease production if agreement is not reached. The fallback position of a representative member of the group is equal to  $A$ . Accordingly, the generalised Nash bargaining problem can be written as follows<sup>7</sup>:

$$\begin{aligned} \underset{W}{Max} U^\beta \Pi &= \underset{W}{Max} \left( \frac{L}{N} (W - A) \right)^\beta (R(L) - W L) \\ s.t. \quad R'(L) &= W \end{aligned} \quad (3)$$

with  $\beta \in [0,1]$  the relative bargaining power of the workers in the wage bargain. The first order condition of this problem is given by:

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<sup>7</sup> See Nickell (1999, pp. 3) for a discussion on the notation.

$$W = A + \beta \frac{(R(L) - WL)}{L} \quad (4)$$

Expression (4) suggests that real wages are affected by the outside option, real profits-per-employee and the relative bargaining power of the workers.

The corresponding *statistical* specification, which will serve as a benchmark for our empirical analysis, can be written as follows:

$$w_{ij} = \delta_0 + \delta_1 X_i + \delta_2 Z_j + \beta \left(\frac{\Pi}{L}\right)_j + \varepsilon_i \quad (5)$$

where  $w_{ij}$  is the logarithm of gross hourly wages of the worker  $i$  in the firm  $j$ ,  $X_i$  the vector of the individual characteristics of the workers and their working conditions (6 dummy variables showing the highest completed level of education; prior potential experience, its square and its cube; seniority within the current company and its square; sex; 8 occupational dummies; a dummy indicating whether the contract is part-time or full-time; an indicator showing whether the individual is paid a bonus for shift work, night-time and/or weekend work and 3 dummies for the type of contract);  $Z_j$  a vector of firm characteristics (2 regional dummies indicating where the establishment is located; the size of the establishment; 3 dummies indicating the form of financial and economic control and 35 dummies indicating the sectoral affiliation);  $\left(\frac{\Pi}{L}\right)_j$  the logarithm of profit per employee in the firm  $j$  and  $\varepsilon_{ij}$  an error term<sup>8</sup>.

Two econometric problems arise when using current profits as an explanatory variable. First, there is an accounting relationship between wages and current profits: if wages increase,

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<sup>8</sup> This specification is standard in the economic literature (see e.g. Nekby, 2003). However, it could be argued that specific variables representing the outside option of the workers should be included in equation (5). To account for this potential omitted variable bias, we tested an alternative specification including among the explanatory variables the sector unemployment rate and the sector mean hourly wage. The intuition behind this choice is that when the sector unemployment rate diminishes, the probability of finding a job elsewhere goes up and therefore wage claims increase. In contrast, a drop in the expected alternative wage mitigates envy effects and wage claims. Findings (available upon request) show that the inclusion of these variables in our wage regressions has no impact on the wage-profit elasticity.

profits (i.e. value added – remuneration of labour) automatically decrease. Estimation of rent-sharing would be downward biased. Second, a positive relationship between wages and current profits may arise because higher wages can provide incentives to employees to step up their effort (cf. efficiency wage theory). It would lead to an upward biased estimation of rent-sharing. In order to correct for those problems, we applied 2SLS, using 2001 profits as instruments for 2003 profits. The results are shown in Table 2. We can see that the coefficient of the profit variable is higher in the second specification (2SLS) than in the first specification (OLS).

**Table 2: Log wage equation, full sample**

Dependent variable: log (gross hourly wages)	Specification 1: OLS <sup>a</sup>	Specification 2: 2SLS <sup>a, b</sup>
Profits-per-worker (ln) <sup>c</sup>	0.016*** (0.003)	0.030*** (0.004)
Individual characteristics and working conditions <sup>d</sup>	Yes	Yes
Firm characteristics <sup>e</sup>	Yes	Yes
Industry effects <sup>f</sup>	Yes	Yes
Group effects <sup>g</sup>	Yes	Yes
R <sup>2</sup>	0.46	0.46
Prob > F	0.00	0.00
R <sup>2</sup> , first stage	-	0.65
Prob > F, first stage	-	0.00
# employees	28494	
# establishments	2012	

Source: SES, 2003 and SBS, 2001 and 2003

\* p < 0.10; \*\* p < 0.05; \*\*\* p < 0.01

Notes : <sup>a</sup> White (1980) heteroscedasticity-consistent standard errors are reported between brackets; <sup>b</sup> The instrument used in the IV regressions (besides the exogenous variables in equation (5)) is 2001 profits-per-worker; <sup>c</sup> Firm annual gross operating surplus per worker ; <sup>d</sup> Dummy for gender; 6 dummies for education; prior potential experience, its square and its cube; seniority within the current company and its square; a variable showing whether the individual received a bonus for shift work, night work and/or weekend work; 3 dummies for the type of contract; a dummy indicating if the worker is part-time and 8 occupational dummies. <sup>e</sup> Region where the establishment is located (2 dummies); size of the establishment (i.e. number of workers); presence of firm agreement; financial and economic control (3 dummies). <sup>f</sup> Two-digit industry dummies (NACE nomenclature); <sup>g</sup> Group effects estimations use the correction for common variance components within groups developed by Over, Jolliffe and Foster (1996) preprogrammed in the “cluster” option of Stata (StataCorp, 1999).

### *Rent-sharing by degree of centralisation*

In order to estimate the impact of centralisation on rent-sharing, we run specification 2 in the centralised and the decentralised samples. Our results (Table 3) indicate that rent-sharing is significantly higher in decentralised industries.

**Table 3: Log wage equation by degree of centralisation, before matching**

Dependent variable: log (gross hourly wages)	Centralised industries <sup>a, b</sup>	Decentralised industries <sup>a, b</sup>
Log (profit / employee)	0.022*** (0.004)	0.086*** (0.017)
Individual characteristics and working conditions <sup>d</sup>	Yes	Yes
Firm characteristics <sup>e</sup>	Yes	Yes
Industry effects <sup>f</sup>	Yes	Yes
Group effects <sup>g</sup>	Yes	Yes
R <sup>2</sup>	0.45	0.40
Prob > F	0.00	0.00
R <sup>2</sup> , first stage	0.65	0.66
Prob > F, first stage	0.00	0.00
# employees	21348	4901
# establishments	1669	343

Source: SES, 2003 and SBS, 2001 and 2003

\* p < 0.10; \*\* p < 0.05; \*\*\* p < 0.01

Notes : <sup>a</sup> White (1980) heteroscedasticity-consistent standard errors are reported between brackets; <sup>b</sup> The instrument used in the IV regressions (besides the exogenous variables in equation (5)) is 2001 profits-per-worker; <sup>c</sup> Firm annual gross operating surplus per worker ; <sup>d</sup> Dummy for gender; 6 dummies for education; prior potential experience, its square and its cube; seniority within the current company and its square; a variable showing whether the individual received a bonus for shift work, night work and/or weekend work; 3 dummies for the type of contract; a dummy indicating if the worker is part-time and 8 occupational dummies. <sup>e</sup> Region where the establishment is located (2 dummies); size of the establishment (i.e. number of workers); presence of firm agreement; financial and economic control (3 dummies). <sup>f</sup> Two-digit industry dummies (NACE nomenclature); <sup>g</sup> Group effects estimations use the correction for common variance components within groups developed by Over, Jolliffe and Foster (1996) preprogrammed in the “cluster” option of Stata (StataCorp, 1999).

However, since firm-level characteristics may differ across industries it is not certain that the difference in rent-sharing is due to centralisation. Indeed, we noted in the previous section that decentralised industries are characterised by higher profits and apparently stronger workplace representation than centralised industries. So it may be that the conditions for rent-sharing are less present in centralised industries. In other words, firms currently in centralised industries would perhaps not generate more rent-sharing even if they were under decentralised bargaining. In order to correctly identify the impact of wage bargaining centralisation, we use propensity score matching. This amounts to comparing a sample of “treated” workers with a control sample of “non-treated” workers who have similar observed characteristics. For the present point, we consider “treated” workers to be those who are employed in a decentralised industry, and for the next point, those covered by a SE agreement in addition to the ME agreement. To be precise, we use nearest neighbour matching with replacement. We first estimate for each firm a propensity score based on the probability of being in a decentralised industry. This is done by a probit estimation. Then, for each firm in the decentralised sample,

we select the firm in the centralised sample that has the closest propensity score<sup>9</sup>. A centralised firm may be used more than once as a match. Lastly, we have constructed a sub-sample of centralised firms that has the same distribution of probability of being in a decentralised industry as in the decentralised sample. This method replicates natural experiments because whether or not a firm is in the centralised or the decentralised sample becomes as random. Therefore, any remaining difference in rent-sharing between the two samples should be attributable to the degree of centralisation<sup>10</sup>. The variables included in the probit model are ones that influence both the degree of centralisation and the level of rent-sharing<sup>11</sup>. Theoretically, rent-sharing mainly depends on two parameters: 1) the rents generated by the firm; 2) the bargaining power of workers. We therefore include variables that influence or signal worker bargaining power (average tenure in the firm, percentage of female workers, percentage of part time workers, structure of the firm's workforce by contract, by occupation (ISCO 2 digits), establishment size, state ownership) and profit per employee. We also include variables indicating the economic environment (industry (NACE 1 digit), the region of the establishment) and a dummy indicating whether the firm is covered by a firm-specific agreement. Finally, in order to control for other employers' practices, we also introduce the percentage of workers with variable pay. The pseudo R<sup>2</sup> of the probit is 0.30, which is very well compared to other studies on collective bargaining structure. As a comparison, in Schnabel *et al.* (2006), the pseudo R<sup>2</sup> are 0.23 and 0.16 respectively for the U.K. and Germany. 13 firms from the decentralised sample were dropped because no match close enough was found for them. For the remaining firms, the matches are very close: the mean differences in propensity score between decentralised and centralised firms is 0,001 and ranges between 0 and 0,099. Of the 1669 firms in the centralised sample, 217 were used as a match. 71% of those firms have a weight of 1 which means that they are matched to a single decentralised firm. The largest weight is 7. For most variables, matching has reduced the

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<sup>9</sup> We impose a calliper of 0,01, which means that the difference in propensity score cannot exceed 0,01.

<sup>10</sup> It must be stressed that this is only on the basis of observable characteristics. So if there are unobserved characteristics that influence both the degree of decentralization and the level of rent-sharing, we cannot exclude that the difference in rent-sharing between the two samples is due to differences in those unobserved characteristics.

<sup>11</sup> If a variable influences centralisation but not rent-sharing, there is no need to control for differences between centralised and decentralised firms so we do not include it in the estimation.



differences in means between the two samples: the mean absolute standardised difference<sup>12</sup> decreases from 24% to 8%<sup>13</sup>. Table 4 shows that, even using PSM, the wage-profit elasticity is more than four times higher in decentralised than in centralised industries.

**Table 4: Log wage equation by degree of centralisation, matched samples**

Dependent variable: log (gross hourly wages)	Centralised industries <sup>a, b</sup>	Decentralised industries <sup>a, b</sup>
Log (profit / employee)	0.020*** (0.007)	0.085*** (0.020)
Individual characteristics and working conditions <sup>d</sup>	Yes	Yes
Firm characteristics <sup>e</sup>	Yes	Yes
Industry effects <sup>f</sup>	Yes	Yes
Group effects <sup>g</sup>	Yes	Yes
R <sup>2</sup>	0.47	0.40
Prob > F	0.00	0.00
R <sup>2</sup> , first stage	0.77	0.64
Prob > F, first stage	0.00	0.00
# employees	3241	4471
# establishments	217	330

Source: SES, 2003 and SBS, 2001 and 2003

\* p < 0.10; \*\* p < 0.05; \*\*\* p < 0.01

Notes : <sup>a</sup> White (1980) heteroscedasticity-consistent standard errors are reported between brackets; <sup>b</sup> The instrument used in the IV regressions (besides the exogenous variables in equation (5)) is 2001 profits-per-worker; <sup>c</sup> Firm annual gross operating surplus per worker ; <sup>d</sup> Dummy for gender; 6 dummies for education; prior potential experience, its square and its cube; seniority within the current company and its square; a variable showing whether the individual received a bonus for shift work, night work and/or weekend work; 3 dummies for the type of contract; a dummy indicating if the worker is part-time and 8 occupational dummies. <sup>e</sup> Region where the establishment is located (2 dummies); size of the establishment (i.e. number of workers); presence of firm agreement; financial and economic control (3 dummies). <sup>f</sup> Two-digit industry dummies (NACE nomenclature); <sup>g</sup> Group effects estimations use the correction for common variance components within groups developed by Over, Jolliffe and Foster (1996) preprogrammed in the “cluster” option of Stata (StataCorp, 1999).

### *Rent-sharing by degree of centralisation and bargaining level*

In order to estimate the impact of the bargaining level on rent-sharing, we further divide the samples according to the level at which wage bargaining occurs. Our results, shown in Table 5, indicate that the presence of a firm-specific agreement (in addition to the industry agreement) increases rent-sharing in centralised industries. Despite a higher coefficient, SE bargaining does not significantly increase rent-sharing in decentralised industries.

<sup>12</sup> The standardised difference is defined as the difference of the sample means in the treated (here decentralised) and non-treated (here centralised) sub-samples as a percentage of the square root of the average of the sample variances in the treated and non-treated groups.

<sup>13</sup> Results from probit estimations and sample means before and after matching are provided in the appendix.

Nevertheless, for both bargaining regimes, the elasticity of wages to profits is higher in decentralised industries.

**Table 5:**  
**Log wage equation by bargaining level and degree of centralisation, before matching**

Dependent variable: log (gross hourly wages)	Centralised industries		Decentralised industries	
	ME <sup>a, b</sup>	SE <sup>a, b</sup>	ME <sup>a, b</sup>	SE <sup>a, b</sup>
Log (profit / employee)	0.019*** (0.004)	0.038*** (0.010)	0.047* (0.025)	0.108*** (0.029)
Individual characteristics and working conditions <sup>d</sup>	Yes	Yes	Yes	Yes
Firm characteristics <sup>e</sup>	Yes	Yes	Yes	Yes
Industry effects <sup>f</sup>	Yes	Yes	Yes	Yes
Group effects <sup>g</sup>	Yes	Yes	Yes	Yes
R <sup>2</sup>	0.47	0.43	0.45	0.38
Prob > F	0.00	0.00	0.00	0.00
R <sup>2</sup> , first stage	0.65	0.72	0.84	0.62
Prob > F, first stage	0.00	0.00	0.00	0.00
# employees	17709	3639	1825	3076
# establishments	1430	239	164	179

Source: SES, 2003 and SBS, 2001 and 2003

\* p < 0.10; \*\* p < 0.05; \*\*\* p < 0.01

Notes : <sup>a</sup> White (1980) heteroscedasticity-consistent standard errors are reported between brackets; <sup>b</sup> The instrument used in the IV regressions (besides the exogenous variables in equation (5)) is 2001 profits-per-worker; <sup>c</sup> Firm annual gross operating surplus per worker ; <sup>d</sup> Dummy for gender; 6 dummies for education; prior potential experience, its square and its cube; seniority within the current company and its square; a variable showing whether the individual received a bonus for shift work, night work and/or weekend work; 3 dummies for the type of contract; a dummy indicating if the worker is part-time and 8 occupational dummies. <sup>e</sup> Region where the establishment is located (2 dummies); size of the establishment (i.e. number of workers); financial and economic control (3 dummies). <sup>f</sup> Two-digit industry dummies (NACE nomenclature); <sup>g</sup> Group effects estimations use the correction for common variance components within groups developed by Over, Jolliffe and Foster (1996) preprogrammed in the “cluster” option of Stata (StataCorp, 1999).

As for the decentralisation process, it is possible that firms covered by a SE agreement, in addition to the ME, are different from the others. We again use the PSM method to identify the effect of the bargaining level on rent-sharing. We keep the same specification for the probit so we control for variables affecting the workers’ bargaining power, firm’s profit, economic environment and other employers’ pay policies. In short, matching has reduced differences in characteristics between the ME and the SE samples. The mean absolute standardised difference decreases from 16% to 7% and from 28% to 12% respectively for the centralised and the decentralised industries. Results obtained after using PSM (Table 6) confirm and accentuate the previous ones. Within centralised industries, firms not covered by a firm-specific agreement do not generate rent-sharing anymore. In decentralised industries, both bargaining regimes generate rent-sharing to the same extent.

**Table 6:**  
**Log wage equation by bargaining level and degree of centralisation, matched samples**

	Centralised industries		Decentralised industries	
Dependent variable:	ME <sup>a, b</sup>	SE <sup>a, b</sup>	ME <sup>a, b</sup>	SE <sup>a, b</sup>
log (gross hourly wages)				
Log (profit / employee)	0.011 (0.007)	0.039*** (0.010)	0.112*** (0.024)	0.109*** (0.030)
Individual characteristics and working conditions <sup>d</sup>	Yes	Yes	Yes	Yes
Firm characteristics <sup>e</sup>	Yes	Yes	Yes	Yes
Industry effects <sup>f</sup>	Yes	Yes	Yes	Yes
Group effects <sup>g</sup>	Yes	Yes	Yes	Yes
R <sup>2</sup>	0.49	0.47	0.54	0.38
Prob > F	0.00	0.00	0.00	0.00
R <sup>2</sup> , first stage	0.89	0.72	0.90	0.64
Prob > F, first stage	0.00	0.00	0.00	0.00
# employees	2564	3556	912	2549
# establishments	179	233	76	162

Source: SES, 2003 and SBS, 2001 and 2003

\* p < 0.10; \*\* p < 0.05; \*\*\* p < 0.01

Notes : <sup>a</sup> White (1980) heteroscedasticity-consistent standard errors are reported between brackets; <sup>b</sup> The instrument used in the IV regressions (besides the exogenous variables in equation (5)) is 2001 profits-per-worker; <sup>c</sup> Firm annual gross operating surplus per worker ; <sup>d</sup> Dummy for gender; 6 dummies for education; prior potential experience, its square and its cube; seniority within the current company and its square; a variable showing whether the individual received a bonus for shift work, night work and/or weekend work; 3 dummies for the type of contract; a dummy indicating if the worker is part-time and 8 occupational dummies. <sup>e</sup> Region where the establishment is located (2 dummies); size of the establishment (i.e. number of workers); financial and economic control (3 dummies). <sup>f</sup> Two-digit industry dummies (NACE nomenclature); <sup>g</sup> Group effects estimations use the correction for common variance components within groups developed by Over, Jolliffe and Foster (1996) preprogrammed in the “cluster” option of Stata (StataCorp, 1999).

## 5. Conclusion

In this paper, we estimate the impact of the degree of centralisation on rent-sharing for Belgian blue collar workers and test whether the presence of a single-employer (SE) agreement (in addition to a multi-employer (ME) agreement) has a similar impact on rent-sharing in centralised and decentralised industries.

We base ourselves on a matched worker-firm data set (the combination of the *Structure of Earnings Survey* for 2003 and the *Structure of Business Survey* for 2001 and 2003) which contains valuable information on firm and worker characteristics, and on firms’ profits and valued added. In addition, it provides two interesting variables regarding wage bargaining institutions. The first one indicates whether workers in a firm are covered only by a ME wage agreement or whether their wages are additionally covered by a SE wage agreement. This information is available separately for white- and blue-collar workers so it enables us to

overcome a serious misclassification problem encountered in most recent papers on the wage effects of collective bargaining systems. The second variable related to collective bargaining indicates to which joint committee (JC) each firm belongs. This variable, generally not reported in matched worker-firm data sets, makes it possible to identify precisely by which industry agreement each firm is covered. Thanks to these two variables, we are able to construct a quantitative indicator of centralisation, based on the percentage of workers covered by a SE agreement within each JC.

We take account of the potential endogeneity of profits by applying 2SLS, using 2001 profits as instruments for 2003 profits. We also use a propensity score matching method to take into account the fact that firm-level characteristics may vary across bargaining regimes. We find that the wage-profit elasticity is 4 times higher within decentralised than in centralised industries. This puts into perspective the argument advanced by Teulings and Hartog (2002) that unions do not operate as rent seekers in corporatist countries. Indeed, it seems that this depends on the degree of centralisation of the industry. Moreover, we find that, within centralised industries, rent-sharing is present only for firms covered by a SE agreement in addition to the ME agreement. This is an expected finding since ME agreements do not take into account firm-specific characteristics. This result is also in line with Gürtzgen (2005) who found that industry-wide contracts suppress rent-sharing in Germany. Finally, we find that, within decentralised industries, both SE and ME bargaining generate rent-sharing to the same extent. The explanation might be that, within decentralised industries, wages are mainly set at the firm level, so even if a worker is not covered by a SE collective agreement, he nevertheless receives pay supplements from the employer. The fact that it also generates rent-sharing indicates that bargaining need not be collective to generate rent-sharing. This is in line with Gürtzgen (2005) who found that rent-sharing is present in the non-union sector, and with the Anglo-American literature showing that rent-sharing is not a particularity of the unionised sector.

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**Appendix Table 1 :**  
**First stage regression, full sample**

<b>Dependant variable : Profit/employee 2003 (log)</b>	
<i>Profit/employee 2001 (log)</i>	0,618
	(11,41)***
<i>Firm-level agreement</i>	0,041
	(0,75)
<i>Female</i>	-0,056
	(1,54)
<b><i>Highest academic qualification (ref : primary or no degree)</i></b>	
Lower secondary	0,006
	(0,15)
General upper secondary	-0,094
	(1,25)
Vocational upper secondary	-0,006
	(0,13)
Higher non-university short type	0,078
	(1,09)
University and non-university higher education, long type	0,186
	(1,46)
Post-graduate	0,064
	(0,40)
Ph.D.	-0,375
	(2,17)**
<i>Potential professional experience</i>	0,001
	(0,15)
<i>Potential professional experience (squared)</i>	0,000
	(0,01)
<i>Potential professional experience (cubed)</i>	0,000
	(0,09)
<i>Part time</i>	-0,047
	(1,16)
<b><i>Type of contract (ref : unlimited term)</i></b>	
Limited term contract	-0,237
	(2,84)***
Apprenticeship	-0,103
	(0,88)
Other	-0,070
	(0,45)
<i>doing team, shift, night or weekend work</i>	-0,013
	(0,30)
<b><i>Tenure in the firm</i></b>	-0,002
	(0,64)

<b><i>Tenure in the firm (squared)</i></b>	0,000
	(0,19)
<b><i>Occupational classification (ref: Machine operators and assemblers)</i></b>	
Extraction and building trade workers	-0,099
	(0,81)
Metal, machinery and related trade workers	-0,145
	(1,60)
Precision, handicraft, printing and related trade workers	-0,165
	(1,10)
Other craft and related trade workers	0,013
	(0,10)
Stationary plant and related operators	0,022
	(0,19)
Drivers and mobile plant operators	0,069
	(0,86)
Sales and services elementary occupations	-0,093
	(0,68)
Labourers in mining, construction, manufacturing and transports	0,021
	(0,24)
<b><i>Establishment's region (ref: Flanders)</i></b>	
Brussels	-0,162
	(1,82)*
Walloon	-0,033
	(0,56)
<b><i>Economic and financial control (ref: &gt;50% privately owned)</i></b>	
>50% State owned	-0,069
	(0,38)
Other	-0,434
	(4,51)***
<b><i>Establishment's size (log)</i></b>	0,086
	(3,01)***
<b><i>Industry affiliation (ref: manufacture of chemicals and chemical products)</i></b>	
Mining and quarrying	0,532
	(2,12)**
Manufacture of food products and beverage	-0,038
	(0,24)
Manufacture of tobacco products	0,249
	(1,31)
Manufacture of textiles	-0,442
	(3,01)***
Manufacture of wearing apparel	-0,227
	(1,06)
Manufacture of leather and leather products	0,280
	(1,63)

Manufacture of wood and wood products	0,053
	(0,28)
Manufacture of pulp, paper and paper products	-0,149
	(0,51)
Publishing, printing and reproduction of recorded media	0,002
	(0,01)
Manufacture of coke, refined petroleum products and nuclear fuel	0,413
	(2,23)**
Manufacture of rubber and plastic products	0,027
	(0,16)
Manufacture of other non-metallic mineral products	-0,117
	(0,79)
Manufacture of basic metals	-0,198
	(1,26)
Manufacture of fabricated metal products	-0,042
	(0,29)
Manufacture of machinery and equipment	-0,311
	(1,74)*
Manufacture of electrical machinery and apparatus	-0,435
	(1,78)*
Manufacture of radio, television and communication equipment and apparatus	-0,001
	(0,01)
Manufacture of medical, precision and optical instruments, watches and clocks	-0,020
	(0,13)
Manufacture of motor vehicles, trailers and semi-trailers	-0,205
	(0,70)
Manufacture of other transport equipment	-0,963
	(5,03)***
Manufacture of furniture	-0,190
	(0,94)
Recycling	-0,703
	(1,26)
Construction	-0,347
	(2,27)**
Sale, maintenance and repair of motor vehicles and motorcycles	-0,048
	(0,30)
Wholesale trade and commission trade	0,194
	(1,52)
Retail trade; repair of personal and household goods	-0,130
	(0,93)
Hotel and restaurants	-0,425
	(2,07)**
Land transport	-0,277
	(1,94)*

Supporting and auxiliary transport activities; travel agencies	-0,309
	(1,97)*
Post and telecommunications	-0,450
	(1,67)
Activities auxiliary to financial intermediation	-0,001
	(0,01)
Real estate activities	0,256
	(0,48)
Renting of machinery and equipment without operator	0,152
	(0,41)
Computer and related activities	-0,391
	(1,05)
Other business activities	-0,749
	(3,72)***
Constant	3,390
	(5,02)***
R <sup>2</sup>	0,65
F stat	(68,2011) = 31,42
Observations	26249

Source: SES. 2003 and SBS. 2001 and 2003

\*  $p < 0.10$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$

**Appendix Table 2 :**  
**Second stage regression, full sample**

<b>Dependant variable : Gross hourly wages 2003 (log)</b>	
<i>Profit/employee 2003 (log) instrumented</i>	0,030
	(6,96)***
<i>Firm-level agreement</i>	0,035
	(3,87)***
<i>Female</i>	-0,123
	(19,94)***
<i>Highest academic qualification (ref : primary or no degree)</i>	
Lower secondary	0,018
	(2,60)***
General upper secondary	0,049
	(5,29)***
Vocational upper secondary	0,047
	(5,54)***
Higher non-university short type	0,098
	(5,62)***
University and non-university higher education, long type	0,162
	(3,46)***
Post-graduate	0,254
	(1,37)
Ph.D.	0,483
	(29,78)***
<i>Potential professional experience</i>	0,004
	(4,38)***
<i>Potential professional experience (squared)</i>	0,000
	(1,92)*
<i>Potential professional experience (cubed)</i>	0,000
	(0,92)
<i>Part time</i>	-0,029
	(4,12)***
<i>Type of contract (ref : unlimited term)</i>	
Limited term contract	-0,006
	(0,73)
Apprenticeship	-0,589
	(18,99)***
Other	-0,023
	(1,00)
<i>doing team, shift, night or weekend work</i>	0,058
	(7,56)***
<i>Tenure in the firm</i>	0,010
	(15,62)***

<b><i>Tenure in the firm (squared)</i></b>	0,000
	(8,10)***
<b><i>Occupational classification (ref: Machine operators and assemblers)</i></b>	
Extraction and building trade workers	0,013
	(0,98)
Metal, machinery and related trade workers	0,021
	(1,99)**
Precision, handicraft, printing and related trade workers	0,004
	(0,29)
Other craft and related trade workers	-0,016
	(1,51)
Stationary plant and related operators	0,009
	(0,61)
Drivers and mobile plant operators	-0,016
	(1,01)
Sales and services elementary occupations	-0,012
	(0,96)
Labourers in mining, construction, manufacturing and transports	-0,038
	(3,44)***
<b><i>Establishment's region (ref: Flanders)</i></b>	
Brussels	-0,002
	(0,17)
Walloon	-0,017
	(2,34)**
<b><i>Economic and financial control (ref: &gt;50% privately owned)</i></b>	
>50% State owned	0,058
	(1,87)*
Other	0,098
	(4,76)***
<b><i>Establishment's size (log)</i></b>	0,018
	(6,99)***
<b><i>Industry affiliation (ref: manufacture of chemicals and chemical products)</i></b>	
Mining and quarrying	-0,160
	(2,67)***
Manufacture of food products and beverage	-0,151
	(6,08)***
Manufacture of tobacco products	-0,117
	(4,28)***
Manufacture of textiles	-0,156
	(6,21)***
Manufacture of wearing apparel	-0,292
	(10,53)***
Manufacture of leather and leather products	-0,404
	(9,28)***

Manufacture of wood and wood products	-0,171
	(6,63)***
Manufacture of pulp, paper and paper products	-0,095
	(3,39)***
Publishing, printing and reproduction of recorded media	0,063
	(1,86)*
Manufacture of coke, refined petroleum products and nuclear fuel	0,223
	(2,74)***
Manufacture of rubber and plastic products	-0,142
	(5,00)***
Manufacture of other non-metallic mineral products	-0,070
	(1,94)*
Manufacture of basic metals	-0,101
	(3,07)***
Manufacture of fabricated metal products	-0,150
	(6,12)***
Manufacture of machinery and equipment	-0,132
	(5,32)***
Manufacture of electrical machinery and apparatus	-0,177
	(6,48)***
Manufacture of radio, television and communication equipment and apparatus	-0,161
	(5,76)***
Manufacture of medical, precision and optical instruments, watches and clocks	-0,161
	(3,66)***
Manufacture of motor vehicles, trailers and semi-trailers	-0,158
	(5,33)***
Manufacture of other transport equipment	-0,051
	(1,01)
Manufacture of furniture	-0,243
	(9,82)***
Recycling	-0,176
	(5,91)***
Construction	-0,066
	(2,64)***
Sale, maintenance and repair of motor vehicles and motorcycles	-0,127
	(8,12)***
Wholesale trade and commission trade	-0,197
	(8,12)***
Retail trade; repair of personal and household goods	-0,232
	(8,07)***
Hotel and restaurants	-0,271
	(7,74)***
Land transport	-0,228
	(7,74)***

Supporting and auxiliary transport activities; travel agencies	-0,084
	(1,83)*
Post and telecommunications	-0,184
	(6,64)***
Activities auxiliary to financial intermediation	-0,237
	(6,12)***
Real estate activities	-0,151
	(4,37)***
Renting of machinery and equipment without operator	-0,219
	(6,83)***
Computer and related activities	-0,144
	(3,86)***
Other business activities	-0,144
	(5,43)***
Constant	0,035
	(3,87)***
R <sup>2</sup>	0,462
F stat	( 68,2011)=973,73
Observations	26249

Source: SES. 2003 and SBS. 2001 and 2003

\* p < 0.10; \*\* p < 0.05; \*\*\* p < 0.01



**Appendix Table 3 :  
Centralisation status, firm-level regression**

<b>Dependent variable : Being in a decentralised industry</b>	
<i>Firm-level agreement</i>	0,733
	(5,08)***
<i>Percentage female</i>	0,674
	(2,81)***
<i>Percentage part-time</i>	0,238
	(0,71)
<i>Mean tenure</i>	0,039
	(3,35)***
<i>Type of contract (ref: percentage unlimited term)</i>	
Percentage limited term	0,931
	(1,93)*
Percentage apprenticeship	-13,221
	(-1,58)
Percentage other contract	0,222
	(0,2)
<i>Economic and financial control (ref: &gt;50% privately owned)</i>	
>50% State owned	2,040
	(3,53)***
Other	0,827
	(2,7)***
<i>Establishment's size</i>	0,002
	(3,15)***
<i>Establishment's size (cubed)</i>	0,000
	(-2,19)**
<i>Occupational classification (ref: %age Machine operators and assemblers )</i>	
Percentage Extraction and building trade workers	-0,658
	(-1,29)
Percentage Metal, machinery and related trade workers	-1,316
	(-5,68)***
Percentage Precision, handicraft, printing and related trade workers	-0,680
	(-2,32)**
Percentage Other craft and related trade workers	-1,015
	(-4,36)***
Percentage Stationary plant and related operators	0,658
	(2,65)***
Percentage Drivers and mobile plant operators	-0,339
	(-1,18)
Percentage Sales and services elementary occupations	-0,601
	(-1,54)
Percentage Labourers in mining, construction, manufacturing and transports	-0,327

	(-1,39)
<b><i>Profit/employee</i></b>	0,000
	(1,77)*
<b><i>Establishment's region (ref: )</i></b>	
Brussels	0,308
	(1,74)*
Walloon	0,518
	(3,68)***
<b><i>Industrial classification (ref: )</i></b>	
nace_g	0,115
	(0,7)
nace_i	-0,477
	(-2,06)**
nace_k	-1,185
	(-2,67)***
<b><i>Percentage with variable pay</i></b>	0,215
	(1,21)
<b><i>Constant</i></b>	-1,785
	(-8,16)***
Number of obs	1702
Wald chi2(30)	336,18
Prob > chi2	0
Pseudo R2	0,30

Source: SES, 2003 and SBS, 2001 and 2003

\* p < 0.10; \*\* p < 0.05; \*\*\* p < 0.01

**Appendix Table 4 :**  
**Imbalance in Means Between Treated and Matched Comparators, Plus Standardised differences.**

	Centralised sample pre-match	Centralised sample matched	Decentralised sample	Standardised difference before match	Standardised difference after match
Firm-level agreement	0,08	0,27	0,41	-82%	-31%
%age female	0,19	0,29	0,32	-36%	-11%
%age part-time	0,18	0,21	0,21	-9%	0%
Mean tenure	6,74	8,86	10,39	-65%	-26%
%age limited term	0,05	0,08	0,06	-8%	8%
%age apprenticeship	0,01	0,00	0,00	24%	0%
%age other contract	0,01	0,00	0,00	9%	2%
>50% State owned	0,00	0,00	0,02	-17%	-10%
Othe financial control	0,03	0,06	0,06	-15%	-1%
Establishment's size	54,87	102,05	119,61	-43%	-10%
Establishment's size (cubed)	20544,26	33076,76	41844,94	-3%	-1%
%age Extraction and building trade workers	0,13	0,01	0,01	52%	2%
%age Metal, machinery and related trade workers	0,17	0,05	0,06	44%	-1%
%age Precision, handicraft, printing and related trade workers	0,04	0,03	0,03	7%	5%
%age Other craft and related trade workers	0,13	0,04	0,09	14%	-16%
%age Stationary plant and related operators	0,03	0,16	0,15	-44%	6%
%age Drivers and mobile plant operators	0,13	0,09	0,12	5%	-7%
%age Sales and services elementary occupations	0,15	0,09	0,14	2%	-16%
%age Labourers in mining, construction, manufacturing and transports	0,15	0,25	0,18	-12%	22%
Profit/employee	16525,71	26440,09	27373,23	-29%	-3%
Brussels	0,09	0,07	0,10	-6%	-10%
Walloon	0,23	0,34	0,34	-24%	0%
nace_c	0,00	0,00	0,00	4%	0%
nace_f	0,16	0,00	0,00	61%	0%
nace_g	0,26	0,29	0,32	-14%	-9%
nace_h	0,03	0,00	0,00	27%	0%
nace_i	0,12	0,06	0,10	6%	-8%
nace_j	0,00	0,00	0,00	8%	0%
nace_k	0,12	0,06	0,02	40%	16%
%age with variable pay	0,08	0,12	0,15	-23%	-10%

Source: SES, 2003 and SBS, 2003