LABOR UNIONS, UNION DENSITY AND THE UNION WAGE PREMIUM*

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"Unions have an increasingly important role to play at the national level. But they can only do this if they can claim to represent the workers. The question of legitimacy strikes me as the main challenge facing European unions today."

The Future of Unions, Olivier Blanchard, 2000

ABSTRACT

The influence of trade unions' activity in the Portuguese labor market is reviewed, resorting to the information provided by around 200 000 firms on the number of unionized workers. In particular, the membership determinants are studied; the workers' wage benefit in more unionized firms is estimated; and the wages' compositional changes, due to different levels of firm's unionization, are revealed.

As in other developed countries, Portugal has recorded a steady erosion of the union representation. For 2010, the estimate of the union density in the private sector of the economy is around 11 percent. The union presence is more important in sizeable firms, when the company's equity is public, and in industries sheltered from competition. The unionized workers benefit from a substantial wage premium. In more unionized firms, this gap reaches levels above 30 percent, in contrast with non-unionized firms, with the same observed characteristics, that work in the same industry and region.

1. What do Unions do?

A labor union can be characterized as "an association of workers who bargain collectively with their employer, regarding the terms and conditions [pecuniary and non-pecuniary] of employment" (Farber, 2001). Differently, the labor unions are introduced as a coalition of employees which intend to negotiate with their employer over the share of economic rents. A critical dimension of the union activity portrays the organization as a vehicle for the workers to voice their grievances about the workplace (Hirschman, 1970).

The mainstream economic theory accepts that labor unions resort to the bargaining process to pursue the maximization of their members' welfare. In a simplified approach, the negotiation objectives may be abridged to the raise of wages (monopoly model) or of the workforce payroll (efficient contracts model), which combines, as targets, employment and wages.

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Within this framework, the bargaining power of a labor union, which is essential in the definition of the market equilibrium, is outlined by the capability of the labor organizations to mobilize the workers, in order to inflict economic losses to the firms, while upholding the inherent strike costs.

A conventional approach to empirically outline the bargaining power of a labor union resides in determining its mobilizing capability, through the union density, and the amplitude of its influence, conferred by the legislative context, through the union coverage.

2. Why do workers unionize?

The worker's decision to be unionized is settled by confronting the utility shift, which the consumption of that good provides, with the utility change resulting from the consumption of the most valued alternative good. Union membership requires, ordinarily, the payment of a fee, and entitles the worker to a bundle of benefits. In this strict perspective, the unionization good does not significantly diverge from any other consumption good available.

Conventionally, the benefits of unionized employees are partitioned into private and collective. For example, the reinforced employment protection, the grant of a wage premium, the improved workplace conditions, the availability of proper channels to present grievances without fear of dismissal or employer's confrontation, and the protection against arbitrary decisions of the employer are conventional examples of collective benefits. Differently, a greater investment in training and education, free legal advice, the provision of health insurance, and the access to beneficial pension schemes or financial loans are regularly offered as private benefits (Farber, 2001).

There are benefits which are endorsed to every employee regardless of its union status. As an illustration, the existence of a unique human resource policy, which covers every employee, involving questions like job protection, workplace conditions or even the union wage premium is ordinary, and it is decisively influenced by the union presence. Contrarily, the free legal advice, provided by the labor organizations, is an exclusive right of the unionized workers.

In this context, the union adhesion is frequently considered an imperfect club good, as an important share of its inherent benefits is extended to every worker independently of the status of its affiliation. This imperfection forges incentives to free-riding. This means that some employees prefer to not join a labor union, as they are capable to perk from a substantial share of the benefits of unionism, while they avoid the costs of affiliation. In their utility analysis, the exclusive benefits of the unionized workers do not compensate the intrinsic costs.

From the perspective of the worker, the option to adhere to a labor union is the decision about the consumption of an imperfect club good. Henceforth is not rare the presence of free-riding activity eroding the union density.

3. How are wages bargained in Portugal?

In the Portuguese labor market, collective bargaining is a core component of the wage determination. In the bargaining process, the Portuguese Constitution irrevocably attributes the worker representation's monopoly to labor unions (article 56º).

In general, the collective agreements only oblige the unionized workers, the signatory firms, or those represented in the employers' federations. Surprisingly, there are no legal mechanisms to unfold the identity of the subscribing firms, when represented by employer's federations, and the subscribing workers. This conundrum is ordinarily solved by the Government which extends the coverage of the agreements to the entire sector using *Portarias de Extensão*.[1]

1 Martins (2013) and Guimarães *et al*. (2013) provide suggestive evidence of the negative effects of the Regulations of Extension on the employment in the Portuguese Labor Market.

These legal instruments delineate the key legal frameworks which regulates the labor relationships and, in particular, they establish the wage floors applied to a very detailed grid of job titles (around 30 000).

In 2010, the major influence of collective bargaining is indisputable. That framework determined the wage floors by which 88.5 percent of the employees' labor contracts were governed, and was the reference to the Firm's Agreements which subsequently were signed.[2] Therefore, the labor unions were capable to influence 92.3 percent despite the 10.9 percent representation in the same pool of employees. From another perspective, the base wages of 50 percent of the covered workers are determined by collective conventions in which the union density is below 5 percent. This discrepancy between union coverage and union density has been mounting due to the sharp shrinkage of the union density and the maintenance of coverage at very high levels.

4. The database

This study resorts to the individual records of *Relatório Único of 2010*. The data is collected through a mandatory questionnaire to every establishment with at least one wage earner, and it is implemented by the Ministry of Solidarity, Employment and the Social Security. In the current study, we limit our analysis to the pool of full-time employees in mainland Portugal, with ages between 16 and 65, excluding the workers of agriculture, forestry, fishing, public administration and extraterritorial organizations and bodies.

In 2010, the following question was answered in the survey to employers: "*Indicate the number of workers for which you have knowledge of the respective affiliation in a labor union (because they are union delegates, because you discount a fee from their salary to deliver to the union, or because the worker informed you about his affiliation, namely to determine the collective regulation which is applicable)*." The answers to this question are the core of the information used to the calculus of the union density rates.

5. Brief descriptive tour

The referred question had 198 326 replies from firms, which employed a total of 2 337 809 employees. The answers convey the information of an average union density rate estimate of 10.9 percent. This figure is likely to be consistent with those presented in Blanchflower and Bryson (2002), in which the average rate recorded a steady decline, from 52 percent in 1980, to 40 percent in 1990, 30 percent in 1995 and 25 percent in 1998.

The steady decline in the union density rate is not limited to the Portuguese case. Addison (2013) signposts that membership erosion has occurred in 23 of the 24 developed countries considered since 1980's, typically exceeding 30 percent in that period. However, reinforcing the trend presented by Blanchflower and Bryson, Pontusson (2013) include the Portuguese membership erosion among the most severe ones, only superseded by those in New Zealand and France.

At European level, Portugal seems to have followed a path similar to the French case.[3] Several authors suggest that the collective bargaining, with a persistent high union coverage, is the main motive to the lack of French workers' affiliations, as many of them opt to free-ride.[4]

The union presence is particularly meaningful in the financial and insurance activities (63.8 percent), and in the sector of electricity, gas, steam and air conditioning supply (60.5 percent). The sector of transportation and storage also presents a significant union density rate (31.3 percent). In the remaining sectors of the economy, the union density rate fluctuates between 1.4 percent and 15.7 percent (Table 1). The distribution by sectors of unionization suggests that the union's offer of health services (or complementary

2 In 2010, The Firm's Agreements represented 3.85 percent of the workers included in the study.

3 For the French case, data collected in Blanchflower and Bryson (2002) presented an union density rate of 22 percent in 1980, and 10 percent in 1995.

4 See Golden *et al*. (1997), Traxler (1994, 1996) and Booth *et al*. (2000).

Table 1

UNION DENSITY RATES BY INDUSTRY

ISIC 1	Description of ISIC	Union density rate	Weight of the sector in total number of workers
K	Financial and insurance activities	63.80%	3.61%
D	Electricity, gas, steam and air conditioning supply	60.46%	0.31%
H	Transportation and storage	31.30%	5.34%
J	Information and communication	15.65%	2.56%
E	Water supply; sewerage, waste management and remediation activities	14.48%	0.82%
B	Mining and quarrying	11.96%	0.41%
C	Manufacturing	11.69%	24.23%
R	Arts, entertainment and recreation	10.55%	0.78%
Q	Human health and social work activities	9.42%	7.90%
I	Accommodation and food service activities	8.01%	6.88%
S	Other service activities	7.54%	2.76%
G	Wholesale and retail trade; repair of motor vehicles and motorcycles	4.58%	19.46%
N	Administrative and support service activities	4.65%	7.49%
P	Education	4.09%	1.66%
F	Construction	2.86%	11.10%
M	Professional, scientific and technical activities	2.36%	3.98%
L	Real estate activities	1.44%	0.71%
	Total number of workers		2,337,809

Source: *Relatório Único de 2010*.

schemes of health insurance) attracts a substantial adhesion of employees. From a different perspective, similarly to other economies, the union density rates are higher in natural monopolies and other sectors sheltered from competition. In those sectors, the presence of economic rents eases the organization of workplaces, and induces a more effective extraction of rents.

It is observed a very robust positive link between the size of the firm and the union membership (Table 2). While in firms with 1 to 4 employees the union density rate is below 1 percent, in firms with 500 or more employees the union density rate reaches 30.1 percent.

In small firms there will be greater difficulties in promoting union membership. The union is typically more concerned in maximizing overall membership. Henceforth, from the management perspective of the union's resources, it is rational to collectively represent larger groups of workers where the return, by unit of effort, measured in number of affiliations, is larger. Furthermore, smaller firms entangle lower pressure from coworkers to unionism. Finally, in those firms there is ordinarily a closer relationship between workers and the employer, which makes the need of intermediation more expendable.

Due to the same reasoning, the labor organization is concentrated in the more populated urban areas, namely in Lisbon and in the North region, particularly in the urban area of Oporto.

The prevalence of unionization is higher among male, non-foreigners, college graduates, and those with an open-ended contract (Table 3). The gender differential is not considerable, but, in the case of foreigners and fixed-term workers, the reduction to about a half of affiliations deserves being noticed. Indeed, these cohorts of workers have more fragile employment relationships, and henceforth, are more exposed to unemployment. Thus, there will be a weaker tie among the worker, the firm and the other coworkers, which do not favor unionization. For this group of employees, as the duration of the worker relationship is known and limited since the beginning, there will be a lower investment in improving the workplace conditions.

Table 2

UNION DENSITY RATES BY THE CHARACTERISTICS OF FIRMS		
	Characteristics of firms	**Union density rate**
Size of the firm	1 a 4 workers	0.87%
	5 a 9 workers	1.38%
	10 a 49 workers	3.68%
	50 a 99 workers	8.33%
	100 a 249 workers	11.91%
	250 a 499 workers	16.71%
	Mais de 500 workers	30.06%
Region NUT II	North	9.17%
	Center	6.54%
	Lisbon	15.59%
	Alentejo	6.89%
	Algarve	6.27%

Source: *Relatório Único de 2010.*

Table 3

UNION DENSITY RATES BY THE CHARACTERISTICS OF THE WORKERS		
	Characteristics of the workers	**Union density rate**
Education	Below to elementary schooling	8.00%
	Preparatory schooling	8.77%
	High schooling	13.29%
	College Graduate	15.75%
Gender	Woman	10.37%
	Man	11.29%
Origin	National	11.17%
	Foreigner	5.40%
Type of contract	Fixed term contract	5.69%
	Permanent contract	12.50%

Source: *Relatório Único de 2010.*

Interestingly, the union density rates substantially increase with education, despite the literature recognition that a more educated worker has greater incentive to bargain individually, as the singularity of his knowledge provides him with greater bargaining power in comparison with the union. Conceivably, the higher union density rate among graduates is due to their strong presence in the financial and insurance activities.

6. About the determinants of unionization

In order to jointly infer the determinants of unionism and to account for the correlations among them, we employ a multiple regression model.[5] The estimation results are summarized in chart 1. In this chart, the dots represent the point estimate of the regression coefficients, and the lines correspond to the confidence intervals at 95% level of confidence. Of course, if a confidence interval crosses the vertical reference centered at zero the variable will not be statistically significant.

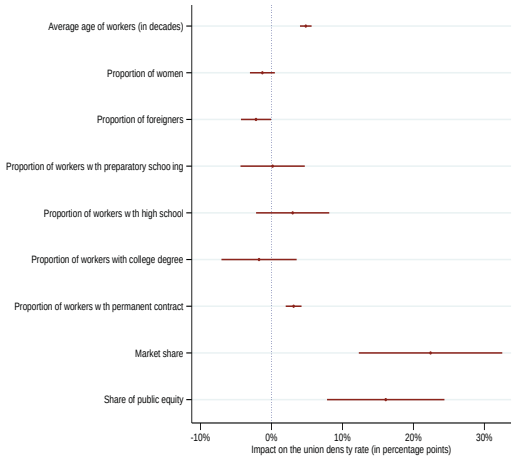
Broadly, the results confirm the reasoning already provided in the previous section. Even with this consistency, four coefficients deserve a detailed discussion. Firstly, the average worker's age estimate reveals

5 The alternative use of zero inflated count models does not qualitatively alter the results (see Vilares, 2013).

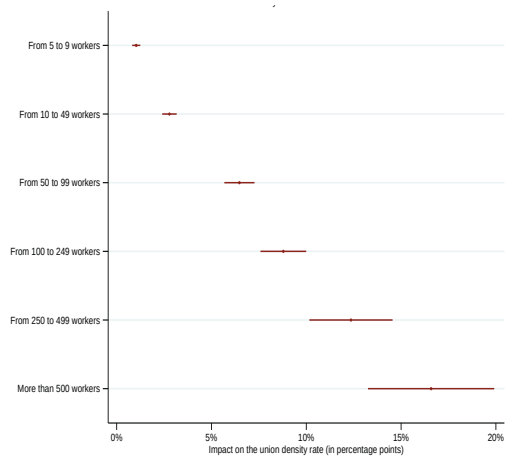
Chart 1

FIRM LEVEL DETERMINANTS OF UNIONIZATION

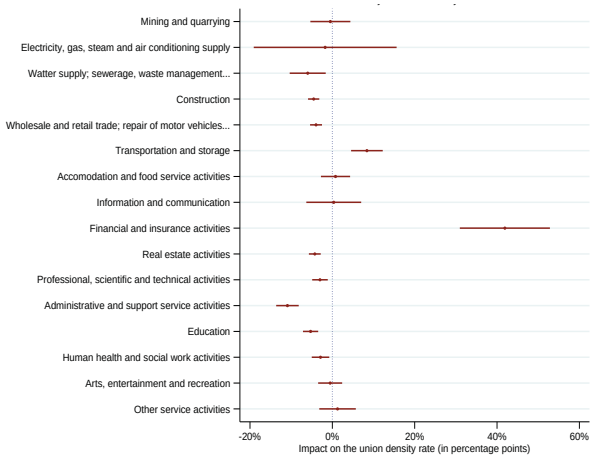
By the characteristics of workers, the contract, and the public equity[a]



By the size of the firm[b]



By sectors of activity [c]



Source: *Relatório Único de 2010*.

Notes: Estimation obtained resorting to the OLS estimator. The dots represent the point estimation of the regression coefficients, and the lines correspond to the confidence intervals at 95% confidence level. **(a)** Control group (Schooling): Proportion of workers with an education below the preparatory school. **(b)** Control group: From 1 to 4 workers. **(c)** Control group: Manufacturing.

that an increase in 10 years is associated with an increase by 5 percentage points of the union density rate. Noticeably, older workers are more unionized.

Secondly, there is strong evidence that companies with public equity have substantially higher union density rates. A fully public owned company records a 18.8 percentage points greater union density rate, comparatively with a 100 percent private counterpart. Frequently, regarding the public sector of the economy, it is referred that the atomistic nature of the property rights provides a more favorable background to the satisfaction of the labor unions' demands.

Regarding competition, the view that more protected activities have a higher level of unionization is reinforced. Either due to legal impediments (legal monopolies), or due to the nature of the economic activity (natural monopolies), the more unionized sectors are precisely located in activities sheltered from competition. Due to the imperfect nature of competition, the existence of economic rents extracted by firms in their product's markets attracts the union organizations, which seek to favor their members with the share of those rents. From the turnover perspective, for each percentage point increase in the

companies' market share (measured by the turnover) there is an increase by 0.22 percent of the union density rate.[6]

Fourthly, the higher prevalence of membership among college graduates is blurred, when the relationship is controlled for worker's observed characteristics, the firm's industry and region. Now, the owners of a high school diploma evidence the greatest prevalence of unionism.

Furthermore, the chart reveals a sizable monotonic relation between the level of membership and the size of firms, signposting that this relationship survives to the presence of the industry as control.

The suggestion of a strong industry asymmetry is partially attenuated when the firm's and worker's observed characteristics are taken into account. Nevertheless, the conspicuous cases of Financial and insurance activities, the Administrative and support service activities and the Transportation and Storage sector persist.

The first case is eventually the unique private industry where the labor unions offer a private health subsystem to workers (SAMS), suggesting that the offer of health services (or complementary schemes of health insurance) feeds a greater workers' adhesion.

Regarding the Administrative and support service activities, it is possible that the large presence of temporary labor firms, in which the employment relation is fickler and more unstable, provide an explanation for the lower union density rate.

Finally, it is known that the transportation sector accumulates several conditions which eases the success of labor disputes launched by unions: either due to the fact that the elasticity of service's demand is inelastic; or because there is a very low substitutability of inputs; or due to the low weight of the workforce payroll in the total expenditure of the firm; or because it is viable to impose restrictions to the production function which binds the firm to more labor utilization ("featherbedding").[7]

7. The Union Wage Premium in Portugal

The transfer of economic rents to the workforce is unfolded through an array of pecuniary and non pecuniary benefits. Among those, the estimation of the unionism's impact on the workers' wages, the so called union wage premium, is a classical concern of labor economics.

Conventionally, this union wage premium is measured as the differential between the wages of a worker in more unionized workplaces and an identical worker in less unionized environments. When the worker's choice is known, the comparison is made between two identical workers with contrasting decisions. In this study, due to the lack of knowledge about the worker's decision we exploit the first approach.

Whenever there is bargaining power of unions, and rents generated from imperfections in the product's markets there is margin to workers to claim and collect benefits, which partially may assume the form of a union wage premium.

In order to flexibly define the union wage premium, comparing firms with different union density rates, we implemented a fixed effect regression model and the smoothing of those fixed effects through a kernel regression.[8] This methodology results in a non-parametric curve (that is, without any functional form imposed ex-ante), which exhibits the relationship between union density rates and union wage premia.

6 In the computation of the market shares it was considered the definition for the industry the ISIC 5.

7 The corollaries of Slutsky have a generalized application here.

8 Essentially, in a first step the model is estimated with the standard controls and 2289 fixed effects corresponding to each level of union density rate in the database. In the second step, the estimates of the fixed effects are graphically presented via the implementation of a kernel estimator. See Vilares (2013) for a detailed discussion of this methodology.

In the current exercise we studied three formulations of controls: the gross union wage premium curve (this means without any controls); the union wage premium curve comparing workers with identical observed characteristics; and the union wage premium curve comparing identical workers in firms which operate in the same industry and region.[9]

In chart 2, the estimates of the union wage premium are presented through curves which link the wage level and the union density rate. Immediately, the union's bargaining power converts into wage increases in a non-linear pattern. More precisely, until a firm's unionization of 25 percent the union wage premium is negligible. After this value, the premium displays a sharp increment until it reaches its maximum for a union density between 60 and 80 percent. Beyond those levels of unionization, the relationship sustains a plateau at very high wage premia.

To secure a sizable impact of the union activity on wages, it seems to be required a critical membership scale. However, the capability to marginally increase the wage premia is exhausted for union density rates above 75 percent.

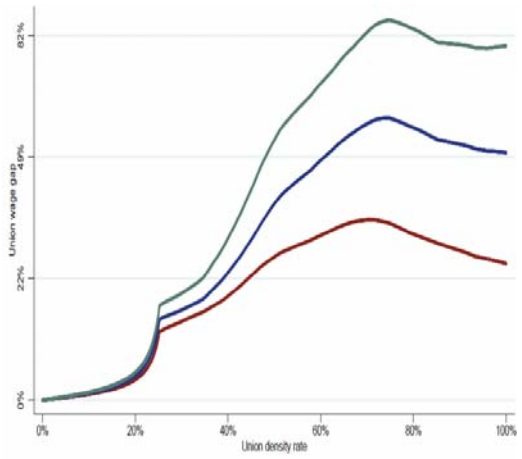
The green curve establishes the comparison between workplaces with different union density rates and the ones without any unionized worker. Here, the curve reveals a monotonic increase with membership until it reaches a maximum union wage premium of 87 percent. For workplaces where more than 75 percent of the workforce is unionized, which corresponds to the group of firms with more affiliated workers, the average value of the wage premium is 81 percent (Table 4).

Nevertheless, if the observed characteristics of the workers are taken into account, the union wage premium reaches a maximum of 59 percent. For companies with more than 75 percent of the workforce

Chart 2

UNION WAGE PREMIUM IN PORTUGAL

Union wage premium curve

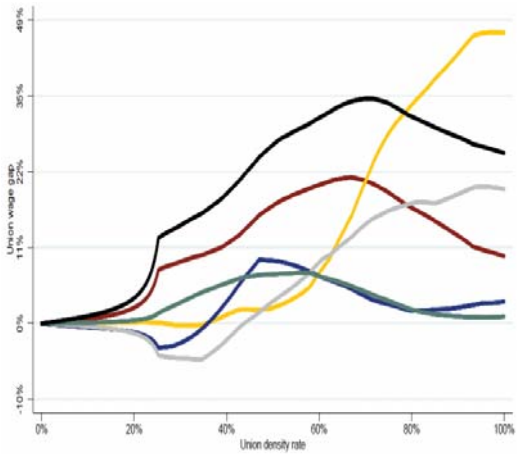


- Union wage premium controlled for the characteristics of workers, the region (NUT II), and the industry (ISIC 1) of the firm.
- Union wage controlled for the characteristics of workers (age, gender, foreign or national, education)
- Gross union wage premium (without controls)

Source: *Relatório Único de 2010*.

Note: Estimates obtained through a fixed effect model and a nonparametric kernel regression.

Union wage premium decomposed by the parts of total compensation



- Overall compensation
- Shift subsidy
- Base wage
- Meal subsidy
- Other bonuses not attach to productivity
- Overtime compensation

Source: *Relatório Único de 2010*.

Note: We resorted to the specification with controls for the characteristics of the firm and the worker.

9 We considered as worker's control variables: age, squared age, gender, a binary variable for national or foreign and a set of education dummies. At firm level we considered the NUT II regions and the ISIC 1 industries.

represented by a union, the correspondent average value is 53.5 percent. In comparison with the previous exercise, the reduction in the wage premium mirrors the higher levels of education of the affiliated workers.

Lastly, when the firms' location and industry is considered, the maximum union wage premium achieves 34.5 percent, with an average premium of 29 percent for workplaces with an union density rate larger to 75 percent.

These estimates for Portugal are considerably larger when compared with the other countries, even when methodological differences are accounted for. Also, they are sizably greater than the 17.9 percent obtained by Blanchflower and Bryson (2002) in the single study of union wage premia for Portugal which we found.[10]

In Portugal, the worker's overall labor compensation is composed by the base wage and a set of fringe benefits (lunch subsidy, shift subsidy, overtime compensation, and other bonuses not attached to productivity). By replicating the methodology implemented to each component of overall compensation we are capable to accurately estimate the impact of bargaining power on those contends.

The analysis of those components allows the detection of relevant compositional effects, as they present dissimilar trends. The profile of each component of remuneration allows the identification of union's priorities. In this structure, the unions obtain greater success in bargaining for more generous fringe benefits, even when it implies lower base wages. Therefore, a trade-off is established between the base wage and fringe benefits, in particular, the lunch subsidies and the bonuses.

8. Final Remarks

A steady erosion of union membership has been recorded in Portugal, and in the most developed countries. In 2010, the estimate of the union density rate for the private sector of the Portuguese economy is about 11 percent. The union prevalence is greater in larger firms, in sectors in which unions additionally provide health services, in sectors sheltered from competition, and in firms with a strong presence of public equity. The unionized workers benefit from a very substantial union wage premium, independently of the metric used.

The evidence of a sizable union wage premia does not allow, per se, to establish a casual nexus between union bargaining power and wages. The phenomenon of reverse causality may occur from the fact that union prevalence is not random, as unions may locate preferably in firms with more generous compensation policies, or those more permeable to the unions' demands.

There exists a substantial differential between the number of unionized workers and the number of workers covered by collective agreements. This gap differs significantly among industries and sizes

Table 4

UNION WAGE PREMIUM FOR DIFFERENT LEVELS OF UNIONIZATION

Firm's union density rate:		0% to 25%	25% to 50%	50% to 75%	75% to 100%
Union wage premium	Without controls	2.85%	29.19%	71.58%	80.96%
	Controls for worker's characteristics	2.45%	22.51%	50.22%	53.52%
	Controls for worker's and firm characteristics	2.08%	17.94%	31.66%	28.86%
Distribution of unionized workers per group		21.11%	16.48%	22.14%	40.27%

Source: *Relatório Único 2010*.

10 The study of Blanchflower and Bryson resorts to individual information about the membership. Since the union wage premium is typically extended to every worker of the firm, despite is union status, it is credible that studies of that nature systematically underestimates the impact of union influence.

of firms. In this context, the generalized use of regulations of extension, which extends to the entire industry the agreements settled between unions and employers' federations with **weak or very weak** representation, is especially problematic. In these cases, it is conceivable that unions and employers' federations mainly represent larger firms and better paid workers.

The framework of the collective bargaining was constructed under the assumption of a strong representation of unions and employers' federations. Through the decades, the use of regulations of extension helped the erosion of this representation, and provided the proper ground for the misalignment between bargained wages and feasible wages, which tends to raise unemployment (Martins 2013, Guimarães *et al*., 2013).

Therefore, it seems clear that the implementation of regulations of extension should be parsimonious and dependent on a set of objective and transparent criteria based on a minimum representation of unions and employers' federations.

In general, it seems that the use of decentralized bargaining instruments provides an enhanced internalization of the idiosyncratic characteristics of firms, favoring a closer representation of workers, which will improve the efficiency of the bargaining process.

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