



**HAL**  
open science

# Green not (only) for profit: an empirical examination of the effect of environmental-related standards on employees' recruitment

Gilles Grolleau, Naoufel Mzoughi, Sanja Pekovic

## ► To cite this version:

Gilles Grolleau, Naoufel Mzoughi, Sanja Pekovic. Green not (only) for profit: an empirical examination of the effect of environmental-related standards on employees' recruitment. *Resource and Energy Economics*, 2012, 34 (1), pp.74–92. 10.1016/j.reseneeco.2011.10.002 . hal-01994856

**HAL Id: hal-01994856**

**<https://institut-agro-montpellier.hal.science/hal-01994856>**

Submitted on 12 Sep 2023

**HAL** is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

**Green Not (only) for Profit: An Empirical Examination of the Effect of Environmental-Related Standards on Employees' Recruitment**

Gilles Grolleau

Supagro, UMR 1135 LAMETA, F-34060 Montpellier

[grolleau@supagro.inra.fr](mailto:grolleau@supagro.inra.fr)

Naoufel Mzoughi

INRA, UR 767 Ecodéveloppement, 84914 Avignon Cedex 9, France

[nmzoughi@avignon.inra.fr](mailto:nmzoughi@avignon.inra.fr)

Sanja Pekovic

Centre d'étude de l'emploi and University Paris-EST Marne-La-Vallée, F-77454 Marne-La-Vallée

[sanja.pekovic@cee.enpc.fr](mailto:sanja.pekovic@cee.enpc.fr)

**Abstract:** Thanks to an original database on French firms we investigate the impact of environmental-related standards on employees' recruitment. Using a bivariate probit model, we show that voluntary environmental-related standards (*i.e.*, ISO 14001 standard, organic labeling, fair trade, etc.) improve the recruitment of professional and non-professional employees. This finding suggests that, beyond environmental considerations, human resources management can drive registration.

**Key words:** environmental-related standards, recruitment.

**JEL codes:** Q50, J20.

## **Green Not (only) for Profit: An Empirical Examination of the Effect of Environmental-Related Standards on Employees' Recruitment**

*'Environmental initiatives are having a direct impact on companies' ability to recruit the best staff, and are an increasingly important factor in retaining them.'* (*The Sunday Times*, May 11, 2008)

### **1. Introductory remarks and related literature**

In a well-known contribution, the Nobel laureate in economics Milton Friedman (1970) argued that 'there is one and only one social responsibility of business –to use its resources and engage in activities designed to increase its profits so long as it stays within the rules of the game'. In the same vein, Blinder (1987, quoted by Arora and Gangopadhyay, 1995) stated that 'the conventional wisdom in the environmental literature goes as follows: 'If the law says that the firm can emit up to 500 tons of glop per year, it has no reason to spend a penny to reduce its discharges to 499 tons''. Nevertheless, the empirical evidence shows that numerous firms exhibit their voluntary social responsibility commitments. This evidence is notably reflected in the sizeable economics literature devoted to firms' proactivities, especially the adoption of environmental-related standards (Nakamura *et al.*, 2001; Anton *et al.*, 2004; Grolleau *et al.*, 2007). Environmental standards are intended to motivate any organization to be 'clean and green'. They are generally voluntary and based on the principle of continuous improvement. The ISO 14001 standard is the most widespread environmental-related standard. It prescribes how a firm can develop an environmental policy, identify environmental aspects and impacts of its activities, products and services, define the significance of these impacts, rank them, identify legal and other requirements governing the organization's operation, establish objectives and targets, implement programs to meet those standards, establish an auditing system and procedures for management review and implement corrective action, if needed (Grolleau *et al.*, 2007). The latest data available indicates that up to December 2008, at least 188,815 ISO 14001 certificates had been issued in 155 countries ([www.iso.org](http://www.iso.org), accessed on September 27, 2010).

In line with the Porter hypothesis, several scholars have emphasized possible economic and environmental benefits resulting from well-crafted voluntary initiatives, such as environmental-related standards (Porter and van Der Linde, 1995; Klassen and McLaughlin, 1996; Hart, 1997; Reinhardt, 2000; Dowell *et al.*, 2000). In a recent survey, Ambec and Lanoie (2008) listed seven channels through which environmental standards may raise the benefits of firms or cut their costs: better access to markets, possibility for differentiation of products, commercialization of pollution-control technology, savings on regulatory, material energy and services, capital, and labor costs. Noteworthy, this should not occult the fact that implementing environmental standards or voluntary codes can also

be time-consuming, costly and mainly window-dressing rather than delivering expected results in terms of environmental performance (Howard *et al.*, 2000).

Among economic benefits, a relatively neglected area is *whether and how* environment-related standards improve human resource management. For example, the multinational corporation, Dole Food Co. Inc. reported that ‘key benefits [of adopting environmental management systems] include strong employee motivation and loyalty which translates into reduced absenteeism and improved productivity’.<sup>1</sup> In the same vein, Grolleau *et al.* (2007, see also Darnall *et al.*, 2000) showed that ISO 14001 registration among French agrofood firms was mainly driven by the desire to improve human resource management. Among the several dimensions of human resource management likely to be affected by the adoption of environmental-related standards, recruitment is an excellent candidate. For instance, according to Turban and Cable (2003), attracting good applicants is considered as the most important human resource management practice. Hence, the aim of this paper is to investigate for whether recruitment is enhanced when a firm has adopted environmental-related standards. Such an enhancement implies that environmental standards deliver more than environmental benefits and firms can strategically use them for their ability to generate win-win opportunities.

Attracting top candidates may be easier for firms known for their environmental stewardship or corporate social performance (CSP), more generally. Backhaus *et al.*,’s (2002) study suggests that CSP is an important attribute for job seekers. Moreover, the authors argue that, among several dimensions, environment and community relations have the largest effects on firm attractiveness. Bauer and Aiman-Smith (1996) show that a firm’s proactive environmental stance is positively related to its attractiveness, intentions to pursue employment with that company and acceptance of a job offer. Investigating different job-seeking groups, Schmidt-Albinger and Freeman (2000) conclude that not only CSP is positively related to firm’s attractiveness but also this CSP effect is larger when the firm seeks to attract highly educated applicants with a high level of job choice. Interestingly, even Friedman conceded that ‘it may well be in the long run interest of a corporation that is a major employer in a small community to devote resources to providing amenities to that community or to improving its government. That may *make it easier to attract desirable employees* (emphasis added by the authors), it may reduce the wage bill or lessen losses from pilferage and sabotage or have other worthwhile effects.’ McKinsey (1991, quoted by Gladwin, 1993) surveyed 403 senior executives from around the world and found that 68% of them think that ‘organizations with a poor environmental record will find it increasingly difficult to recruit and retain high caliber employees’. Improvement of

---

<sup>1</sup> Anonymous, 2001, Dole Reports Motivation, Health and Safety, and Productivity Benefits from ISO 14001. ISO Management Systems—*The International Review of ISO 9000 and ISO 14000*, December, 56-58.

safety conditions through environmental standards is likely to attract employees (see also *The Sunday Times*, May 11, 2008).

Building notably on signaling theory (Spence, 1973), Turban and Greening (1997, 2000) argue that CSP may provide a competitive advantage in attracting good job applicants. The authors underline that CSP sends signals to job applicants about what it would be like to work for a given firm. Similarly, Brekke and Nyborg (2008) demonstrated that firms may be able to use their 'green' profile as a screening device to attract more productive workers. According to Rynes *et al.* (1991), the environmental signals are important in the early stages of the job selection process because good candidates may be more attracted if they perceive positive signals about the firm. Noteworthy, the individual's behavior or aspirations in a given domain (for example, protecting the environment) could be an indicator of his behavior in another domain (for example, working harder which in turn increases profitability) (Porter and Kramer, 2006).

Moreover, several authors argue that people prefer working for companies they regard as ethical and responsible, in firms that fit the image they would like to give to themselves (Frank, 2003; Akerlof and Kranton, 2005). For instance, Dechant and Altman (1994) argue that employees perceptions of a firm's environmental behavior and whether it fits their values profile affects their willingness to work for that firm. Crifo and Diaye (2010) also demonstrate that non monetary incentives (fringe benefits, status, identity or self-image) play an important role in a firm's employment policy. Assuming that individual's utility increases with their altruistic behavior, Frank (2003, see also Brekke and Nyborg, 2008) contends that if the wages in two companies are the same, there would be an excess supply of applicants to the socially responsible company. In equilibrium, the less altruistic jobs are expected to offer a compensating wage premium. Therefore, altruistic individuals are likely to accept lower wages, and thus allow the firm to balance the cost of its socially responsible operations. Frank's (2003) survey results show that 88 percent of socially concerned respondents would prefer a job for the American Cancer Society rather than for Camel Cigarettes with an average compensating wage premium of about \$ 24.000 per year. In the same vein, Judge and Bretz (1992) indicate that while pay, promotional opportunities and the type of work are important predictors of job choice intentions, they are less important than firm values. According to Turban and Greening (1997, 2000), job applicants have better self-images when working for socially responsive firms over their less responsive counterparts.

A related argument can be found in the conceptual framework proposed by Margolis (1982), where individuals have two utility functions, one motivated by egoistic considerations and the other motivated by altruistic considerations. Their behavior depends therefore on the trade-off between these two functions. Environmental standards by their nature call for the altruistic utility function. Indeed, individuals would prefer socially responsible companies to reduce their cognitive dissonance, *i.e.*,

attenuate the possible intrinsic conflict between their employees' preferences (such as earning a high wage) and their citizens' preferences (such as clean environment).

Given the previous discussion, we test whether *ceteris paribus* environmental-related standards improve companies' recruitment.<sup>2</sup> The remainder of this paper is organized as follows. Section 2 presents the data and model specification. The results are provided and discussed in section 3. Section 4 concludes and suggests policy and managerial implications.

## **2. Data and model specification**

The data is extracted from the French Organizational Changes and Computerization's (COI) 2006 survey.<sup>3</sup> This survey was created by researchers and statisticians from the National Institute for Statistics and Economic Studies, the Ministry of Labor and the Center for Labor Studies. The original dataset included a representative sample of 13 790 private firms located in France from all industries except agriculture, forestry and fishing. Firms were asked to fill in a self-administrated questionnaire concerning the utilization of information technologies and work organizational practices in 2006, and changes that have occurred since 2003. Firms were also interviewed on the economic goals of organizational change and the economic context in which those decisions were made. The question about recruitment was stated as follows: 'Do you have difficulties in recruiting?' Two categories of employees are distinguished: (1) professional employees other than computer specialists, and (2) non-professional employees. For each category of employees, the surveyed firms had to answer either on a 4-point scale, ranging from 'no difficulties' to 'very high difficulties', or choose 'no recruitment'. Because two variables, namely the average wage and exports (see description below), were not available in the COI database, we merged it with two other French databases, that is, the Annual Statement of Social Data (DADS) and the Annual Enterprise Survey (EAE) to obtain information about wages and export, respectively. The final dataset includes 10 840 firms.

The dependent variables, denoted *PROFESSIONAL EMPLOYEES* and *NON-PROFESSIONAL EMPLOYEES*, are binary variables equal to 1 if the firm has no or weak problems of recruiting professional and non-professional employees, respectively. To test the main hypothesis of the paper,

---

<sup>2</sup> One can argue that if the less altruistic jobs are expected to offer a compensating wage premium, while altruistic individuals are likely to accept lower wages, and if the wage reflects this sufficiently, less altruistic jobs with higher wages are indifferent to altruistic jobs with lower wages to the employees. If environmental-related standards improve companies' recruitment process, this can indicate that the wage does not sufficiently adjust to difference in between less altruistic jobs and altruistic jobs. The wage adjustment can be imperfect notably because intrinsic motivations cannot always be translated into monetary tradeoffs (Frey, 1994).

<sup>3</sup> More details about the design and scope of this survey are available on [www.enquetecoi.net](http://www.enquetecoi.net). : Survey COI-TIC 2006-INSEE-CEE/Treatments CEE.

that is, environmental-related standards improve companies' recruitment *ceteris paribus*, we use the variable denoted *STANDARDS*, which is a binary variable equal to 1 if the firm was registered according to one of the following standards, *i.e.*, ISO 14001 standard, organic labeling, fair trade, etc., in 2006. Unfortunately, we cannot distinguish between those standards, since they were put together in the survey under the same name.

Several factors that are likely to influence the recruitment serve as control variables. First, the ease of recruitment is likely to vary across sectors. Some sectors are more attractive than others for a variety of reasons such as better wages and better working conditions compared to a similar position in another sector. Some sectors can also benefit from the fact that job seekers prefer working for companies they regard as corresponding to their values and expectations. The sector effect is tested using the variable *ACTIVITY*. According to the French Nomenclature, we consider 11 sectors: agrifood, consumption goods, cars and equipments, intermediate goods, energy, construction, commercial, transport, financial and real-estate activities, services for firms and services for individuals. We do not formulate predictions regarding which sectors experience more or less difficulties in recruiting employees. Despite its interest, this issue is beyond the scope of this paper.

Second, the firm size is likely to influence the recruitment of employees. Among other advantages, bigger firms frequently have more financial resources, more human resources, have access to various recruiting channels and can offer better promotion opportunities or services, resulting in being more attractive to job seekers, compared to smaller firms (Atkinson and Storey, 1994). The effect of firm size, broadly considered, is tested through the variables *SIZE* (number of employees), *GROUP* (belonging to a group) and *NETWORK* (belonging to a business network such as a franchise network).

Third, wages offered by firms (*WAGE*) may have an impact on recruitment. Higher wages are likely to attract more candidates. According to Phelps (1968), when firms are confronted with a difficulty to fulfill jobs they may respond by offering higher wages compared to wages paid elsewhere, in order to encourage potential candidates to choose their company.<sup>4</sup>

Fourth, firms registered for a quality standard (QS) might experience fewer difficulties in recruiting employees. Key features of QS include increased employees participation in decision-making

---

<sup>4</sup> One may argue this would be reversed causality, *i.e.*, wages would be endogenous. A way to deal with this issue is to model *WAGE*, that is, analyze its determinants and then introduce it in our model. Nevertheless, our data-set does not include the appropriate variables to conduct such analysis. In addition, as described below, such models need an instrumental variable, that is, one that may explain wages and not recruitment, which is also not available in our database.

procedures, improved job satisfaction and security, greater autonomy, and better communication between employees, which are likely to attract potential employees (Hackman and Wageman, 1995). This effect is tested using two variables: *ISO9 2003* (registration according to the standard ISO 9001, EAQF, etc. in 2003) and *ISO9 2006* (registration according to the standard ISO 9001, EAQF, etc. in 2006).<sup>5</sup> These variables allow taking into account potential correlation within firms between environmental and organizational issues, that is, if potential employees are only sensitive to the effects resulting from these organizational improvements and insensitive to the environmental effects, then the adoption of an environmental standard in addition to a quality standard will not improve the recruitment process.

Fifth, firms that relocate abroad a part of their business might have less problems of recruitment since they are visible to a larger pool of workers from which they can potentially attract applicants. This is especially true for vacancies where the pool of appropriate local applicants is too small (Saunders, 1990). These firms may also hold many attractive characteristics for job-seekers such as more varied career opportunities, in addition to working abroad, which may be attractive *per se*. This effect is tested using the variable *RELOCATION* which captures whether the firm has an office or plant abroad.

Finally, it is possible that potential employees prefer working in more profitable firms. Several scholars (*e.g.*, Fombrun and Shanley, 1990) indicate that a firm's position compared to its rivals, for example in terms of economic performance, is a major component of early job choice decisions. In order to control for this effect, we use the variable *PERFORMANCE* which indicates how the market of the main activity of the firm has evolved between 2003 and 2006, that is, whether it is going down, steady or growing.

Noteworthy, the same unobservable factors may have an impact on both employees' recruitment and the firm's likelihood to register for environmental-related standards. Previous studies (*e.g.*, Arora and Cason, 1995; Nakamura *et al.*, 2001 ; Grolleau *et al.*, 2007; Arimura *et al.*, 2008) show that the firm size, ISO 9001 registration and the main activity of a firm are positively related to participation in environmental-related standards such as ISO 14001. Grolleau and Mzoughi (2005) argue that achieving scale economies by applying the same standard in all production units regardless of the location can drive firms to adopt environmental-related standards. Thus, we apply a bivariate probit model in order to correct for endogeneity (Greene, 2003).<sup>6</sup> The model relies on a simultaneous

---

<sup>5</sup> Due to data limitations we cannot investigate the effect of all the variables over time.

<sup>6</sup> Results from a simple logistic regression are also available from the authors upon request. These results are similar to those obtained with the bivariate probit model. Nevertheless, we preferred not to use a logit model because it is not sufficient to solve the endogeneity issue (Greene, 2003).

estimation approach in which the factors that determine a firm's environmental registration are estimated simultaneously with the factors that determine recruitment. The two equations are jointly estimated using maximum likelihood. The variables used in estimation, their definitions and sample statistics are presented in Table 1. We also present a crosstab analysis of the interdependence between the variable *STANDARDS* and control variables. No problem of multicollinearity has been detected (Appendix 1).

[Insert Table 1 around here]

Our observed variables,  $Y_1$  and  $Y_2$ , corresponding respectively to environmental-related standards and recruitment are defined by:

$$\begin{aligned} Y_1 &= 1 && \text{if } Y_1^* > 0, \\ Y_1 &= 0 && \text{otherwise.} \end{aligned} \quad (1)$$

$$\begin{aligned} Y_2 &= 1 && \text{if } Y_2^* > 0, \\ Y_2 &= 0 && \text{otherwise.} \end{aligned} \quad (2)$$

$Y_1^*$  and  $Y_2^*$  are latent variables influencing the probability of registration with environmental-related standards and employees' recruitment, respectively. We consider the following bivariate probit model:

$$\begin{cases} Y_1^* = \alpha_1 + \beta_1 X_1 + \delta Z_1 + \mu_1 \\ Y_2^* = \alpha_2 + \beta_2 X_2 + \gamma Y_1 + \mu_2 \end{cases} \quad (3)$$

where  $x_1$  is a vector of exogenous variables including a constant firm's characteristics (*ACTIVITY*, *SIZE*, *GROUP*, *NETWORK*, *ISO9 2003*, *ISO9 2006*, *RELOCATION* and *PERFORMANCE*).  $x_2$  encompasses the exogenous variables in  $x_1$  and *WAGE*.  $\beta_1$ ,  $\beta_2$ ,  $\delta$  and  $\gamma$  are slope coefficients to be estimated.  $\alpha_1$ ,  $\alpha_2$ ,  $\mu_1$  and  $\mu_2$  are the intercepts and disturbance terms for the two equations, respectively. Finally, the vector of variables  $z_1$  represents the instrumental variable which usually guarantees the identification of the model and helps to estimate correlation coefficients (Maddala, 1983). Indeed, in order to identify the bivariate probit, we generally need an additional variable that will explain the probability of environmental-related standards but not relevant to explain recruitment.<sup>7</sup> In this paper, we use the share of exports in total sales (*EXPORT*) as an instrumental variable. Signaling or screening rationales (Spence, 1973) can explain why exportation affects adoption of environmental-related standards (see Bellesi *et al.*, 2005 for empirical evidence). Firms that have distant customers are more likely to prove their environmental commitment through institutional devices like environmentally-related standards because firms' environmental performance is frequently unobservable, especially to customers located in areas which are institutionally,

---

<sup>7</sup> Wilde (2001) states that to achieve identification it is sufficient in recursive bivariate probit models that each equation includes one varying exogenous regressor.

geographically and culturally different. In other words, environmental standards may prove the ability of the supplier to meet environmental expectations of customers and make public unobservable attributes (Grolleau *et al.*, 2007). Noteworthy, it is also plausible that the destination of exports matters. In order to partly capture this effect, we use the variable *DESTINATION* to distinguish between different groups of sales destinations, that is, whether the firm operates on (1) the local, regional and national market, (2) European Union market, or (3) international market.<sup>8</sup> However, we do not expect *a priori* an effect of exports on employees' recruitment. Moreover, even if a potential effect exists it can be captured by the variable *WAGE*, used as a control variable. Indeed, since the contribution of Bernard and Jensen (1995), some empirical studies showed that average wages in exporting firms are higher than in non-exporting firms from the same industry and region (for a recent review of the literature, see Schank *et al.*, 2007).

Residuals of the equations above follow a normal bivariate distribution with zero means and a covariance matrix that writes, after normalizations to 1 of the diagonal elements, as follows:

$$\begin{pmatrix} \mu_1 \\ \mu_2 \end{pmatrix} \rightarrow N(0, \Sigma), \text{ where } \Sigma = \begin{pmatrix} 1 & \rho_{12} \\ \rho_{12} & 1 \end{pmatrix}$$

In estimating the interrelationship, a bivariate probit model produces '*rho*' from the first portion of the model estimation. When *rho* is statistically different from zero, that is, the probability that a relationship exists between environmental-related standards and recruitment, simultaneous estimation procedures are essential to appropriate estimation.

### 3. Results and discussion

Bivariate probit estimation results are presented in Tables 2 and 3, together with goodness-of-fit measures (Maximum-Likelihood estimation). We also report marginal and average treatment effects for the variable *STANDARDS*. As it is common for discrete variables, the marginal effect is calculated as the difference between the probabilities estimated at the sample means when the dummy variable takes the values of 1 and 0, respectively. The average treatment effect is the average difference between the probability that a firm improves its recruitment when it is registered for an environmental standard and the probability that it improves its recruitment when it is not registered for an environmental standard (the firms are randomly selected in the sample). Hence, the average treatment effect equals:

---

<sup>8</sup> This variable does not perfectly capture the destination effect, since these destinations are not exclusive, that is, firms may operate on the three markets. More precisely, firms in the survey were asked to give a yes/no answer to each of the three following questions: do you operate on local market? Do you operate on EU market? Do you operate on international (other than EU) market?

$$\frac{1}{N} \sum_{i=1}^N [\Phi(\alpha_2 + X_{2i}\beta_2 + \gamma) - \Phi(\alpha_2 + X_{2i}\beta_2)] \quad (4)$$

[Insert Tables 2 and 3 around here]

In both models *rho* is significantly different from 0. This means that the variable *STANDARDS* is endogenous and it confirms the interest in using the bivariate probit model. The negative sign of correlation coefficients implies that the unobserved factors that increase the probability of environmental-related registration also decrease professional or non-professional recruitment propensity. This unexpected finding may be plausible. For instance, if the firm is located in an area characterized by a high industrial waste and pollution, this will increase the firm's probability to adopt environmental-related standards to better deal with environmental issues or due to external pressure, but also discourage potential candidates who might fear pollution. As suggested by one of the reviewers, this issue might be resolved using regional dummies. Unfortunately, our data does not allow us to take into account such considerations. Moreover, using a Rivers-Vuong test (not reported) we find that the presence of endogeneity cannot be rejected since the residuals are significant for professional and non-professional employees.

We first present the estimation results regarding the factors that may influence firms to adopt environmental-related standards. The results are similar for both models, that is, for professional and non-professional employees. As expected, the variables *SIZE*, *GROUP*, *ISO9 2003*, *ISO9 2006* and *RELOCATION* are significant at the 1% level. Marginal effects indicate that the ISO 9000 standard registration has the largest impact on environmentally-related standards adoption. For instance, implementation of a quality standard in 2006 raises firms' probability to adopt an environmental-related standard by 0.19 and 0.21 points when considering professional and non-professional employees, respectively. Belonging to a network was found to have a negative impact on environmental-related standards adoption. Firms' economic performance has not an important impact on adoption of environmental-related standards, since the variable *GROWING* is only significant (at the 10% level) when considering non-professional employees. Two sectors, that is, intermediate goods and energy, are more sensitive to the registration of environmental-related standards (not reported). Finally, as expected our instrumental variables are positive and significant for both models, even if the variable *DESTINATION* is only significant at the 10% level. Presumably, a more refined analysis of firms' sales destinations is needed to get a more clear-cut conclusion.

The main hypothesis of the paper, that is, environmental-related standards have an impact on recruitment, is confirmed for professional and non-professional employees, since the variable *STANDARDS* is significant at the 1% level and has the largest marginal effect in both models. This result is consistent with that of several studies (*e.g.*, Grolleau *et al.*, 2007) which showed that improvement of human resource management is one of the major drivers of environmental

management systems registration. Nevertheless, the estimated average treatment (and marginal) effects of environmental standards are very large from an economic point of view. If wages would compensate fully for less altruistic jobs, then the effect should be zero after controlling for wages. This issue deserves further attention, even if wage adjustment can be imperfect (see footnote 2). Nevertheless, regardless of their level, our main focus is on the sign of the estimated average treatment effects which confirms a positive effect of environmental standards on recruitment. Taking this into account, average treatment effects unexpectedly show that the hypothesis is relatively less supported for professional employees than non-professional ones. Firms with environmental-related standards are 47 percent points (respectively 79 percent points) more likely to improve recruitment of professional employees (respectively non-professional employees) compared to firms without environmental-related standards.<sup>9</sup> This result may indicate that professional employees do not pay attention to environmental-related standards as non-professional employees may do. Alternatively, professional employees who are generally more educated might have developed a cynical view about companies' efforts to be/seem greener. If professional employees assume that the company has ulterior motives for its environmental initiatives beyond the call of greenness and if they suspect manipulation, that can lessen the positive effects of environmental proactivities.<sup>10</sup>

Our analysis provides also information about other determinants of recruitment. The results are similar for both models. Surprisingly, the variable *SIZE* is significant only when considering non-professional employees. The variables *GROUP*, *NETWORK* and *WAGE* are significant, as expected. In other words, big firms, firms who belong to a group or a network, and firms who offer higher wages have fewer problems in recruiting employees. The marginal effects of 0.07 and 0.09 for *WAGE* indicate that this variable has a slightly more important impact on recruitment, compared to other control variables. The variables *ISO9 2003* and *ISO9 2006* are significant but their signs are negative. This result can be explained by the divergence between promises and real impacts of adopting an ISO 9001 standard. Several authors (*e.g.*, Lasfargues, 1994) argue that ISO 9001 rarely delivers the expected benefits and the adoption process reduces employees' autonomy and flexibility, impedes creativity because of formal procedures, is red tape generating and time-consuming and frequently constitutes a source of

---

<sup>9</sup> As suggested by one of the reviewers, the significantly high magnitude of the estimated relationship for both professional and non-professional employees could be explained by the fact that the variable size is presented in the (unlogged) continuous form. To check this issue, we have included a finer set of firm size categories (6 dummies). The results (not reported) confirm this conjecture, since the main results remain unchanged while the magnitude of the estimated relationship decreases significantly at 22 percent points (respectively 28 percent points) for professional employees (respectively non-professional employees). These results are available from authors upon request.

<sup>10</sup> A recent literature stressed that beyond outcomes people devote significant attention to underlying intentions and motivations, especially if they are aged (*e.g.*, Sutter, 2007 and references therein).

stress at the workplace, especially at audit times. If job seekers are informed about these presumed real effects of ISO 9001, they may be less interested to apply to firms where the standard is implemented. The variable *RELOCATION* has no impact on recruitment of professional and non-professional employees. This result may be explained by the fact that we do not take into account the reasons behind relocation. For instance, if a firm relocates a part of its business in order to lower wage rates, which are an often quoted reason for relocating labor-intensive divisions, it might experience a difficulty to attract professional employees. Moreover, when the market of the firm's main activity got down between 2003 and 2006, recruitment of professional and non-professional employees is more difficult, as expected, the variable *DOWN* being significant and its signs negative. However, when the market has grown (*GROWING*), the firm has only a difficulty to recruit non-professional employees. This result may be due to the fact that firms mainly respond to market growth by adjusting the number non-professional employees. Furthermore, when considering non-professional employees, the variable *ACTIVITY* (not reported in Tables 2 and 3) is significant for 3 sectors: consumption goods, services for firms and services for individuals. This result can be explained by the fact that usually in those sectors employers use more 'word-of-mouth' (that is, informal) recruitment methods –via relatives, friends, current employees and people already known as workers at other firms (e.g., suppliers/competitors) (Goodman *et al.*, 1998). An implication of this result could be that sectors/firms seeking highly professional employees are more likely to benefit from adopting environmental-related standards than the others, notably in terms of facilitated recruitment.

Finally, several versions of the model have been estimated to investigate the robustness of results (see Appendix 2). In models 1, 2 and 3, the variables measuring the firm's size, presence of a quality standard and relocation have been successively omitted. Moreover, since the variable *EXPORT* is continuous, it may seem that it is more likely to capture firm size than export *per se*. To check this issue, we tested two models including exportation as a dummy variable and in a quadratic form, respectively (models 4 and 5). Models 6 and 7 repeat the basic analysis considering only small or medium sized firms, respectively. Generally, the main results remain unchanged. The impact of environmental-related standards turns to be insignificant only when repeating the analysis for medium sized firms separately. This result could be explained by the elimination of an important number of firms or a selection problem. We have also run the models using two-stage least squares (2SLS), which does not rely on the normality assumption (see Appendix 3). The results also stand up in this case.

#### **4. Concluding remarks**

Our empirical investigation shows that firm's environmental commitments matter to good people management. More precisely, environmental-related standards can deliver benefits beyond environmental considerations such as contributing to successful recruitment which may in turn

improve business performance (Huselid, 1995). It confirms previous findings suggesting that a firm's environmental responsibility is an important attribute to job seekers (*e.g.*, Greening and Turban, 2000), especially when applicants can compare and rank firms. Hence, companies that are socially or environmentally proactive have vested interests in communicating their commitments to potential candidates. By attracting environmentally-sensitive employees, firms can benefit from self reinforcing effects and strengthen their greenness. On another side, 'employers with poor green credentials can lose out in the hunt for talented people' (*The Sunday Times*, May 11, 2008). Nevertheless, our findings also suggest that some employees may be sensitive to underpinning motives beyond the call of greenness and would prefer firms where environmental commitments are real and not only 'smokescreen' to reach other purposes. In sum, environmental commitments can be used as an important recruitment tool, especially in sectors where recruitment is a sensitive issue. Policymakers and supporters of voluntary standards can also emphasize this benefit in order to encourage firms to adopt these initiatives. This finding suggests new ways of achieving the Porter hypothesis promises. Our main result opens a new door for a refined and broader assessment of the effects of environmental voluntary approaches.

A promising issue is to investigate *how* and *the ways by which* environmental-related standards affect other dimensions of human resource management. These various dimensions are likely to interact (*e.g.*, recruitment, employees' morale) and resulting tradeoffs deserve more academic attention (Frank, 2003). In addition, the effect of environmental-related standards should be further examined taking into account the temporal dimension, by verifying whether employees 'reward' differently long-term and short-term commitment to environmental issues. In the same vein, it may be interesting to test whether environmental-related standards constitute a good retention device, especially in sectors where employee turnover is high. Moreover, it is possible that the effect of environmental-related standards on recruitment is different not only between professional and non-professional employees but also between male and female employees. Investigating the gender effect constitutes also an interesting perspective in future studies. Finally, as stressed by Schmidt-Albinger and Freeman (2000), some dimensions of corporate social performance may be more important than others for highly professional employees. Hence, it would be interesting to examine the impact of different environmental dimensions on firms' attractiveness.

## References

- Akerlof, G.A., Kranton, R.E., 2005, Identity and the Economics of Organizations, *Journal of Economic Perspectives*, 19(1), 9-32.
- Ambec, S., Lanoie, P., 2008, When and Why Does It Pay To Be Green, *Academy of Management Perspective*, 23, 45-62.

- Anton, W.R.Q., Deltas, G., Khanna, M., 2004, Incentives for Environmental Self-regulation and Implications for Environmental Performance, *Journal of Environmental Economics and Management*, 48, 632-654.
- Arimura, T.H., Hibiki, A., Katayama, H., 2008, Is a Voluntary Approach an Effective Environmental Policy Instrument? A Case for Environmental Management Systems, *Journal of Environmental Economics and Management*, 55(3), 281-295.
- Arora, S., Cason, T., 1995, An Experiment in Voluntary Environmental Regulation: Participation in EPA's 33/50 Program, *Journal of Environmental Economics and Management*, 28, 271-286.
- Arora, S., Gangopadhyay, S., 1995, Toward a Theoretical Model of Voluntary Overcompliance, *Journal of Economic Behavior and Organization*, 28(3), 289-310.
- Atkinson, J., Storey, D., 1994, Small Firms and Employment, In Atkinson, J. and Storey, D., Eds, *Employment, the Small Firm and the Labor Market*, Routledge, London, 1-27.
- Backhaus, K., Stone, B., Heiner, K., 2002, Exploring the Relationship between Corporate Social Performance and Employer Attractiveness, *Business and Society*, 41(3), 292-318.
- Bauer, T.N., Aiman-Smith, L., 1996, Green Career Choices: The Influences of Ecological Stance on Recruiting, *Journal of Business and Psychology*, 10(3), 445-458.
- Bellesi, F., Lehrer, D., Tal, A., 2005, Comparative Advantage: The Impact of ISO 14001 Environmental Certification on Exports, *Environmental Science and Technology*, 39, 1943-1953.
- Bernard, A.B., Jensen, J.B., 1995, Exporters, Jobs, and Wages in U.S. Manufacturing: 1976–1987, *Brookings Papers on Economic Activity (Microeconomics)*, 67-119.
- Brekke, K.A., Nyborg, K., 2008, Attracting Responsible Employees: Green Production as Labor Market Screening, *Resource and Energy Economics*, 30(4), 509-526.
- Crifo, P., Diaye, M.A., 2010, The Composition of Compensation Policy: From Cash to Fringe Benefits, *Annales d'économie et statistiques*, forthcoming.
- Darnall, N., Gallagher, D.R., Andrews, R.N.L., Amaral, D., 2000, Environmental Management Systems: Opportunities for Improved Environmental and Business Strategy? *Environmental Quality Management*, 9, 1-9.
- Dechant, K., Altman, B., 1994, Environmental Leadership: From Compliance to Competitive Advantage, *Academy of Management Executive*, 8(3), 7-27.
- Dowell, G., Hart, S.L., Yeung, B., 2000, Do Corporate Environmental Standards Create or Destroy Market Value? *Management Science*, 46, 1059–1074.
- Fombrun, C., Shanley, M., 1990, What's in a Name? Reputation Building and Corporate Strategy, *Academy of Management Journal*, 33, 233-258.
- Frank, R.H., 2003, *What Price the Moral High Ground? Ethical Dilemmas in Competitive Environments*, Princeton University Press.
- Frey, B.S., 1994, How Intrinsic Motivation is Crowded Out and In, *Rationality and Society*, 6(3), 334-352.

- Friedman, M., 1970, The Social Responsibility of Business is to Increase its Profits, *The New York Times Magazine*, September 13th, New York.
- Gladwin, T.N., 1993, The Meaning of Greening: A Plea for Organizational Theory, In Fischer, K., and Schot, J., Eds, *Environmental Strategies for Industry*, Washington, DC: Island Press, 37-62.
- Goodman, J., Earnshaw, J., Marchington, M., Harrison, R., 1998, Unfair Dismissal Cases, Disciplinary Procedures, Recruitment Methods and Management Style: Case Study Evidence from Three Industrial Sectors, *Employees Relations*, 20(6), 536-550.
- Greene, W., 2003, *Econometric Analysis*, Upper Saddle River, NJ: Prentice-Hall.
- Grolleau, G., Mzoughi, N., 2005, Overcomplying For Profit: A Note, *Environmental Economics and Policy Studies*, 6(4), 267-269.
- Grolleau, G., Mzoughi, N., Thomas, A., 2007, What Drives Agrifood Firms to Register for an Environmental Management System? *European Review of Agricultural Economics*, 34(2), 233-255.
- Hackman, J.R., Wageman, R., 1995, Total Quality Management: Empirical, Conceptual and Practical Implications, *Administrative Science Quarterly*, 40(2), 309-342.
- Hart, S., 1997, Beyond Greening: Strategies for a Sustainable World, *Harvard Business Review*, 75(1), 66-76.
- Howard, J., Nash, J., Ehrenfeld, J., 2000, Standard or Smokescreen? Implementation of a Voluntary Environmental Code, *California Management Review*, 42(2), 63-82.
- Huselid, M., 1995, The Impact of Human Resource Management Practices on Turnover, Productivity, and Corporate Financial Performance, *Academy of Management Journal*, 38, 635-672.
- Judge, T.A., Bretz, R.D., 1992, Effects of Work Values on Job Choice Decisions, *Journal of Applied Psychology*, 77, 261-271.
- Klassen, R., McLaughlin, C., 1996, The Impact of Environmental Management on Performance, *Management Science*, 42, 1199-1214.
- Lasfargues, Y., 1994, ISO, Sado, Maso, *Le Monde*, 29 juin 1994.
- Maddala, G.S., 1983, *Limited-Dependent and Qualitative Variables in Econometrics*, Cambridge University Press.
- Margolis, H., 1982, *Selfishness, Altruism and Rationality*, Cambridge: Cambridge University Press.
- Nakamura, M., Takahashi, T., Vertinsky, I., 2001, Why Japanese Firms Choose to Certify: A Study of Managerial Responses to Environmental Issues, *Journal of Environmental Economics and Management*, 42, 23-52.
- Phelps, E.S., 1968, Money-Wage Dynamics and Labor-Market Equilibrium, *Journal of Political Economy*, 76, 678-711.
- Porter, M., Kramer, M., 2006, Strategy and Society: The Link between Competitive Advantage and Corporate Social Responsibility, *Harvard Business Review*, 84(12), 77-92.

- Porter, M., Van Der Linde, C., 1995, Toward a New Conception of the Environment-Competitiveness Relationship, *Journal of Economic Perspectives*, 9(4), 97-118.
- Reinhardt, F.L., 2000, *Down to Earth: Applying Business Principles to Environmental Management*, Boston, MA: Harvard Business School Press.
- Rynes, S.L., Bretz, R., Gerhart, B., 1991, The Importance of Recruitment in Job Choice: A Different Way of Looking, *Personnel Psychology*, 44, 487-521.
- Saunders, M.N.K., 1990, Migration and Job Vacancy Information, In Johnson, J.H., and Salt, J., Eds, *Labour Migration*, London: David Fulton Publishers, 137-154.
- Schank, T., Schnabel, C., Wagner, J., 2007, Do Exporters Really Pay Higher Wages? First Evidence from German linked Employer–Employee Data, *Journal of International Economics*, 72(1), 52-74.
- Schmidt-Albinger, H., Freeman, S., 2000, Corporate Social Performance and Attractiveness as an Employer to Different Job Seeking Populations, *Journal of Business Ethics*, 28, 243-254.
- Spence, M., 1973, Job Market Signalling, *Quarterly Journal of Economics*, 87(3), 355-374.
- Sutter, M., 2007, Outcomes versus Intentions: On the Nature of Fair Behavior and its Development with Age, *Journal of Economic Psychology*, 28(1), 69-78.
- The Sunday Times*, May 11, 2008, Begin with the Staff, [http://business.timesonline.co.uk/tol/business/related\\_reports/best\\_green\\_companies/article3904820.ece](http://business.timesonline.co.uk/tol/business/related_reports/best_green_companies/article3904820.ece), accessed on October 19, 2010.
- Torgler, B., Garcia-Valinas, M.A., 2007, The Determinants of Individuals' Attitudes Towards Preventing Environmental Damage, *Ecological Economics*, 63, 536-552.
- Turban, D.B., Cable, D.M., 2003, Firm Reputation and Applicant Pool Characteristics, *Journal of Organizational Behavior*, 24, 733-751.
- Turban, D.B., Greening, D.W., 1997, Corporate Social Performance and Organizational Attractiveness to Prospective Employees, *Academy of Management Journal*, 40, 658-672.
- Turban, D.B., Greening, D.W., 2000, Corporate Social Performance as a Competitive Advantage in Attracting a Quality Workforce, *Business and Society*, 39, 254-280.
- Wilde, J., 2001, Identification of Multiple Equation Probit Models with Endogenous Dummy Regressors, *Economics Letters*, 69, 309-312.

**Table 1: Definition of variables and sample statistics (N=10840)**

Variable	Definition	Mean	Standard deviation	
<i>Dependent variables</i>				
PROFESSIONAL EMPLOYEES	Problems in recruitment of professional employees Dummy variable (=1 if no or weak)	0.40	0.49	
NON PROFESSIONAL EMPLOYEES	Problems in recruitment of non-professional employees Dummy variable (=1 if no or weak)	0.62	0.48	
<i>Independent variables</i>				
STANDARDS	Registered for ISO 14001, organic labeling or fair trade Dummy variable (=1 if registered in 2006)	0.17	0.38	<b>STANDARDS*Control variables<sup>a</sup></b>
ACTIVITY1	The main activity of the firm is agrifood Dummy variable (=1 if yes)	0.06	0.24	9%
ACTIVITY2	The main activity of the firm is consumption goods Dummy variable (=1 if yes)	0.06	0.24	5%
ACTIVITY3	The main activity of the firm is cars and equipments Dummy variable (=1 if yes)	0.08	0.27	12%
ACTIVITY4	The main activity of the firm is intermediate goods Dummy variable (=1 if yes)	0.15	0.35	25%
ACTIVITY5	The main activity of the firm is energy Dummy variable (=1 if yes)	0.01	0.08	2%
ACTIVITY6	The main activity of the firm is construction Dummy variable (=1 if yes)	0.08	0.27	8%
ACTIVITY7	The main activity of the firm is commercial Dummy variable (=1 if yes)	0.22	0.41	19%
ACTIVITY8	The main activity of the firm is transport Dummy variable (=1 if yes)	0.09	0.29	6%
ACTIVITY9	The main activity of the firm is financial and real-estate activities Dummy variable (=1 if yes)	0.02	0.14	1%
ACTIVITY10	The main activity of the firm is financial and real-estate activities Dummy variable (=1 if yes)	0.18	0.38	10%
ACTIVITY11	The main activity of the firm is services for firms and services for individuals Dummy variable (=1 if yes)	0.05	0.22	3%
SIZE	The firm size (Continuous variable) Size categories: SMALL (20 TO 199 employees) MEDIUM (200 TO 499 employees) BIG (more than 500 employees)	393.87	2574	932.31
GROUP	Belonging to a group Dummy variable (=1 if yes)	0.59	0.49	76%
NETWORK	Belonging to a network Dummy variable (=1 if yes)	0.83	0.37	85%
WAGE	Logarithm of average wage within a firm (Continuous variable)	9.67	0.45	9.79
ISO9 2003	Certified with ISO 9000 Dummy variable (=1 if certified in 2003)	0.47	0.50	80%
ISO9 2006	Certified with ISO 9000 Dummy variable (=1 if certified in 2006)	0.42	0.49	87%
RELOCATION	Relocation abroad of a part of the business Dummy variable (=1 if yes)	0.06	0.23	12%
PERFORMANCE	How the market of the main activity of the firm evolved between 2003 and 2006 DOWN STEADY GROWING	0.26 0.51 0.23	0.44 0.50 0.42	25% 49% 26%
EXPORT	The share of exports in total sales (€) (Continuous variable)	0.10	0.21	0.19
DESTINATION	The market on which the firm operates LOCAL (=1 if market is local, regional, or national) EU (=1 if market is European (25 countries)) INTERNATIONAL(=1 if market is out of European Union)	0.98 0.44 0.33	0.13 0.50 0.47	98% 62% 50%

<sup>(a)</sup>: We present a crosstab analysis of the interdependence between the variable *STANDARDS* and control variables, that is, the frequency of environmental-related standards registration for each control variable. For continuous variables, it represents the mean of that variable in registered firms.

**Table 2: Bivariate probit estimates of the effect of environmental-related standards on recruitment of professional employees**

Variables	STANDARDS			PROFESSIONAL EMPLOYEES			
	Estimate	z-value	Marginal effects	Estimate	z-value	Marginal effects	
Intercept	-1.67***	-18.05	-	-1.96***	-6.53	-	
STANDARDS	-	-	-	1.01***	8.45	0.47***	
SIZE	0.00***	2.56	5.55-e06***	0.00	1.57	7.02e-06	
GROUP	0.17***	4.40	0.03***	0.17***	5.75	0.07***	
NETWORK	-0.32***	-6.05	-0.07***	0.22***	5.38	0.08***	
WAGE	-	-	-	0.19***	5.73	0.07***	
ISO9 2003	0.25***	3.86	0.05***	-0.10*	-1.81	-0.04*	
ISO9 2006	0.92***	13.41	0.19***	-0.21***	-3.55	-0.08***	
RELOCATION	0.26***	4.10	0.06***	0.08	1.26	0.03	
PERFORMANCE	DOWN	0.05	1.12	0.01	-0.09***	-2.89	-0.04***
	GROWING	0.04	0.99	0.01	-0.03	-0.99	-0.01
EXPORT	0.56***	7.03	0.11***				
DESTINATION	EU	0.09*	1.84	0.02*			
	INTERNATIONAL	0.08*	1.74	0.02*			
Likelihood ratio				-9639.45			
WaldChi2(36)				2279.09			
Rho				-0.51***			
Wald test of rho=0 Chi2(1)				35.83***			
Confidence intervals of <i>STANDARDS</i>				0.77 - 1.24			
Total number of firms in the sample				9 348			
Number of registered firms in the sample				1 675			
Average treatment effects of <i>STANDARDS</i>				0.47***			
Confidence intervals of <i>STANDARDS</i> after average treatment effects				0.46-0.48			

The regressions include sectoral dummy variables. (\*), (\*\*), (\*\*\*) indicate parameter significance at the 10, 5 and 1 per cent level, respectively. The z value is computed as the estimated coefficient divided by its robust-estimated standard error.

**Table 3: Bivariate probit estimates of the effect of environmental-related standards on recruitment of non-professional employees**

Variables	STANDARDS			NON-PROFESSIONAL EMPLOYEES			
	Estimate	z-value	Marginal effects	Estimate	z-value	Marginal effects	
Intercept	-1.66***	-18.27	-	-2.52***	-6.91	-	
STANDARDS	-	-	-	1.14***	7.36	0.79***	
SIZE	0.00***	2.33	6.92-06***	0.00*	1.76	0.00*	
GROUP	0.13***	3.29	0.03***	0.12***	3.43	0.04***	
NETWORK	-0.33***	-6.03	-0.08***	0.13***	2.77	0.04***	
WAGE	-	-	-	0.32***	7.84	0.09***	
ISO9 2003	0.23***	3.50	0.05***	-0.13*	-1.91	-0.04*	
ISO9 2006	0.96***	13.60	0.21***	-0.23***	-2.88	-0.07***	
RELOCATION	0.23***	3.40	0.05***	0.12	1.43	0.03	
PERFORMANCE	DOWN	0.05	1.25	0.01	-0.07**	-2.04	-0.02**
	GROWING	0.08*	1.86	0.02	-0.08**	-2.01	-0.02**
EXPORT	0.50***	5.82	0.10***				
DESTINATION	EU	0.09*	1.87	0.02*			
	INTERNATIONAL	0.08	1.54	0.02*			
Likelihood ratio				-7346.72			
WaldChi2(36)				2184.59			
Rho				-0.65***			
Wald test of rho=0 Chi2(1)				20.78***			
Confidence intervals of <i>STANDARDS</i>				0.83 -1.44			
Total number of firms in the sample				8 503			
Number of registered firms in the sample				1 542			
Average treatment effects of <i>STANDARDS</i>				0.79***			
Confidence intervals of <i>STANDARDS</i> after average treatment effects				0.79-0.80			

The regressions include sectoral dummy variables. (\*), (\*\*), (\*\*\*) indicate parameter significance at the 10, 5 and 1 per cent level, respectively. The z value is computed as the estimated coefficient divided by its robust-estimated standard error.

**Appendix 1: Pearson correlation coefficients** (As for Tables 2 and 3, we do not report results concerning the variable ACTIVITY)

	PROF EMPLOYEES	NON EMPLOYEES	PROF STANDARDS	SIZE	GROUP	NETWORK	ISO9 2003	ISO9 2006	WAGE	RELOCATION	DOWN	STEADY	GROWING	EXPORT	LOCAL	EU	INTERNATI.
PROFESSIONAL EMPLOYEES	1.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NON-PRO EMPLOYEES	0.36	1.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
STANDARDS	0.05	0.06	1.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SIZE	0.06	0.02	0.09	1.00	-	-	-	-	-	-	-	-	-	-	-	-	-
GROUP	0.12	0.08	0.16	0.24	1.00	-	-	-	-	-	-	-	-	-	-	-	-
NETWORK	0.04	0.02	0.02	0.08	0.12	1.00	-	-	-	-	-	-	-	-	-	-	-
ISO9 2003	0.02	0.02	0.35	0.23	0.24	0.13	1.00	-	-	-	-	-	-	-	-	-	-
ISO9 2006	0.02	0.02	0.37	0.22	0.25	0.13	0.88	1.00	-	-	-	-	-	-	-	-	-
WAGE	0.08	0.08	0.12	0.07	0.20	0.25	0.20	0.20	1.00	-	-	-	-	-	-	-	-
RELOCATION	0.04	0.04	0.12	0.10	0.12	0.08	0.11	0.10	0.11	1.00	-	-	-	-	-	-	-
DOWN	-0.05	-0.04	-0.01	-0.02	-0.01	-0.03	-0.03	-0.04	-0.02	0.02	1.00	-	-	-	-	-	-
STEADY	0.01	0.01	-0.02	-0.00	-0.03	-0.03	-0.02	-0.01	-0.04	-0.04	-0.61	1.00	-	-	-	-	-
GROWING	0.03	0.03	0.04	0.00	0.04	0.05	0.06	0.06	0.07	0.02	-0.32	-0.55	1.00	-	-	-	-
EXPORT	0.08	0.05	0.19	0.03	0.18	0.17	0.23	0.22	0.28	0.19	-0.01	-0.04	0.06	1.00	-	-	-
LOCAL	-0.02	0.00	-0.02	0.00	-0.01	-0.02	-0.00	-0.00	-0.03	-0.03	0.00	0.01	-0.00	-0.14	1.00	-	-
EU	0.11	0.07	0.16	0.05	0.19	0.20	0.23	0.23	0.29	0.19	0.03	-0.06	0.04	0.45	0.00	1.00	-
INTERNATIONAL	0.10	0.05	0.16	0.04	0.19	0.17	0.21	0.20	0.30	0.21	0.01	-0.05	0.06	0.49	-0.04	0.70	1.00

## Appendix 2: Check of the robustness of the overall results (1/3)

Variables	Model 1 (omitting SIZE, GROUP and Network)				Model 2 (omitting SIZE, GROUP, Network and ISO9)								Model 3 (omitting SIZE, GROUP, Network, ISO9, RELOCATION and DESTINATION)											
	STANDARDS		PRO EMPLOYEES		STANDARDS		NON-PRO EMPLOYEES		STANDARDS		PRO EMPLOYEES		STANDARDS		NON-PRO EMPLOYEES		STANDARDS		PRO EMPLOYEES		STANDARDS		NON-PRO EMPLOYEES	
	Estimate	z-value	Estimate	z-value	Estimate	z-value	Estimate	z-value	Estimate	z-value	Estimate	z-value	Estimate	z-value	Estimate	z-value	Estimate	z-value	Estimate	z-value	Estimate	z-value	Estimate	z-value
Intercept	-1.74**	-20.46	-2.11**	-7.14	-1.73***	-20.85	-2.55***	-7.19	-1.41***	-17.19	-1.85***	-6.65	-1.37***	-17.32	-2.37***	-7.03	-1.41***	-17.24	-1.85***	-6.66	-1.38***	-17.40	-2.33***	-6.93
STANDARDS	-	-	1.16***	11.11	-	-	1.23***	10.41	-	-	1.35***	16.94	-	-	1.29***	16.10	-	-	1.37***	18.11	-	-	1.32***	17.34
SIZE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GROUP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NETWORK	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WAGE	-	-	0.23***	7.18	-	-	0.33***	8.65	-	-	0.19***	6.45	-	-	0.30***	8.25	-	-	0.19***	6.46	-	-	0.30***	8.14
ISO9 2003	0.27***	4.24	-0.09*	-1.61	0.25***	3.77	-0.12*	-1.76	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ISO9 2006	0.92***	13.36	-0.23***	-3.69	0.95***	13.62	-0.24***	-3.23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RELOCATION	0.26***	4.12	0.08	1.42	0.23***	3.46	0.12	1.55	0.31***	5.06	0.00	0.02	0.37***	5.68	0.05	0.62	-	-	-	-	-	-	-	-
DOWN	0.04	1.00	-0.09***	-2.88	0.05	1.18	-0.07**	-2.02	0.01	0.20	-0.08***	-2.56	0.02	0.58	-0.07*	-1.84	0.01	0.29	-0.08***	-2.54	0.02	0.58	-0.06*	-1.83
GROWING	0.03	0.86	-0.03	-0.79	0.07*	1.72	-0.07*	-1.91	0.07*	1.92	-0.05	-1.49	0.11	2.66	-0.09***	-2.43	0.08**	1.99	-0.05	-1.51	0.11***	2.66	-0.09***	-2.46
EXPORT	0.59***	7.56			0.51***	6.14			0.67***	9.23			0.64***	8.10			0.68***	9.56			0.64***	8.10		
EU	0.08*	1.84			0.09*	1.94			0.20***	4.61			0.21***	5.01			-	-			-	-		
INTERNATIONAL	0.10**	2.13			0.08*	1.74			0.13***	3.06			0.12***	2.77			-	-			-	-		
Likelihood ratio		-9724.30				-7403.86				-10214.44				-7887.46				-10230.13				-7887.46		
WaldChi2(36)		2364.79				2260.67				2008.67				1765.92				1988.86				1765.92		
Rho		-0.59***				-0.85***				-0.72***				-0.76***				-0.73***				-0.76***		
Wald test of rho=0		51.29***				33.82***				82.42***				59.69***				88.88***				61.04***		
Chi2(1)																								
Confidence intervals of STANDARDS		0.95-1.36				0.99-1.46				1.20-1.51				1.13-1.45				1.17-1.55				1.17-1.45		
Total number of firms in the sample		9 348				8 503				9 348				8 503				9 348				8 503		
Number of registered firms in the sample		1 675				1 542				1 675				1 542				1 675				1 542		
Marginal effects of STANDARDS		0.47***				0.79***				0.47				0.79***				0.47***				0.79***		
Average treatment effects of STANDARDS		0.47***				0.79***				0.47***				0.79***				0.47***				0.79***		
Confidence intervals of STANDARDS after average treatment effects		0.46-0.48				0.79-0.80				0.46-0.48				0.79-0.80				0.46-0.48				0.79-0.80		

The regressions include sectoral dummy variables. (\*), (\*\*), (\*\*\*) indicate parameter significance at the 10, 5 and 1 per cent level, respectively. The z value is computed as the estimated coefficient divided by its robust-estimated standard error.

## Appendix 2: Check of the robustness of the overall results (2/3)

Variables	Model 4 (including exportation as a dummy)								Model 5 (including exportation in a quadratic form)							
	STANDARDS		PRO EMPLOYEES		STANDARDS		NON-PRO EMPLOYEES		STANDARDS		PRO EMPLOYEES		STANDARDS		NON-PRO EMPLOYEES	
	Estimate	z-value	Estimate	z-value	Estimate	z-value	Estimate	z-value	Estimate	z-value	Estimate	z-value	Estimate	z-value	Estimate	z-value
Intercept	-1.84***	-16.76	-2.01***	-6.65	-1.87***	-17.00	0.99***	3.19	-1.66***	-17.95	-1.96***	-6.53	-1.65***	-18.19	-1.65***	-18.19
STANDARDS	-	-	0.97***	7.70	-	-	0.76***	3.36	-	-	1.00***	8.35	-	-	1.16***	7.81
SIZE	0.00***	2.58	0.00	1.61	0.00***	2.50	-2.48e-06	-0.42	0.00***	2.56	0.00	1.58	0.00***	2.34	0.00*	1.74
GROUP	0.18***	4.56	0.17***	5.77	0.18***	4.74	0.12***	3.85	0.17***	4.38	0.17***	5.77	0.13***	3.26	0.12***	3.39
NETWORK	-0.30***	-5.66	0.21***	5.33	-0.28***	-5.27	0.04	0.82	-0.32***	-6.08	0.22***	5.37	-0.33***	-6.07	0.13***	2.82
WAGE	-	-	0.19***	5.86	-	-	-0.07**	-2.03	-	-	0.19***	5.73	-	-	0.31***	7.79
ISO9 2003	0.25***	3.89	-0.10*	-1.76	0.23***	3.57	-0.08	-1.34	0.25***	3.85	-0.10*	-1.80	0.23***	3.50	-0.13*	-1.95
ISO9 2006	0.93***	13.49	-0.21***	-3.43	0.96***	14.12	-0.09	-1.19	0.92***	13.38	-0.21***	-3.53	0.95***	13.52	-0.24***	-3.00
RELOCATION	0.26***	4.17	0.08	1.32	0.26***	4.00	0.03	0.41	0.26***	4.10	0.08	1.28	0.23***	3.41	0.11	1.40
DOWN	0.05	1.08	-0.09***	-2.89	0.04	1.00	-0.04	-1.26	0.04	1.08	-0.09***	-2.89	0.05	1.23	-0.07**	-2.05
GROWING	0.04	0.95	-0.03	-0.98	0.05	1.20	-0.02	-0.48	0.04	1.05	-0.03	-0.98	0.06	1.30	-0.08**	-2.03
EXPORT	0.63***	7.64			0.59***	6.82			0.80***	4.74			0.82***	4.61		
EU	0.09*	1.84			0.13***	2.59			0.08*	1.61			0.08	1.59		
INTERNATIONAL	0.08*	1.74			0.08	1.53			0.07	1.53			0.06	1.30		
EXPORT (binary/quadratic)	0.15***	3.19			0.14***	2.82			-0.36*	-1.64			-0.49**	-2.07		
Likelihood ratio		-9634.10				-9143.22				-9638.07				-7344.64		
WaldChi2(36)		2235.56				1769.00				2280.73				2238.93		
Rho		-0.49***				-0.38***				-0.51***				-0.66***		
Wald test of rho=0		30.33***				6.23***				35.29***				22.43***		
Chi2(1)																
Confidence intervals of STANDARDS		0.73-1.22				0.32-1.20				0.76-1.23				0.87-1.45		
Total number of firms in the sample		9 348				8 503				9 348				8 503		
Number of registered firms in the sample		1 675				1 542				1 675				1 542		
Marginal effects of STANDARDS		0.47***				0.79***				0.47				0.79***		
Average treatment effects of STANDARDS		0.47***				0.79***				0.47***				0.79***		
Confidence intervals of STANDARDS after average treatment effects		0.46-0.48				0.79-0.80				0.46-0.48				0.79-0.80		

The regressions include sectoral dummy variables. (\*), (\*\*), (\*\*\*) indicate parameter significance at the 10, 5 and 1 per cent level, respectively. The z value is computed as the estimated coefficient divided by its robust-estimated standard error.

## Appendix 2: Check of the robustness of the overall results (3/3)

Variables	Model 6 (considering small sized firms only)								Model 7 (considering medium sized firms only)							
	STANDARDS		PRO EMPLOYEES		STANDARDS		NON-PRO EMPLOYEES		STANDARDS		PRO EMPLOYEES		STANDARDS		NON-PRO EMPLOYEES	
	Estimate	z-value	Estimate	z-value	Estimate	z-value	Estimate	z-value	Estimate	z-value	Estimate	z-value	Estimate	z-value	Estimate	z-value
Intercept	-1.58**	-14.90	-1.83***	-4.77	-1.54***	-15.01	-2.30***	-5.37	-1.21***	-4.16	-2.89***	-3.46	-1.21***	-4.16	-4.02***	-3.39
STANDARDS	-	-	0.76***	2.79	-	-	1.08***	3.63	-	-	0.68	1.33	-	-	0.41	0.28
GROUP	0.05	1.04	0.15***	4.34	0.01	0.29	0.16***	4.07	0.06	0.53	0.15*	1.70	0.06	0.53	0.02	0.86
NETWORK	-0.31***	-5.07	0.23***	4.76	-0.33***	-5.34	0.12***	2.18	-0.59***	-3.88	0.21	1.57	-0.59***	-3.88	0.11	0.46
WAGE	-	-	0.18***	4.32	-	-	0.30***	6.13	-	-	0.26***	2.86	-	-	0.47***	3.31
ISO9 2003	0.07	0.83	-0.04	-0.56	0.02	0.29	-0.04	-0.58	0.26	1.60	-0.07	-0.54	0.26	1.60	0.04	0.18
ISO9 2006	1.01***	11.34	-0.22***	-2.72	1.07***	12.31	-0.24***	-2.00	0.98***	5.48	-0.12	-0.86	0.98***	5.48	-0.20	-0.65
RELOCATION	0.10	0.91	0.06	0.66	-0.02	-0.14	0.17	1.60	0.40***	3.10	0.08	0.56	0.40***	3.10	0.32	0.93
DOWN	0.04	0.77	-0.10***	-2.68	0.03	0.52	-0.13***	-2.92	-0.01	-0.12	-0.10	-1.19	-0.01	-0.12	-0.18	-1.53
GROWING	0.01	0.10	-0.02	-0.53	0.05	0.79	-0.06	-1.37	-0.14	1.42	-0.09	-1.04	-0.14	1.42	-0.06	-0.50
EXPORT	0.28**	1.93			0.32	1.14			0.72*	1.72			0.72*	1.72		
EU	0.07	1.10			0.06	0.97			0.09	0.69			0.09	0.69		
INTERNATIONAL	0.08	1.23			0.04	0.65			-0.02	-0.15			-0.02	-0.15		
Likelihood ratio		-6052.71				-4844.34				-1562.50				-1065.92		
WaldChi2(36)		1028.08				956.10				367.90				303.02		
Rho		-0.36**				-0.60***				-0.40				-0.22		
Wald test of rho=0		4.59**				5.67***				1.34*				0.06		
Chi2(1)																
Confidence intervals of STANDARDS		0.17-1.27				0.50-1.66				-0.32-1.68				-2.42-3.24		
Total number of firms in the sample		6 353				5 774				1 423				1 295		
Number of registered firms in the sample		729				691				335				303		
Marginal effects of STANDARDS		0.42***				0.76***				0.54				0.85		
Average treatment effects of STANDARDS		0.42***				0.76***				0.54				0.85		
Confidence intervals of STANDARDS after average treatment effects		0.41-0.43				0.76-0.78				0.52-0.57				0.83-0.87		

The regressions include sectoral dummy variables. (\*), (\*\*), (\*\*\*) indicate parameter significance at the 10, 5 and 1 per cent level, respectively. The z value is computed as the estimated coefficient divided by its robust-estimated standard error.

**Appendix 3: 2SLS estimates of the effect of environmental-related standards on recruitment**

Variables	PROFESSIONAL EMPLOYEES		NON-PROFESSIONAL EMPLOYEES		
	Estimate	z-value	Estimate	z-value	
Intercept	-0.18	-1.19	-0.11	-0.97	
STANDARDS	1.22***	5.75	0.74***	4.94	
SIZE	-2.66-06	-0.82	-2.79-06	-1.04	
GROUP	0.04***	2.35	0.03***	2.31	
NETWORK	0.12***	5.79	0.06***	3.40	
WAGE	0.06***	5.51	0.08***	6.25	
ISO9 2003	-0.10***	-2.95	-0.07***	-2.60	
ISO9 2006	-0.21***	-4.77	-0.12***	-3.54	
RELOCATION	-0.04	-1.09	-0.02	-0.67	
PERFORMANCE	DOWN	-0.04***	-2.89	-0.02**	-1.99
	GROWING	-0.02	-1.30	-0.03***	-2.34
Root MSE	0.61		0.47		
Total number of firms in the sample	9 348		8 503		
Number of registered firms in the sample	1 675		1 542		

The regressions include sectoral dummy variables. (\*), (\*\*), (\*\*\*) indicate parameter significance at the 10, 5 and 1 per cent level, respectively. The z value is computed as the estimated coefficient divided by its robust-estimated standard error.