Union Membership and Job Satisfaction:

Initial Evidence from French Linked Employer-Employee Data[1]

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Abstract

A number of contradictory theoretical hypotheses have been advanced regarding the relationship between unionization and job satisfaction. The effect of unionization on job satisfaction is thus an empirical issue. In this article, the existing empirical literature is reviewed through a meta-analysis. In addition, new evidence of the effects of unionization on overall job satisfaction is presented using French linked employer-employee data from the 2011 REPONSE Survey. The results indicate that union members are less satisfied with their jobs and more likely to complain than non-members. However, after controlling for endogeneity of union membership, I find this difference in job satisfaction between unionized and non-unionized employees disappears.

Keywords: Meta-analysis, labor union, job satisfaction, linked employer-employee survey, REPONSE survey

[1] First draft, please do not quote without permission of author.

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Many employers are paying more and more attention to the well-being of their employees and to how they perceive their current jobs. Job satisfaction can be roughly defined as a subjective construct representing the overall emotional feeling individuals have about their job. According to the literature, job satisfaction is associated with important work-related outcomes, such as organizational commitment, job performance, and organizational citizenship behaviors, as well as lower levels of turnover and absenteeism (Warr, 1999). One common research finding is that job satisfaction is correlated with unionization (Freeman, 1978). However, despite a voluminous literature, there are still many gaps in our understanding of the process through which union membership impacts job satisfaction or conversely how job satisfaction can affect unionization. There is not only disagreement about the theoretical impact of unionization on job satisfaction but also contradictory findings from the empirical studies. Thus, the aim of this article is first to offer a quantitative review of the evidence. Meta-analysis is now used widely to identify patterns and draw inferences from the diversity of results and detect possible regularities in the association between unionization and job satisfaction. The meta-analysis presented here involves a comprehensive survey of the published empirical literature. Additionally, the second aim of this article is to present new estimates of the effect of unionization on job satisfaction. Indeed, existing studies suffer from important limitations that are dealt with in this paper. First, many studies fail to account for the endogeneity of individual membership. Most existing studies have

highlighted how the investigation of this relationship can be complicated by the presence of unobservable factors that influence both workers' perceptions and decisions to join the union (see Heywood, 2002; Bryson et al., 2010). As Bryson et al. (2004, 2010) proposed, we use an instrumental variable approach to shed light on a puzzling finding often reported in the literature: namely, that unionized employees are less satisfied than non-unionized employees. Second, only a limited range of countries have been investigated (mainly the US and UK). This study in the French context allows for comparisons of union effects on job satisfaction across cultural values and industrial relations systems. Because values differ across cultures, it is worth examining unionization and job satisfaction on a French data set.[2] Moreover, it is beneficial to study this relationship in France because it can contribute to our knowledge of employment relations in different countries. One of the consequences of globalization is that IR and HR professionals often need knowledge about unions in more than one country (Strauss, 1998). Third, important interactions have often been ignored in the existing literature, especially those between union membership and situational variables such as individual incentives. In this study, we want to examine the interplay of situational and dispositional variables, including an analysis of interactive effects on job satisfaction.

Using linked employer-employee data representative of the French workforce, we replicate a model of job satisfaction with endogenous sorting of employees into union membership and unionized establishments that was first developed by Bryson et al. (2010) in the UK context. Bryson et al. (2010: 2) show that "*such an extension is crucial, since the negative membership/satisfaction differential disappears once selection into unionized workplaces is taken*

[2] A comparison of job satisfaction in Europe indicates that the average level of satisfaction is quite high but varies at national level. According to the 4th *European Working Conditions Survey*, Denmark has the most satisfied employees on average. Second is the United Kingdom, followed by Norway, Switzerland and Austria. France has a low level of job satisfaction. In general, French workers are less satisfied than their counterparts in the main industrialized countries in Europe.

into account." For unionized workplaces, Bryson et al. (2004, 2010) indicate that the dissatisfaction of members is entirely due to the endogeneity of membership, excluding the "voice" or free-riding arguments. It appears that "*individuals who unionize are less satisfied ex ante, as would be the case if they had higher expectations toward the job compared to non-members.*" Are French workers who unionize less satisfied *ex ante*? Is there a voice effect in France? What is the role of situational and dispositional variables in the relationship between union membership and job satisfaction?

The paper is structured as follows. Section 1 presents a brief review of the theoretical arguments linking unionization and job satisfaction. Section 2 describes the data and the features of the empirical methods used. The main results are presented and interpreted in Section 3. Section 4 concludes the paper by discussing the implications of the results and the limitations of the research.

Union Membership and Job Satisfaction: A Meta-Analytic Review of the Literature

In this section, I examine the different explanations that have been offered by the existing literature and the empirical research conducted to examine these explanations.

Theoretical considerations

The relationship between union membership and job satisfaction has received extensive attention from scholars since the seminal work of Richard B. Freeman was published in 1978. In his article, Freeman (1978) suggests that union members are less satisfied than non-union workers but are also less inclined to quit their jobs. Union members have a voice mechanism to express dissatisfaction with current terms and conditions and this mechanism may lead them to identify

an increasing number of job characteristics that should be improved. Drawing on Hirschman's (1970) exit voice theory, Freeman (1978) argues that unionized work environments protect employees, who are thus more willing to express their discontent with working conditions. According to Borjas (1979), "*the exit-voice hypothesis argues that in order for the workers' voice to be heard effectively, it is important for the union to make them aware of what is wrong with their jobs.*" This dissatisfaction may increase the bargaining power of the union and may even create an incentive to overestimate the problems in the workplace (Hammer and Avgar, 2005).

A number of other authors have provided a second explanation for the negative association between unionization and job satisfaction: union jobs are less attractive than comparable non-union jobs in certain facets, such as the nature of tasks or working conditions (Pfeffer and Davis-Blake, 1990; Gordon and Denisi, 1995; Bender and Sloane, 1998). Unpleasant jobs are more likely to lead to unionization (in the mining industry, chemical industry, and so on). In addition, jobs may also become less attractive after unionization if management reacts to higher labor costs by decreasing allocations to the physical work environment or putting pressure on employees.

A third explanation that is particularly relevant in the French context is that the individual worker who joins a union has different personal characteristics from those who prefer not to be unionized. That is, dissatisfied workers have more incentive to join a union, then it is job dissatisfaction that influence union membership. The nature of these differences goes beyond demographic characteristics and more towards ideological values. This hypothesis suggests that some workers may be attracted to union status for more reasons than the promise of prospective gain. In both cases, job dissatisfaction causes unionization and it would be necessary to distinguish between characteristics of union job and characteristics of union workers. All these arguments refers to the "sorting hypothesis" (or reverse causation) which postulates that the

characteristics of individuals who join the union or the features of the workplace are likely to influence the discontent of union members and the fact that individuals tend to unionized (Bryson et al. 2010).

Berger, Olson and Boudreau (1983) offered another explanation for the relationship between union membership and job satisfaction. They consider that union membership has a direct effect on the job outcomes workers receive (for example, pay, job security). If this is so, one could expect job satisfaction to be highest where unions are present at the workplace. Finally, Berger et al. (1983) found that unions have a significant effect on satisfaction with pay but that this is generally offset by a negative effect on satisfaction with the work itself.

In sum, these different views consider a non-random allocation of employees across unionized and non-unionized jobs that may give rise to reverse causation issues and to the need to control for observed and unobserved differences across individuals, jobs and workplaces. These arguments are not new in the literature (see Bryson et al., 2010, for a review) but most existing studies have been unable to deal with all these issues in the same time. Given these conflicting theoretical arguments, it is clear that the net effect of unionization on job satisfaction is an empirical issue. The results from the existing empirical research have been inconclusive in terms of the ability to explain and predict job satisfaction. Some studies confirm the exit-voice hypothesis (Borjas, 1979; Schwochau, 1987; Kochan and Helfman, 1981; Miller, 1990; Miller and Mulvey, 1991) but several others have reached different conclusions and argue that union member dissatisfaction is not evident at all (Pfeffer and Davis-Blake, 1990).

Finally, most of the authors argued that the mixed findings likely result from the varying specifications of job satisfaction across the literature. To shed new light on the union/job satisfaction relationship, this study first compiles, analyzes, and describes empirical studies

measuring the effect of unionization on job satisfaction in different countries from 1962 to 2013. The systematic collection of empirical results provides me the tools to conduct a meta-analysis using the existing set of primary empirical results.

A Meta-Analysis of the Union-Job Satisfaction Relationship

Sample and coding

There have been several empirical investigations on union-job satisfaction relationship. Most of the existing studies have been done in the US (Odewahn and Petty, 1980; Hersch and Stone, 1990; Premack and Hunter, 1988), the UK (Guest and Conway, 2004), Canada (Renaud, 2002) and Australia (Miller, 1990) and try to challenge the exit-voice hypothesis (see Hammer and Avgar, 2005, for a literature review). An extensive computer based search was conducted revealing a total of 54 studies that contained a total of 224 estimates of the relationship between unionization and job satisfaction. These studies are listed in Table A1 in appendix, together with the sample size, the country investigated, the time period of the data.

An important observation is that some of the studies on the relationship between unionization-job satisfaction use a logit or probit model to estimate the relationship whereas others use linear regression estimates. In order to deal with this issue and to combine the results of all existing studies we define an effect size that does not include the magnitude of the relationship and we rather focus on the direction and statistical significance of the estimates. In this analysis, we ultimately distinguish between negative, insignificant and significantly positive study results. The table 1 shows that 72% of the estimates are negative. When a distinction is made between statistically significant and insignificant results, the number of insignificant negative results is of the same order of magnitude as the number of insignificant positive results. However, a

significantly negative relationship is observed frequently (44%) while very few observations find a significantly positive relationship between unionization and job satisfaction (7%).

TABLE 1
Descriptive statistics on sign of the union-job satisfaction estimates and their statistical significance using a 5% critical significance level (N=224)

Sign		Count	Percentage (%)	Count	Percentage (%)
Negative	Significant	98	44	162	72
	Insignificant	64	29		
Positive	Insignificant	46	21	62	28
	Significant	16	7		
Total		224	100	224	100

Meta-analysis can be used to combine all the studies in order to assess the unionization-job satisfaction effect. This represents a synthesis of the available evidence and a quantitative overview of what researchers have established (Hunter and Schmidt, 1990). In this meta-analysis, the unit of observation is the estimated categorical effect, and the moderator variables measured for each estimated effect refer to the study from which the estimate was derived. Different types of moderator variables are hypothesized to influence the estimated effect of unionization on job satisfaction: variables capturing model specification and estimation, variables capturing measurement and definitions, and study-specific variables.

Given the focus on direction and significance of estimated effects, the meta-analysis uses a limited dependent variable model. Ordered probit models are chosen since the three effect categories imply a natural ordering based on the t-statistic. We distinguish between significantly negative, insignificant and significantly positive estimates using a categorical effect size estimator as the dependent variable. The categories are labelled 0, 1 and 2 respectively, using a 5% critical significance level. In estimating this model we have to deal with the fact that some studies have produced more than one estimate. Following Bijmolt and Pieters (2001), we then

estimate a model with equal weights per study in which each observation is weighted with the inverse of the total number of estimates that is drawn from the same study:

$$w_{ks} = \frac{M}{M_s S}, \forall\, s=1,\ldots, S, \text{k}=1,\ldots, M_s$$

where M is the total number of estimated effects, M_s is the number of estimated effects from study s, and S is the total number of studies. This approach prevents studies with a large number of estimates from having a large influence of the estimations results.

Meta-Analytic Results

The ordered probit estimates and associated marginal effects are presented in Table 2. Regarding the measurement of job satisfaction, there is no difference in study outcomes between studies that use a five-point Likert scale and studies that use other Likert scales (the omitted category is using an index of job satisfaction scales). The effects of different econometric estimators appear to be trivial. OLS studies display the same probability to produce negative, insignificant and positive results. In other words, the proportion of the three types of effects does not differ significantly between the studies using logit or probit estimation, and OLS estimations. However, studies that use panel data and control for endogeneity produce more positive estimates than studies that use cross-sectional data (the omitted category). In other words, it seems important to deal with the issue of endogeneity when examining the relationship between unionization and job satisfaction. This relationship also appears to have been non constant over the years. The results suggest that the probabilities of finding a significantly positive estimate are higher for 80s and the 2000s compared to 90s. These results may be due to studies and data improving over the years. The publication trend may mimic unobservable changes in the research design, the date and/or

econometrics techniques over years. Just like the temporal effect, the spatial context is also expected to contribute to systematic difference in the intensity and direction of the union/job satisfaction relationship. Interestingly, for UK studies the probability of positive results is significantly lower than elsewhere. This is a stimulating result since it suggests that unionization operate differently in UK than in other countries. Focusing on the role of wages and promotion as additional covariates is of particular importance. That is, models that include a control variable for wages are more likely to yield insignificant effects as models without a control for wages. Regarding control for promotion, the analysis suggests that including a control for promotion is more likely to yield positive effects as models without a control for promotion.

The application of meta-analysis to the existing empirical studies thus points clearly to the conclusion that unions have different impact on job satisfaction depending on a number of factors. In fact, several empirical issues explain why there is so much difference between the results of existing studies. A first key empirical issue is selection to membership.[3] The results of the meta-regressions show that model specification and estimation are the primary sources of variation among the estimated effects. First, adding a wage level variable or a control for promotion is of importance and favors insignificant or positive impacts of unionization on job satisfaction. The meta-analysis results clearly suggest that it is crucial to control for working conditions in our examination of job satisfaction. Indeed, job satisfaction may have less to do with union membership than the particular set of working conditions. Second, individual characteristics (such as race, occupation…) influence both unionization and dissatisfaction, so that the observed differential would reflect spurious correlation.

[3] Union workers could express greater dissatisfaction simply because unsatisfied workers are more likely to join a union.

TABLE 2
Estimates and Associated Marginal Effects of Meta-analysis Ordered Probit Model (*t* in Parentheses)

	Ordered Probit Model	Marginal Effects Model		
		Significantly Negative	Insignificant	Significantly Positive
JS 1-4	0.520	-0.202	0.168	0.034
	(1.25)	(-1.30)	(1.38)	(0.95)
JS 1-5	0.417	-0.161	0.130	0.030
	(1.01)	(-1.05)	(1.13)	(0.76)
JS 1-7	-0.210	0.084	-0.074	-0.010
	(-0.42)	(0.42)	(-0.41)	(-0.48)
JS 1-10	0.169	-0.067	0.057	0.010
	(0.38)	(-0.39)	(0.40)	(0.34)
JS DUMMY	-0.571	0.222	-0.203	-0.019
	(-1.30)	(1.39)	(-1.35)	(-1.55)
1970	0.549	-0.211	0.171	0.040
	(1.05)	(-1.11)	(1.23)	(0.74)
1980	0.786**	-0.294**	0.229***	0.065
	(2.01)	(-2.22)	(2.58)	(1.27)
2000	1.065**	-0.377**	0.266***	0.111
	(2.00)	(-2.44)	(3.51)	(1.19)
DF	-0.001**	0.000*	-0.000*	-0.000*
	(-2.22)	(2.22)	(-2.19)	(-1.79)
USA	-0.700	0.274	-0.239	-0.034
	(-1.43)	(1.49)	(-1.50)	(-1.27)
UK	-0.572	0.225	-0.201	-0.024*
	(-1.33)	(1.37)	(-1.32)	(-1.64)
ECOJOURN	0.455	-0.178	0.151	0.028
	(1.50)	(-1.54)	(1.59)	(1.18)
IRJOURN	0.249	-0.098	0.084	0.015
	(0.90)	(-0.91)	(0.93)	(1.79)
SERVICES	-1.021***	0.378***	-0.347***	-0.031**
	(-2.71)	(3.17)	(-3.08)	(-2.13)
PANEL	2.253***	-0.551***	0.066	0.485**
	(3.49)	(-8.75)	(0.33)	(2.01)
PROBIT	-0.226	0.089	-0.077	-0.013
	(-0.67)	(0.68)	(-0.68)	(-0.64)
PROMOTION	0.615**	-0.235**	0.190**	0.045
	(2.15)	(-2.20)	(2.34)	(1.45)
FIRMSIZE	-0.051	0.020	-0.017	-0.003
	(-0.15)	(0.15)	(-0.15)	(-0.15)
WAGES	0.665**	-0.260**	0.231**	0.029*
	(2.23)	(-2.33)	(2.30)	(1.79)
HOURS	0.046	-0.018	0.016	0.002
	(0.13)	(-0.13)	(0.13)	(0.14)
EDUCATION	-0.534	0.206*	-0.167*	-0.039
	(-1.58)	(1.67)	(-1.84)	(-1.08)
OCCUPATION	-0.820***	0.307***	-0.240***	-0.067
	(-2.71)	(2.97)	(-3.37)	(-1.59)
RACE	1.176***	-0.435***	0.343***	0.092**
	(3.63)	(-4.14)	(4.40)	(2.08)
ENDOG	0.379	-0.146	0.118	0.028
	(0.81)	(-0.85)	(0.94)	(0.60)

Constant 1	0.376
Constant 2	2.460
Number of obs	224
F (24, 200)	2.96***

To deal with this issue, Gordon and Denisi (1995), for example, control for differences by using samples of members and non-members drawn from the same work environment. Their results indicate no effect of union membership on job satisfaction once working conditions are controlled for in three agency shops. More recently, Bryson et al.(2004) account for endogenous selection and control for both individual and workplace heterogeneity. They find that the difference in job satisfaction between unionized and non-unionized workers disappears, suggesting that a selection effect, rather than a causal effect, characterizes this relationship. The negative relationship between unionism and job satisfaction may simply be due to the fact that workers who are intrinsically unhappy with their jobs are more likely to join a union.

The institutional setting is a further issue. The meta-analysis suggests that the spatial context matters. The negative effect of unionization on job satisfaction cannot be generalized to all industrialized countries. In certain countries, the potential free-rider problem needs to be addressed (Garcia-Serrano, 2009). In France, for example, the costs of unionization outweigh the benefits as all employees can benefit from collective bargaining even if they are not unionized (cf. infra). Joining a union is a real challenge and can be considered a strong act of resistance. In this context and these conditions, one can assume that unionized workers report less overall job satisfaction than non-unionized workers, especially for union members non-covered by a collective agreement at the workplace. Thus, it seems important to take into account the distinction between union members, non-members covered by collective agreements and non-

covered workers if we want to build an accurate model of job satisfaction (Powdthavee, 2011). Hence, it would be beneficial to provide theoretical insight into the factors and variables that shape the relationship between unionization and job satisfaction by using data from other industrialized countries. This is one main reason why it is interesting to study the relationship between unionization and job satisfaction in the French context

Institutional setting: Union membership in France

The rate of union membership in France is among the lowest in OECD countries (7.5% in 2013), while its rate of collective bargaining coverage is among the highest (93% in 2013). This apparent paradox refers to the France's unique employment relations system, in which unions and employers negotiate for all branch employees, not specific members, through the collective agreement extension procedure (*erga omnes* principle). Therefore, the distinction between union density and bargaining coverage is essential.

In the French employment relations system, collective bargaining may occur at three levels: between union reps and workplace or firm, industry-level between unions and employers' associations, and national agreements between union confederations, national employers' organizations and the government. Because the law imposes a norm hierarchy between these three levels of bargaining, national agreement is often followed by industry and/or company agreement and agreements at firm or plant level are constrained by those of higher levels (for instance, firm agreements usually set minimum wage above industry and national standards). Although these levels co-exist, the law (Auroux laws) encourages firm-level bargaining and workplace agreements in France, especially since 1982 (Laroche, 2009). This may occur through union reps (or union delegate) at the workplace level. This means that decisions taken at this

level are specific – such as those regarding wage increase, working time, work contract and so on – and may affect job satisfaction differently depending on whether the union reps sign an agreement with the employer or not.

Regarding the *erga omnes* principle, this characteristic of the French employment relations may explain the low level of union membership as most of the French workers act as free riders, taking advantage of union bargaining without supporting the cost associated to union membership (in the case of discrimination). Moreover, French unionists do not have exclusive benefits or incentives (such as pension, or free legal assistance) when joining a union. Finally, one could ask why some French workers join a union?

As it could not be because of exclusive benefits that can compensate for the monetary and psychological costs, the incentive to join a union comes mostly from an ideological commitment to the union or peer pressure at the workplace.

Hence, I argue that institutional conditions in France, distinct from those in the USA, are likely to affect the nature of the relationship between unionization and job satisfaction. In highly regulated labor market like in France, workers may have a greater incentive to express discontent where there are generous unemployment benefits which reduce the cost of job loss. Given this specific context, it is important to make the distinction between union members and covered non-members, as Table 3 shows. This is because the net returns on membership are not so high. Members and non-members benefit from collective bargaining whatever they are unionized or not. These benefits are available to unionized and non-unionized workers alike. In France, we could consider that the returns on collective bargaining do not offer an incentive for individuals to join a union.

Finally, the costs of becoming a union member are considerable. For all these reasons, the net value of membership is certainly not the same in a workplace where there is already a bargaining union and a workplace without one. In France, workplace-level unionization (or union density) is a strong predictor of individual union membership. As in other countries, workers tend to conform to the norm in the workplace. French union membership is often based on a notion of collective solidarity. There is some evidence that French unions promote a sense of identity that is distinct from the employer, raising awareness of "them and us" and thus aligning union membership with dissatisfaction both with the employer and the work experience.

TABLE 3
The Incidence of Union Membership to Union Presence in the Workplace

	Non-member (%)	Member (%)	Number of observations
No union for bargaining at the workplace	4,610 (95.6)	212 (4.4)	4,822
Union for bargaining at the workplace	5,385 (83.6)	1,056 (16.4)	6,441
Total			11,263

Note: Sample derived from REPONSE 2011 after exclusion of observations with missing values in the independent variables used in the regression analysis.

Only 4% of French workers in non-covered workplaces are union members (see Table 3). They pay union membership and receive collective bargaining benefits like all the other workers in the same industry (all the workers are covered at least by a national and/or a sectoral collective agreement). These union members are typically those who lost the election at the workplace

level.[4] We might infer by their membership that these workers would prefer to be recognized as a union representative for collective bargaining at the workplace. This suggests that union members in non-unionized workplaces could be less satisfied than those in unionized workplaces. In other words, union members in workplaces with collective bargaining at the workplace will exhibit higher level of job satisfaction[5].

In this paper I attempt to address these different issues by using a large, nationally representative, linked employer-employee data set that provides a set of information for examining membership effects on job satisfaction.

Data and Methods

The data used in this study are drawn from the linked employer-employee French REPONSE survey conducted in late 2010 and early 2011. The REPONSE survey is a nationally representative survey of French workplaces with 10 or more employees from all sectors of the economy except agriculture. The survey covers a wide range of issues, allowing us to control for a large set of individual-level and workplace-level characteristics. I use both the management interview part of the survey and the survey of employees in workplaces where a management interview has been carried out. (A full list of the variables used in the analysis is contained in Table A3 of the Appendix.) The sample of workplaces is a stratified random sample with over-representation of larger workplaces and some industries. To extrapolate from my analyses to the

[4] The legal context of union representation in France was changed by a law passed on August 20, 2008, since when union representation in the workplace has been reformed to improve social dialogue. A union now has to obtain at least 10% of electoral votes to be able to negotiate with an employer. Moreover, collective agreements are only valid if they are signed by one or more unions having at least 30% of votes and if union opposition has less than 50% of total votes cast.

[5] Selection effect *or* voice effect? The hypothesis is that union members in a non-unionized environment (i.e. without collective bargaining at the workplace level) will be more willing to express their voice than union members in a unionized environment. Additionally, as joining a union is a real challenge when there is no bargaining coverage at the workplace, one can consider that there is a strong voice effect.

population from which the employees were drawn (French workplaces with 10 or more employees), I weight the analysis using employee weights that compensate for any sample non-response bias that may affect the employee survey. My sample is all employees with complete information on the variables used in the analysis: namely, 11, 378.

In this study, the dependent variable is first based on a single global rating method asking employees to respond to the question: "*Overall, I am satisfied with my job*." Responses are rated on a four-point scale ranging from 1 = strongly agree to 4 = strongly disagree. This measure is an indicator of global job satisfaction. The other approach identifies key elements in a job and asks for the employee's feelings about each. Here, the survey asked each employee to provide a rating, on a five-point scale from 1 = very satisfied to 5 = very dissatisfied, for how satisfied they were on four aspects of their jobs: (1) the pay they received; (2) the training opportunities; (3) the work climate; and (4) the working conditions. For each of facet I constructed a dummy variable equal to 1 if the employee was either "very satisfied" or "satisfied" and zero otherwise.

Following Bryson et al. (2010), I construct another overall job satisfaction measure by adding the four dummies obtained. According to Wanous, Reichers and Hudy (1997), using a single global measure of job satisfaction (from the *survey*) is essentially as valid as summing up responses to a number of job satisfaction facets (*score*). Finally, I consider these two measures of overall job satisfaction in this research.

Table 4 cross-tabulates the two measures of overall job satisfaction against individual membership status and indicates that members tend to report lower satisfaction levels than non-members on both indicators.[6]

[6] I draw on two questions in the REPONSE survey. First, "*Are you a member of a trade union?"* (for union membership) and second "*Is there a union representative at the workplace, recognized by management for negotiating pay or working conditions*?" (for union coverage at the workplace).

TABLE 4
Union membership and job satisfaction

Overall job satisfaction (score)			*Overall job satisfaction (survey)*		
Number of job facets about which was "very satisfied" or "satisfied"	*Member*	*Non-member*	*Reported degree of satisfaction*	*Member*	*Non-member*
4	16.7	24.2	Very satisfied	7.7	12.9
3	22.2	27.5	Satisfied	57.6	62.9
2	25.0	23.5	Dissatisfied	28.7	20.8
1	21.5	15.1	Very dissatisfied	6.0	3.3
0	14.6	9.7			
P	0.0000		*P*	0.0000	

Notes: Figures are column percentages that take account of survey design. No. of observations = 11,079. *P* indicates the *p*-value of a Pearson chi-square test of independence of the two variables.

Econometric Specification

Because the dependent variable is ordinal in nature, I used ordered probit regression to describe the relationship between job satisfaction and union membership. In these econometric models, I regress the satisfaction indicator on union membership and a set of controls that include personal attributes, job and workplace characteristics. I was able to include a number of variables in addition to standard ones (wages, hours worked, occupations and so on) available in most datasets (see the full set of control variables in the Appendix).

The model

While the effects of unionization on job satisfaction are often studied taking unionization as a given, we account for the endogenous selection induced by the possible reverse causality between unionization and job satisfaction (Bryson et al. 2004). I argue that, due to estimation problems or data deficiencies, most previous studies on this topic suffer from a number of limitations, which we deal with in this research.

We then develop a model that estimates unionization and job satisfaction simultaneously by maximum likelihood, taking into account unobserved correlation. To do this, we first estimate the introduction of unionization as follows:

$$P(Y_i = 1 \mid Y_i = 0) = f\,(\alpha_1 + X_1\beta_1 + U_i\delta + CB_i\omega + u_1) \quad (1)$$

where $P(Y_i = 1 \mid Y_i = 0)$ is the probability of being satisfied with work for individual *i*. U_i denotes unionization and X_1 is a vector that summarizes other workplace and individual characteristics; u_1 denotes the unobserved error.

We use probit estimations to estimate equation (1). Probit estimations allow us to control for differences in observed characteristics. In order to account for unobserved heterogeneity, we augment equation (1) with a probit equation for the probability of being a union member, since unionized workers could be a non-random sample of the population. For example, the probability of being unionized is expressed as follows:

$$P(U_i = 1) = f\,(\alpha_2 + X_2\beta_2 + CB_i\omega + u_2) \quad (2)$$

where X_2 comprises all variables that might predict *unionization*, including instruments. We allow for a correlation between equations (1) and (2), denoted by $\rho = \text{cov}\,(u_1,u_2)$. Indeed, by simultaneously estimating equations (1) and (2) we are able to separately identify the correlation between unobservable (the ρ coefficient), thus the coefficient δ in equation (1) from the bias induced by unobserved heterogeneity.

We augment also equations (1) and (2) with a probit equation for the probability of being covered by a collective agreement at the workplace level (assessing by the presence of at least one union rep at the workplace). The probability of being covered by a collective agreement at establishment level is expressed as follow:

$$P(CB_i = 1) = f\,(\alpha_3 + X_3\beta_3 + u_3)$$

where X_3 comprises all variables that might predict *collective bargaining at the workplace*, including instruments. We allow for a correlation between equations (1) and (3), denoted by ρ = cov (u_1,u_3). Indeed, by simultaneously estimating equations (1), (2) and (3) we are able to separately identify the correlation between unobservable (the ρ coefficient), thus the coefficient ω in equation (1) from the bias induced by unobserved heterogeneity.

I estimate the equations (1), (2) and (3) using a multivariate probit model. I compute the estimations in Stata using the *mvprobit* command provided by Cappellari and Jenkins (2003). This type of econometric model requires the availability of valid "instruments," i.e. variables that can be deemed to affect only unionization, with no direct effect on job satisfaction. To do this, the model includes two main instruments in equations (1), (2) and (3). Following Bryson et al. (2010), I use establishment age as a first instrumental variable. I hypothesize that the older the workplace, the more it is likely that a union is present for bargaining purposes, a statement that some empirical studies support in France (Laroche, 2002). On the other hand, I maintain that it has no residual impact on membership probabilities, once the effect of workplace union presence has been controlled for. As a second instrumental variable, I use an indicator of whether a workplace belongs to a multi-establishment firm or not as a second instrument. I assume that the single (vs multiple) establishment nature of the firm has an independent effect on job satisfaction, net of union presence and other workplace attributes, while it matters for workplace unionization, since it affects its costs. To my knowledge, the econometric literature does not provide tests on instrument validity for multivariate probit models. Following Cappellari and Jenkins (2003), I test for instrument relevance by testing whether the instruments were statistically significant in the "unionization" equation, but not in the "job satisfaction" equation. Wald tests are used to test for relevance (see Table A5 in the Appendix for details).

Besides the exclusion restrictions, I model the union presence equation using demographic characteristics of the individual (age, gender, qualification) and workplace attributes (size, industry, ownership, etc.); a similar specification applies for the membership equation, which, in addition, includes workplace union density. The choice of variables comes from previous empirical work on satisfaction, especially the work of Bryson et al. (2004, 2010).

Results

Table 5 reports estimates of the endogenized membership coefficients. The estimated coefficient on union membership reveals that, after endogenization of membership status, union membership has no residual effect on certain facets of job satisfaction.

TABLE 5
The effect of union membership on job satisfaction: estimates from models with endogenous union membership

	Whole sample	*CB at the workplace*	*No CB at the workplace*
Marginal effect of union membership dummy in equation for job satisfaction with			
Overall satisfaction (survey)	-0.087 (0.088)	-0.046 (0.147)	-0.075 (0.615)
Overall satisfaction (score)	-0.246 (0.139)	-0.083 (0.166)	-0.434 (0.144)***
Correlation of unobservables across equations for union membership and job satisfaction with			
Overall satisfaction (survey)	0.002 (0.143)	-0.066 (0.263)	-0.049 (0.971)
Overall satisfaction (score)	0.237 (0.206)	-0.033 (0.256)	0.507 (0.196)***

Notes: Results are derived from a simultaneous equations model for job satisfaction and union membership. Reported are marginal effects associated with union membership in job satisfaction equations. The effect refers to the shift in the probability of being "very satisfied" or "satisfied" associated with a change in the membership from 0 to 1. The number of observations is 11,378 in the whole sample, of which 6,441 are in the sample of workplaces covered by union bargaining and 4,937 in other workplaces. Robust standard errors are in parentheses. Regression uses survey weights. *Statistically significant at the .10 level; ** at the .05 level; ***at the .01 level.

Splitting the sample by collective bargaining coverage at the workplace indicates slight differences between members' and non-members' satisfaction. Among covered workers the differential is no longer significant, whereas the effect remains negative and significant for overall job satisfaction among non-covered employees (score only). It seems that the nature of

members' satisfaction differs depending whether or not the workplace is covered by collective bargaining. In workplaces where there is no collective bargaining, the fact of being a union member increases dissatisfaction. The correlation between unobservables of the membership and overall job satisfaction equation is also positive and significant.

This result indicates that in the absence of union representation (coverage), membership is a way to increase bargaining power in the workplace. This is consistent with the voice hypothesis. In the French context, another explanation could be that this negative relationship between membership and job satisfaction can reflect members' frustration with the absence of bargaining in the workplace. Conversely, for covered employees, members' dissatisfaction is spurious and not causal and disappears once the determinants of membership are taken into account. This is consistent with the "sorting hypothesis" and the fact that individual incentives to sort into membership may actually be larger in covered jobs.

As Bryson et al. (2010) suggest, the evidence about the nature of non-covered members' dissatisfaction could be non-conclusive if it reflects unobserved heterogeneity in the process that allocates individuals into membership and coverage. Indeed, these may be individuals who become union members because there was peer pressure in the workplace to join the union. To deal with this issue, it is recommended to account for sorting not only into membership but also into bargaining coverage by using a model that treats both membership and bargaining coverage as endogenous (a three-stage equation model).

TABLE 6

Full estimates of job satisfaction equation with (1) exogenous union membership and with (2) endogenous union membership and endogenous selection into workplace with union coverage

	Exogenous	Endogenous		
	Job satisfaction (score)	Job satisfaction (score)	Union membership	CB coverage
Male	-0.082*	-0.084*	-0.005	0.032
Aged under 25	Ref	Ref	Ref	Ref
Aged 25–29	-0.058	-0.052	0.216	-0.024
Aged 30–39	-0.164*	-0.149	0.486***	0.143
Aged 40–49	-0.207**	-0.181*	0.680***	0.232**
Aged 50–59	-0.259***	-0.220**	0.833***	0.305***
Aged 60 and over	0.226	0.241	0.598**	0.278
No educational qualification	Ref	Ref	Ref	Ref
Brevet, CAP-BEP	-0.212***	-0.215***	-0.077	0.046
Baccalauréat (High School diploma)	-0.270***	-0.262***	0.066	0.141
Bac+2 to Bac+4 (Undergraduate)	-0.362***	-0.363***	-0.044	0.097
> Bac+4 (Graduate)	-0.491***	-0.490***	-0.072	0.099
Operative and assembly	Ref	Ref	Ref	Ref
Craft and skilled service	-0.150**	-0.152**	-0.007	-0.030
Clerical and secretarial	0.098	0.089	-0.217**	0.056
Professional, Sales	0.061	0.058	-0.098	0.153
Manager	0.274***	0.256**	-0.316**	0.005
Other occupations	0.078	0.082	0.037	0.069
Availability of family friendly policies	0.344***	0.345***	-	-
Training opportunities	0.346***	0.343***	-	-
Has control over the range of execution	0.224***	0.223***	-	-
Thinks management understanding of employees' problems	0.747***	0.743***	-	-
Loyal to the aims of the company	0.371***	0.369***	-	-
Feeling bored	-0.644***	-0.639***	-	-
Paid less than €10 per hour	Ref	Ref	-	-
Paid €10–14 per hour	0.200***	0.207***	-	-
Paid €15–19 per hour	0.282***	0.290***	-	-
Paid €20–29 per hour	0.457***	0.462***	-	-
Paid more than €30 per hour	0.693***	0.693***	-	-
Less than 1,500 total hours worked	Ref	Ref	-	-
1,500–1,799 hours worked	-0.089	-0.082	-	-
1,800–1,999 hours worked	-0.082	-0.076	-	-
More than 2,000 hours worked	-0.038	-0.035	-	-
10–19 employees	Ref	Ref	Ref	Ref
20–49 employees	-0.072	-0.067	-0.028	0.318***
50–99 employees	-0.024	0.006	0.001	1.125***
100–199 employees	0.001	0.056	0.137	1.700***
200–499 employees	-0.057	0.010	0.130	2.367***
500 or more employees	0.103	0.176	0.097	3.029***
Food manufacturing Industry	0.162	0.184	0.468***	0.172
Coke and refined petroleum ind.	-0.231	-0.216	0.139	3.542***

Electric component Industry	-0.043	-0.028	0.352**	0.265**
Transport equipment industry	-0.281	-0.265	0.422**	-0.116
Other manufacturing industries	-0.226***	-0.207**	0.340***	0.484***
Electricity, gas, water	-0.087	-0.057	0.353**	1.146***
Construction	0.049	0.053	0.067	0.176*
Wholesale and retail	Ref	Ref	Ref	Ref
Transports	0.170*	0.207**	0.533***	0.482***
Hotels and restaurants	0.147	0.170	0.573***	0.080
Communication	-0.149	-0.117	0.767***	0.214
Financial services	0.010	0.057	0.681***	0.483***
Real estate	0.250	0.302	0.726***	0.640***
Education, Health	-0.012	-0.008	0.216**	-0.103
Public administration	0.080	0.101	0.365***	0.386***
Other business and services	-0.103	-0.066	0.689***	0.664***
Part-time employees	0.095	0.096	-	
Share high-skilled employees	0.329**	0.287	-0.707***	-0.227
Share medium skilled employees	Ref	Ref	Ref	Ref
Share low-skilled employees	0.308***	0.280***	-0.382***	-0.296***
Publicly-owned establishment	0.036	0.039	-	-
Union rep in the workplace	-0.045	-0.108	0.376**	-
Single establishment*	-	-	-0.306***	-0.512***
Establishment older than 20 years*	-	-	0.117**	0.149***
Union membership	-0.254***	-0.566		
Corr (satisfaction, membership)		0.171		
Corr (satisfaction, coverage)		0.058		
Corr (coverage, membership)		0.181**		
Observations	10,080	10,056		

Notes: Probit coefficients derived from estimation of overall job satisfaction model.
* Significant at 10% level; ** significant at 5% level; *** significant at 1% level.

Table 6 presents the results from this model. Considering overall job satisfaction (score)[7], the correlation between unobservables in the membership and satisfaction equation is positive (but not significant). This is suggestive of a positive selection effect of intrinsically more satisfied individuals into union membership. In other words, it seems that it is not dissatisfaction itself that motivates workers to join a union. Rather, it seems that union membership lowers overall job satisfaction, consistent with the voice hypothesis. There is also a positive correlation between unobservables in the membership and union coverage equation. Considering the characteristics of French industrial relations, this positive coefficient indicates that union membership determinants

[7] The results are similar if we consider the other measure of overall job satisfaction (from the survey).

are closely related to bargaining coverage determinants. Finally, these results suggest that union members are no more frustrated than non-members and do not have higher expectations of their job. There is no genuine member dissatisfaction. It seems that other factors can better explain job satisfaction among unionized and non-unionized workers. Hence, I examined the effects of incentives such as promotion and wages on job satisfaction for unionized and non-unionized employees.

Specifically, I estimated other non-linear models in which union membership is interacted with individual incentives (such as promotion during the previous three years). Tables 7 presents probit regression results for overall job satisfaction with incentives interaction.

TABLE A5
Probit regression results for job satisfaction with union interactions

	OVERALL JOB SATISFACTION (Score)			
	Exogenous		Endogenous	
	(1) Union membership/rep	(2) Interaction with incentive	(3) Union membership/rep	(4) Interaction with incentive
Union membership	-0.229***	-0.171***	-0.205	-0.204
	(-3.17)	(-3.26)	(-0.84)	(-0.84)
Individual incentives (promotion)	0.347***	0.259***	0.350***	0.351***
	(7.02)	(7.03)	(7.02)	(6.78)
Membership×Ind. incentives	-	-0.035	-	-0.024
		(-0.32)		(-0.15)
Control Variables	Yes	Yes	Yes	Yes
n	9,656	9,656	9,633	9,633

Notes: * Significant at 10% level; ** significant at 5% level; *** significant at 1% level. Full specifications for the models are available from the author. Reported are probit coefficients associated with union member dummy variables in ordered probit.

I find that there is no relationship between union membership and job satisfaction after controlling for endogeneity and such interaction effects. In other words, these results do not provide support for a moderating influence of individual incentives on the relationship between union membership and job satisfaction. There is clearly a strong and positive relationship

between individual incentives and job satisfaction but the results suggest that the satisfaction effects associated with unionization are dependent on individual incentives.[8]

Conclusion

This study deals with the effect of unionization on job satisfaction, and tries to shed new light on the puzzling evidence that union members are less satisfied than non-union members. While these results have been challenged by Bryson et al. (2010) in recent contributions that model the endogeneity of unionization decisions with job satisfaction, the evidence remains rather mixed and specific to some countries. Using a French data set that combines employer and employee attributes and an instrumental variable approach, I find no evidence of a negative causal relationship between union membership and job satisfaction in the French context. Like Bryson et al. (2010), I consider that the satisfaction differential between unionized and non-unionized workers is due to unobserved differences linked to satisfaction and membership status.

The results of this study allow at least two main conclusions. For unionized workplaces (i.e. where there is a union delegate with bargaining power in the workplace) the satisfaction for members and non-members does not differ in the French context, once membership endogeneity is controlled for. These findings are consistent with those obtained by Bryson et al. in the UK context. Workers in an establishment without union delegates to represent them for collective bargaining at workplace level may express their discontent to encourage co-workers to support union activities. Alternatively, union membership may increase their awareness of unsatisfactory

[8] To go further, I also test different specifications to investigate the impact of membership and wage levels. The results demonstrate that wage levels is strongly associated with job satisfaction but the interaction between membership and wage levels does not affect job satisfaction in France.

job aspects in a context where there are no union reps to voice their dissatisfaction. These results are consistent with a causal effect of membership on job satisfaction (voice effect).

The analysis in this paper is far from complete. Clearly, the results obtained here should be replicated over different time periods to gain more understanding of the effects of unionization. An alternative way to account for union membership effects on job satisfaction is the use of a fixed-effects model with longitudinal data. Rather than estimating job satisfaction equations in level forms, one can estimate changes in job satisfaction as a function of changes in union membership and other explanatory variables. Research that examines union-satisfaction effects longitudinally would be clearly useful in France. Rusbult et al. (1988) suggested "*that there may be interesting temporal aspects of responding to job dissatisfaction. It is possible that there are natural progressions in response mode, such that loyalty is more probable as an initial response than it is following another reaction*", like unionization. In addition, I do not focus on the different types of French union in the workplace; this research only examines these relationships at a general level. This approach enables the investigation of the relationship between union membership and job satisfaction regardless of the nature of the union present in the workplace. Each confederation has its own strong political and/or religious tradition, which may influence its attitude to workplace employment relations and pay bargaining. For instance, future research in France might provide additional insights into the relationship between the communist CGT, or the revolutionary SUD, and job satisfaction in the workplace.

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APPENDIX

TABLE A1
Studies included in the Meta-Analysis (N=54)

Authors/year of publication	*Country analyzed*	*No of observations/ estimates*	*Period*	*Method of Analysis*
Allen & Keaveny (1981)	USA	1	1979-1980	Correlation
Artz (2010)	USA	4	1979-2004	Probit
Artz (2012)	USA	4	1979-2004	Probit
Bartel (1981)	USA	4	1969-1971	OLS/probit
Bass & Mitchell (1976)	USA	1	1975	Correlation
Belfield & Harris (2010)	UK	6	1985-1990	Probit
Bender & Sloane (1998)	UK	18	1986-1987	Probit
Berg (1999)	USA	4	1996-1997	Logit
Bigoness (1978)	USA	1	1975	OLS
Blanchflower & Oswald (1999)	USA/Various	11	1972-1996	Probit
Bockerman & Ilmakuna (2006)	Finland	1	1997	Probit
Borjas (1979)	USA	18	1971	OLS, Probit
Bryson, Cappellari & Lucifora (2004)	UK	8	1998	Probit
Cappellari, Lucifora & Piccirilli (2004)	UK	2	1998	Probit
Clark (1996)	UK	1	1991	Probit
Clark (1997)	UK	6	1991	Probit
Clark, Oswald & Warr (1996)	UK	3	1991	Probit
Donohue & Heywood (2004)	USA	21	1979	Probit
Drago, Estrin & Wooden (1992)	Australia	1	1988	Probit
Drakopoulos & Theodossiou (1997)	UK	2	1986	Probit
Fiorillo & Nappo (2011)	Italie	3	1993-2000	Probit
Flemming & Kler (2011)	Australia	2	2001	Probit
Freeman (1978)	USA	3	1969-1972	OLS
Garcia-Serrano (2009)	Spain	10	2000-2003	Probit
Garcia-Serrano (2011)	Spain	2	2001-2004	Probit
Gius (2013)	USA	1	2007	Logit/IV
Gordon & Denisi (1995)	USA	4	1980-1986	OLS/Logit
Green & Heywood (2008)	UK	1	1998-2004	Probit
Guest & Conway (2004)	UK	3	1996-1998	OLS
Hersch & Stone (1990)	USA	3	1986	OLS
Heywood, Siebert, Wei (2002)	UK	4	1991-1994	Logit/OLS
Heywood & Wei (2006)	USA	2	1988-1990	Probit
Holland, Pyman, Cooper & Teicher (2011)	Australia	3	2007	Probit
Kalleberg & Loscocco (1983)	USA	2	1972-1973	OLS
Kochan (1979)	USA	3	1977	OLS
Lillydahl & Singell (1993)	USA	3	1988	Probit
Lincoln & Booth (1993)	USA/Japan	4	1982-1983	OLS
Long (2005)	Australia	4	2001	Probit
Meng (1990)	Canada	1	1988	OLS
Miller (1990)	Australia	8	1985	OLS/Probit
Mohr & Zoghi (2008)	Canada	1	1999-2002	Probit
Pfeffer & Davis-Blake (1990)	USA	6	1977	OLS
Powdthavee (2011)	UK	2	1991-2000	OLS
Renaud (2002)	Canada	2	1989	Probit
Rose (2003)	UK	1	1999	OLS

Sinha & Sarma (1962)	India	1	1960	Correlation
Sloane & Williams (2000)	UK	6	1986	Probit
Smerek & Peterson (2007)	USA	1	2004	OLS
Souza-Poza & Souza-Poza (2010)	UK	3	1991-2000	Probit
Theodossiou & Vasileiou (2007)	Europe	6	1996	OLS
Theodossiou & Zangelidis (2009)	UK	2	1991-2004	Probit
Uppal (2005)	Canada	2	1991	Probit
Wooden & Warren (2004)	Australia	4	2001	Probit
Zeytinoglu et al. (2013)	Turkey	4	2008	OLS

Note: k= number of correlations. N= Total/average sample size for all studies combined. Schriesheim (1978), Schwochau (1987), Odewahn & Petty (1980), Leigh (1986) are not included in this sample as we are unable to calculate effect sizes from these studies given the lack of information available.

TABLE A2
Variable definitions and summary measures

Dependent Variable					
EFFECT	Categorical Effect		Proportion		
	Negative: y=0		0.438		
	Insignificant: y=1		0.491		
	Positive: y=2		0.071		
		Mean	s.d	Min.	Max.
Moderator variables					
Job satisfaction Measures					
JS 1-4	Likert scale 1-4	0.290	0.455	0	1
JS 1-5	Likert scale 1-5	0.147	0.355	0	1
JS 1-7	Likert scale 1-7	0.138	0.346	0	1
JS 1-10	Likert scale 1-10	0.219	0.414	0	1
JS DUMMY	Job satisfaction dummy	0.183	0.388	0	1
Data characteristics					
SERVICE	Service (vs manufacturing) data	0.094	0.292	0	1
PANEL	Panel data	0.076	0.265	0	1
DF	Degrees of freedom	8.804	21,418	63	140,917
Spatial, temporal and econometric issues					
1970	Study period < 1980	0.272	0.446	0	1
1980	Study period [1980-1989]	0.308	0.463	0	1
1990	Study period [1990-1999]	0.272	0.446	0	1
2000	Study period > 2000	0.147	0.355	0	1
USA	Data from USA	0.411	0.493	0	1
UK	Data from UK	0.295	0.457	0	1
ECOJOURN	Published in Economic Journals	0.384	0.487	0	1
IRJOURN	Published in Industrial Relations Journals	0.371	0.484	0	1
ENDOG	Endogeneity/IV estimations	0.089	0.286	0	1
PROBIT	Logit/probit estimation	0.679	0.468	0	1
Control Variables in primary studies					
PROMOTION	Control for promotion	0.152	0.360	0	1
FIRMSIZE	Control for firm/organization size	0.496	0.501	0	1
WAGES	Control for wage level	0.741	0.439	0	1
HOURS	Control for working hours	0.585	0.494	0	1
EDUCATION	Control for education	0.768	0.423	0	1
OCCUPATION	Control for occupation	0.728	0.446	0	1
RACE	Control for race	0.482	0.501	0	1

TABLE A3
Descriptive Statistics of the REPONSE 2011 Sample

	Whole sample	*Covered members*	*Covered non-members*	*Non-covered members*	*Non-covered non-members*
Number of observations	11,378	1,056	5,385	212	4,610
Overall Job Satisfaction (Survey)					
Very satisfied	12.31	7.23	11.44	10.14	14.61
Satisfied	62.37	58.73	63.86	51.69	61.89
Dissatisfied	21.67	28.25	21.31	30.92	20.26
Very dissatisfied	3.65	5.79	3.40	7.25	3.24
Overall Job Satisfaction (Score)					
0	10.26	13.85	8.93	18.50	10.56
1	15.79	21.76	15.03	20.00	15.22
2	23.66	25.02	23.96	25.00	23.08
3	26.97	22.75	27.62	19.50	27.30
4	23.31	16.62	24.47	17.00	23.84
Satisfaction with pay					
Very satisfied	4.38	2.69	4.00	3.38	5.22
Satisfied	34.41	30.67	37.90	25.60	36.46
Dissatisfied	43.14	45.19	42.87	47.34	42.80
Very dissatisfied	16.08	21.44	15.23	23.67	15.52
Satisfaction with training opportunities					
Very satisfied	10.81	7.06	11.59	7.92	10.85
Satisfied	46.13	46.27	49.20	38.12	42.71
Dissatisfied	29.04	31.57	28.00	31.68	29.63
Very dissatisfied	14.02	15.10	11.22	22.28	16.82
Satisfaction with work climate					
Very satisfied	17.22	9.84	16.08	17.39	20.21
Satisfied	51.48	51.40	52.40	41.06	50.97
Dissatisfied	22.21	26.52	23.04	24.64	20.12
Very dissatisfied	9.09	12.25	8.48	16.91	8.70
Satisfaction with working conditions					
Very satisfied	14.14	8.39	13.95	10.10	15.79
Satisfied	56.77	50.24	58.06	51.44	57.05
Dissatisfied	23.55	32.70	23.07	23.56	22.05
Very dissatisfied	5.55	8.67	4.91	14.90	5.12
Male	55.73	59.70	54.84	51.43	56.19
Aged under 25	5.14	1.14	4.57	3.30	6.79
Aged 25–29	10.14	4.92	9.34	4.25	12.65
Aged 30–39	26.96	23.39	27.69	20.75	27.31
Aged 40–49	32.91	37.03	32.83	38.68	31.82
Aged 50–59	23.04	31.72	24.01	30.66	19.46
Aged 60 and over	1.79	1.80	1.56	2.36	1.97
No educational qualification	9.38	11.69	8.38	12.14	9.84
Brevet, CAP-BEP	38.24	43.01	35.72	37.86	40.05
Baccalauréat (High School diploma)	14.74	14.94	14.68	17.48	14.73
Bac+2 to Bac+4 (Undergraduate)	25.92	24.23	26.89	21.84	25.32
> Bac+4 (Graduate)	11.73	6.13	14.33	10.68	10.06
Operative and assembly	15.60	21.32	14.59	13.73	16.40
Craft and skilled service	15.97	18.99	14.38	15.69	18.38

Clerical and secretarial	18.43	13.73	16.48	20.10	21.60
Professional, Sales	17.81	20.16	20.10	15.20	14.97
Manager	23.18	14.12	25.62	17.16	19.53
Other occupations	9.01	11.68	8.83	18.14	9.12
Availability of family friendly policies	64.62	64.04	66.33	57.35	63.27
Training opportunities	47.71	49.38	51.27	44.02	43.25
Has control over the range of execution	68.07	57.66	68.37	58.77	70.71
Thinks management understanding of employees' problems	50.32	39.71	51.25	36.67	52.14
Loyal to the aims of the company	61.09	51.11	60.72	51.46	64.24
Feeling bored	13.32	17.41	12.76	17.45	12.86
Paid less than €10 per hour	37.79	30.97	31.92	45.75	45.55
Paid €10–14 per hour	36.62	42.42	37.57	33.49	34.49
Paid €15–19 per hour	12.61	14.39	14.54	8.49	10.24
Paid €20–29 per hour	8.96	9.66	11.10	7.55	6.38
Paid more than €30 per hour	4.02	2.56	4.87	4.72	3.34
Less than 1,500 total hours worked	20.50	15.72	19.52	20.28	22.58
1,500–1,799 hours worked	16.58	17.99	16.71	16.98	16.05
1,800–1,999 hours worked	48.53	54.45	52.11	48.58	43.21
More than 2,000 hours worked	14.38	11.84	11.66	14.15	18.16
1≤ workplace tenure<5 years	21.02	7.95	19.42	20.28	26.27
5≤workplace tenure<10 years	23.92	17.05	22.51	26.42	27.35
10≤ workplace tenure<20 years	27.54	33.43	29.19	26.42	26.53
Workplace tenure≥20 years	27.52	41.57	28.88	26.89	19.85
10–19 employees	10.42	2.84	2.19	20.75	21.26
20–49 employees	25.51	10.80	9.75	46.70	46.18
50–99 employees	16.97	13.07	16.21	20.28	18.46
100–199 employees	15.25	21.59	19.26	8.49	9.41
200–499 employees	15.47	26.14	24.14	1.89	3.67
500 or more employees	16.38	25.57	28.45	1.89	1.02
Manufacturing	26.49	35.79	33.32	8.96	17.29
Electricity, gas, water	2.02	2.75	2.60	1.89	1.21
Construction	7.42	2.94	4.14	6.13	12.34
Wholesale and retail	14.11	8.71	12.01	7.08	18.13
Transports	10.20	15.06	9.53	15.09	9.61
Hotels and restaurants	2.37	1.52	1.15	7.08	3.71
Communication	4.03	3.03	3.86	6.60	4.27
Financial services	3.65	4.73	5.03	3.77	1.80
Real estate	1.23	1.61	1.75	2.36	0.43
Education, Health	12.28	8.14	10.97	11.32	14.84
Public administration	13.89	13.35	13.87	24.06	13.41
Other business and services	2.34	2.37	1.76	5.66	2.84
Part-time employees	14.64	11.37	13.88	17.45	16.00
Share high-skilled employees	15.61	14.33	18.30	14.05	12.93
Share low-skilled employees	36.56	39.33	35.09	28.87	38.09
Single establishment*	43.41	32.20	33.65	44.34	57.27
Publicly owned establishment	27.45	37.57	39.45	17.54	11.92
Establishment older than 20 years*	70.94	78.39	74.72	73.12	64.19

Notes: * Instrumental Variables.
Source: REPONSE Survey 2011

TABLE A4
Descriptive Statistics of the REPONSE 2011 Sample

	Whole sample	*Covered*	*Non-covered*
Number of observations	11,378	6,495	4,879
Overall Job Satisfaction (Survey)			
Very satisfied	12.31	10.71	14.46
Satisfied	62.37	63.05	61.46
Dissatisfied	21.67	22.47	20.61
Very dissatisfied	3.65	3.77	3.46
Overall Job Satisfaction (Score)			
0	10.26	9.74	10.94
1	15.79	16.13	15.34
2	23.66	24.10	23.10
3	26.97	26.95	27.02
4	23.31	23.09	23.61
Satisfaction with pay			
Very satisfied	4.38	3.80	5.15
Satisfied	34.41	36.71	36.01
Dissatisfied	43.14	43.23	42.98
Very dissatisfied	16.08	16.25	15.86
Satisfaction with training opportunities			
Very satisfied	10.81	10.86	10.73
Satisfied	46.13	48.74	42.65
Dissatisfied	29.04	28.61	29.64
Very dissatisfied	14.02	11.79	16.99
Satisfaction with work climate			
Very satisfied	17.22	15.04	20.13
Satisfied	51.48	52.21	50.53
Dissatisfied	22.21	23.68	20.23
Very dissatisfied	9.09	9.07	9.11
Satisfaction with work conditions			
Very satisfied	14.14	13.05	15.61
Satisfied	56.77	56.76	56.79
Dissatisfied	23.55	24.66	22.07
Very dissatisfied	5.55	5.54	5.53
Male	55.73	55.57	55.92
Aged under 25	5.14	4.02	6.62
Aged 25–29	10.14	8.59	12.22
Aged 30–39	26.96	26.93	27.03
Aged 40–49	32.91	33.53	32.08
Aged 50–59	23.04	25.30	20.05
Aged 60 and over	1.79	1.63	2.01
No educational qualification	9.38	8.97	9.92
Brevet, CAP-BEP	38.24	36.97	39.97
Baccalauréat (High School diploma)	14.74	14.68	14.79
Bac+2 to Bac+4 (Undergraduate)	25.92	26.43	25.21
> Bac+4 (Graduate)	11.73	12.94	10.11
Operative and assembly	15.60	15.72	16.31
Craft and skilled service	15.97	15.13	18.14
Clerical and secretarial	18.43	16.03	21.43

Professional, Sales	17.81	20.06	15.08
Manager	23.18	23.68	19.35
Other occupations	9.01	9.39	9.70
Availability of family friendly policies	64.62	65.92	62.93
Training opportunities	47.71	50.97	43.34
Has control over the range of execution	68.07	66.52	70.15
Thinks management understanding of employees' problems	50.32	49.41	51.53
Loyal to the aims of the company	61.09	59.11	63.77
Feeling bored	13.32	13.53	13.02
Paid less than €10 per hour	37.79	31.89	45.64
Paid €10–14 per hour	36.62	38.32	34.37
Paid €15–19 per hour	12.61	14.46	10.17
Paid €20–29 per hour	8.96	10.85	6.42
Paid more than €30 per hour	4.02	4.48	3.40
Less than 1,500 total hours worked	20.50	18.97	22.57
1,500–1,799 hours worked	16.58	16.95	16.11
1,800–1,999 hours worked	48.53	52.39	43.35
More than 2,000 hours worked	14.38	11.69	17.97
1≤ workplace tenure<5 years	21.02	17.54	25.99
5≤workplace tenure<10 years	23.92	21.65	27.40
10≤ workplace tenure<20 years	27.54	29.78	26.42
Workplace tenure≥20 years	27.52	31.04	20.19
10–19 employees	10.42	2.29	21.21
20–49 employees	25.51	9.92	46.24
50–99 employees	16.97	15.77	18.59
100–199 employees	15.25	19.69	9.35
200–499 employees	15.47	24.42	3.57
500 or more employees	16.38	27.91	1.05
Manufacturing	26.49	33.65	16.94
Electricity, gas, water	2.02	2.62	1.23
Construction	7.42	3.93	12.07
Wholesale and retail	14.11	11.52	17.52
Transports	10.20	10.44	9.88
Hotels and restaurants	2.37	1.22	3.91
Communication	4.03	3.73	4.39
Financial services	3.65	4.99	1.87
Real estate	1.23	1.74	0.55
Education, Health	12.28	10.50	14.65
Public administration	13.89	13.81	14.00
Other business and services	2.34	1.86	2.97
Part-time employees	14.64	13.53	16.14
Share high-skilled employees	15.61	17.62	12.94
Share low-skilled employees	36.56	35.76	37.64
Single establishment*	43.41	33.46	56.65
Publicly owned establishment	27.45	39.07	12.11
Establishment older than 20 years*	70.94	75.32	65.15

Source: REPONSE Survey 2011

TABLE A5

Regression coefficients for the variables excluded from the satisfaction equations in the model with endogenous membership and test of significance of those variables in the membership and satisfaction equations

	Overall Job Satisfaction (score)		*Overall Job Satisfaction (survey)*	
	Coeff.	*SE*	*Coeff.*	*SE*
Regression coefficients from union membership equation				
Single establishment	-0.343***	0.050	-0.340***	0.051
Establishment age > 20	0.144***	0.055	0.143***	0.054
	X^2 (d.f.)	*p*-value	X^2 (d.f.)	*p*-value
Significance of instruments in equation for				
Union membership	51.93 (2)	0.000	50.85 (2)	0.000
Job satisfaction	3.41 (2)	0.182	2.37 (2)	0.305

Notes: Regression coefficients and robust standard errors are derived from the simultaneous equations model for job satisfaction and union membership. Regression models are estimated using a GHK simulator with 50 Halton draws and survey weight. All the other instrumental tests are available from the author on request.