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# Union Mediation and Adaptation to Reciprocal Loyalty Arrangements<sup>⊥</sup>

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## Abstract:

This study assesses the industrial relations application of the ‘loyalty-exit-voice’ proposition. The loyalty concept is linked to reciprocal employer-employee arrangements and examined as a job attribute in a vignette questionnaire distributed to low and medium-skilled employees. The responses provided by employees in three European countries indicate that reciprocal loyalty arrangements, which involve the exchange of higher effort for job security, are one of the most desirable job attributes. This attribute exerts a higher impact on the job evaluations provided by unionised workers, compared to their non-union counterparts. This pattern is robust to a number of methodological considerations. It appears to be an outcome of adaptation to union mediated cooperation. Overall the evidence suggests that the loyalty-job evaluation profiles of unionised workers are receptive to repeated interaction and negative shocks, such as unemployment experience. This is not the case for the non-union workers. Finally, unionised workers appear to ‘voice’ a lower job satisfaction, but exhibit low ‘exit’ intentions, compared to the non-unionised labour.

Keywords: Trade Union, Loyalty, Reciprocity, Adaptation, Conjoint Analysis, Exit, Voice.

JEL Classification: C35, D03, D63, J28, J51

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## 1. Introduction

Human interaction and collective behaviour are often shaped by social norms, *i.e.* behavioural regularities that are based on a socially shared belief about how one ought to behave. Social norms are enforced by informal social sanctions (Akerlof, 1980; Fehr and Gächter, 1998). Hirschman (1982) suggests that institutions can enforce social norms and induce specific behaviours which may finally become part of the behavioural profile of the individual. Such profiles may entail self-centered, opportunistic, reciprocal and cooperative behaviour. In some occasions, acquired preferences can be internalized and become constraints on behaviour (Ariely, Loewenstein and Prelec, 2003; 2006; Carpenter, 2005). Dunlop (1944) was among the first to relate this institutional function to collective action by stating that “*the institutionalized form of collective action may introduce new preferences in the same way the household modifies individual preferences*”. In addition, “*interaction patterns of a given form of collective action could alter preferences and in addition various forms of collective action can obviously affect the choice of the group even if preferences remain stable*” (Duncan and Stafford, 1980). A key mechanism for the establishment of social norms and collective behaviour is reciprocity, particularly in environments where the relations and obligations are not governed by explicit agreements (Fehr, Gächter and Kirchsteiger, 1997; Fehr and Gächter, 2000)<sup>1</sup>.

In the industrial relations literature, the loyalty-exit-voice framework suggests that unionised workers exhibit distinct behavioural profiles that are shaped by the context of industrial relations and the environment of mediation and collective action. Hirschman (1970) originally introduced this framework to explain why dissatisfied citizens do not leave their countries or dissatisfied customers do not forgo a given product or firm. Freeman and Medoff (1984) applied this idea to workplace relations to show that unionised workers are more loyal to their employers than non-union workers. Their loyalty differs from unswerving faith to the firm and it is likely to be ‘paternalistic’<sup>2</sup> and mediated by the union via the perception that a third body may intervene and settle any dispute. Akerlof (1982) emphasizes that loyalty is based on employer-employee reciprocity and points out that the concepts of loyalty-exit-voice in industrial relations can be expressed in terms of norms and a gift exchange which are partially endogenously determined. He also notes that the analysis of labour contracts as partial gift exchange can relate to the view

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<sup>1</sup> Dohmen *et al.* (2009) present evidence on the relationship between reciprocity measures and future labour market outcomes, such as wages, effort, unemployment and absenteeism.

<sup>2</sup> Paternalism has been described in the context of internal labour markets as the practice of building loyalty and fostering individual worker dependence on the employer as an alternative to financial incentives (Doeringer, 1986).

of trade unions as a collective voice. [Akerlof \(1983\)](#) also explains value-changing processes that can bring about the endogenous emergence of loyalty, labeled as “loyalty filters”.

The above imply that union membership is related to particular types of social preferences, which involve both positive and negative expressions of reciprocity towards the employer, *i.e.* gift exchange and retaliation. Unionised workers are more likely to exercise ‘voice’ and raise their concerns or even reciprocate in a negative way. However, the negative expressions do not result in inducing unionised workers to utilise the option of ‘exiting’ an unpleasant situation and thus quitting their job. The union literature provides ample empirical evidence regarding the voice and exit functions of unionised workers (reviewed in [Lewin, 2005](#)). The literature also shows that there may be a variable impact of workplace relations and management practices on performance in terms of output per worker ([Katz, Kochan and Gobeille, 1983](#); [Freeman and Medoff, 1984](#); [Harter, Schmidt and Hayes, 2002](#); [Kleiner, Leonard and Pilarski, 2002](#); [Bartel, Freeman, \*et al.\*, 2003](#)). Furthermore, [Krueger and Mas \(2004\)](#) and [Mas \(2008\)](#) provide evidence on expressions of negative reciprocity by unionised workers, in terms of output quality, defective production and formal complaints. It is shown that this punishment behaviour takes place when concessions are demanded during bargaining disputes and when replacement workers are hired next to returning union workers during industrial action. However, direct empirical evidence on the attribute of loyalty and its link to reciprocity is scarce ([Cahuc and Kramarz, 1997](#)).

In view of the above, this paper investigates the preferences for arrangements involving employer – employee reciprocity and mutual loyalty. A dataset with very rich information on semi-skilled employees from three European countries is used. The empirical methodology employed is conjoint analysis, a stated preference technique which involves evaluation of hypothetical job scenarios. It is shown that the unionised workers exhibit a greater preference for reciprocal loyalty compared to their non-union counterparts in evaluating alternative hypothetical jobs. This difference in tastes is found to be robust to a number of methodological considerations, including the incorporation of individual fixed effects and controls for endogenous switching into union membership. Repeated interaction exerts a significant impact on the evaluation gap between jobs with and without loyalty for unionised workers, but it does not alter the loyalty-evaluation profiles for non-unionised employees. Moreover, recent unemployment experience is found to diminish the differences in evaluations of jobs with and without the loyalty attribute only for the union workers. Thus, the evidence indicates that a higher preference for reciprocal loyalty arises as an outcome of adaptation to union-mediated cooperation. The attitudinal structuring and intra-organisational consensus functions of the

union can mediate such outcomes (Walton and McKersie, 1991), via communication, information, and reputation effects that facilitate the attribution of intentions (Fehr and Fischbacher, 2002; McCabe, *et al.*, 2003). Finally, by utilising the stated job satisfaction and quitting intentions as proxies for the ‘voice’ and ‘exit’ functions, this study confirms the findings of the literature that unionised workers are more likely to exercise the ‘voice’ rather than the ‘exit’ option.

The structure of the paper is as follows: *Section 2* offers a brief literature review and outlines the empirical strategy, and *Section 3* introduces the dataset, the main variables of interest for this study and presents summary statistics. *Section 4* discusses the main methodological issues. *Sections 5* and *6* report and discuss the empirical results, with respect to the job vignette evaluations which include the reciprocal loyalty attribute, and the ‘voice’ and ‘exit’ expressions of the employees, respectively. Finally, *Section 7* concludes.

## **2. Background and Empirical Strategy**

Freeman and Medoff (1984) suggest that unionised workers are more loyal to their employers compared to non-unionised employees. They propose that as a result of organisational loyalty, union workers are less likely to quit in response to workplace conflict. Instead, unionised workers are more likely to exercise ‘voice’, through formal and efficient dispute resolution arrangements. Unions provide their employees with a more effective voice to communicate their concerns, partly by promoting ‘legitimacy’ at the workplace (Freeman, 1976; 1980). Legitimacy is related to reciprocal employer-employee arrangements, mediated by the union (Doeringer, 1984).

The assertion that social preferences for reciprocal ‘loyalty’ are more likely to prevail among unionised workers can be explained in a number of ways. First, reciprocal behaviour may be generated by an innate desire to be kind or hostile in response to kindness or hostility. This, along with perceptions of process-related justice (Fuller and Hester, 2001) and relative concerns (Farber and Saks, 1980) can induce union formation and membership. Second, an appreciation of reciprocal arrangements can rise with exposure and experience, without a shift in tastes, in line with Stigler and Becker (1977). Moreover, in situations of repeated interaction with incomplete contracts, reputation can deter selfish behaviour. In this sense, the mediating role of the union and its ability to facilitate communication, information, and reputation can induce cooperative outcomes (Simon, 1951; Milgrom and Roberts, 1992; Ostrom, 1998). Third, the union can be

thought to have a norm-enforcing role to its members. Individuals may not be aware of some preferences, until they experience a certain situation, in line with the notion of ‘*coherent arbitrariness*’ (Ariely et al., 2003; 2006)<sup>3</sup>. Membership in a social group can also transform individuals, leading to internalized roles, norms and values that affect behaviour (Akerlof, 1980; Booth, 1985; Bowles, 1998; Akerlof and Kranton, 2000; 2005; Goette, Huffman and Meier, 2006). In a similar fashion, the dominance of a ‘trait’ in a group may enhance replication via ‘conformist’ behaviour and cognitive dissonance<sup>4</sup>, independently of the payoff to those exhibiting the ‘trait’.

Theory and experimental evidence on intention-based reciprocity (Fehr and Fischbacher, 2002; McCabe, et al., 2003) have suggested that the attribution of intentions is pivotal in inducing reciprocal responses, and have recently highlighted some interesting patterns. One of the key issues for understanding reciprocity is the way agents evaluate the (un-)kindness of an action (Stanca, et al., 2009). Studies have shown that cooperators may punish more and target their punishment at the defectors (Falk, et al., 2005). Identical consequences trigger different reciprocal responses in different environments (Falk and Fischbacher, 2006); communication may influence motivation and trustworthy behavior (Charness and Dufwenberg, 2006); and social ties induce higher punishment, and punishment coordination (even without communication), as social ties trigger stronger emotional reactions (Reuben and van Winden, 2008). In the labour market, workplace mediation facilitates communication, the revelation of information about intentions and reputation during bargaining. These can easily be linked to some of the functions of the trade union.

In similar spirit, the behavioural theory of labour negotiations by Walton and McKersie (1991)<sup>5</sup> distinguishes between four types of bargaining prevalent in behaviour during negotiations, i.e. distributive, integrative, and importantly attitudinal, and intra-organisational<sup>6</sup>. The former two

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<sup>3</sup> A relevant evolutionary view suggests that “*cognitive adaptations for social exchange*” can generate patterns of reciprocal behavior under the influence of environmental stimulæ (Cosmides and Tooby, 1992; Ben-Ner and Putterman, 2000).

<sup>4</sup> Cognitive dissonance involves a situation where people are confronted with a phenomenon that conflicts with their previously held beliefs, thus creating internal pressure for an after-the-fact rationalization of the unexpected phenomenon (Festinger, 1957). In Akerlof and Dickens (1982), individuals choose their beliefs and then process information to reinforce those beliefs.

<sup>5</sup> Originally published in 1965.

<sup>6</sup> Distributive bargaining is a competitive conflict process intended to influence the division of limited resources. Integrative bargaining comprises of activities aimed at increasing the joint gain available to the negotiating parties. Attitudinal structuring is shaped by activities that influence the attitudes of the parties towards each other. Intra-organisational bargaining involves negotiation activities within the negotiating parties aimed at achieving consensus, and aligning the expectations of chief negotiators/representatives and their constituents/principals.

functions are joint decision-making processes, while attitudinal structuring is an interpersonal socioeconomic process designed to change attitudes and relationships. Attitudinal structuring comprises of activities that influence the attitudes of the parties towards each other and affect the social bonds between the units involved, aiming to the benefit of both parties. Moreover, intra-organisational bargaining is aimed at achieving consensus within the negotiating parties. The authors stress several characteristics of labour negotiations that heighten the attitudinal dimensions: the issues themselves often involve human values, and the way in which they are handled affects the overall relationship. Moreover, the weapons used often involve sanctions which can exert an influence on the tone of the relationship. The relationship between parties is usually unique, continuing, and long-term; thus, the attitudinal dimension provides one mechanism by which successive negotiations are linked together. Furthermore, they discuss how the decline of unionism made intra-organisational bargaining particularly intense, as management negotiations find it challenging to develop consensus among members of the relevant negotiating bodies, a function that was facilitated by the mediation of union representatives to their constituents.

However, the operationalisation of the loyalty concept, the link to reciprocity and mediation, and its empirical investigation are scarce. As a notable exception, [Cahuc and Kramarz \(1997\)](#) empirically investigate a mechanism, where power is exchanged for loyalty, and where there is delegation of authority from a firm to a collective of workers. This operation turns out to stabilize employment and decrease turnover in a similar fashion to efficiency wages. In a related empirical study, [Boroff and Lewin \(1997\)](#) define loyalty as organizational commitment or “the *degree to which a person identifies with an organization*”. They link loyalty to ‘exit’ and ‘voice’ functions of the trade union. However, their empirical study does not fully support the proposition that unionized workers are more loyal to their employers than non-union workers. Other expressions of loyalty operationalised include: “*giving private and public support to the organization*” ([Rusbult, Farrell, et al., 1988](#)) and “*organizational citizenship*” ([Cappelli and Rogovsky, 1998](#)).

In view of the above limitations and gaps in the literature, this study first examines differences between union and non-union workers in the preference for reciprocal loyalty in the employment relationship. Preferences regarding various attributes of a job are elicited using a vignette questionnaire and conjoint analysis. One of the included job attributes is reciprocal employer-employee loyalty, in terms of exchange of job security for higher effort. The approach followed assumes that the utility a worker derives from a job stems from specific attributes that describe the job, rather than the job *per se*. The underpinnings of this approach originate in

Lancaster (1966; 1971) and Rosen (1974). It is a stated preference methodology rooted in the random utility theory (McFadden, 1973; Hanemann, 1984). Thus, the stated utility from a job  $j$  is expressed as:  $U_j = U(a_{jy})$ , where  $a_{jy}$  is a vector of  $y$  job characteristics describing a job  $j$ . Individuals are indifferent between two jobs 1 and 2, if  $U(a_{1y}) = U(a_{2y})$ . Knowledge of the function  $U(\cdot)$  makes it possible to calculate trade-off ratios, defined as the extent to which an individual may accept less of one job characteristic when compensated by an increase in another characteristic, without the overall evaluation of a job being affected. Thus, the trade-off ratio

between attributes 1 and 2 of a given job is:  $\frac{\frac{\partial U}{\partial a_{j1}}}{\frac{\partial U}{\partial a_{j2}}}$ . The derived trade-off ratios provide a

measure of the relative importance of a job attribute, such as ‘loyalty’, for the union and non-union workers. Differences in preferences for attributes and tradeoff ratios between the two groups are established using a number of robustness checks discussed in the next sections

Furthermore, this study examines the ‘voice’ and ‘exit’ expressions of union and non-union workers. In the literature, loyalty is assumed to be positively correlated with the exercise of ‘voice’ and negatively correlated with exit behaviour. Following Hersch and Stone (1990) the ‘voice’ function is related to the expressed job satisfaction<sup>7</sup>, while the ‘exit’ function of workers is revealed by the worker’s intention to quit the firm in the near future. The literature has interpreted the lower job satisfaction of union workers as an expression of the ‘exit-voice’ mechanism. As a byproduct of loyalty, union workers are more likely to express dissatisfaction rather than seek employment elsewhere. Thus, their dissatisfaction is not genuine in the sense that it does not lead to quits, but it is instead a device through which the expressed dissatisfaction of the unionised workers can offer arguments to strengthen the trade union’s case in its negotiation with the employer for achieving more favourable terms of employment. The strategy adopted in investigating this issue aims to exclude alternative explanations of the satisfaction differential between union and non-union workers, such as: worse industrial relations (Bender and Sloane, 1988), higher tenure, compensating differentials, reverse causality (Borjas, 1979; Duncan and Stafford, 1980; Kochan and Helfman, 1981; Hersch and Stone, 1990). Finally,

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<sup>7</sup> Most of the literature interprets the lower job satisfaction of unionized workers as ‘voice’. A different view would question whether job satisfaction as expressed in surveys, is the same as that expressed to managers and supervisors. An alternative measure of ‘voice’ is the incidence of formal grievances. However, job satisfaction and grievances are found to be negatively related and the empirical evidence indicates that the grievance rates of non-union workers are half of that of union workers (Lewin, 2005). A measure of grievance is not available in the dataset used in this study.



voice is linked to the exit behaviour and the main hypothesis examined suggests that *ceteris paribus*, unionized workers will be less likely to quit their jobs.

### 3. The Data

#### 3.1 *The Database*

The data used in this study is part of the *EPICURUS* database, a multi-country project funded by the European Commission. The data was collected during the 4<sup>th</sup> quarter of 2004, in Denmark, Finland, France, Greece, the Netherlands, Spain and the United Kingdom. Identical questionnaires were administered in all countries and were translated in several rounds by native speakers, experienced in survey design. Four European companies specializing in surveys were employed for the task. They reported no complaints from the respondents or other problems associated with the survey. The questionnaires were administered to a homogenous group of individuals. The target group was unskilled/semi-skilled employees between the ages of 18 and 65. The survey included only individuals with low or middle education (*i.e.* it excluded individuals with a 5 or 6 education level in the 1997 ISCED International Classification scale)<sup>8</sup>. Students, the self-employed and employees in fishery and agriculture were also excluded. Around 1,000 individuals per country were interviewed, with the exception of Greece (800), Spain and Finland (300), due to budgetary constraints. The dataset contains the essential demographic information and extensive information at the individual and the household level. A large number of questions address issues related to current and past job outcomes, job satisfaction and well-being. The second part of the questionnaire is designed to elicit workers preferences about jobs and job attributes<sup>9</sup>.

This study utilises the data from Greece, Netherlands and the United Kingdom to assess the 'loyalty-exit-voice' hypothesis by examining behavioural differences between union and non-union workers. The surveys for Greece, the Netherlands and the United Kingdom are carried out by the same company using identical protocols<sup>10</sup>. Thus, only data for the above countries are

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<sup>8</sup> *A posteriori* analysis of background variables shows that the sample successfully represents the targeted population.

<sup>9</sup> An extensive analysis of the questionnaire and the database is available from the authors upon request and is also available in the reports to the European Commission (*EPICURUS Project, 2004; 2005*). Moreover, descriptions of other features of the dataset are available in *Panos and Theodossiou (2009)*, and *Pouliakas and Theodossiou (2009)*.

<sup>10</sup> The survey was carried out by the INTERVIEW♦NSS (<http://www.interview.nl/>), a Dutch-based company with wide experience on surveys in the Netherlands and around the world.

used to ensure compatibility<sup>11</sup>. Thus, the sample used comprises of 2,809 individuals, 24% (673) of which are union members, and the remaining 76% (2,136) are non-unionised workers. The rates of union membership in the sample are: 22.9% in Greece, 29.4% in the Netherlands, and 19.4% in the United Kingdom. The descriptive statistics in *Table 1* suggest that the sample is fairly representative of the observed unionisation rate per country, taking into account that the EPICURUS sample includes only low and semi-skilled employees<sup>12</sup>.

**[Insert Table 1 about here]**

### 3.2 *Descriptive Statistics*

*Table 2* presents the variables used, their means for the pooled dataset, and the means for the union and non-union worker groups respectively. Significance levels from a t-test of differences in the means between the two latter groups are also presented. It is shown that union workers are more likely to earn higher wages compared to non-union workers. The average PPP-divided net monthly wage for the union sample is €1,768 versus €1,586 for the non-union sample. The difference is statistically significant at the 1% level. Union workers have slightly higher weekly work hours, with an average of 35.9, as opposed to 34.6 hours for non-union workers. The former are more likely to be older, with higher labour market experience and job tenure, more likely to be male, married, in permanent jobs, in civil service and the public sector, in large firms, and more likely to have received some form of training during the last year. Moreover, union workers are more likely to be employed in the industries of ‘Public Administration and Defence’, ‘Health and Social Work’, ‘Transportation, Storage and Communications’, ‘Community, Social and Personal Service’ and ‘Utilities’. They are also more likely to be found in occupations such as ‘Plant and Machine Operators and Assemblers’, ‘Technical and Associate Professional’, and ‘Craft and Related Trades’.

**[Insert Table 2 about here]**

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<sup>11</sup> Moreover, this choice can also be justified in view of the fact that the three countries are more similar in terms of their collective bargaining environments. The Nordic and Scandinavian countries are characterised by very high rates of unionisation. Finally the EPICURUS samples for Finland and Spain are of smaller size. The choice of the 3-country sample ensures the homogeneity of the protocols and procedures used in collecting the data. However, the results obtained in the next sections of this study are robust to all possible sample choices, including the 7-country sample. These results are available from the authors upon request.

<sup>12</sup> For the purpose of this study union membership is the key factor of interest, rather than other collective agreement schemes. This distinction is made clear in the survey questionnaire. The rates of collective agreement coverage are larger in the four countries in the sample, 32% in Greece, 77.5% in the Netherlands, and 28.6% in the United Kingdom. However, collective wage agreements are not always negotiated by the local trade unions.

### 3.3 *Expressions of 'Exit' and 'Voice'*

*Table 3* reports the summary statistics for the variables related to the workers' perception regarding the working conditions that they face. These are relevant to the 'voice' and 'exit' functions. The levels of significance from a t-test of mean differences between union and non-union workers are also displayed, along with significance levels for differences in the distributions. The latter concern the ordinal satisfaction variables and are obtained using both two-sample robust rank order tests (Fligner and Policello, 1981) and Mann-Whitney non-parametric tests. Compared to non-union employees, unionised workers are less satisfied with their job overall, and the same pattern holds for the vast majority of the different facets of their job. Thus, they are significantly less satisfied with the promotion prospects, their relationship with the employer/supervisor, and his/her behaviour, the use of initiative, the work itself, the times of work and working hours, the work load and work tension, the level of stress, and the physical risk of the job. The only facets that turn out to exhibit an insignificant satisfaction difference between the two groups are total pay and job security.

Moreover, unionised workers are more likely to provide negative assessments regarding the environment and the nature of their job, compared to their non-union counterparts. They are more likely to find it tiring, dangerous, and physically demanding, and of low quality (noisy, dirty, hot, etc.). They are also more likely to report the incidence of a work-related sickness or injury, although the difference in the number of individual injuries or illnesses reported is insignificant. Hence, union workers provide far more negative assessments of their jobs. This consistently lower assessment of the job quality by the union workers could be indicative of either employment in jobs of objectively lower quality, or a reflection of the 'voice' function that has been noted in the union literature. It appears that unionised workers 'voice' their concerns and complaints loudly, particularly in periods of workplace conflict. This however, does not indicate a higher willingness to leave the firm. It may be interpreted as an outcome of loyalty to the firm that induces the perception that the workers may improve their circumstances via the exercise of 'voice' and union mediation.

In view of the above, it is important to investigate whether such differences between union and non-union workers persist after controlling for job characteristics. This would encourage the interpretation of the low satisfaction exhibited by the union workers as 'voice'. An indication in favour of this interpretation is the fact that unionised workers are much less likely to report that they intend to quit their job compared to non-union workers, notwithstanding all the above differences in the 'voiced' expressions of dissatisfaction. As the last row of *Table 3* shows, 25%

of the unionised workers report that they intend to quit their job in the near future, compared to 40.5% of the non-unionised. The difference is significant at the 1% level<sup>13</sup>.

**[Insert Table 3 about here]**

### 3.4 *The Vignette Questionnaire*

A part of the EPICURUS questionnaire is designed to elicit preferences for job attributes. This is accomplished by utilising job vignettes that enable the use of a conjoint analysis approach. The main objective of conjoint analysis is to identify the value that individuals attach to the various attributes of a good or service, such as a job, a house, health care or the environment<sup>14</sup>. This technique essentially involves four main steps. These are: (1) Identification of the relevant characteristics - attributes of the good to be evaluated; (2) Quantification – level assignment to the characteristics; (3) Design of scenarios (vignettes), as a combination of the former two steps; (4) Preference identification of the respondents, by ranking, rating, or discrete choice (Louviere, Hensher and Swait, 2000). Since the number of scenarios increases with the number of characteristics and levels, not all of the scenarios generated can be included in a questionnaire as the respondents have a finite attention span. Thus, quasi-experimental designs are used to reduce the number to a convenient level. The selection of job attributes in the EPICURUS questionnaire is based on the literature and prior analysis of the determinants of perceived quality at work<sup>15</sup>.

The approach followed assumes that a job  $j$  may be adequately described by a vector of  $y$  attributes  $a_y$ , contained in a job vignette/scenario. Thus, each vignette is defined by ten job attributes that were identified as highly important in determining the perception of quality at work. The 10 attributes of each vignette are: (1) Net wage (as a percentage increase from the current wage); (2) type of contract (e.g., permanent or temporary); (3) working hours; (4) working times; (5) access to training opportunities; (6) work organization; (7) control over own work; (8) work intensity; (9) age of retirement; (10) and loyalty from the side of the firm and the side of the employee. All other aspects of the job described are considered identical to a respondent's current job, and this is made clear in each vignette.

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<sup>13</sup> The differences in the summary statistics presented in Tables 2 and 3 are remarkably robust in each country sub-sample. This feature and the homogeneity of the targeted population allowed the pooling of the data in one sample.

<sup>14</sup> The methodology of conjoint analysis originates in marketing research. There are several applications in economics (van Beek, Koopmans and van Praag, 1997; Lindeboom and van Doorslaer, 2004; Ferrer-i-Carbonell, van Praag and Theodossiou, 2007; van Soest, Delaney, *et al.*, 2007; Kristensen and Johansson, 2008; Poulidakas and Theodossiou, 2009; *inter alia*).

<sup>15</sup> That analysis was based on the use of available datasets for the countries in the sample, such as the European Community Household Survey (ECHP).

Respondents are asked to evaluate the vignettes on a scale from 0 to 10, where 0 represents the least and 10 the most satisfactory job<sup>16</sup>. Thus, the respondents are induced to trade off some characteristics for others and to incorporate the notion of opportunity cost into their decision-making process. Each respondent is asked to evaluate 5 hypothetical job offers (vignettes), involving different levels for each of the attributes. The respondents are also alerted to the fact that all other attributes of the hypothetical job are identical to their actual current job. Moreover, the values of the ten attributes are distributed at random, in order to eliminate the correlation of individual characteristics and vignette attributes. Orthogonality and large variance of the vignettes is ensured in the design phase. A typical vignette is reported in *Figure 1. Table A1* in the Appendix presents the whole range of attributes along with their descriptive statistics for the sample, and then for union and non-union workers respectively. Differences in the frequency of all attributes between union and non-union workers are statistically insignificant, as ensured in the design phase. This feature facilitates the analysis of vignette evaluation for union and non-union workers separately.

**[Insert Figure 1 about here]**

A great benefit of this approach is its ability to yield multiple observations per respondent on hypothetical decision contexts. It is important that respondents understand, are committed to and can respond to the relevant hypothetical scenarios. Care is also taken to avoid any possible framing effects. For this reason nowhere in the vignette questionnaire is the union identity issue mentioned to respondents<sup>17</sup>.

### 3.5 *The Loyalty Attribute*

Preferences regarding various attributes of a job are elicited using conjoint analysis. One of the included job attributes is reciprocal employer-employee loyalty. This is conceptualised in the vignettes by offering two alternative options: (i) “*Loyalty from both sides (employer and employee) is required; shirking and low performance is impossible*”, and (ii) “*The firm requires no loyalty; shirking and low performance is possible*”. Detailed additional explanations of each attribute were available to the respondents upon request.

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<sup>16</sup> Furthermore, they are asked to reply whether such a job would be acceptable by them. While the analysis in the next section uses vignette evaluation as the dependent variable, all findings in this paper are robust to the use of vignette acceptability as an alternative form of job evaluation.

<sup>17</sup> A framing effect occurs when choices made under the influence of institutionally determined framing may later be repeated even in the absence of the framing effect if the effects of exposure to the object of choice, or dissonance reduction effects are strong (Bowles, 1998). In the questionnaire, there are only two questions related to unions regarding whether the individual is a member of the union and whether the employer accepts unions. For the typical respondent there is a ten-minute time interval between responding to the above questions and the evaluation of the vignettes in the last part of the questionnaire.

The ‘Loyalty-No Shirking’ attribute is explained to the respondent as follows: “*The firm treats you with the same norms as the other firms operating in the same labour market, except for the specific attributes mentioned above. Loyalty to your employer is required. Thus, you cannot get away with shirking (e.g. by taking longer coffee breaks than allowed, by working slowly) and low performance work. The employer has loyalty to you. Thus the employer will not fire you for the duration of your contract whatever its length (including lifetime contracts)*”. The ‘No Loyalty-Shirking’ attribute is also explained as: “*The firm treats you with the same norms as the other firms operating in the same labour market, except for the specific attributes mentioned above. No loyalty to your employer is required. Thus, you can get away with shirking (e.g. by taking longer coffee breaks than allowed, by working slowly) and low performance work. The employer has no loyalty to you. Thus the employer can fire you at any time and you can leave the job at any time too*”.

## 4. Methodological Issues

The empirical strategy in this study focuses in identifying differences between union and non-union workers, first regarding the vignette evaluations and the impact of the job attributes, and second on stated job satisfaction and quitting intentions. The summary statistics in *Table A1* suggest that that the distributions of vignette evaluation for union and non-union workers are significantly different. A two-sample Robust Rank-Order Test (Fligner and Policello, 1981), testing that the two independent groups are sampled from the same population provides a U-statistic equal to 5.209 (p-value=0.000)<sup>18</sup>. Moreover, a Kolmogorov-Smirnov test rejects the null hypothesis that the two populations come from the same overall distribution at all conventional levels (D=0.0441, corrected p-value=0.000). A similar pattern is shown for job satisfaction in *Table 3*. The distributions for the two groups do not come from the same population, as indicated by both the robust-rank-order test (U= 2.072; 2-tailed asymptotic p-value=0.0382; 1-tailed= 0.0191), and the Kolmogorov-Smirnov (D= 0.0583; corrected p-value=0.055) test. Thus, the disaggregation into union and non-union groups is justified. This is reinforced by Chow tests for the specifications presented in the following sections.

### 4.1 *Conjoint Analysis*

In the survey, respondents are asked to evaluate a vector of five alternative job vignettes on a scale from 0 to 10. Typically, the ordered probit or logit model is used to estimate the parameters

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<sup>18</sup> The robust rank-order test is an alternative of the Mann-Whitney-Wilcoxon test for non-normal populations with unequal variances. This test assumes neither normality, nor equal variances, nor equal shape.

that account for respondents' rankings of all alternatives. The behavioural foundation of these specifications is a random utility model. For individual  $i$ , let there be a choice set  $C$  with  $J$  elements, with each element indexed  $j=1, 2, \dots, J$ . Let the vector of attributes for each element in the choice set available be denoted  $a_{ij}$ , and let  $x_i$  denote the characteristics of each individual. The utility of each element in the choice set for each individual is represented as  $U_{ij} = V(x_i, a_{ij}) + \varepsilon_{ij} = V_{ij} + \varepsilon_{ij}$ , where  $V_{ij}$  is the deterministic component of utility, and  $\varepsilon_{ij}$  is the stochastic component. Let individual  $i$  generate a survey response  $r_i = \{r_{i1}, r_{i2}, \dots, r_{ij}\}$ , that is, a ranking of the choice set in descending order of preference. The probability of a given survey response may then be expressed as:

$$Pr(r_i) = Pr[U_i(r_{i1}) > U_i(r_{i2}) > \dots > U_i(r_{ij})]$$

The probability of this preference ordering may be decomposed as:

$$Pr[U_i(r_{i1}) > U_i(r_{i2}) > \dots > U_i(r_{ij})] = Pr[U_i(r_{i1}) > U_i(r_{ij}) \text{ for } j=2, \dots, J] Pr[U_i(r_{i2}) > U_i(r_{ij}) \text{ for } j=3, \dots, J] \dots Pr[U_i(r_{i,j-1}) > U_i(r_{ij})]$$

Hence, the  $J$ -dimensional survey response describing the order of preferences is equivalent to  $J-1$  binary statements of which alternative is preferred, given the censoring of more-preferred elements of the full choice set.

Thus, the conjoint analysis of the impact of each attribute on the vignette evaluation requires the creation of a pseudo-panel or so-called 'exploded' dataset. This is obtained via the pooling of the individual responses to each vignette. Since individuals evaluate each job vignette on a discrete scale from 0 to 10, their true evaluation is a latent variable, *i.e.* its true value is not observed exactly. The observed evaluation  $U^*$  is an ordered categorical variable.

#### 4.2 The COLS Approach for Ordinal Dependent Variables

One can adopt an appropriate linearization of the ordinal evaluation responses, as an alternative to the traditionally used Ordered Probit or Logit techniques<sup>19</sup>. This is deemed desirable as a feature of conjoint analysis is that multiple evaluation responses are collected per individual, which violates the assumption of independent errors. Hence, panel econometric techniques are used in order to take the potential unobserved heterogeneity into account. In addition, given that the study also seeks to correct for selectivity bias it has been necessary to facilitate the estimation of the model by adopting an appropriate linearization of the ordinal variable  $U_{ij}$ . Moreover, cardinal evaluations facilitate the computation of the trade-off ratios between the attributes. This

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<sup>19</sup> The methodology is outlined below for the case of vignette evaluation, but it is also applicable to the ordinal job satisfaction variable [0-10], in which case one needs to ignore the presence of elements that entail vignette attributes and the availability of alternatives.

study uses the Cardinal OLS (COLS) approach (van Praag and Ferrer-i-Carbonell, 2004: Ch. 2). This assumes that respondents are supplying a cardinal evaluation, but it takes into account that they are unable to give precise information about their evaluation, due to the categorical format of the responses. This empirical approach requires the assumption that an individual  $i$ 's latent evaluation of a job  $j$ ,  $U_{ij}$ , depends on the values of the job's  $y$  attributes,  $a_{ij,y}$ , as specified in the vignettes, and on  $k$  individual and current job characteristics, denoted by  $x_{ik}$ . Hence:

$$U_{ij} = U_i(a_{ij,y}; x_{ik}) \quad (1)$$

Since individuals evaluate each job vignette on a discrete scale from 0 to 10, their true evaluation is a latent variable, *i.e.* its true value is not observed exactly. The observed evaluation  $U^*$  is an ordered categorical variable. In the empirical equivalent of (1), if it is assumed that  $U_{ij}^*$  is a linear function of the  $y$  attributes, the  $k$  individual characteristics, and a random error term,  $\varepsilon_i$ , then:

$$U_{ij}^* = \beta' a_{ij,y} + \gamma' x_{ik} + \varepsilon_{ij} \quad (2)$$

Hence, in this study,  $U_{ij}^*$  is transformed by linearising the ordinal evaluation responses. Thus, any observed value of the discrete variable  $U_{ij}^*$  represents a transformation of the latent evaluation  $U_{ij}$  belonging to one of the intervals:  $[0, 0.5]$ ,  $(0.5, 1]$ , ...,  $(9.5, 10]$ . Normalizing the scale to the  $[0, 1]$ -interval, the COLS approach replaces the inexactly known value of  $U_{ij}$  by its conditional expectation,  $\bar{U}_{ij}$ , according to the following formula (Maddala, 1983, p.366):

$$\bar{U}_{ij} = E(U_{ij} | \lambda_{n-1} < U_{ij} \leq \lambda_n) = \frac{n(\lambda_{n-1}) - n(\lambda_n)}{N(\lambda_n) - N(\lambda_{n-1})}. \text{ where } n(\cdot) \text{ and } N(\cdot) \text{ stand for the normal}$$

density and distribution functions, respectively, and  $\lambda$  takes its values in  $\{0, 0.05, 0.15, \dots, 0.95, 1\}$ .

After the observed evaluation of the vignette is transformed into the conditional mean of the latent evaluation, OLS can be applied to the transformed linear model:

$$\bar{U}_{ij}^* = \beta' a_{ij,y} + \gamma' X_{ik} + \varepsilon_{ij} \quad (3)$$

where  $\varepsilon_i$  is a symmetric error term with mean zero. COLS is shown to yield consistent parameter estimates (Ferrer-i-Carbonell and Frijters, 2004), identical to those obtained by ordered probit (except for a factor of proportionality), as efficient as probit estimates (Stewart, 1983), but computationally much easier.



The examination of vignette evaluation requires the creation of a pseudo-panel, based on the 5 consecutive responses by each individual to the vignettes. Hence, taking into account the probable correlation structure between the five individual vignette evaluations, the error term  $\varepsilon_{ij}$  is decomposed into an individual-specific effect  $\theta_i$  and a white noise component  $\zeta_{ij}$ , where  $E(\zeta_{ij})=0$  and  $E(\theta_i, \zeta_{ij})=0$ . Both random-effect and fixed-effects models are utilized in the analysis of the vignette evaluation. However, the random-effects model has the advantage of allowing the incorporation of controls for individual and current job characteristics that are invariant across responses, such as gender, education etc. The individual random effects account for the unobservable characteristics that are constant across each vignette's evaluation, but different for each individual: for example, individual personal traits such as motivation, ability, aspiration etc. Thus, the regression accounts for the fact that given personal characteristics, individuals with higher job aspirations will tend to report lower  $U^*$  than individuals with lower aspirations. This is equivalent to rewriting the error structure in Eq. (3) as:  $\varepsilon_{ij} = \theta_i + \zeta_{ij}$ , where  $\theta_i$  is the individual random effect and  $\zeta_{ij}$  is the usual error term. Typically, both error terms are assumed to be random and uncorrelated with the observable explanatory variables. The equivalent of Eq. (3) is estimated for union and non-union workers by random effects, controlling for a number of individual characteristics that do not vary across evaluations. Alternatively, the fixed effects model allows the estimation of within-individual effects, by allowing for job attributes and time-invariant unobserved effects to be correlated. Thus, it is desirable to ensure the robustness of the results in models where unobserved characteristics, for instance benevolence, are allowed to be correlated with the loyalty attribute.

#### 4.3 Endogenous Switching into Union Membership

The estimation of equation (3) for union and non-union workers via COLS is subject to an endogenous sample selection, since the unobserved determinants of union membership may be correlated with unobservables in the job satisfaction equations. The view that preferences and attitudes over jobs and their attributes can differ and such differences can pre-exist and even induce union formation can not be dismissed *a priori*. For example, individuals with particular types of social preferences, such as loyal or reciprocal types might be more likely to work in unionised workplaces or become union members (Farber and Saks, 1980; Fuller and Hester, 2001). In this case, the correlation of unobservables with union affiliation should be positive. Alternatively, such norms and values can be enforced by repeated interaction, or as a 'social custom' prescribed by the workplace mediation practices in unionised firms (Booth, 1984).

However, the ratings of jobs with different attributes are only observed after the individual has decided to join a trade union. This is also the case with other outcomes of interest, such as the stated job satisfaction and quitting intentions. Thus, to ensure robustness, it is important to account for endogenous switching into union membership when estimating the determinants of the job evaluations of union and non-union workers. This is accomplished via using a Heckman-type selection correction model (Heckman, 1978; 1979; Lee, 1978; Maddala, 1983). The model takes into account the latent propensity of an individual to become a member of a trade union, as follows:

$$L_i^* = \delta'x_{iw} + \omega_i \quad (4)$$

where  $L$  indicates union membership and  $\omega$  is a normally distributed error term, with  $E(x, \omega)=0$ . In the analysis of vignette evaluation, (4) becomes<sup>20</sup>:

$$L_i^* = \gamma'a_{ij,n} + \delta'x_{iw} + \omega_i \quad (5)$$

At least one variable in  $x$  must be identifying the selection equation. This should be excluded from the evaluation equation (4), *i.e.*  $k \leq w$ . The instruments, *i.e.* the exogenous variables that identify the first stage equation for union membership, must be unrelated to the job evaluations of union and non-union workers. The choice of instruments in this study benefits from the richness of the EPICURUS data, and the availability of rich external data. Two new variables are defined, namely *Union Recognition* and *Union Concentration*, which are used to identify the union membership equation.

*Union Recognition* is a dummy variable taking the value 1 if the firm where the individual is employed is covered by a collective wage agreement that is negotiated solely by a trade union, and the value 0, if it is not covered by a collective wage agreement, or if it is covered by an agreement that is not negotiated by a trade union. The summary statistics in Table 2 show that 39.8% of the individuals in the sample are employed in firms where a trade union is the sole negotiator of collective agreements. The statistics for the two groups further show that 74.9% of union workers are employed in such firms, as opposed to 28.8% of non-union workers. The difference is statistically significant at the 1% level.

*Union Concentration* is created by the use of two data sources. The 2009 Database on Institutional Characteristics of Trade Unions (Visser, 2009) provides historical data on 90 variables related to collective action in 34 countries. A summary measure of concentration of unions at peak and

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<sup>20</sup> The characteristics of the hypothetical job are incorporated in the first stage probit regression for union membership, since it is a reduced form model.

sectoral level is used for the three countries. This is generated as the summation of membership concentration at central or confederal level (Herfindahl index at central or peak level) and membership concentration at the industry level, within confederations (Herfindahl index at sectoral level). This measure is then multiplied by the union membership rates by country and industry from within the EPICURUS database (and multiplied by ten). The statistics at the bottom of Table 3 indicated that the measure for union concentration has a higher value for union workers compared to their non-union counterparts, and the difference is statistically significant at the 1% level.

The two instruments are used to identify the first stage probit equation for union membership, shown in *Column 1* of the *Appendix Table A2*. The three specifications of the Table correspond to three different equations for vignette evaluation, job satisfaction, and quitting intentions respectively. Although these will be discussed in more detail in the next section, it is important to point out that the two variables for *Union Recognition* and *Union Concentration* in the middle of the table are highly statistically significant and both exert a large positive impact on the probability of trade union membership. Moreover, they are jointly significant rejecting the null hypothesis at all conventional levels, as indicated by the Wald  $\chi^2$  tests at the bottom of Table A2 . In the case of vignette evaluation, the modified version of eq. (3) that controls for endogenous union membership is then estimated for union and non-union workers separately via maximum likelihood. This is an efficient estimator that allows for robust standard errors and the clustering of the standard errors at the individual level. The latter feature accounts for potential serial correlation across the consecutive vignette responses.

#### 4.4 *The Rank-Ordered Logit Model for Conjoint Analysis*

Conceptually, both the COLS and the ordered probit model are appropriate methodologies to model rating or ranking data<sup>21</sup>. However, ratings data, might be seriously flawed if respondents use different ‘anchors’ in the ratings (Calfée et al., 2001). For example, a respondent who generated ratings of 2, 4, 6, 7, and 7 for the five vignettes could have a utility function (up to a linear transformation) that is identical to that of a respondent who gave ratings of 5, 7, 9, 10, and 10. When the data are aggregated across subjects, a common ordering is estimated, and with it a common anchoring strategy. If respondents had similar tradeoffs but different anchoring strategies, the estimation process would be unable to discriminate between diverse tradeoffs and

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<sup>21</sup> In this study, the robustness of all the results that are generated with the random effects COLS method is always ensured by comparing the results of the next section to those obtained using the random effects ordered probit method (available upon request).

diverse anchoring strategies. Estimated tradeoffs could therefore be highly unreliable even if respondents' underlying preferences were very similar<sup>22</sup>.

Preferences in case-rank data are typically analysed in the framework of the rank-ordered logit (ROLM) model (Beggs *et al.*, 1981), in the spirit of the conventional random utility framework (Manski, 1977). Assume again the random utility specification,  $U_j = \beta' a_j + \varepsilon_j$ , where  $\beta$  are the relative weights associated with the  $j$  alternatives,  $a_j$ , while  $\varepsilon_j$  is the random component of the ratings. Rank-ordered logit assumes that the disturbance parameter in the random utility function takes on an independent type-I extreme value distribution (McFadden, 1974). The model makes full use of all ranking information by repeatedly applying the multinomial logit model to an 'exploded' data set. Each choice set consists of a ranked choice and the lower-ranked alternatives. The probability that a given rank ordering will be observed has the closed-form solution:  $\Pr[U(r_1) > U(r_2) \dots > U(r_j)] = \prod_{h=1}^{J-1} \frac{\exp^{\beta' a(r_h)}}{\sum_{m=h}^J \exp^{\beta' a(r_m)}}$ , where  $a(r_h)$  is the vector of attributes of the alternative ranked  $h$  in the ordering. Given an independent sample of  $N$  individuals facing independent and identically distributed  $\varepsilon_j$ , the log-likelihood function to be maximized is:

$$L(\beta) = \sum_{i=1}^N \ln \left[ \prod_{h=1}^{J-1} \frac{\exp^{\beta' a(r_{ih})}}{\sum_{m=h}^J \exp^{\beta' a(r_{im})}} \right] = \sum_{i=1}^N \sum_{h=1}^{J-1} \beta' a(r_{ih}) - \sum_{i=1}^N \sum_{h=1}^{J-1} \left[ \ln \sum_{m=h}^J \exp^{\beta' a(r_{im})} \right]$$

where  $a(r_{ih})$  represents the attributes of the alternative that individual  $i$  assigned in ranking  $h$ .

Rank-ordered logit may appear not to suffer from the 'spacings' problem because it is a purely ordinal model that makes no assumptions about utility intervals. For a given choice set, all the lower-ranked alternatives simply provide lower utility than the chosen highest-ranked alternative. However, the logit model imposes its own spacings restriction, via the independence from irrelevant alternatives property, *i.e.* the assumption that the ratio of choice probabilities depends on the ratio of the choices' utilities but not on any other alternative's utility. This could make it appear that a particular alternative has much greater relative utility than it actually has simply because it is consistently chosen over a slightly less attractive alternative. Because one does not have theoretical grounds for choosing between rankings or ratings data, or between COLS, rank-ordered logit, or ordered probit, this study explores these alternative approaches in estimating

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<sup>22</sup> However, in all likelihood respondents tend to have preferences that 'bunch' some jobs together and space others apart. Uneven utility spacings tend to be 'smoothed' as respondents' orderings are aggregated; thus, the spacing assumption implied by the ordered probit model may not have a large effect on parameter estimates (Calfree *et al.*, 2001).

the stated preference models. Only the results from the first two approaches are shown for space considerations (the latter are available upon request). Thus, it is ensured that the observed estimates are robust to the context of choice, *i.e.* the rating of jobs on a 0-to-10 scale (with 10 indicating the greatest satisfaction), or the ranking of vignettes, with the most-favoured job ranked the highest, and so on.

## 5. Job Evaluation and Reciprocal Loyalty

The last two sections of this study present estimates of the loyalty-exit-voice expressions of union and non-union workers. In this section, Loyalty is approximated by the impact of a relevant attribute involving reciprocity in a vignette questionnaire. In the next section, the ‘voice’ and ‘exit’ expressions are examined in terms of the stated job satisfaction and quitting intention, using non-vignette data from the conventional part of the questionnaire.

### 5.1 *Vignette Evaluation and the Loyalty Attribute*

*Specification (1)* in *Table 4* presents random effects COLS estimates of vignette evaluation, for the union and non-union employees respectively. The COLS model with random effects includes control variables for individual and work-related characteristics. Panel (B) presents the coefficients and standard errors of the detailed specification. On the top of the Table, Panel (A) calculates a point estimate and a standard error for the trade-off ratio between the loyalty and the wage attribute. This ratio reflects the wage compensation that the average worker would require in exchange for the loss of employer-employee loyalty. The results from the first specification of *Table 4* indicate that the loyalty attribute exerts a significant positive impact on the evaluations of both union and non-union workers. Expectedly, wages and hours of work exert the highest impact on the evaluations of alternative job scenarios in both samples. So does the type of contract received, with workers having a preference for permanent contracts which entail lower risks in terms of job security and compensation compared to other types of contracts. The examination of differences in the coefficients between union and non-union workers indicates that permanent contracts with no risk of losing the job, and permanent contracts providing compensation in case of job loss exert a significantly higher impact on the evaluations of union workers, *ceteris paribus*. So do temporary contracts that entail the possibility of continuation with a permanent contract. Although it is shown that job security matters more to unionised workers, the impact of the wage change coefficient exerts a smaller impact in the union group than it does among the non-unionised workers. The difference in the coefficients is significant at the 5%

level using a Wald  $\chi^2$  test. This can be interpreted in accordance with the evidence in [Bewley \(1998\)](#) that non-union workers care more about changes in wages but are relatively insensitive to absolute wage levels or wage levels relative to comparable workers in other firms<sup>23</sup>. In contrast, the author finds that union workers care more about wage bargaining outcomes relative to other workers.

Furthermore, the results in Table 4 reveal an interesting and persistent pattern. The effect of the loyalty attribute is much higher for the sample of union workers compared to the non-union ones. The difference in the coefficients is statistically significant at the 10% level, and the calculated trade-off ratios between loyalty and wage changes in Panel (A) indicate that the wage compensation required for the loss of loyalty is 19.3% of the current wage for union workers and close to 12.1% for non-union workers<sup>24</sup>. The estimates of the differences in the tradeoff ratios are statistically significant at the 5% level, and suggest that unionised workers would have to experience a 60% higher wage increase compared to their non-union counterparts, in order to give up the employer-employee loyalty in a job. The above estimates are obtained after controlling for a large number of variables, namely, vignette attributes (I), current job characteristics that correspond to the vignette attributes, such as wages, hours of work, types of contract *etc.* (II), and other individual and current work-related characteristics, such as education, gender marital status, job tenure and experience, sector of work, firm size, occupation, industry, and country (III). The majority of the individual and current work-related characteristics do not exert a significant impact on job evaluation, and the coefficients are not significantly different between union and non-union workers. The exceptions are hours of work and formal retirement age on the current job. Unionised workers reporting more hours of work in the current job, and those with a higher formal retirement age give higher valuations to the job scenaria, compared to their non-union counterparts.

**[Insert Table 4 about here]**

The differences between union and non-union workers, concerning the impact of the loyalty attribute and the calculated trade-off ratios, reveal an interesting pattern in the random-effects COLS model of Table 4. Union workers give higher evaluations to jobs involving loyalty and no shirking arrangements than to those that do not, compared to non-union workers, and the loss

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<sup>23</sup> This empirical observation contributed to the ‘coherent arbitrariness’ conjecture ([Ariely et al., 2003; 2006](#)), according to which individuals do not have a prior good idea of certain preferences, but formulate these based on experience and stimuli provided by the environment.

<sup>24</sup> The loyalty/wage ratios and their standard errors are obtained as point estimates for the nonlinear combination of the parameter estimates for the loyalty and wage attributes.

of this attribute would require a higher monetary compensation in terms of foregone wage increases for the union group. The estimates appear to accord well with the assertion in the literature that union workers have a higher preference for loyalty. This loyalty is related to employer-employee reciprocal arrangements in this study. Hence, it is important to examine the robustness of this finding and its nature, exploring different methodological frameworks and potential explanations.

### **5.1.1 Robustness I: Individual Fixed Effects**

*Specification (3)* in *Table 5* presents estimates from a COLS model with individual fixed effects for union and non-union workers respectively. The model accounts for individual unobserved heterogeneity that is constant across evaluations, but is allowed to be correlated with the observable characteristics. Thus, unobserved characteristics, such as ability or fairness, which could be correlated with the impact of the loyalty attribute, are accounted for. Although the model does not allow the incorporation of individual characteristics that are constant across evaluations, such as gender, education and current job characteristics, it estimates within-individual effects, *i.e.* the coefficients reveal the impact exhibited by changes in the vignette attributes within individuals.

**[Insert Table 5 about here]**

The results are in line with the previous estimates from the random effects COLS model. The reciprocal loyalty attribute exerts a higher impact on the evaluations made by union workers, compared to non-unionised employees. The difference in the coefficients between the two groups is significant at the 10% level, and the difference in the loyalty/wage ratios significant at the 5% level. The calculated tradeoff ratios suggest that union workers would require a compensation equal 19.6% of their current wage, while the figure is 11.9% for the non-union workers. Thus, a 64.7% higher wage increase would be required for union workers to give up the loyalty attribute. The remaining differences between the two groups are also robust. Thus, wage changes exhibit a lower impact on the evaluations of union workers, and so do the permanent wage contracts and jobs involving lower intensity in terms of work speed, compared to the evaluations of non-union workers.

### **5.1.2 Robustness II: Endogenous Switching into Union Membership**

The fixed-effects estimates detailed above indicate that after accounting for individual unobserved effects that are likely to be correlated with the preference for reciprocity and loyalty, the effect of the relevant attribute and the difference in the magnitude of the effects between the

two groups remain unaltered. This is important, because a key candidate explanation of the loyalty differences is related to pre-existing individual differences in preferences for such attributes. These can lead to endogenous union formation and membership. Thus, such preferences might be formed *ex-ante* i.e. they might be valued by the individual before he/she joins the union. In order to account for this possibility, *Specification (2)* of *Table 4* presents the estimates from a Heckman-type vignette evaluation model that accounts for endogenous switching into union membership status. Coefficients and robust standard errors are presented. The latter are clustered at the individual level, to allow for potential serial correlation in the five consecutive vignette evaluations by individuals. The identifying restrictions for the first stage union membership regressions (presented in Column (1) of Table A2 in the Appendix) involve two variables related to union recognition and concentration. A Wald  $\chi^2$  test with two degrees of freedom indicates that all identifying restrictions used are insignificant in predicting vignette evaluation for both groups of workers (shown in the bottom of *Table 4*). They are jointly significant in the selection equation. Furthermore, a Lagrange multiplier (LM) test showing whether the two instruments should be included in the evaluation equations is used. The LM tests for union and non-union workers are not significant at conventional levels. This tentatively suggests that the restrictions for identifying the selection effects are adequate. Finally, a Wald test accepts the independence of the two equations and thus the model can be consistently estimated with COLS.

The estimation results, after controlling for endogenous switching into the union, show that the difference in the impact of the loyalty attribute between union and non-union workers persists. Union members require a 62% higher wage increase than non-unions workers in order to accept forgoing the loyalty attribute. The difference in the coefficients and trade-off ratios between union and non-union members is significant at the 10% and the 5% level respectively. The earlier finding that jobs involving permanent contracts or prospects and lower intensity are valued more highly by union workers is also confirmed. The results from *Specification (2)* suggest that endogenous switching into union membership does not account for the different evaluations of jobs involving reciprocal loyalty that are observed to be higher among union workers compared to their non-union counterparts.

### **5.1.3 Robustness III: Ranking of Jobs and the Rank-Ordered Logit Model**

A final methodological concern that needs to be addressed in order to establish the robustness of the estimated effects involves the consideration that workers may provide rankings of the job vignettes they receive, that induce ties to their responses (Calfee et al., 2001). The appropriate



model of conjoint analysis that mitigates such concerns is the rank-ordered logit model. *Specification (4)* of *Table 5* presents the coefficients and standard errors of the vignette attributes from this model of ranked evaluation. Importantly, the results prove robust, and are virtually unchanged in terms of the effect of loyalty on the job evaluations by union and non-union workers. The coefficients of this attribute are again significantly higher for union workers at the 10% level. The magnitude of the loyalty/wage tradeoff ratios is slightly altered, with the difference between the two groups in the compensation required decreasing at a figure closer to 50%. Moreover, the differences in the types of contracts that induce higher valuations are no longer significant at conventional levels. Given the robustness of the results in terms of all four specifications and models employed, one should conclude that the difference in the impact of the loyalty attribute between union and non-union workers is a robust result<sup>25</sup>.

### 5.2 *Loyalty and Repeated Interaction*

The previous section shows that the difference in the loyalty-job evaluation relationship between union and non-union workers is robust to a number of specifications and models used. Importantly, it remains robust when endogenous switching into union membership is accounted for, and when models with individual fixed effects are estimated. The above are consistent with the view that there is an *ex post* element to the prevalence of loyalty differences between the union and non-union groups, *i.e.* these differences might be induced or strengthened *ex-post* due to membership in a trade union which mediates for reciprocal loyalty arrangements and hence, internalised via adaptation. This section investigates this issue, by examining the workers' loyalty-evaluation profiles, focusing on factors that reflect labour market experience and the length of the current employment relationship. The objective is to examine whether preferences for loyalty are reinforced by experience and tenure on the current job, and if there are differences in these interactions between the union and non-union groups.

*Figure 2* presents linear predictions from vignette evaluation COLS regressions with random effects, for union and non-union workers. The predictions shown are for jobs with and without the loyalty attribute. The 95% confidence intervals are also plotted for each of the two linear

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<sup>25</sup> Further experimentation with a number of alternative specifications and samples provided results consistent with those reported here. These involved: (a) the use of vignette acceptability as a dependent variable capturing an alternative form of job evaluation; (b) vignette acceptability included in the list of controls among vignette attributes, in vignette evaluation regressions; (c) the estimation of all four specifications for extended country samples in the EPICURUS database, involving 4, 5, 6, and all 7 countries. These results provided further evidence of robustness and are available upon request from the authors.

predictions. The specifications used are similar to Specification (1) of Table 4<sup>26</sup>, and all other characteristics are held constant at the mean. The three panels of the figure plot the evaluation profiles for jobs involving loyalty and jobs without loyalty, by age, labour market experience and tenure, respectively. It is immediately evident from the inspection of the figures that the gap between the linear predictions for jobs with and without loyalty is higher for union workers compared to the non-unionised employees. The picture is consistent with the coefficients and trade-off ratios reported in the last section. Moreover it appears that, *ceteris paribus*, vignette evaluation is negatively related to age and experience, and positively related to tenure.

**[Insert Figure 2 about here]**

The confidence intervals for each prediction, and the potential overlap between the two predictions for jobs with and without loyalty, indicate that differences in workers' evaluations between the two types of jobs are less likely to be significant at younger ages, for workers with less years of experience in the labour market, and for workers in the first year of tenure in the firm. This pattern is very clear for the unionised group. For non-unionised workers, the 95% confidence intervals of predicted evaluations for jobs with and without loyalty very seldom overlap. Thus, for non-unionised workers, the smaller differences between the two predictions are more likely to be persistent across age, experience and tenure profiles. In contrast, the bigger difference between the predicted evaluations of the two types of jobs observed for unionised workers are made significant for the older workers, with the longer experience, and after the first year of tenure in the firm. Thus, the profiles shown for the two groups of workers suggest that exposure and repeated interaction are related to a stronger preference for loyalty only among the unionised workers. The observed relationship between repeated interaction and a preference for reciprocal loyalty for the union group can be justified as an outcome of exposure and experience to union mediated interaction and cooperation. Such acquired preferences are typically internalised via adaptation.

### 5.3 *Loyalty and Unemployment Scarring*

In *Figure 3*, the predicted evaluation-loyalty profiles are plotted for the two groups, by past unemployment experience and by past unemployment duration. The literature suggests that past unemployment experience and duration exert a 'scarring' impact, *i.e.* they have a negative effect on the individual's earning capacity (Gregory and Jukes, 2001), and well-being (Clark et al., 2001).

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<sup>26</sup> When age is included in the specification, experience is excluded. In the specification with unemployment in the next sub-section, unemployment experience, and weeks in unemployment during the last year are added to the previous specification.

Thus, although the relevant literature favours the view that norms of reciprocal loyalty are more binding among unionised workers compared to their non-union counterparts, the literature also suggests that there is a higher incidence of polarisation and militancy in unionised workplaces. Thus, loyalty may also involve ‘voiced’ expressions of negative reciprocity during periods of dispute and confrontation. Krueger and Mas (2004) and Mas (2006; 2008) offer extensive evidence of negative reciprocity via acts of retaliation, complaints, and lower performance by unionised workers, during periods of industrial action, the hiring of replacement workers by employers, and after union defeats in wage bargaining.

Hence, one may expect that unemployment experience is likely to diminish the loyalty gap in job evaluations. This is likely to be more pronounced among unionised workers if the norm of loyalty is internalised via exposure to union mediation and adaptation to group norms. The two plots in *Figure 3* verify that this is the case. Predicted evaluations and 95% confidence intervals are shown for jobs with and without loyalty disaggregated by union membership. The horizontal axis of the first plot shows unemployment incidence in the year before the survey, and that of the second plot shows the logarithm of weeks in unemployment during the previous year<sup>27</sup>. Recent unemployment is shown to be negatively related to alternative job evaluation for union workers, and positively related to the evaluations of non-unionised workers. Moreover, it is shown that the large evaluation gap between jobs with and without loyalty diminishes for unionised workers when unemployment is experienced within the last year. This is not the case for the smaller evaluation gap between jobs with and without loyalty, which is observed for the non-unionised workers. The difference in the predictions for the two types of jobs remains significant for both non-unionised workers with and those without any unemployment experience. Moreover, the second plot shows that the gap between the two types of alternative jobs becomes insignificant after roughly 5 weeks in unemployment for unionised workers, but it takes about 20 weeks to diminish the evaluation-loyalty gap for non-union employees.

**[Insert Figure 3 about here]**

The above suggest that the loyalty-evaluation gap for union workers is affected far more by unemployment, compared to the respective profile for non-union workers, which in turn implies that differences in attitudes to loyalty. The insignificant differences in evaluations for jobs with and without loyalty which appear to increase sooner or only for unionised workers with recent unemployment experience can be interpreted as a stronger negative shock-effect of

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<sup>27</sup> The statistics in Table 3 show that the incidence and duration of recent unemployment are lower among unionised workers.

unemployment experience to unionised worker loyalty. This conclusion is reinforced by the opposite slopes of the unemployment-job evaluation curves of union and non-union workers. Such experiences are likely to trigger expressions of negative reciprocity on the current job by the union workers, although they are not accompanied by favourable evaluations of alternative jobs or intentions to exit the current job. The above are supportive of the loyalty-exit-voice proposition and the evidence on negative reciprocity expressions in the literature, when the link between loyalty and reciprocity is taken into account. In this sense, unemployment experience can be thought to exert a negative shock effect to the positive reciprocity intentions induced by union mediation, and disrupt the process of adaptation to group norms.

Overall, the results can be interpreted as evidence of the 'loyalty filtering' role of the trade union, via attitudinal structuring and intra-organisational consensus. These functions of the union mediate the development of norms of reciprocity among union workers. The workers adapt to such norms, in a fashion that is both consistent with a shift in tastes towards cooperative outcomes through repeated interaction, adaptation and conformist transmission that shape preferences. Acquired preferences are applicable to other settings, such as alternative job evaluations based on current experience. These processes are facilitated by the interaction with a third party, such as the union, that mediates communication and the attribution of intentions between employers and employees. Moreover, unemployment experience may disrupt the process of adaptation to the group norm of positive reciprocity, and trigger expressions of negative reciprocity and retaliation. The union can be thought to provide a large menu of 'voice' expressions to its workers. [Mas \(2008\)](#) reviews evidence from the literature on group polarisation, which suggests that participants in group discussions advocate more extreme positions compared to non-participants. Thus, strong feedback effects across individuals due to social interactions can have persistent and lasting effects on individual behaviour.

The next section examines the expressions of voice and exit behaviour of workers in their current job. First, differences between unionised and non unionised workers in 'voice' expressions mirrored in the reported job satisfaction are examined. Second, differences between these groups in the intention to quit the job are studied.

## 6. Voice and Exit: Job Satisfaction and Quitting Intentions

This section investigates the evidence offered in Table 3 which suggests that, on average, union workers are less satisfied with their jobs compared to non-union employees. The literature points out that there are five main reasons for this being so (Borjas, 1979; Duncan and Stafford, 1980; Kochan and Helfman, 1981; Hersch and Stone, 1990; Bender and Sloane, 1998). First, it is likely that union workers' relative dissatisfaction stems from poor industrial relations or from the fact that unions form themselves in firms where satisfaction is low anyway. Bender and Sloane (1998) find that when controlling for the industrial relations climate, the negative relationship between unionisation and satisfaction dwindles to insignificance in many cases. Second, the observed lower job satisfaction of unionised workers may be an outcome of a reverse causation in the relationship between unionization and job satisfaction. Third, it may reflect a flatter wage-tenure profile in the union sector. Fourth, compensating differentials may give rise to a union premium for less favourable working conditions. Finally, the lower job satisfaction of union workers may be an expression of the exit-voice mechanism. As a by-product of loyalty, union workers are more likely to express dissatisfaction rather than seek for employment elsewhere. Thus, this 'voiced' dissatisfaction, reflecting the hope of forcing change, is distinct from 'genuine' dissatisfaction. Following Hersch and Stone (1990), this section investigates the above five explanations, by examining the correlates of job satisfaction and quitting intentions using regression analysis, after controlling for the features that are relevant to the proposed explanations. In addition, it extends their analysis via the more detailed examination of the explanations related to the climate of industrial relations and reverse causality.

Table 6 presents COLS estimates of job satisfaction regressions. The list of explanatory variables includes the logarithms of PPP adjusted monthly wage rate, and hours of work, union membership status, a vector of personal and job characteristics (gender, education, cohabitation/marital status, and the log of the number of children aged less than 16) and a vector of work-related characteristics (paid overtime, firm-size, sector of activity, log of tenure, experience, permanent job, training during the last year, occupation and industry (1-digit)). Coefficients and robust standard errors are reported. Column (1) presents estimates from a standard job satisfaction regression, in which explicit working conditions are not included in the set of the explanatory variables. In accordance with the literature, unionised workers are less satisfied with their job overall, *ceteris paribus*. The coefficient is -0.108, statistically significant at the 1% level. The logarithms of weekly hours of work and job tenure are negatively related to job satisfaction. The logarithms of wage rate, paid overtime and experience, along with training and a

permanent contract status are positively related to job satisfaction. The male workers are less satisfied with their jobs on average. Unsurprisingly, the education variables turn out to exert an insignificant impact, since the survey targets the low-skilled, with low levels of education. Finally, civil servants appear to draw the highest job satisfaction from their job compared to the other four occupational categories<sup>‡</sup>.

**[Insert Table 6 about here]**

### 6.1 *The Climate of Industrial Relations*

Column 2 of Table 6 presents estimates from a job satisfaction regression that also controls for the climate of industrial relations. In the questionnaire, workers are asked to respond to the following question: “Do you have a good relationship with your employer/supervisor?” The responses allow the construction of a binary variable, approximating the climate of industrial relations. The statistics in Table 3 further show that 85.1% of the workers in the sample consider their relations with their employer/supervisor as good. The figures are 81.9% for union workers and 86.1% for non-union workers. The difference between the two groups is statistically significant at the 1% level. Alternative measures available in the dataset are responses for the satisfaction with ‘relations with employer/supervisor’, and satisfaction with ‘employer’s behaviour’ (shown in Table 3). However, the results when using the latter measures are similar to those presented in Column 2, and they are not reported<sup>‡</sup>. The estimation results in Column 2 of Table 6 show that the negative coefficient for the union membership variable is significant at the 1% level, when accounting for the climate of industrial relations. The inclusion of the latter variable lowers the magnitude of the union coefficient to -0.088, but this falls short of explaining the low level of job satisfaction exhibited by the unionised workers.

### 6.2 *Reverse Causality*

The issue of reverse causality between job satisfaction and union membership can also serve as an explanation for the observed lower job satisfaction of union workers. This is examined in Table 7, which reports results from the analysis of the membership-job satisfaction link using propensity score matching. Consistency of the effects estimated with propensity scores hinges upon the assumption that selection into union membership is captured by observables. However, unlike linear regression techniques, it computes the differential within the ‘common support’, *i.e.* by comparing members and non-members that are similar with respect to observable attributes (Blundell and Costa-Dias, 2000). Regression analyses use functional form assumptions to project the differential outside the common support, potentially biasing the results (Dehejia and Wahba, 2002). Therefore, it seems important to investigate the membership

– job satisfaction issue within the common support. The estimate shown in Table 7 is the effect of ‘treatment on the treated’ for the whole sample, *i.e.* the mean difference in satisfaction across union members and their matched non-member counterparts. The specification of the probit estimator used to generate the propensity scores is presented in *Column 2* of *Table A2* in the Appendix.

The estimates presented in the first panel of *Table 7* are based on nearest neighbour matching, and those of the second panel are from kernel-based matching (the latter requires bootstrapped standard errors based on 100 replications). Overall, the matching estimates support the findings of the regression analysis in *Table 6*, *i.e.* the lower job satisfaction exhibited by union workers. In both Panels of *Table 7*, union membership is associated with a negative and statistically significant effect on job satisfaction, *i.e.* between -0.084 and -0.090, similar in magnitude to that of *Table 6*. This confirms the earlier analysis, though the parameter of interest is not the same.

**[Insert Table 7 about here]**

### *6.3 Flatter Wage-Tenure Profile*

The flatter wage-tenure profile of unionised workers is another possible explanation of their lower job satisfaction. *Column 3* of *Table 6* presents a specification that examines whether the difference in job satisfaction can be explained by the higher tenure of unionised workers (also shown in *Table 2*). An interaction term between the logarithm of job tenure and union membership is introduced in the specification of the previous *Column 1*. Job satisfaction is U-shaped in job tenure, as revealed by the negative coefficient of the log of tenure. The coefficient of the interaction term is small, positive, and statistically insignificant. The effect of union status is marginally insignificant (at the 10% level) when the interaction term is included. However, the magnitude of the coefficient increases. This indicates that the high job tenure alone can not explain the lower job satisfaction of unionised workers compared to their non-union counterparts.

### *6.4 Compensating Wage Differentials*

A fourth alternative explanation of the lower job satisfaction of union members compared to non-union workers is that although the former enjoy higher wages, these may reflect compensating differentials for jobs of lower quality and unfavourable working conditions. *Columns 4 and 5* investigate this explanation. In *Column 4*, two additional variables which account for work conditions are introduced in the job satisfaction regression, namely the logarithms of the numbers of work related injuries and illnesses during the past two years that caused the

employee to take at least one day off-work. Interestingly, both variables exhibit a negative impact on job satisfaction but their inclusion does not reduce the significance of the union membership and the wage effects<sup>28</sup>. The magnitude of the union variable is only reduced to -0.084. Yet, union workers report a greater incidence of work-related illnesses and injuries compared to the non-unionized ones. Overall, this might be interpreted as evidence that although work-related injuries and illnesses do reduce job satisfaction, they are not sufficient to explain neither the lower job satisfaction nor the higher wages of the union workers.

To further examine the compensating differentials explanation the approach of [Hersch and Stone \(1990\)](#) is used which amounts to adding working condition variables in the job satisfaction regression. The variables used are similar to those identified by [Duncan and Stafford \(1980\)](#) as the most important in explaining the union wage premium. These capture whether the employee performs repetitive work such as machine operation, the effort at work, and the ability of the employee to put own ideas into practice at work<sup>29</sup>. *Column 4* shows that the former two variables are negatively related to job satisfaction, and freedom to put own ideas in practice exerts a positive impact. The inclusion of the three variables reduces the magnitude of both the union status and wage coefficients. However, the negative union status coefficient remains significant, and equals -0.081. The interpretation is that the compensating differentials explanation is not sufficient to account for the lower job satisfaction reported by the union members. Overall, the above results suggest that union membership has an impact on job satisfaction that is independent of wages and working conditions.

### 6.5 Exit-Voice: Non-Genuine Dissatisfaction?

Finally, the exit-voice tradeoff as an explanation of the lower job satisfaction that results from the higher loyalty of union workers is investigated. One should expect that if union workers report genuinely lower job satisfaction compared to their non-union counterparts then this should be reflected on their intention to quit the current job. Using an approach similar to [Hersch and Stone \(1990\)](#), logit estimates of the determinants of the intention to quit are presented in *Table 8*. The regressors are union status, job satisfaction, wages, and a set of

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<sup>28</sup> As another test, interaction terms between injury/illness rates and union membership are introduced. The effect of the interaction terms turns out to be statistically insignificant. Results are available upon request.

<sup>29</sup> The variables introduced are: (1) a categorical variable equal to 1 for workers who state that they certainly have a repetitive work; (2) an index in the [0, 1] interval, created through the summation of workers' stated opinion for the intensity of the factors that make their job hard. Responses range from 1 to 5, and the options are: (a) high speed or high rhythm, (b) tight deadlines, (c) relationship with the boss or supervisor, (d) colleagues or co-workers. Thus, the index is 0 for a worker for whom none of these factors make his/her job hard, and 1, for a worker for whom all of these factors make it tough; (3) equal to 1 if the employee is frequently, nearly always or always allowed to put own ideas into practice at work.



personal and work characteristics. *Column 1* presents the estimates for the whole sample using a logit regression, where an interaction term between union status and job satisfaction is also introduced. Marginal effects and robust standard errors are reported in *Column 1*. *Columns 2 and 3* report the estimated coefficients and robust standard errors, for the union and non-union workers respectively, from a linear probability model that controls for endogenous switching into union membership<sup>30</sup>. The first stage regression for union membership is shown in *Column 3* of *Table A2* in the Appendix. The instruments used to identify the selection equation are the *union recognition* and *union concentration* variables. Moreover, a Wald  $\chi^2$  test reports differences in the coefficients between the two groups.

**[Insert Table 8 about here]**

For the whole sample, the coefficient of union membership is negative, statistically significant, and large. The marginal effect is -0.181, indicating that the union membership reduces quitting intentions by 18.1%, *i.e.* nearly by 50% given the observed and predicted probabilities for quitting intentions. The magnitude of the effect is large, comparable to that of an individual having a permanent contract. Job satisfaction exerts a negative impact on the propensity to quit. The marginal effect is -0.052, significant at the 1% level. Thus, an increase of job satisfaction from approximately 6 to 8 ( $\frac{1}{2}$  standard deviations below the mean to  $\frac{1}{2}$  standard deviations above the mean) reduces the propensity to quit by 5.2%, *i.e.* an effect equal to 13.9% in view of the quitting intention frequencies. The coefficient of the interaction between union status and job satisfaction is insignificant, suggesting that the lower job satisfaction of unionised workers does not increase their quitting propensity. In the linear probability model with endogenous switching, shown in *Columns 2 and 3*, the estimated coefficient of job satisfaction is -0.022 for unionised workers and -0.049 for the non-union workers. Both effects are statistically significant at the 1% level, and the difference between the two coefficients is statistically significant at the 1% level (Wald  $\chi^2$  test=6.94).

Thus, for both union and non-union workers the expressed dissatisfaction does appear to be genuine in the sense that it does lead to a higher propensity to quit. However, the effect on the propensity to quit is significantly lower for unionised workers. This interpretation of the voice explanation is in line with [Hersch and Stone \(1990\)](#) who find that unions do lead to greater expressions of dissatisfaction among union workers, even when objective measures of job characteristics are held constant, but the dissatisfaction has real consequences for the propensity to quit. However, the effect for union workers is nearly half of that for non-union workers.

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<sup>30</sup> Estimates using the logit model in Columns 2 and 3 do not alter the results and conclusions presented<sup>‡</sup>.

## 7. Concluding Remarks

This study reassesses the 'loyalty-exit-voice' proposition in its application in the industrial relations, using a unique database. The loyalty concept is linked to reciprocal employer-employee arrangements and examined as a job attribute in a stated preference framework for low and medium-skilled employees in three European countries, *i.e.* Greece, the Netherlands, and the United Kingdom. The results show that reciprocal loyalty arrangements, involving the exchange of higher effort for job security, are rated by the workers as one of the most desirable job attributes. This attribute exerts a higher impact on the job evaluations provided by unionised workers, compared to their non-union counterparts. This is a strong pattern, robust to a number of methodological considerations. It is also shown that for union members this type of social preference is likely to be an outcome of adaptation to union mediated cooperation, as it turns out to be stronger for unionised workers with higher job and labour market experience. Yet, these do not significantly alter the loyalty-evaluation profile of non-union workers. Moreover, recent unemployment experience has a negative effect on the job evaluations and loyalty preferences of unionised workers, but it does not alter the respective profiles of non-union employees. Overall the evidence suggests that unionised workers are more receptive to arrangements involving reciprocity, and this entails both the positive reciprocity via adaptation to cooperation, and the reaction to harmful events that may induce negative reciprocity.

Finally, the examination of attitudes towards the current job confirms the 'exit-voice' function of the union that has been documented in the literature. Union workers express greater dissatisfaction with most facets of their current job. This lower job satisfaction can not be explained by the climate of industrial relations, the potential reverse causality in the job satisfaction - union membership relationship, high tenure, and/or compensating differentials. However, unionised workers are less likely to intend to quit their jobs, consistent with their aforementioned loyalty explanation. The impact of job satisfaction on the intention to quit the job is consistent with the 'exit-voice' explanation of the low job satisfaction of union workers. Thus, although the dissatisfaction of unionised workers appears genuine in terms of its impact on the intention to quit the job in the near future, the satisfaction effect is significantly smaller for unionised workers, compared to their non-union counterparts.

The results highlight the 'loyalty filtering' role of the trade union, in mediating the attitudinal structuring and intra-organisational bargaining dimensions of labour negotiations. Reciprocity is a key mechanism for the enforcement of social norms and the enhancement of collective action

in environments where the relations and obligations are not governed by explicit agreements. Communication, information and reputation are pivotal for the attribution of intentions that can induce reciprocal responses of both loyalty and retaliation. Moreover, the psychological process of adaptation facilitates the strengthening and conformism to group norms. Economic institutions can induce specific behaviours and often acquired preferences can be internalised and become constraints on behaviour.

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**Endnotes:**

‡ The mentioned results that are not shown, due to space considerations, are available from the authors upon request.

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Figure 1  
Typical Vignette

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Imagine that, for some reason, you had to stop with your current job and had to look for a new one. Imagine that after a short time you get several offers. We will list them on the following screen. These listed job offers do not differ from your current job except for some points we specifically mention.

Can you please evaluate these offers on a scale from 0 to 10, where 0 means the worst possible and 10 the best possible offer? And indicate if they are acceptable?"

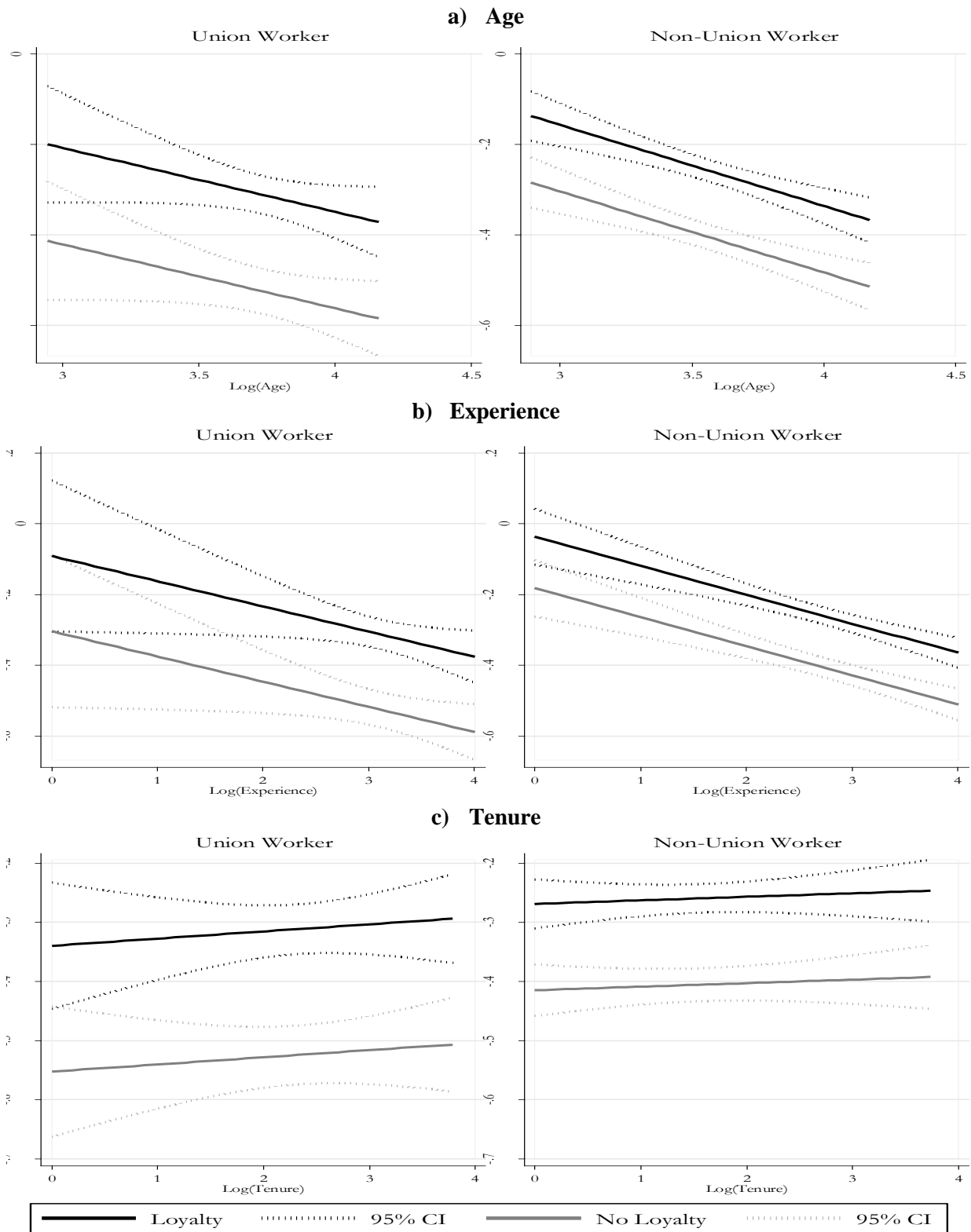
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<b>Wage:</b>	20 % more than now per hour
<b>Type of contract:</b>	Permanent with risk of losing the job with no severance pay
<b>Working hours:</b>	20 hours a week
<b>Working times:</b>	Rotating shift system
<b>Training opportunities:</b>	The employer will offer you a 10-workday training program in the course of the year
<b>Work organization:</b>	The job involves working in a varying team
<b>Work conditions:</b>	No one controls your work
<b>Work speed:</b>	The job is fairly demanding, which means that sometimes you may have to work at high speed
<b>Retirement:</b>	You can retire at age 55
<b>Behavioral norms:</b>	Same working conditions as in other firms. No loyalty from both sides. Shirking and low performance is possible

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- How would you rate this offer? ..... *Please, evaluate this offer on a scale from 0 to 10, where 0 means the worst possible and 10 the best possible job*
  - Would this job offer be acceptable to you?..... *Yes/No*
- 
-

Figure 2  
Loyalty-Evaluation profiles and Repeated Interaction

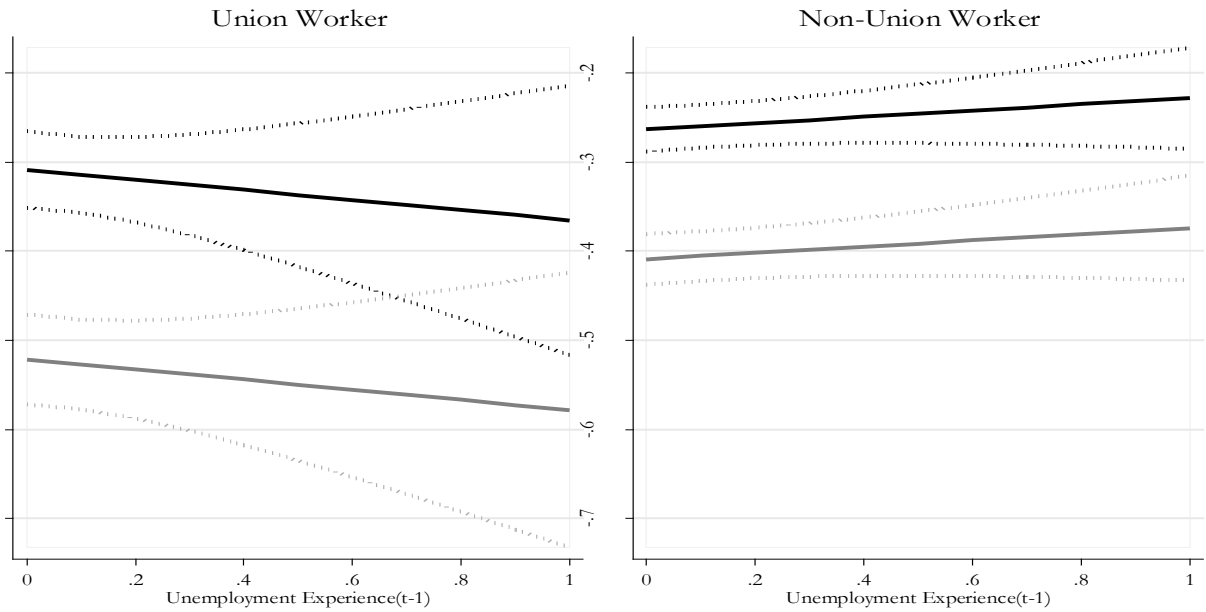


Notes:

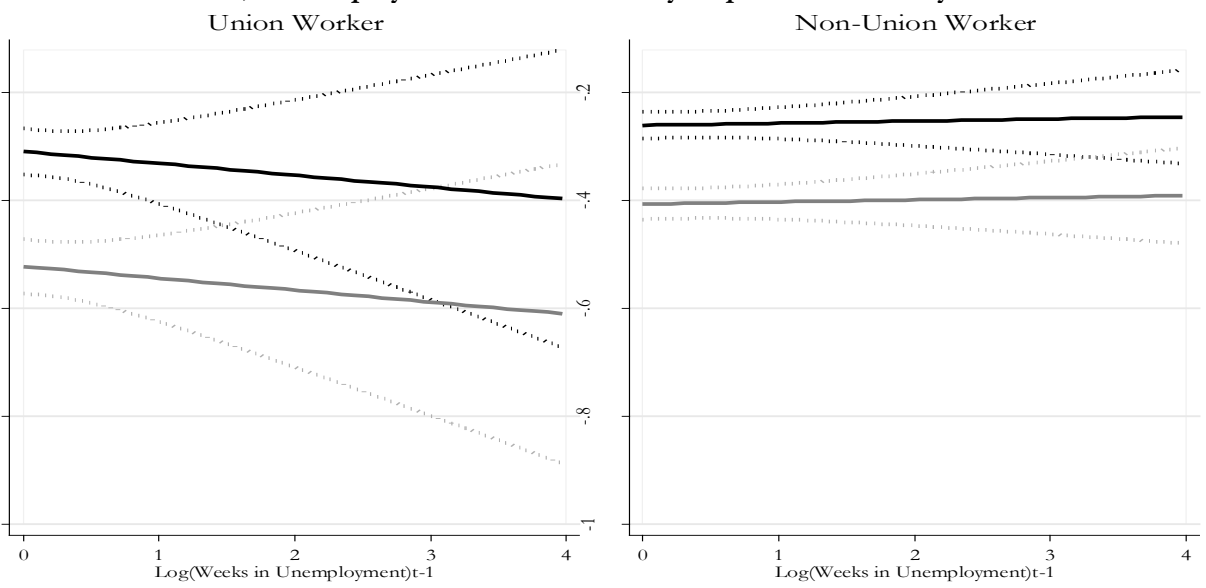
The vertical axis shows linear predictions from random-effects COLS vignette evaluation regressions for union and non-union workers.

Figure 3  
Loyalty-Evaluation profiles and Unemployment

**a) Unemployment Experience in the year prior to the survey**



**b) Unemployment duration in the year prior to the survey**



Notes:  
Comments in Figure 2 apply

Table 1  
The Sample

	Sample			% Union Membership			
	Sample Size	Union Workers	Non-Union Workers	EPICURUS 2004	ICTWSS <sup>[a]</sup> 2004-2005	E.U. Total <sup>[b]</sup> 2006	E.U. (2006) Blue-Collar: Unskilled – Skilled <sup>[b]</sup>
<i>Pooled Sample</i>	2,809	673	2,136	24.0%	24.8%	26.7%	18.7%-32.7%
Greece	800	183	617	22.9%	23.0%	22%	11%-27%
Netherlands	1,007	296	711	29.4%	22.0%	28%	26%-42%
United Kingdom	1,002	194	808	19.4%	29.5%	30%	19%-29%

Sources:

<sup>[a]</sup> ICTWSS Database on Institutional Characteristics of Trade Unions (Visser, 2009): <http://www.uva-aias.net/207>

<sup>[b]</sup> European Commission (2006): p.25-26.

Table 2  
Selected Summary Statistics for the Pooled Sample: Averages and Mean Differences

Variable	Pooled Sample	Union Workers	Non-Union Workers
Net monthly wage	1,629.5	1,767.9***	1,585.9
Weekly working hours	34.9	35.9***	34.6
Paid overtime hours	1.23	1.53**	1.13
Age	38.60	43.07***	37.19
Experience	20.82	25.19***	19.44
Tenure	9.28	14.29***	7.70
Male	50.7%	65.2%***	46.2%
Married	53.4%	61.7%***	50.8%
No. of children aged less than 16 (No. if ≠0)	0.62 (1.68)	0.61 (1.71)	0.62 (1.67)
Low education	95.4%	93.3%	96.1%***
Permanent contract	86.0%	90.9%***	84.4%
Training during last year	37.6%	41.6%**	36.3%
Work intensity	0.54	0.55	0.54
Own idea implementation	48.6%	44.1%	50.1%***
Machine	57.3%	55.1%	58.0%
Repetitive work	33.8%	32.8%	34.1%
<b>Sector</b>			
Private sector	61.2%	41.5%	67.4%***
Non-profit	10.2%	10.9%	9.9%
Civil service	14.9%	28.5%***	10.6%
Public sector	13.7%	19.2%***	12.0%
<b>Firm Size</b>			
1-10 employees	23.7%	11.3%	27.6%***
10-24 employees	15.5%	10.7%	17.0%***
25-99 employees	21.2%	22.6%	20.8%
100-499 employees	20.0%	28.5%***	17.4%
More than 500 employees	19.5%	26.9%***	17.2%
<b>Occupation</b>			
Managers	3.4%	2.2%	3.8%*
Professional	2.5%	3.1%	2.3%
Technical & associate professional	9.4%	11.1%*	8.9%
Clerical & secretarial	23.6%	21.1%	24.3%*
Craft & related trades	3.9%	5.2%**	3.5%
Personal & protective service	4.2%	4.3%	4.2%

*Table 2 continued in next page*

*Table 2 continued from last page*

Labouring in mining, construction, manufacturing & transportation	4.8%	5.5%	4.6%
Sales and services	15.3%	8.2%	17.6%***
Plant & machine operators and assemblers	4.5%	8.3%***	3.3%
Armed forces	1.7%	3.3%***	1.2%
Other occupations	26.7%	27.6%	26.4%
<b><u>Industry</u></b>			
Mining & quarrying	0.1%	0.0%	0.1%
Utilities	1.4%	3.1%***	0.8%
Manufacturing	8.2%	9.1%	8.0%
Construction	5.8%	6.7%	5.5%
Trade & repairs	15.1%	7.0%	17.7%***
Hotels & restaurants	4.2%	2.4%	4.7%***
Transport, storage & communication	6.9%	9.1%***	6.2%
Financial intermediation	5.0%	3.4%	5.5%**
Real estate & business	1.2%	0.3%	1.5%**
Other services	13.6%	12.2%	14.0%
Public administration & defence	7.2%	13.8%***	5.1%
Education	3.7%	3.7%	3.7%
Health and social work	9.5%	11.9%**	8.8%
Community, social and personal service	4.3%	5.8%**	3.9%
Private households	0.5%	0.1%	0.6%**
Extra-territorial organisations	0.9%	0.5%	1.0%
Other activities	12.6%	11.1%	13.1%
<b><u>Instruments</u></b>			
Union recognition	39.8%	74.9%***	28.8%
Union concentration	0.84	1.03***	0.78

Notes:

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ : From a t-test of mean differences between union and non-union workers.

Table 3  
Sample Averages and Mean Differences between Union and Non-Union Workers

	Pooled	Union Workers	Non-Union Workers
<i>Satisfaction with:</i>			
Job overall	6.85	6.75	6.87**
Promotion prospects	4.57	4.29	4.66***
Total pay	5.39	5.30	5.42
Relations with employer/supervisor	7.08	6.73	7.19***
Job security	7.01	6.97	7.03
Use of initiative	6.88	6.63	6.96***
The work itself	7.06	6.90	7.11***
Hours of work	6.96	6.90	6.97*
Times of work	7.03	6.75	7.11***
Employer's behaviour	6.60	6.05	6.78***
Work load	6.17	5.80	6.29***
Work tension	5.90	5.49	6.03***
Level of job stress	5.73	5.24	5.88***
Physical risk	6.65	5.96	6.87***
<i>Finds job to be:</i>			
Tiring	61.6%	69.2%***	59.2%
Of low quality in terms of environment	44.4%	55.3%***	41.0%
Dangerous	34.9%	46.2%***	31.4%
Physically demanding	28.0%	33.3%***	26.3%
<i>Other Characteristics:</i>			
Good industrial relations	85.1%	81.9%	86.1%***
Incidence of work-related injury	11.4%	15.9%***	9.9%
Incidence of work-related illness	20.1%	25.1%***	18.5%
No. of work-related injuries (No. if ≠0)	0.20 (1.86)	0.27** (1.82)	0.17 (1.88)
No. of work-related illnesses (No. if ≠0)	0.51 (2.69)	0.73* (3.05)	0.44 (2.53)
Unemployment in last year	9.5%	5.1%	11.0%***
No. of weeks in unemployment <sub>t-1</sub> (No. if ≠0)	16.68	0.68 (14.31)	1.82*** (17.02)
Intension to quit the job in near future	36.7%	25.0%	40.5%***

Notes:

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ : From a t-test of mean differences between union and non-union workers, and a two-sample Fligner-Policello robust rank order test for differences in the distributions for the ordinal satisfaction variables. The significance levels obtained from the latter are robust to the use of the Mann-Whitney non-parametric test.

Table 4  
Loyalty: Vignette Evaluation

Specifications with: <i>Vignette Attributes and Individual Characteristics</i>	(1) <b>COLS with Random Effects</b>			(2) <b>Endogenous Switching COLS</b>		
	Union Workers	Non-Union Workers	Wald $\chi^2$ test	Union Workers	Non-Union Workers	Wald $\chi^2$ test
<b>A) Calculated Trade-Off Ratios:</b>						
Loyalty/%Wage change	0.193*** [0.032]	0.121*** [0.016]	4.05**	0.189***[0.033]	0.117***[0.016]	3.85**
<b>B) Model Specification:</b>						
<b>I. Vignette Attributes</b>						
Loyalty and no shirking	0.217*** [0.033]	0.149*** [0.019]	3.18*	0.213***[0.034]	0.146***[0.019]	2.86*
% Net wage change	1.123***[0.051]	1.239*** [0.030]	3.86**	1.122***[0.060]	1.249***[0.035]	3.34*
Log(Weekly working hours)	6.341***[1.276]	5.984*** [0.742]	0.06	6.083***[1.422]	5.854***[0.815]	0.02
Log(Week. work.hours) squared	-0.951*** [0.184]	0.911*** [0.107]	0.03	-0.915***[0.205]	-0.893***[0.118]	0.01
Log(Days of training)	0.015 [0.011]	0.025*** [0.007]	0.57	0.01 [0.012]	0.021***[0.007]	0.67
Age of retirement	-0.004 [0.006]	0.005 [0.003]	2.01	-0.003 [0.006]	0.006 [0.004]	1.34
Age of retirement squared	0.110 [0.093]	-0.028 [0.055]	1.62	0.082 [0.098]	-0.036 [0.056]	1.09
<b>Type of Contract:</b>						
Permanent, no risk of losing job	0.438***[0.063]	0.299*** [0.036]	3.65*	0.429***[0.068]	0.303***[0.040]	2.54
Permanent, risk, compensation	0.285***[0.069]	0.091** [0.040]	5.92**	0.290***[0.074]	0.101** [0.043]	4.86**
Permanent, risk, no compensation	0.046 [0.068]	0.007 [0.039]	0.25	0.043 [0.074]	0.011 [0.042]	0.14
Temporary, possibility to permanent	0.355***[0.070]	0.180*** [0.040]	4.77**	0.355***[0.079]	0.197***[0.044]	3.03*
Temporary, possibility to temporary	0.141** [0.057]	0.240*** [0.033]	2.28	0.136** [0.056]	0.223***[0.034]	1.76
Temporary, no continuation	[Ref.]	[Ref.]		[Ref.]	[Ref.]	
<b>Working Schedules</b>						
Flexible working hours	0.147***[0.054]	0.154*** [0.031]	0.01	0.164***[0.060]	0.187***[0.033]	0.11
Office working hours	0.001 [0.046]	0.088*** [0.027]	2.71	0.016 [0.050]	0.118***[0.028]	3.15**
Rotating shifts	-0.139***[0.045]	-0.075*** [0.026]	1.50	-0.116***[0.044]	-0.045* [0.027]	1.91
Employer decides	[Ref.]	[Ref.]		[Ref.]	[Ref.]	
<b>Work Organisation</b>						
Job not in teamwork	0.106***[0.038]	0.079*** [0.022]	0.38	0.079** [0.039]	0.069***[0.022]	0.05
Job in varying teamwork	0.108***[0.037]	0.078*** [0.021]	0.50	0.101***[0.037]	0.072***[0.021]	0.46
Job has a fixed routine	[Ref.]	[Ref.]		[Ref.]	[Ref.]	
<b>Control over Work</b>						
Job has a fixed routine	-0.114***[0.039]	-0.073*** [0.022]	0.82	-0.134***[0.040]	-0.097***[0.023]	0.66
You can choose the order of tasks	-0.088** [0.042]	-0.018 [0.024]	2.11	-0.100** [0.042]	-0.033 [0.025]	1.90
No one controls your work	[Ref.]	[Ref.]		[Ref.]	[Ref.]	
<b>Work Intensity</b>						
Often working at high speed	[Ref.]	[Ref.]		[Ref.]	[Ref.]	
Sometimes working at high speed	0.279***[0.054]	0.131*** [0.031]	5.76**	0.272***[0.059]	0.125***[0.034]	4.67**
Never working at high speed	0.132***[0.048]	0.038 [0.028]	2.86*	0.119** [0.051]	0.024 [0.029]	2.60
Often tight deadlines	-0.089* [0.048]	-0.056** [0.028]	0.35	-0.083 [0.053]	-0.049* [0.029]	0.31
Sometimes tight deadlines	0.104** [0.050]	0.091*** [0.029]	0.05	0.101* [0.052]	0.097***[0.030]	0.00
Never tight deadlines	0.158***[0.057]	0.119*** [0.033]	0.35	0.161***[0.056]	0.125***[0.033]	0.31
<b>II. Relevant Current Job Characteristics</b>						
Log(Monthly wage)	0.020 [0.060]	0.010 [0.026]	0.02	0.022 [0.049]	0.012 [0.026]	0.03
Log(Weekly hours of work)	0.410***[0.121]	0.083* [0.045]	6.46**	0.398***[0.117]	0.083* [0.044]	6.33**
Training during the last year	-0.017 [0.051]	-0.030 [0.026]	0.05	-0.015 [0.050]	-0.027 [0.025]	0.05
Log(Formal retirement age)	1.336** [0.589]	0.042 [0.454]	3.03*	1.354***[0.523]	0.03 [0.403]	4.02**
Has to retire before 65	0.037 [0.068]	0.034 [0.050]	0.00	0.038 [0.064]	0.035 [0.046]	0.00
<b>Type of Contract:</b>						
Permanent, no risk of losing job	-0.182 [0.124]	-0.059 [0.047]	0.86	-0.186** [0.092]	-0.057 [0.047]	1.58
Permanent, risk, compensation	-0.080 [0.129]	-0.066 [0.054]	0.01	-0.086 [0.099]	-0.062 [0.052]	0.05
Permanent, risk, no compensation	-0.176 [0.140]	-0.028 [0.056]	0.96	-0.175 [0.107]	-0.026 [0.055]	1.54
Temporary, possibility to permanent	-0.054 [0.197]	-0.001 [0.087]	0.06	-0.055 [0.187]	0.002 [0.079]	0.08
Temporary, possibility to temporary	0.108 [0.174]	0.008 [0.070]	0.28	0.113 [0.149]	0.015 [0.069]	0.36
Temporary, no continuation	[Ref.]	[Ref.]		[Ref.]	[Ref.]	
<b>Working Schedules</b>						
Fixed working hours	-0.114 [0.091]	-0.005 [0.049]	1.11	-0.11 [0.095]	-0.011 [0.048]	0.88

Table 4 continued in next page

*Table 4 continued from last page*

	Union Workers		Non-Union Workers		Wald $\chi^2$ test	Union Workers		Non-Union Workers		Wald $\chi^2$ test
Rotating shifts	-0.029	[0.094]	0.059	[0.057]	0.65	-0.025	[0.093]	0.06	[0.055]	0.62
Variable, employee decides	-0.067	[0.114]	0.057	[0.059]	0.93	-0.063	[0.119]	0.049	[0.059]	0.71
Variable, negotiated	-0.124	[0.108]	0.017	[0.057]	1.33	-0.117	[0.105]	0.006	[0.057]	1.07
Variable, employer decides	[Ref.]		[Ref.]			[Ref.]		[Ref.]		
<u>Work Organisation</u>										
Job not in teamwork	0.003	[0.066]	-0.021	[0.033]	0.11	-0.001	[0.066]	-0.022	[0.033]	0.08
Job in varying teamwork	0.032	[0.058]	-0.034	[0.033]	0.96	0.032	[0.053]	-0.036	[0.033]	1.19
Job has a fixed routine	[Ref.]		[Ref.]			[Ref.]		[Ref.]		
<u>Control over Work</u>										
Job has a fixed routine	-0.072	[0.094]	0.05	[0.049]	1.33	-0.076	[0.096]	0.048	[0.053]	1.27
You can choose the order of tasks	0.009	[0.089]	0.04	[0.044]	0.10	0.005	[0.092]	0.037	[0.048]	0.10
No one controls your work	[Ref.]		[Ref.]			[Ref.]		[Ref.]		
<u>Work Intensity</u>										
Often working at high speed	-0.026	[0.077]	-0.05	[0.040]	0.07	-0.028	[0.076]	-0.048	[0.040]	0.06
Sometimes working at high speed	0.086	[0.068]	0.007	[0.035]	1.07	0.084	[0.066]	0.007	[0.035]	1.06
Never working at high speed	[Ref.]		[Ref.]			[Ref.]		[Ref.]		
Often tight deadlines	0.082	[0.074]	0.111***	[0.039]	0.12	0.081	[0.070]	0.109**	[0.042]	0.11
Sometimes tight deadlines	0.066	[0.070]	0.04	[0.037]	0.11	0.062	[0.068]	0.036	[0.039]	0.11
Never tight deadlines	[Ref.]		[Ref.]			[Ref.]		[Ref.]		
<b>III. Other Characteristics</b>										
Low education	-0.076	[0.098]	-0.073	[0.068]	0.00	-0.08	[0.099]	-0.075	[0.070]	0.00
Male	-0.036	[0.060]	0.034	[0.028]	1.13	-0.039	[0.051]	0.038	[0.027]	1.76
Married	0.111*	[0.057]	0.030	[0.027]	1.60	0.117**	[0.051]	0.030	[0.027]	2.29
Log(No. of children aged<16)	-0.024	[0.050]	-0.018	[0.026]	0.01	-0.026	[0.045]	-0.017	[0.026]	0.03
Log(Experience)	-0.066	[0.050]	-0.081***	[0.019]	0.08	-0.073	[0.051]	-0.079***	[0.018]	0.02
Log(Tenure)	0.009	[0.031]	0.006	[0.015]	0.01	0.010	[0.034]	0.010	[0.018]	0.00
Sector [4]	{+}		{+}			{+}		{+}		
Firm size [5]	{+}		{+}			{+}		{+}		
Occupations [11]	{+}		{+}			{+}		{+}		
Industry [17]	{+}		{+}			{+}		{+}		
Greece	-0.013	[0.085]	-0.035	[0.044]	0.05	-0.013	[0.079]	-0.036	[0.043]	0.07
Netherlands	0.003	[0.062]	0.102***	[0.031]	2.10	0.002	[0.059]	0.106***	[0.030]	2.43
United Kingdom	[Ref.]		[Ref.]			[Ref.]		[Ref.]		
Constant	-18.29***	[3.332]	-10.76***	[2.320]		-17.82***	[3.083]	-10.48***	[2.171]	
ln $\sigma$	-		-			-0.254***	[0.025]	-0.231***	[0.013]	
$\rho$	-		-			-0.042	[0.102]	0.020	[0.086]	

**C) Test Statistics (p-values in parentheses)**

Chow (Wald $\chi^2$ ) test	189.15***	(0.000)
Two-sample Kolmogorov-Smirnov test for equality of distribution functions	0.044****	(0.000)
Two-Sample Fligner-Policello Robust Rank Order Test	5.209***	(0.000)
1 <sup>st</sup> stage: Wald $\chi^2_{(2)}$ for joint significance of restrictions	145.73***	(0.000)
2 <sup>nd</sup> stage: Wald $F_{(2)}$ for joint significance of excluded	1.26 (0.285)	0.38 (0.685)
2 <sup>nd</sup> stage: LM $_{(2)}$ test for omitted variables	4.03 (0.133)	0.86 (0.650)
Wald $\chi^2$ test for independence ( $\rho=0$ )	0.23	(0.631)

Number of obs. (individuals)	2,968 (598)	9,341 (1,876)	12,309
R <sup>2</sup> (overall)	0.288	0.266	-
Log-likelihood	-	-	-19,511.5
$\sigma_u / \sigma_\varepsilon$	0.411 / 0.679	0.372 / 0.705	-
$\rho$	0.268	0.218	-
$\chi^2$	1,318.1***	3,867.7***	1,273.8***

**Notes:** \* p<0.10, \*\* p<0.05, \*\*\* p<0.01. The Loyalty/Wage ratio is derived as a point estimate and standard error for the non-linear combination of the estimates for the two attributes. The Wald  $\chi^2$  test is equal to:  $\frac{(Coef_{.UW} - Coef_{.NUW})^2}{S.E.^2_{UW} + S.E.^2_{NUW}}$ . The critical values from the  $\chi^2$ -distribution with one degree of freedom are: 1%: 6.635; 5%: 3.841; 10%: 2.706. The estimation method in the endogenous switching regression model is maximum-likelihood with robust standard errors, clustered at the individual level.



Table 5  
Loyalty: Vignette Evaluation

Specifications with: <i>Vignette Attributes</i>	(3)			(4)		
	COLS with Fixed Effects			Rank-Ordered Logit		
	Union Workers	Non-Union Workers	Wald $\chi^2$ test	Union Workers	Non-Union Workers	Wald $\chi^2$ test
<b>A) Calculated Trade-Off Ratios<sup>‡</sup>:</b>						
Loyalty/%Wage change	0.196*** [0.032]	0.119*** [0.016]	4.63**	0.215*** [0.034]	0.143*** [0.017]	3.59*
<b>B) Model Specification – Vignette Attributes</b>						
Loyalty and no shirking	0.213*** [0.032]	0.146*** [0.018]	3.33*	0.487*** [0.073]	0.347*** [0.040]	2.83*
% Net wage change	1.087*** [0.050]	1.223*** [0.029]	5.42**	2.262*** [0.119]	2.422*** [0.067]	1.37
Log(Weekly working hours)	6.715*** [1.315]	6.354*** [0.783]	0.06	16.867*** [3.017]	14.220*** [1.671]	0.59
Log(Week. work. hours) squared	-1.004*** [0.189]	-0.963*** [0.113]	0.04	-2.518*** [0.434]	-2.154*** [0.241]	0.54
Log(Days of training)	0.023** [0.011]	0.027*** [0.007]	0.11	0.063** [0.026]	0.066*** [0.015]	0.01
Age of retirement	-0.002 [0.006]	0.005 [0.003]	0.92	-0.004 [0.013]	0.016** [0.007]	1.90
Age of retirement squared	0.069 [0.093]	-0.024 [0.055]	0.76	0.182 [0.208]	-0.145 [0.115]	1.89
<u>Type of Contract:</u>						
Permanent, no risk of losing job	0.400*** [0.062]	0.316*** [0.036]	1.41	0.698*** [0.145]	0.575*** [0.078]	0.56
Permanent, risk, compensation	0.276*** [0.068]	0.107*** [0.040]	4.66**	0.435*** [0.155]	0.192** [0.084]	1.90
Permanent, risk, no compensation	0.044 [0.069]	0.052 [0.040]	0.01	0.117 [0.159]	0.102 [0.085]	0.01
Temporary, possibility to permanent	0.330*** [0.072]	0.193*** [0.043]	2.68*	0.534*** [0.169]	0.310*** [0.092]	1.36
Temporary, possibility to temporary	0.145** [0.058]	0.280*** [0.034]	4.06**	0.347*** [0.131]	0.543*** [0.073]	1.70
Temporary, no continuation	[Ref.]	[Ref.]		[Ref.]	[Ref.]	
<u>Working Schedules</u>						
Flexible working hours	0.109* [0.057]	0.127*** [0.033]	0.08	-0.057 [0.127]	0.202*** [0.070]	3.18*
Office working hours	-0.016 [0.049]	0.062** [0.029]	1.87	-0.241** [0.110]	0.051 [0.061]	5.41**
Rotating shifts	-0.150*** [0.045]	-0.110*** [0.026]	0.58	-0.455*** [0.102]	-0.255*** [0.056]	2.98*
Employer decides	[Ref.]	[Ref.]		[Ref.]	[Ref.]	
<u>Work Organisation</u>						
Job not in teamwork	0.125*** [0.037]	0.081*** [0.022]	1.07	0.341*** [0.083]	0.174*** [0.046]	3.06*
Job in varying teamwork	0.092** [0.037]	0.094*** [0.021]	0.01	0.280*** [0.085]	0.213*** [0.046]	0.48
Job has a fixed routine	[Ref.]	[Ref.]		[Ref.]	[Ref.]	
<u>Control over Work</u>						
Job has a fixed routine	-0.121*** [0.041]	-0.029 [0.024]	3.75*	-0.226** [0.091]	-0.086* [0.049]	1.83
You can choose the order of tasks	-0.091** [0.043]	0.012 [0.025]	4.23	-0.078 [0.094]	0.036 [0.052]	1.12
No one controls your work	[Ref.]	[Ref.]		[Ref.]	[Ref.]	
<u>Work Intensity</u>						
Often working at high speed	[Ref.]	[Ref.]		[Ref.]	[Ref.]	
Sometimes working at high speed	0.301*** [0.055]	0.117*** [0.032]	8.44***	0.848*** [0.124]	0.374*** [0.067]	11.32***
Never working at high speed	0.159*** [0.050]	0.044 [0.029]	3.87*	0.452*** [0.111]	0.131** [0.061]	6.40
Often tight deadlines	-0.06 [0.051]	-0.055* [0.030]	0.01	0.038 [0.114]	-0.055 [0.064]	0.51
Sometimes tight deadlines	0.127** [0.052]	0.083*** [0.031]	0.53	0.379*** [0.117]	0.269*** [0.064]	0.67
Never tight deadlines	0.144** [0.056]	0.135*** [0.032]	0.02	0.435*** [0.131]	0.418*** [0.071]	0.01
Constant	-12.01*** [2.286]	-11.16*** [1.362]		-	-	
Number of obs. (individuals)	3,312 (668)	10,559 (2,122)		3,312 (668)	10,559 (2,122)	
R <sup>2</sup> (pseudo/overall)	0.230	0.241		0.199	0.199	
$\sigma_u / \sigma_e$	0.541 0.682	0.506 0.710		- -	- -	
$\rho$	0.387	0.337		-	-	
Log-likelihood	-3,044.5	-10,170.6		-1,873.1	-6,228.3	
LR $\chi^2$ / F-stat	52.1***	162.7***		932.3***	3,090.9***	

**Notes:**

\* p<0.10, \*\* p<0.05, \*\*\* p<0.01. Coefficients and standard errors are shown.  
The comments at the bottom of Table 4 apply.

Table 6  
Voice: Job Satisfaction

	(1)	(2)	(3)	(4)	(5)
	Baseline	Industrial Relations	Tenure	Compensating Differentials	
Log(Net monthly wage)	0.062** [0.031]	0.057* [0.029]	0.062** [0.031]	0.052* [0.031]	0.035 [0.029]
Log(Weekly working hours)	-0.119** [0.053]	-0.116** [0.051]	-0.119** [0.053]	-0.096* [0.053]	-0.087* [0.051]
Log(Paid overtime hours)	0.046** [0.018]	0.041** [0.017]	0.046** [0.018]	0.054*** [0.018]	0.053*** [0.017]
Male	-0.065* [0.034]	-0.046 [0.032]	-0.065* [0.034]	-0.066** [0.033]	-0.058* [0.032]
Married	0.041 [0.033]	0.023 [0.031]	0.041 [0.033]	0.028 [0.032]	0.05 [0.031]
Log(Number of children aged<16)	0.011 [0.031]	-0.006 [0.029]	0.011 [0.031]	0.014 [0.030]	-0.015 [0.029]
Log(Experience)	0.056** [0.025]	0.048** [0.023]	0.056** [0.025]	0.059** [0.024]	0.040* [0.023]
Log(Tenure)	-0.035** [0.018]	-0.027 [0.017]	-0.037* [0.019]	-0.038** [0.018]	-0.041** [0.017]
Trade union member	-0.108*** [0.035]	-0.088*** [0.033]	-0.125 [0.079]	-0.084** [0.035]	-0.081** [0.033]
Good industrial relations	-	0.563*** [0.036]	-	-	-
Trade union member*Log(Tenure)	-	-	0.008 [0.033]	-	-
Log(No. of work-related injuries)	-	-	-	-0.189*** [0.048]	-
Log(No. of work-related illnesses)	-	-	-	-0.160*** [0.031]	-
Work intensity	-	-	-	-	-0.709*** [0.071]
Own idea implementation	-	-	-	-	0.290*** [0.027]
Repetitive work	-	-	-	-	-0.197*** [0.030]
Permanent Job	0.108** [0.044]	0.096** [0.042]	0.108** [0.044]	0.095** [0.044]	0.123*** [0.042]
Training during the last year	0.153*** [0.031]	0.128*** [0.029]	0.152*** [0.031]	0.148*** [0.030]	0.101*** [0.029]
Greece	0.275*** [0.046]	0.208*** [0.044]	0.276*** [0.046]	0.241*** [0.046]	0.425*** [0.045]
Netherlands	0.323*** [0.040]	0.338*** [0.038]	0.323*** [0.040]	0.312*** [0.039]	0.282*** [0.038]
Education [4]	{+}	{+}	{+}	{+}	{+}
Sector [4]	{+}	{+}	{+}	{+}	{+}
Firm size [5]	{+}	{+}	{+}	{+}	{+}
Occupation [11]	{+}	{+}	{+}	{+}	{+}
Industry [17]	{+}	{+}	{+}	{+}	{+}
Constant	{+}	{+}	{+}	{+}	{+}
No. of observations	2,479	2,479	2,479	2,479	2,460
R <sup>2</sup>	0.073	0.156	0.073	0.095	0.179
F-statistic	3.92***	9.00***	3.84***	5.02***	10.10***

Notes:

\* p<0.10, \*\* p<0.05, \*\*\* p<0.01.

COLS job satisfaction regressions. Coefficients and robust standard errors are presented in brackets. The results are robust to the use of an ordered probit model.

Table 7  
Propensity Score Estimates of Membership/Job Satisfaction Differentials

	<u>Nearest Neighbour Matching</u>		<u>Kernel-based Matching</u>	
	No Common Support	Common Support	No Common Support	Common Support
ATT	-0.084*	-0.085*	-0.090**	-0.090**
[S.E.]	[0.048]	[0.049]	[0.039]	[0.035]
t	1.77	1.72	2.27	2.53
# Treated	673	594	673	594
# Control	646	387	2,136	1,827

Notes:

Bootstrapped standard errors based on 100 replications are displayed for kernel-based matching.

The probit estimator used to generate the propensity scores conditions on variables that, we argue, are exogenous with respect to membership and are liable to affect both membership propensities and job satisfaction. The specification is presented in column 2 of Table A2 in the Appendix.

Table 8  
Exit-Voice: Quitting Intensions

	<u>Logit</u>	<u>Endogenous Switching Linear Probability Model</u>		<i>Wald <math>\chi^2</math></i>
	<i>Pooled</i>	<b>Union Workers</b>	<b>Non-Union Workers</b>	
Job satisfaction	-0.052*** [0.006]	-0.022** [0.009]	-0.049*** [0.005]	6.94***
Trade union member	-0.181** [0.075]	-	-	-
Job satisfaction*Trade union member	0.018 [0.013]	-	-	-
Log(Net monthly wage)	0.050** [0.025]	0.072* [0.040]	0.028 [0.024]	0.90
Log(Weekly working hours)	-0.171*** [0.043]	-0.13 [0.084]	-0.139*** [0.040]	0.01
Log(Paid overtime hours)	0.027* [0.014]	0.03 [0.020]	0.019 [0.014]	0.20
Male	0.058** [0.026]	0.087** [0.043]	0.048* [0.026]	0.59
Married	-0.076*** [0.025]	-0.045 [0.041]	-0.073*** [0.025]	0.34
Log(No. of children aged less than 16)	0.072*** [0.023]	0.116*** [0.036]	0.049** [0.023]	2.42
Log(Experience)	-0.110*** [0.019]	-0.088** [0.037]	-0.087*** [0.018]	0.01
Log(Tenure)	-0.087*** [0.014]	-0.106*** [0.024]	-0.050*** [0.015]	4.00**
Permanent job	0.141*** [0.028]	0.190*** [0.063]	0.113*** [0.032]	1.20
Training during the last year	0.015 [0.024]	-0.008 [0.035]	0.026 [0.024]	0.64
Greece	-0.221*** [0.030]	-0.211*** [0.056]	-0.177*** [0.036]	0.26
Netherlands	0.055* [0.031]	-0.105** [0.048]	0.098*** [0.032]	12.31***
Education [4]	{+}	{+}	{+}	
Sector [4]	{+}	{+}	{+}	
Firm size [5]	{+}	{+}	{+}	
Occupation [11]	{+}	{+}	{+}	
Industry [17]	{+}	{+}	{+}	
Constant	{+}	{+}	{+}	
$\ln\sigma$	-	-0.992*** [0.030]	-0.797*** [0.021]	
$\rho$	-	0.083 [0.136]	0.304** [0.144]	
Observed probability	0.3729	0.245	0.414	
Derivative adjustment factor	0.2338	-	-	
No. of observations	2,486	2,486		
Pseudo R <sup>2</sup>	0.168	-		
Log-likelihood	-1,366.7	-2,423.2		
LR $\chi^2$	550.5***	180.6***		

Notes:

\* p<0.10, \*\* p<0.05, \*\*\* p<0.01

The dependent variable is the intension to quit the firm in the near future. Marginal effects and robust standard errors are presented for the logit model; coefficients and robust standard errors for the linear probability model with endogenous switching. The first stage regression for union membership in the latter model is presented in *Column 3 of Table A2* in the Appendix.

Table A1  
Summary Statistics: Vignette Attributes

	Pooled Sample				Union Workers		Non-Union Workers	
	#Obs.	(#Inds.)			#Obs.	(#Inds.)	#Obs.	(#Inds.)
<b>I. Pseudo-panel sample size</b>	14,045	(2,809)			3,365	673	10,680	(2,136)
	<b>Mean</b>	<b>(St.Dev.)</b>	<b>Min</b>	<b>Max</b>	<b>Mean</b>	<b>(St.Dev.)</b>	<b>Mean</b>	<b>(St.Dev.)</b>
<b>II. Outcomes:</b>								
Vignette evaluation (Cardinalised)	-0.34	(0.93)	-2.063	2.063	-0.41	(0.92)	-0.31***	(0.93)
Vignette evaluation	4.07	(2.66)	0	10	3.86	(2.62)	4.14***	(2.66)
Vignette acceptability	31.5%	(0.46)	0	1	29.0%	(0.45)	32.3%***	(0.47)
<b>III. Vignette Attributes:</b>								
<u>Type of Contract:</u>								
Permanent, no risk of losing job	19.0%	(0.39)	0	1	19.2%	(0.39)	19.0%	(0.39)
Permanent, risk, compensation	11.6%	(0.32)	0	1	11.4%	(0.32)	11.6%	(0.32)
Permanent, risk, no compensation	19.0%	(0.39)	0	1	18.0%	(0.38)	19.3%*	(0.39)
Temporary, possibility to permanent	24.0%	(0.43)	0	1	24.7%	(0.43)	23.8%	(0.43)
Temporary, possibility to temporary	14.7%	(0.35)	0	1	14.9%	(0.36)	14.7%	(0.35)
Temporary, no continuation	11.7%	(0.32)	0	1	11.8%	(0.32)	11.6%	(0.32)
<u>Wages and Hours of Work:</u>								
Hours of work per week	36.09	(10.24)	20	50	36.10	(10.34)	36.09	(10.21)
Percentage wage change	-1.0%	(0.31)	-0.5	0.5	-1.2%	(0.31)	-0.9%	(0.31)
<u>Working Schedules</u>								
Flexible working hours	17.9%	(0.38)	0	1	18.4%	(0.39)	17.8%	(0.38)
Office working hours	28.4%	(0.45)	0	1	29.0%	(0.45)	28.2%	(0.45)
Rotating shifts	31.5%	(0.46)	0	1	31.0%	(0.46)	31.7%	(0.47)
Employer decides	22.2%	(0.42)	0	1	21.6%	(0.41)	22.3%	(0.42)
<u>Days of Training:</u>								
30-90 days	29.3%	(0.46)	0	1	29.0%	(0.45)	29.4%	(0.46)
5-10 days	45.1%	(0.50)	0	1	44.8%	(0.50)	45.2%	(0.50)
0-1 days	25.0%	(0.43)	0	1	25.6%	(0.44)	24.9%	(0.43)
<u>Work Organisation</u>								
Job not in teamwork	29.5%	(0.46)	0	1	29.9%	(0.46)	29.4%	(0.46)
Job in varying teamwork	29.6%	(0.46)	0	1	28.7%	(0.45)	29.9%	(0.46)
Job has a fixed routine	40.8%	(0.49)	0	1	41.4%	(0.49)	40.7%	(0.49)
<u>Control over Work</u>								
Job has a fixed routine	40.9%	(0.49)	0	1	41.6%	(0.49)	40.7%	(0.49)
You can choose the order of tasks	32.5%	(0.47)	0	1	32.3%	(0.47)	32.6%	(0.47)
No one controls your work	26.5%	(0.44)	0	1	26.2%	(0.44)	26.6%	(0.44)
<u>Work Intensity</u>								
Often working at high speed	28.3%	(0.45)	0	1	28.6%	(0.45)	28.2%	(0.45)
Sometimes working at high speed	12.5%	(0.33)	0	1	12.0%	(0.33)	12.7%	(0.33)
Never working at high speed	16.8%	(0.37)	0	1	16.8%	(0.37)	16.8%	(0.37)
Often tight deadlines	16.8%	(0.37)	0	1	16.9%	(0.38)	16.7%	(0.37)
Sometimes tight deadlines	15.7%	(0.36)	0	1	15.8%	(0.36)	15.7%	(0.36)
Never tight deadlines	9.4%	(0.29)	0	1	9.3%	(0.29)	9.4%	(0.29)
<u>Age of Retirement:</u>								
65 years of age	11.6%	(0.32)	0	1	12.2%	(0.33)	11.4%	(0.32)
60 years of age	25.2%	(0.43)	0	1	25.0%	(0.43)	25.3%	(0.43)
55 years of age	20.0%	(0.40)	0	1	19.8%	(0.40)	20.0%	(0.40)
No formal retirement age/Inapplicable	43.3%	(0.50)	0	1	43.1%	(0.50)	43.3%	(0.50)
<u>Behavioural Norms:</u>								
Loyalty and no shirking	55.9%	(0.50)	0	1	56.5%	(0.50)	55.7%	(0.50)
No loyalty and shirking	44.1%	(0.50)	0	1	43.5%	(0.50)	44.3%	(0.50)

Notes: \* p<0.10, \*\* p<0.05, \*\*\* p<0.01: From a t-test of differences in the means between union and non-union workers. For the ordinal vignette evaluation the difference between the two groups is significant at the 1% level, using a Mann-Whitney test, and a robust rank order test.

Table A2  
Trade Union Membership Regressions (1<sup>st</sup> stage) for the Endogenous Switching Models

	(1)		(2)		(3)	
<b>I. Instruments:</b>						
Union concentration	0.269***	[0.024]	0.274***	[0.023]	0.271***	[0.022]
Union recognition	0.068**	[0.033]	0.216***	[0.057]	0.218***	[0.055]
<b>II. Current Job Characteristics:</b>						
Log(Net monthly wage)	0.018	[0.018]	0.018	[0.018]	0.020	[0.019]
Log(Weekly working hours)	0.043	[0.035]	0.028	[0.034]	0.025	[0.034]
Log(Paid overtime hours)	-		0.013	[0.010]	0.015	[0.011]
Male	0.047**	[0.020]	0.049**	[0.020]	0.044**	[0.021]
Married	-0.019	[0.019]	-0.024	[0.019]	-0.023	[0.020]
Log(No. of children aged<16)	0.024	[0.017]	0.02	[0.018]	0.021	[0.018]
Log(Experience)	0.046***	[0.017]	0.049***	[0.017]	0.050***	[0.016]
Log(Tenure)	0.063***	[0.011]	0.064***	[0.011]	0.062***	[0.011]
Training during the last year	0.017	[0.019]	0.014	[0.019]	0.021	[0.019]
Job Satisfaction	-		-		-0.015***	[0.004]
<u>Education:</u>						
Low education	-0.060	[0.048]	-		-	
Pre-primary and primary	-		0.002	[0.028]	0.001	[0.028]
Lower secondary	-		-0.041	[0.029]	-0.043	[0.028]
Upper secondary	[Ref.]		[Ref.]		[Ref.]	
Post secondary non-tertiary	-		0.002	[0.022]	0.001	[0.022]
<u>Type of Contract:</u>						
Permanent contract	-		-0.039	[0.031]	-0.033	[0.031]
Permanent, no risk of losing job	-0.016	[0.039]	-		-	
Permanent, risk, compensation	0.009	[0.043]	-		-	
Permanent, risk, no compensation	0.007	[0.045]	-		-	
Temporary, possibility to permanent	0.086	[0.080]	-		-	
Temporary, possibility to temporary	0.064	[0.071]	-		-	
Temporary, no continuation	[Ref.]		-		-	
<u>Working Schedules</u>						
Fixed working hours	-0.077**	[0.035]	-		-	
Rotating shifts	0.002	[0.037]	-		-	
Variable, employee decides	-0.105***	[0.027]	-		-	
Variable, negotiated	-0.084***	[0.030]	-		-	
Variable, employer decides	[Ref.]		-		-	
<u>Work Organisation</u>						
Job not in teamwork	-0.015	[0.024]	-		-	
Job in varying teamwork	-0.034	[0.021]	-		-	
Job has a fixed routine	[Ref.]		-		-	
<u>Control over Work</u>						
Job has a fixed routine	0.015	[0.035]	-		-	
You can choose the order of tasks	-0.021	[0.032]	-		-	
No one controls your work	[Ref.]		-		-	
<u>Work Intensity:</u>						
Often working at high speed	-0.014	[0.029]	-		-	
Sometimes working at high speed	-0.010	[0.026]	-		-	
Never working at high speed	[Ref.]		-		-	
Often tight deadlines	-0.010	[0.029]	-		-	
Sometimes tight deadlines	-0.004	[0.028]	-		-	
Never tight deadlines	[Ref.]		-		-	
<u>Retirement:</u>						
Log(Formal retirement age)	0.045	[0.265]	-		-	
Has to retire younger than 65	0.052	[0.032]	-		-	
<b>III. Vignette Attributes:</b>						
Log(Weekly working hours)	-0.596	[0.363]	-		-	
Log(Weekly working hours) squared	0.089*	[0.052]	-		-	

*Table A2 continued in next page*

*Table A2 continued from last page*

% Net wage change	-0.007	[0.011]	-	-
Log(Days of training)	-0.003	[0.003]	-	-
Age of retirement	-0.001	[0.001]	-	-
Age of retirement squared	0.018	[0.018]	-	-
Loyalty and no shirking	0.003	[0.006]	-	-
<u>Type of Contract:</u>				
Permanent, no risk of losing job	0.009	[0.013]	-	-
Permanent, risk, compensation	0.005	[0.015]	-	-
Permanent, risk, no compensation	-0.014	[0.017]	-	-
Temporary, possibility to permanent	0.014	[0.021]	-	-
Temporary, possibility to temporary	0.012	[0.015]	-	-
Temporary, no continuation	[Ref.]			
<u>Working Schedules</u>				
Flexible working hours	0.007	[0.017]	-	-
Office working hours	0.007	[0.015]	-	-
Rotating shifts	0.002	[0.011]	-	-
Employer decides	[Ref.]			
<u>Work Organisation</u>				
Job not in teamwork	-0.006	[0.009]	-	-
Job in varying teamwork	-0.013	[0.009]	-	-
Job has a fixed routine	[Ref.]			
<u>Control over Work</u>				
Job has a fixed routine	-0.01	[0.011]	-	-
You can choose the order of tasks	-0.011	[0.012]	-	-
No one controls your work	[Ref.]			
<u>Work Intensity</u>				
Often working at high speed	[Ref.]			
Sometimes working at high speed	-0.003	[0.014]	-	-
Never working at high speed	-0.006	[0.014]	-	-
Often tight deadlines	0.003	[0.015]	-	-
Sometimes tight deadlines	-0.010	[0.014]	-	-
Never tight deadlines	-0.011	[0.012]	-	-
<b>IV. Other Control Variables:</b>				
Sector [4]	{+}		{+}	{+}
Firm size [5]	{+}		{+}	{+}
Occupation [11]	{+}		{+}	{+}
Industry [17]	{+}		{+}	{+}
Country [3]	{+}		{+}	{+}
Constant	{+}		{+}	{+}
Average predicted probability	0.2426		0.2413	0.2402
Derivative adjustment factor	0.1837		0.1831	0.1825
Observed probability	0.2418		0.2404	0.2396
No. of observations	12,385		2,471	2,479
Pseudo R <sup>2</sup>	0.265		0.252	0.258
Log-likelihood	-5,033.6		-1,019.4	-1,013.3
$\chi^2$	605.9***		519.2***	703.4***

Notes: \* p<0.10, \*\* p<0.05, \*\*\* p<0.01. Dependent variable: Trade union membership. Marginal effects and robust standard errors from probit models. Model I has clustered standard errors at the individual level. The corresponding 2<sup>nd</sup> stage equations are for: (1) Vignette Evaluation (*Table 5*); (2) Job satisfaction (*Table 7*); (3) Quitting intention (*Table 8*).