

CAN QUALITY STANDARDS INDIRECTLY IMPROVE EMPLOYEE'S WAGE: EMPIRICAL EVIDENCES FROM MONTENEGRO

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Abstract: *In this paper we investigate the indirect effect of ISO 9000 adoption on employees' wage. Actually, the adoption of quality standards induces firm's re-organization, underlying improvement of work environment and employees' involvement. Therefore, in this paper, we analyze how work environment and employees' involvement are associated with employees' wage. Our empirical results based on Montenegrin employee database from two quality certified firms indicate that better work environment has no influence on employees' wage while employee involvement is positively associated with higher wages.*

Key words: *Wage; Work Environment; Involvement; Quality Standards.*

1. INTRODUCTION

The economic importance of quality systems has grown tremendously over the last decade. The widespread recognition of quality systems has been attributed in great part to the capacity of those systems to assure the survival of firms and the establishment of a superior competitive position for them (e.g. Levine and Toffel, 2009). Moreover, one of the tools that firm can use in order to achieve all factors that are necessary to realize business success is ISO certification (International Standard Organization) (Pekovic, 2008). Actually, ISO 9000 as a quality standard is very often associated with formal quality actions and activities that are by now widely diffused throughout business what is confirmed by the number of certificates delivered at the end of 2007 for the 'famous' ISO 9000 standards. It has been issued to around one million firms around the world. Moreover, the adoption of quality standards will yet further increase because firms have realized that ISO certification has become "must have tool" for business success (Pekovic, 2008).

Most researchers work so far on the benefits of ISO 9000, where they showed that certified firms often obtain benefits from adopting ISO 9000 standard (e.g. Diaye et al., 2010; Terlaak and King, 2006; Corbett et al., 2005). In fact, quality standards are likely to increase firms' competitiveness by lowering defect rates, reducing cost of quality and increasing productivity, on-time delivery and customer satisfaction (Grolleau et al., 2010).

However, there is no hard evidence to date on the impact that employees experience from ISO implementation, especially the financial benefits that employees receive from this approach. More precisely, a part the papers from Levine and Toffel (2009) and

Pekovic and Uradanivia (2008) that demonstrate that implementation of ISO 9000 standard is positively associated with employee's wage, there is no up to our knowledge analysis that evaluates relationship between ISO 9000 standard and employee's wage.

The implementation of ISO 9000 standard requires important changes in organizational and work design. Firms that adopt this standard significantly change work organization, underlying improvement in employee's training participation, decision making, work environment, etc. Hence, in this paper we will examine whether adoption of ISO 9000 standard can indirectly improve employee's wage via improvement in employee's involvement and work environment that are enhanced by adoption of quality standard.

The originality of our contribution is threefold. Firstly, we examine the relationship between ISO 9000 standard and wage, as we said, the subject that is not too much analyzed in the literature. Moreover, we will determinate the effect by looking whether adoption of ISO 9000 standard can indirectly improve employee's wage via improvement in employee's involvement and work environment that are enhanced by adoption of quality standard.

Finally, we will use original database from two quality certified Montenegrin firms. Additionally, the growing sense of concern about quality in Montenegro has been recently underlined by it preparation for entering EU. The remainder of this paper is organized as follows. Section 2 reviews the literature related to the impact of work environment and employee's involvement on wage. Section 3 presents the data and model specification.

The results are provided and discussed in section 4. Section 5 concludes and suggests future directions of research.

2. LITERATURE REVIEW

Work Environment and Wage

Social interaction with colleagues is a highly valued job aspect for many workers. Therefore, work environment related issues have been prioritized in labor policy debates, for instance, a declared target of the European Union, as stated in the consolidated version of the Treaty establishing the European Community¹.

Previous research shows that receiving affective support from colleagues and having good interpersonal relationships at work are positively associated with job satisfaction, job involvement, and organizational commitment, and negatively with employee stress and absenteeism (Lanfranchi and Pekovic, 2010). Therefore, we may indicate that all those improvements due to better work environment could be reflected on firm performance but also on improvement of employee's wage.

Shalley et al. (2000) hypothesized that better work environments can influence individuals' creative behavior and that perceptions of work environments do influence creative performance. Based on previous assumption we may indicate that the creative behavior could be seen as significant factor of wage improvement.

In this sense, Brenner (2004) argue that the ability to share knowledge throughout organizations depends on how the work environment is designed to enable organizations to utilize work environment as if it were an asset. Hence, better organized work environment helps employees to benefit from collective knowledge, what may improve their wage also. Therefore, work environment when appropriately designed, motivates employees toward wage improvement what could be caused by knowledge sharing.

Using time-use data for France and the US, Krueger and Schkade (2008) show that workers who are in jobs that entail more frequent interactions with co-workers are more satisfied with their jobs and in a better mood during work time what could be positively associated with wage improvement.

Generally, we may summarize that better work environment might be associated with higher wages since it associated with improvement of initial levels of employee human capital.

Based on previous discussion, we explore the following hypothesis:

H1: The employee's involvement increases

¹ In the protocol of the Treaty of Maastricht (1992), the social competencies of the European Community were expanded to include "working conditions". A "European Foundation of The Improvement of Living and Working Conditions" had been in place already since 1975.

the probability of wage improvement, *ceteris paribus*.

Employees' Involvement and Wage

The importance of employee involvement as a business strategy was first stressed in the late 1920s and early 1930s. More recently management practice has kindled a renewed interest in this issue. This is due to growing evidence that employee involvement increases effort, which subsequently improves efficiency and productivity, it reduces the costs of monitoring employees and it leads to increased commitment.

In this sense, Zwick (2004) counted three reasons why employee's involvement is important for entire organization. First, employee's involvement takes advantage of the specific knowledge have about their own work processes and combines the skills and expertise of a group of workers (e.g. Levine and Tyson, 1990). Second, workers are expected to have a higher identification with their firms and the decisions taken so that they feel more committed and consequently do a better job (Huselid, 1995; Ichniowski et al., 1997; Godard and Delaney, 2000). Finally, reducing hierarchies may make some employees of the middle management redundant and higher cost autonomy of groups may diminish waste, inventories and inefficiencies (Appelbaum et al., 2000).

Previous literature, mostly argue that employee's involvement is positively associated with wages. Based on human capital theory we may conclude that the participative skills of employees generate spill-over effect of human capital that raises productivity and wages of the firm's members. Using interview and survey data gathered in 1995-1997 from managers and employees in 45 establishments, Bailey et al. (2001) examine how high-performance work practices, such as participation, affected workers' earnings in the apparel, steel, and medical electronics industries. An analysis with extensive controls for personal characteristics and other variables shows a positive relationship between high-performance practices and earnings in the apparel and steel industries. In medical electronics, the same statistically significant association disappears when a control variable for education is added, suggesting that there is a strong relationship between formal education and high-performance systems in that industry.

Using both survey data and field research, Helper et al. (2002) investigate the effects of employee involvement practices on outcomes for blue-collar workers in the auto supply industry. Employing a variety of measures, they find consistent evidence that these practices raise wages by 3-5%. The causal mechanism linking involvement and wages appears most consistent with efficiency wage theories, and least consistent with compensating differences.

Based on U.S. manufacturing employers' database

that covers period 1993-1996, Black et al. (2004) conclude that employees that have been actively engaged in workplace re-organization appear to share some gains in the form of higher wages. However, though these results may be affected by data quality issues, the authors find that these gains do not seem to be evenly distributed within establishments.

In the same sense, Handal and Gittleman (2004) investigate the impact of employee involvement practices on wages and they conclude that those practices may enhance wages.

As indicated by Kanti Nandi (2006), the relationship between employee participation and wages can be considered as a derived relationship from that between employee participation and firm performance. Actually, if employee participation raises firm's performance, one would expect that employees in such firms earn more than those in other firms. Moreover, the author's empirical analysis indicates that there is a wage premium for the employees who work in establishments with participatory practices.

Cristini (2007) examines the effects of high performance workplace practices on employees' well-being. The author purposes and estimates a recursive model that accounts for the links between the quality of work, the wage and the work motivation. Her paper distinguishes between the direct effects of the workplace practices on work motivation, and the indirect effects channeled by the wage and the work quality (working conditions, job security and the intrinsic job content). The results suggest three distinct ways to elicit motivation: involvement, team working and appraisals. Although the overall effect on motivation may be similar, appraisals induce additional motivation indirectly, via the wage but lack any job enrichment effect and actually raise the strictness of supervision; on the contrary, the indirect effect of involvement practices is not via the wage but via job enrichment. Team working has mixed results, usually positive if teams are autonomous on task and procedures, largely negative if teams are responsible for the output and pervasively job impoverishing if task autonomy is not granted. Fully self managed teams however are, at best, ineffective on motivation.

Related to these arguments, we formulate the following hypothesis:

H2: The employee's involvement increases the probability of wage improvement, ceteris paribus.

3. DATA AND MODEL SPECIFICATION

The database and variables

The research presented here is based on MQS 2007

database². The creation of the database is financed by the French ECONET. Two firms among the best in Montenegro are selected, one is a port (service firm) and the other is an agro-industry firm producing high quality alcohol beverages. Both firms are ISO 9001 certified. They are leaders in terms of quality in Montenegro and even in former Yugoslavia. With the help of the statisticians and sociologists of the Center for Labor Studies in France, the questionnaire is constructed (for the employees) and it contains 46 questions. Respectively 251 and 111 employees from the service firm and from the agro-industry firm have answered the questionnaire. The survey in both firms was conducted with the support of the top management because the Center for Quality in Podgorica has been cooperating with both of them. The survey started from mid July 2007 to the end of August 2007. It was simultaneously conducted in both firms using the same methodology: a researcher provides during 15 minutes necessary instructions to a group of 15-20 employees in a room, and then the employees fill the questionnaire. The time allocated to the employees to fill the questionnaire was not limited but on average this time was about 40 minutes. After collecting all the questionnaires, they were analyzed by the Centre for Quality in Podgorica and put into database format using Excel and SAS. After deleting observations that do not provide all necessary information, we work with a sample of 270 employees.

Dependent Variable

The dependent variables presents employee's wage. Actually, our dependent variable has value 1 if employee has superior wage than 400 €

Independent Variable

To test hypotheses of the paper, that is, helpful work environment and employee's involvement impact positively employee's wage, we use the variable denoted *Helpful work environment* and *Involvement*, which are continuous variable.

Control Variable

Our analysis includes several employees' characteristics to control for heterogeneity. The choice of variables is based on previous studies relating work environment, involvement and employee wage (e.g. Zwick, 2004; Handal and Gittleman, 2004; Helper et al., 2002; Cappelli and Neumark, 1999 Black and Lynch, 1997). The variables used in estimation are indicated in Table 1.

² We are thankful to Marc-Arthur Diaye, Zdravko Krivokapic, Jelena Jovanovic and Aleksandar Vujovic for permitting us to use the database.

Table Definition of variables and sample statistics

Variable	Description	Mean	SD	Min	Max
Dependent variables					
Wage	The employee has wage more than 400 € Dummy variable (=1 if yes)	0.69	0.46	0.00	1.00
Independent variables					
elpful Work Environment	The employee and his colleagues are ready to help each others. (Continuous variable)	2.45	0.65	0.00	3.00
Involvement	The employee participates in discussion and meetings. (Continuous variable)	0.75	0.77	0.00	2.00
Gender	The employee is a man Dummy variable (=1 if yes)	0.70	0.46	0.00	1.00
Age	Age (Continuous variable)	45.27	10.82	22.00	62.00
Place of birth	The employee is born:				
	Podgorica	0.16	0.36	0.00	1.00
	Cetinje	0.04	0.16	0.00	1.00
	South of Montenegro	0.47	0.50	0.00	1.00
	Nord of Montenegro	0.21	0.41	0.00	1.00
Not in Montenegro		0.12	0.32	0.00	1.00
Marriage	The employee is married Dummy variable (=1 if yes)	0.71	0.45	0.00	1.00
Child	The employee has children Dummy variable (=1 if yes)	2.29	0.85	0.00	5.00
Education	The employee has:				
	Diploma1 (primary school degree)	0.12	0.33	0.00	1.00
	Diploma2 (technical or lower general secondary degree)	0.17	0.38	0.00	1.00
	Diploma3 (High School degree)	0.37	0.38		
	Diploma4 (two years of superior education)	0.10	0.30	0.00	1.00
	Diploma5 (University degree)				
Diploma6 (PhD or Master degree)	0.21	0.41	0.00	1.00	
		0.03	0.19	0.00	1.00
Seniority	Seniority (Continuous variable)	12.63	9.94	0.00	46.00
Working hours	Daily working hours (Continuous variable)	7.24	5.01	1.00	15.00

The Empirical Model

We want in this paper, to study the effect of helpful work environment and involvement on employees' wage. The model is stated as a discrete-choice model, with the dummy dependent variable indicating wage, Y_i . The dependent variable is defined as follows:

$$Y_i = 1 \text{ if } Y_i^* > 0,$$

$$Y_i = 0 \text{ otherwise.}$$

(1)

The model is defined as follows:

$$Y_i = X_i\alpha + \beta_i ISO_i + \varepsilon_{i_i}.$$

(2)

where Y_i is employees' wage;

X_i vector of control variables including employee's characteristics (*Gender, Age, Place of birth, Marriage, Child Education, Seniority, Working Hours*);

ISO_i presents dummy variables that indicates indirect effect of ISO 9000 standard via better work environment and involvement;

ε_{i_i} presents error term.

4. ESTIMATION RESULTS AND DISCUSSION

Logit estimation results are presented in Table 2.

Table 2: The effect of Work Environment and Involvement on Employees' Wage

		EMPLOYEES' WAGE		
Variables		Estimate	Standard Error	Wald Chi2
Intercept		-3.53	3.43	1.06
WORK ENVIRONMENT		0.12	0.55	0.05
INVOLVEMENT		1.12***	0.36	9.57
GENDER		1.94***	0.67	8.48
AGE		0.20***	0.10	4.54
PLACE OF BIRTH	PODGORICA	0.78	0.99	0.62
	CETINJE	0.57	1.51	0.14
	SOUTH OF MONTENEGRO	-0.17	0.85	0.04
	NORTH OF MONTENEGRO	0.24	0.93	0.06
MARRIAGE		-2.00**	1.01	3.91
CHILD		-0.48	0.31	0.13
EDUCATION	DIPLOMA1	-3.98***	1.30	9.40
	DIPLOMA2	-1.96***	0.86	5.13
	DIPLOMA3	-2.79***	0.75	13.83
	DIPLOMA4	-1.01	0.92	1.20
	DIPLOMA5	0.76**	1.12	4.34
SENIORITY		-0.07	0.08	0.89
WORKING HOURS		-0.44***	0.18	5.67
Likelihood ratio			78.03	
Wald			36.25***	
AIC			189.943	
SC			192.940	
-2 Log L			187.943	
Number of observations			270	

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

The findings provide empirical evidence that helpful work environment do not influence employee's wage. Hence, from these results we reject our first hypothesis, that is, helpful work environment influences positively employee's wage. This surprising results could be explained by the fact that better work environment is more related to employees feelings of job satisfaction (Kopelman et al., 1990) what could present some sort of bonus for employees. Moreover, similarly to our results, Borzaga and Depedri (2005) provide empirical evidence that, in Italian non-profit organizations, satisfaction with colleagues is negatively associated with wages. Actually, based on this fact, we may conclude that helpful work environment is more

linked with non monetary incentives (such as job satisfaction, well-being, etc) than monetary incentives such as wage improvement.

Furthermore, from estimated results we may to conclude that involvement has positive and significant impact on the employees' wage, what confirms our second hypothesis that employees' involvement is positively associated with higher wage. Based on obtained results, we may argue that workplaces with employee involvement have better impact on outcomes for employees such as wage than workplaces without employee involvement thought human capital improvement, compensating differences, efficiency wages, incentives and complementarities and rents-

haring (Helper et al., 2002).

Furthermore, our analysis presents estimation results regarding the factors that may influence employee's wage. As expected, being a man, age, high education, predict higher wage (Handal and Gittleman 2004; Helper et al., 2002). Interestingly, the variables *MARIAGGE* and *WORKING HOURS*, are significant but their sign is negative what induces that those two characteristics impact negatively employee's wage. The possible explanation for negative effect of being married on wage could be explained by the fact that persons in couple or married people are more focused spending time with their family than spending time working what will give them possibility to increase their wage. Concerning working hours, we may conclude that there are more productive people, those people are able that in shorter period of time finish their job and like that they have possibility to earn more money. Finally, our findings indicate that worker's characteristics such as place of birth, having children and seniority do not effect wage improvement since, those variables are not significant.

5. CONCLUSION

The development of technology over the years has changed drastically the characteristics of business. A great increase of concurrence has appeared which has accelerated the globalization of international firms and also the changes of the quality requirement in the business. Those market requirements "push" the producers to adopt quality standards for their products and process of production.

These conditions of work demand constant extra effort of management and of all employees in the company, to improve the performance of procedure and quality of the products. It is necessary to know how to direct the processes of the company, in order to realize

defined aims. Previous literature mostly examine how these standards influence firm business performance (e.g. Diaye et al., 2010; Terlaak and King, 2006; Corbett et al., 2005) showing a positive relationship. However, neglected area is how ISO 9000 standard impacts on employees' wage.

Using a unique dataset from two quality certified firms from Montenegro that provides information on workers, we have conducted empirical analysis to understand if the presence of ISO 9000 quality standard is indirectly associated with higher wages. The indirect effect of ISO 9000 is measured via two dimensions, helpful work environment and employee's involvement. Actually, as it discussed implementation of ISO 9000 induces work re-organization such as improvement of work environment and employee's participation (Pekovic, 2010).

Somewhat surprisingly in light of the literature showing that the re-organization of work has tended to have positive effects on employees' wage, we find that improvement of work environment induced by ISO 9000 standard adoption do not have significant influence on employees' wage. Therefore, we may conclude that better work environment represents a part of the compensation package. On the other side, as we expected employees' involvement is positively and significantly correlated with improvement of wages.

This paper has some limitations that should be taken into account in further research. Firstly, future research is needed to explore equivalent questions in an international setting, especially if we consider that there are cultural differences concerning quality practices. Secondly, there is some need to expand the measurement of employees' outcomes as well as dimensions that are changed due to ISO 9000 implementation. Proposing more indicators will be helpful to understand better what employees' outcomes are affected by different dimensions that are changed by ISO 9000 adoption.

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