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Work recognition and labor productivity: Evidence from French data

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Abstract: We empirically investigate whether labor productivity is related to work recognition. Using survey data about a large sample of French firms (N=5,309), we find that firms in which employees think their work is recognized are likely to report higher labor productivity, compared to firms where employees do not feel recognized. Our estimation results also suggest that labor productivity is strongly related to wages.

Key words: work recognition, labor productivity, wages.

JEL codes: J30, D03.

Work recognition and labor productivity: Evidence from French data

"People's behavior can largely be explained in terms of two dominant interests: economic gain and social acceptance." Harsanyi (1969)

1. Introduction

How to motivate workers, especially in tough times? An intuitive reply will include the use of financial incentives to motivate employees and encourage them to increase their performance (Bénabou and Tirole, 2003; Gneezy et al., 2011). For instance, a large literature has considered the relationship between wages and productivity and suggested several mechanisms likely to explain such a relationship (Bishop, 1987; Dur, 2009). According to efficiency wage theory, firms pay their employees more than market clearing wages in order to retain more experienced and productive employees. Akerlof (1982) argued that when firms increase pay, workers work harder as a proof of loyalty to those employers. At a macroeconomic level, increase in wages raises the cost of labor and leads to factor substitution from labor to capital and consequently to an increase in labor productivity. Moreover, as stressed by Deeprose (1994), in many organizations, rewards are generally defined in terms of wages and salaries.

Nevertheless, despite their importance, financial incentives may be insufficient to induce individuals to do their best (Bénabou and Tirole, 2003). For instance, using a field and a laboratory experiment, Hennig-Schmidt et al (2010) find that increasing wages does not necessarily improve worker productivity. An increasing number of studies emphasize the crucial role of non-monetary incentives as a driver of labor productivity. These incentives encompass a large variety of rewards, such as encouragements, gifts, restaurant tickets, and so on. Crifo and Diaye (2011) show that non-monetary incentives (fringe benefits, status, identity or self-image) motivate employees to perform efficiently. In their principal-agent model, Bénabou and Tirole (2003) argue that under some circumstances, 'encouraging' a worker can send credible signals of confidence and raise self-esteem, which in turn may result in better performance. Using a theoretical framework, Dur (2009) also shows that building up good social-exchange relationships with employees, e.g., through careful attention, may induce them to work harder and this figure is true even when wages are lower. Even if traditional economics is not incompatible with non-material incentives, it has mainly focused on material rewards. Standard economics does not devote much attention to non-monetary rewards. First, in some cases, non-material motives can be considered as cheap talk unlikely to affect real behavior. Second, employees (do you mean 'employers'?) prefer substituting non-material rewards such as praise or recognition for money, especially over time. Third, incorporating numerous non-material rewards in the standard

analytical framework can harm the explicative and predictive power of standard models (Neckermann, 2009).

Among the long list of non-monetary incentives, work recognition seems to be a good candidate for investigation. Recognition has been described as one of the greatest lost opportunities in the business world today, because of its huge power combined with its low cost (e.g., Wagner and Harter, 2006). There is also much evidence supporting the view that the lack of recognition is a major reason why people leave organizations (Ellingsen and Johannesson, 2007). Numerous studies and articles in the management press frequently emphasize that a top motivator of employee performance is recognition. Nelson (2007) describes the relevance of recognition as follows: "Most managers think money is the top motivator –but, it's not. More than anything else, employees want is to be valued for a job well done by those they hold in high esteem. "People today are looking for much more than a paycheck," says Mitchell Thall, President of Epicure (…) Sure, compensation is important, but most employees consider it a right –an exchange for the work one does. Recognition is a gift that is truly valued – especially because it is not required by the manager." A recent survey funded by the private company Make Their Day among a sample of 1200 U.S. employees shows that recognition is extremely important for more than 80% of the surveyed individuals and this figure experienced a significant increase compared to a similar survey achieved in 2007.[1]

Several rationales can explain why recognition can constitute a top motivator for employees (Neckermann, 2009). First, according to neurobiological studies, recognition and praise for good work releases dopamine in the brain. This neurotransmitter stimulates the parts of the brain that process rewards and create positive emotions like satisfaction and enjoyment (Wagner and Harter, 2006). Second, recognition can be perceived by employees as a gift and can activate a desire to reciprocate by increasing effort (Fehr and Gächter, 2000; Kube et al., 2012). For example, using a set of experiments with monetary and non-monetary incentives to perform a real task, Heyman and Ariely (2004) find that reciprocal behavior for a monetary gift is lower than for non-monetary one. Using controlled laboratory experiments in which individuals are assigned to perform a given task, Ariely et al. (2008) show that when a recognition mechanism is introduced, the willingness to put in additional effort increases. Third, recognition can serve to indicate who the best employees are. Other employees caring about status and seeking conformity can increase their effort to reach the level of the best employees (Bradler et al., 2013). Moreover, recognition can enhance the self-esteem of the targeted individual and increase intrinsic motivation leading to more efforts (Deci and Ryan, 2000; Bartol and Srivastava, 2002; Bénabou and Tirole, 2003). For instance, using a controlled field experiment,

[1] Make Their Day. The 2013 employee recognition preference report. http://maketheirday.com/2013-employee-recognition-preference-report/.

Bradler et al. (2013) show that public recognition increases subsequent performance substantially, and particularly so when recognition is exclusively provided to the best performers. Moreover, this performance increase was mainly seen among workers who did not receive recognition.

Using French survey data, the aim of this empirically-based paper is to test whether *labor productivity is relatively higher in firms where employees think their work is recognized*. The originality of our contribution is at least twofold. First, we use large survey data to test the relation between recognition and labor productivity. Even the increasing psychological and management literature dealing with this issue (e.g., Luthans and Stajkovic, 1999; 2000; Stajkovic and Luthans, 1997; 2001; 2003 for meta-analyses) typically lacks measurable economic outcomes, rarely takes regression approach into account, and does not control for important firm characteristics. The scarce economic literature devoted to such issues mainly used experimental settings. For instance, Bradler et al. (2013) admit that using a student sample and short-term employment constitute limitations of their study, which are partially addressed in our investigation. Moreover, using such data allows us to capture real work relationships, which is not the case in laboratory experiments. Second, we control for several variables, notably the combination between recognition and different levels of wage.

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 methods

The data is extracted from three cross-sectional French surveys, namely the 2006 Organizational Changes and Computerization (COI) survey, 2008 Community Innovation survey (CIS), and Annual Statement of Social Data (DADS). The COI survey is a matched employer/employee survey on organizational changes and computerization conducted between November 2005 and April 2006 by researchers and statisticians from the French institute for statistics and economic studies, the Ministry of labor and the center for labor studies. 17,000 private firms with 10 or more employees from all industries except agriculture, forestry and fishing were surveyed. The questionnaire is self-administered and describes work organizational practices in 2006 and changes that have occurred since 2003. Within each surveyed firm, employees were randomly selected and asked about their personal socio-economic characteristics, as well as information about their job and position within the organization.[2] The CIS was also conducted by the institute for statistics and economic studies over the period 2006-2008, based on the Oslo Manual drawn up by the OECD. Firms with at least 20

[2] Nevertheless, we cannot completely rule out the case that successful firms who invest in human resource practices are more likely to respond to this kind of survey.

employees were asked to answer questions about innovation activities and expenditures and human resources allocated to such activities, and a set of more qualitative information about the sources of information, objectives pursued and hampering factors associated with the innovation process. The DADS contains administrative documents filled in by employers and reported to the Social Security and Tax Agencies.[3] After the deletion of firms that did not answer all the relevant questions for our study, we are left with 5,309 observations with 18 or more employees. The dataset from which each variable is extracted is provided in Table 1 along with variables description.

Similarly to several prior studies (e.g., Ichniowski, 1990; Huselid, 1995; Guthrie, 2001; Datta et al., 2005; Bloom and Van Reenen, 2010), the dependent variable, denoted *LABOR_PRODUCTIVITY*, is measured as the logarithm of the ratio of firm sales to number of employees in 2008. Using such a measure does not consider potential cost increases and employees cannot control all its elements (Datta et al., 2005). However, as suggested by Huselid (1995), it provides a single index that can be used to compare a firm's productivity and gives us the opportunity to estimate the Euro value of returns from improved worker recognition.[4] To test our hypothesis, that is that work recognition is positively related to higher labor productivity *ceteris paribus*, we use the variable denoted *RECOGNITION*, which is a binary variable equal to 1 if the employee answered yes the following question (translated from French): "*When you assess what you provide to your firm and the benefits you get, do you think that your work is fairly recognized?*". Interestingly, this question focuses on whether the surveyed employee perceives a fair recognition for his/her work,[5] not on what the executives believe they perform in terms of recognition practices. Moreover, in order to attenuate the potential causal ambiguity bias related to cross sectional data, the variable *RECOGNITION* is measured in 2006. Although less robust than a longitudinal analysis, the use of lagged information can be considered as satisfactory, especially because our data indicates that labor productivity experienced a significant 6% increase between 2006 and 2008.

In order to control for firm-level heterogeneity, our analysis includes a set of control variables representing firm characteristics likely to influence labor productivity. First, as shown by Delmas and

[3] More details about the design and scope of these surveys are available on www.enquetecoi.net (Survey COI-TIC 2006-INSEE-CEE/Treatments CEE), http://www.insee.fr/fr/methodes/default.asp?page=sources/sou-enq-communaut-innovation-cis.htm, and http://www.insee.fr/fr/methodes/?page=definitions/dec-ann-don-soc.htm.

[4] An alternative and intuitive measure of productivity could be a 'real' measure such as volume per worker, but it raises the challenge of comparing apples and oranges if we are not in firms producing similar products. Introducing the price effect is not a perfect solution but allows a consistent comparison across firms and sectors.

[5] Recognition can include a large variety of practices such as formal programs (e.g., employee of the month or top sales award) or more informal devices such as attention, praise, and genuine appreciation.

Pekovic (2013, see also Zwick, 2004), labor productivity is affected by firm size. This effect is tested using the variable *SIZE* corresponding to the number of employees. Second, as stressed in the introductory section, wages are generally considered to have a positive impact on labor productivity. We therefore include a continuous variable representing the firm average hourly wage (*WAGE*).[6] Third, previous research has shown a positive correlation between productivity and working hours (Sousa-Poza and Ziegler, 2003). This effect is captured by the variable denoted *WORKING_HOURS*. Fourth, several scholars (Delmas and Pekovic, 2013; Grolleau et al., 2012) argue that employees in environmentally responsible firms may be more motivated in their work due to the public nature of environmental commitments. Thus, we include a variable denoted *ES* which is a binary variable equal to 1 if the firm has adopted an environmental-related standard, i.e., ISO 14001 standard, organic labeling, fair trade, etc. Fifth, it has also been proved that labor productivity increases with innovation activities (Chudnovsky et al., 2006). This effect is tested using the variable denoted *INNOVATION* which captures whether the firm introduced a product/services, process, organization, or marketing innovation. Hence, this variable takes values between 0 (if the firm did not innovate in any of the four considered areas) and 4 (if it has innovated in all areas). Sixth, labor productivity may also rely upon R&D activities, also used as a control variable (*R&D*). Seventh, labor productivity may vary across sectors. Hence, based on the N36 sector classification created by the French institute for statistics and economic studies, we include eleven sectoral dummy variables representing the following sectors: agrifood, consumption goods, cars and equipment, intermediate goods, energy, construction, commercial, transport, financial and real-estate activities, business services and individual services. The definition of all variables and some descriptive statistics are provided in Table 1. Pearson correlation coefficients (not reported but available upon request) reveal no problem of multicollinearity.

[Insert Table 1 around here]

The relation between work recognition and labor productivity is tested using an Ordinary Least Square (OLS) regression. The model can be written as:

$$ln(y)_i = X_i a + e_i$$

where $\ln(y)_i$, X_i, a, and e_i represent labor productivity, the vector of exogenous variables, estimated coefficients, and error term, respectively. It should be noticed that when the dependent variable is log-transformed, the estimated coefficients should not be directly interpreted. As discussed by Stewart (2005), the percentage change in labor productivity for a small change of a continuous variable is computed as the partial derivative of $ln(y)$ with respect to that continuous variable, that is, $100a$.

[6] A better and more relevant control variable would be individual wages. Indeed, the recognition dummy might also capture parts of wage heterogeneity if employees feel more recognized by being paid adequately. Unfortunately, individual wages are not available in our database.

However, for dummy variables, the percentage impact is computed as $100[exp(a) - 1]$. Moreover, since our data provides information on multiple individuals within each organization, one may argue that organizational level factors lead to correlation of errors across individuals within each organization. Therefore, in order to control for this issue, we apply the cluster command in Stata.

3. Results

The results of the OLS regression are presented in Table 2. We report the results for the whole sample and for separate small (less than 250 employees) and big size firms (250 employees and more). In general, the findings for big firms are closer to those for the whole sample. This figure may be related to the fact that our sample is mainly composed of big firms (4,648 out of 5,309). It is also possible that small firms are more likely to use recognition devices and are characterized by less variability in recognition. For instance, a recent study on a random sample of U.S. firms found that "the smaller the company, the more recognition workers may be receiving" (Accountemps, 2013). The same study argues that employee recognition in large firms can be challenging due to the size and the number of individuals each manager may supervise.

[Insert Table 2 around here]

Considering the whole sample, the adjusted R-square of 0.25 indicates that unobserved individual heterogeneity is still relatively important in the data. The results show that firms in which employees think their work is recognized report higher levels of labor productivity, since the variable *RECOGNITION* is significant at the 1% level. Applying the above-mentioned formula for dummy variables (see Section 2) indicates that work recognition is associated with a 10.5% increase in labor productivity. Our findings are consistent with previous studies (e.g., Ariely et al., 2008; Luthans and Stajkovic, 1999, 2000; Stajkovic and Luthans, 1997, 2001, 2003) concluding that non-monetary rewards, such as recognition, may lead to better employees' performance. For instance, the meta-study of Stajkovic and Luthans (2003) found empirical support for reinforcement theory in the workplace environment. They show that monetary incentives increased employee performance by 23%, recognition devices by 17% and feedback by 10%. If these three reinforcers are used simultaneously, the performance increase reaches 45%. Interestingly, Table 2 also shows that the variable *WAGE* is positively significant. More formally, a marginal change in hourly wage is associated with a 10% increase in labor productivity. In other words, even if labor productivity may increase with non-financial rewards, the role of financial compensation remains important. Moreover, examining the estimates for small and big firms indicates that while *WAGE* is positively associated with *LABOR_PRODUCTIVITY* in both samples, *RECOGNITION* is only significant for the sample of big firms.

As for the other control variables, Table 2 shows that the variables *WORKING HOURS*, *ES*, *INNOVATION* and *R&D* are also positively significant when considering the whole sample. In other

words, consistent with Sousa-Poza and Ziegler (2003), labor productivity increases with the number of worked hours in the firm. It also increases with the adoption of environmental-related standards, as shown by previous studies (e.g., Grolleau et al., 2012). Firms that have introduced innovations and committed in R&D activities report also higher labor productivity, compared to non-innovative firms. However, the variable *SIZE* is not significant. This finding is somewhat surprising and deserves further attention, since even when changing the specification of the variable (not reported), no relation is found between the size of the firm and labor productivity. Nevertheless, this result may be related to the fact that the size of a firm may correspond to different situations, notably with regards to sectors. Finally, the results for sectoral variables show that labor productivity increases (respectively, decreases) when the main activity of the firm is agrifood, cars and equipment, energy, construction, commercial, and financial and real estate (respectively, transport and services for firms or individuals), compared to the reference sector, that is, intermediate goods. Unlike some previous contributions (e.g., Luthans and Stajkovic, 1999) that discussed sectoral effects, we cannot perform a similar analysis. Indeed, due to the nature of the French classification, which is not provided at a sufficiently detailed level, it is quite difficult to interpret these findings in a way which makes sense. In other words, each considered sector includes a set of non-comparable subsectors. For instance, the sector of intermediate goods encompasses different activities (textile, chemicals and electronic components) making the comparison rather meaningless.

In order to go a step further with our analysis, we run another model in which work recognition is analyzed taking into account the level of average hourly wage in the firm. We considered four cases: (1) the employee thinks that his/her work is recognized while he/she works in a company that offers an average wage which is higher than the average wage of all firms (*RECOGNIZED*WAGE_HIGH*), (2) the employee thinks that his/her work is recognized while working in a company that offers an average wage which is lower than the overall average wage (*RECOGNIZED*WAGE_LOW*), (3) the employee thinks that his/her work is not recognized while the average wage is high (*UNRECOGNIZED*WAGE_HIGH*), and (4) the employee is neither recognized nor working in a company with high wages (*UNRECOGNIZED*WAGE_LOW*). Some descriptive statistics regarding these interaction variables are reported in Table 3. They show that the majority of firms (44%) belong to the last case, that is, no recognition and low wages. Interestingly, about 27% of firms pay below average wage while their employees feel recognized, higher than the percentage of firms doing the opposite (12%). Moreover, this figure varies across sectors and firm size.

[Insert Table 3 around here]

The results of the OLS regression using interaction variables are presented in Table 4 (column 2). Due to data limitations, these results should not be over-interpreted. Indeed, since we do not have information about individual wages in the firm, our analysis relies only on aggregated firm data. Notwithstanding this limitation, the results suggest that work recognition matters, but wages seem to

be the factor which is the most relevant with regards to labor productivity. Looking to coefficients and significance levels, it can be argued that labor productivity increases relatively more when wages are high though employees think that their work is not recognized, compared to the case of low wages and high recognition. This finding is consistent with Stajkovic and Luthans (2001) who found that the effect of money on performance is greater than social recognition. In other words, high wages may more compensate for less recognition than the opposite. Nevertheless, similarly to Stajkovic and Luthans (2003), our results emphasize the synergy between money and social recognition, since having both of them would improve the most labor productivity. Moreover, similarly to Table 2, we also report the estimations for separate small and big size firms (columns 3 and 4). Again, the findings for big firms are closer to those for the whole sample than results for small ones.

[Insert Table 4 around here]

4. Conclusion

Scholars increasingly focus attention on work recognition as an underexploited driver of improved performance. Even if the psychology and management literature has examined this issue in several studies (e.g., Luthans and Stajkovic, 1999, 2000; Stajkovic and Luthans, 1997, 2001, 2003), they differ from our study in that ours uses an improved approach to analyzing the impact of recognition on performance. These studies typically lack a precisely measurable economic outcome, rarely take regression approaches into account, and do not control for important firm characteristics. We investigated the *relationship* between work recognition and labor productivity among a large sample of French firms. Our findings support a positive relation, suggesting that firms can improve their performance by rewarding their employees in ways other than financially. Even if our study does not allow a causal interpretation, the correlative evidence on the relationship between recognition and labor productivity is also informative given the fact that this causal relationship is really difficult to identify with real-world data. In comparison to numerous studies in psychology or management, the statistical approach based on a large number of firms adds empirical evidence in the French context and seems at least to come closer to the truth, even if causal inferences cannot be drawn. Moreover, our findings are consistent with and complement recent experimental evidence where materially worthless rewards have a statistically significant impact on performance (Bradler et al., 2013). Nevertheless, our results also show the paramount importance of wages. It seems intuitive that in employment relationships, wages are considered as the basis of the employer-employee arrangement, given that many employment relationships are explicitly and historically occurring in the monetary market rather than the social market (Heyman and Ariely, 2004). Nevertheless, from an efficiency perspective, recognition constitutes a great opportunity for managers by mixing huge power and low cost. To go further, it would be very interesting to check the happiness consequences of similar labor productivity under various combinations of monetary and non-monetary rewards. Moreover, our analysis is based on subjective and relatively vague measure of recognition. Indeed, the used survey

does not provide information on the way recognition might be given to employees. For instance, some people may feel recognized by receiving feedback from time to time while some others may only feel recognized by receiving explicit praise. Thus, an interesting issue for future research is to test the effect of different kinds of work recognition while taking into account their frequency.[7] Furthermore, due to data limitation, we were not in a position to consider the wage dispersion within the firm. Given that workers may be more sensitive to work recognition as it may interact with inequality aversion, for instance, taking into account such dispersion would be fruitful. Last but not least, our study relies on cross-sectional data with lagged information. Despite its usefulness in attenuating the potential causal ambiguity bias, such an approach may not be sufficient in drawing conclusions in a cause-effect language. Hence, another promising perspective is to use longitudinal analysis in order to rigorously address the causality direction. Given the pervasiveness of non-monetary incentives in numerous human interactions, we hope our research will inspire other investigations that can successfully address the previous challenges and lead to more explicit managerial recommendations.

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[7]We are grateful to an anonymous referee for pointing out this important issue.

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Table 1: Definition of variables and descriptive statistics (N=5,309)

Variables	Definition	Mean	SD	Min	Max
LABOR_PRODUCTIVITY **	Logarithm of sales per employee in 2008 (Continuous variable)	5.37	0.94	-0.63	9.72
RECOGNITION*	The employee thinks his/her work is recognized Dummy variable (=1 if yes)	0.44	0.50	0.00	1.00
SIZE*	Number of employees (Continuous variable)	2476.947	8492.424	18.00	111956
WAGE***	Hourly wage within a firm (€) (Continuous variable)	9.63	7.69	1.60	169.569
WORKING_HOURS***	Number of worked hours per year in the firm (Continuous variable)	1939.994	982.7996	123	10000
ES*	Registration for an environmental-related standard (ISO 14001, organic labeling or fair trade, etc.) Dummy variable (=1 if registered in 2003)	0.33	0.47	0.00	1.00
INNOVATION**	The firm innovates (or not) in four areas: product/service, process, organization, and marketing. (Count variable)	1.05	0.97	0.00	4.00
R&D**	Realization of R&D development activities Dummy variable (=1 if yes)	0.57	0.49	0.00	1.00
AGRIFOOD*	The main activity of the firm is agrifood Dummy variable (=1 if yes)	0.09	0.28	0.00	1.00
CONSUMPTION*	The main activity of the firm is consumption goods Dummy variable (=1 if yes)	0.07	0.25	0.00	1.00
CARS*	The main activity of the firm is cars and equipments Dummy variable (=1 if yes)	0.15	0.35	0.00	1.00
INTERMEDIATE*	The main activity of the firm is intermediate goods Dummy variable (=1 if yes)	0.19	0.39	0.00	1.00
ENERGY*	The main activity of the firm is energy Dummy variable (=1 if yes)	0.02	0.15	0.00	1.00
CONSTRUCTION*	The main activity of the firm is construction Dummy variable (=1 if yes)	0.06	0.23	0.00	1.00
COMMERCIAL*	The main activity of the firm is commercial Dummy variable (=1 if yes)	0.16	0.36	0.00	1.00
TRANSPORT*	The main activity of the firm is transport Dummy variable (=1 if yes)	0.07	0.26	0.00	1.00
FIN_REAL_ESTATE*	The main activity of the firm is financial and real-estate activities Dummy variable (=1 if yes)	0.02	0.14	0.00	1.00
SERVICES_F*	The main activity of the firm is services for firms Dummy variable (=1 if yes)	0.14	0.35	0.00	1.00
SERVICES_IND*	The main activity of the firm is services for individuals Dummy variable (=1 if yes)	0.03	0.18	0.00	1.00

*Variables were retrieved from the COI survey.
**Variables were retrieved from the CIS.
***Variables were retrieved from the DADS.

Table 2: OLS estimates of the relationship between work recognition and labor productivity

	Coefficients and significance		
Variables	**Whole sample**	**Small firms**	**Big firms**
Intercept	4.75***	4.57***	4.76***
RECOGNITION	0.10***	-0.03	0.11***
SIZE	-1.26e-06	0.00	-9.33e-07
WAGE	0.01***	0.03***	0.01***
WORKING_HOURS	0.00**	0.00	0.00*
ES	0.17***	0.04	0.17***
INNOVATION	0.07***	0.14***	0.06***
R&D	0.26***	0.07	0.29***
AGRIFOOD	0.53***	0.76***	0.50***
CONSUMPTION	0.14	-0.17	0.18*
CARS	0.15***	0.06	0.15***
ENERGY	0.68***	0.63***	0.67***
CONSTRUCTION	0.14***	0.38**	0.10
COMMERCIAL	0.70***	0.97***	0.66***
TRANSPORT	-0.30***	0.05	-0.34***
FIN_REAL_ESTATE	0.55***	0.56***	0.54***
SERVICES_F	-0.50***	-0.04	-0.56***
SERVICES_IND	-0.66***	-0.09	-0.80***
Observations	5,309	661	4,648
R-squared	0.25	0.23	0.27

(*), (**), (***) indicate parameter significance at the 10, 5 and 1 per cent level, respectively.

Table 3: Some descriptive statistics regarding the interaction variables

	Whole sample (N=5,309)		Small firms (N=661)		Big firms (N=4,648)		Agrifood (N=456)		Consumption g. (N=357)		Cars & equip. (N=783)		Intermediate g. (N=1,037)	
Variables (all binary, =1 if yes)	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
RECOGNIZED*WAGE_HIGH	0.17	0.37	0.10	0.30	0.17	0.38	0.10	0.30	0.22	0.41	0.22	0.41	0.17	0.37
RECOGNIZED*WAGE_LOW	0.27	0.44	0.33	0.47	0.26	0.44	0.34	0.48	0.23	0.42	0.22	0.42	0.26	0.44
UNRECOGNIZED*WAGE_HIGH	0.12	0.33	0.08	0.26	0.13	0.34	0.07	0.25	0.17	0.35	0.14	0.35	0.14	0.35
UNRECOGNIZED*WAGE_LOW	0.44	0.50	0.49	0.50	0.44	0.50	0.49	0.50	0.37	0.49	0.42	0.48	0.43	0.49

Energy (N=126)		Construction (N=305)		Commercial (N=831)		Transport (N=383)		Financial & real estate (N=114)		Services for firms (N=735)		Services for ind. (N=176)	
Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
0.31	0.46	0.12	0.32	0.11	0.31	0.13	0.34	0.12	0.32	0.22	0.42	0.11	0.31
0.25	0.44	0.34	0.47	0.29	0.46	0.32	0.47	0.28	0.45	0.23	0.42	0.25	0.43
0.21	0.41	0.09	0.29	0.07	0.25	0.13	0.34	0.11	0.34	0.15	0.36	0.08	0.27
0.23	0.42	0.45	0.50	0.53	0.50	0.41	0.49	0.49	0.50	0.40	0.49	0.56	0.50

Table 4: OLS estimates of the relationship between work recognition and labor productivity when interaction with wages is taken into account

	Coefficients and significance		
Variables	**Whole sample**	**Small firms**	**Big firms**
Intercept	4.82***	4.82***	4.81***
RECOGNIZED*WAGE_HIGH	0.45***	0.39***	0.45***
RECOGNIZED*WAGE_LOW	0.05**	-0.03	0.06**
UNRECOGNIZED*WAGE_HIGH	0.31***	0.15	0.31***
UNRECOGNIZED*WAGE_LOW	Reference	Reference	Reference
SIZE	-1.06e-06	0.00	-7.23e07
WORKING_HOURS	0.00**	3.22e-06	0.00*
ES	0.16***	0.09**	0.16***
INNOVATION	0.07***	0.14**	0.06**
R&D	0.23***	0.06	0.26***
AGRIFOOD	0.56***	0.72***	0.53***
CONSUMPTION	0.11	-0.20	0.15
CARS	0.14***	0.02	0.14**
ENERGY	0.64***	0.69***	0.62***
CONSTRUCTION	0.16***	0.36**	0.12**
COMMERCIAL	0.71***	0.94***	0.68***
TRANSPORT	-0.31***	0.07	-0.34***
FIN_REAL_ESTATE	0.55***	0.58***	0.54***
SERVICES_F	-0.52***	-0.06	-0.57***
SERVICES_IND	-0.66***	-0.06	-0.78***
Observations	5,309	661	4,648
R-squared	0.27	0.22	0.28

(*), (**), (***) indicate parameter significance at the 10, 5 and 1 per cent level, respectively.