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The influence of human capital of the workforce in the adoption of high-performance work systems: the case of Portugal and Spain

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High-performance work systems (HPWS) can be seen as a set of new forms of work organization combined with flexible human resources (HR) practices that enhance organizational performance through employee involvement and empowerment. It is believed that these set of practices, based on involvement, training and incentives, call for a skilled workforce in order to cope with the demands of decentralized and participative work environment where decision making and problem solving are constant. Moreover, the assumed need of a high-skilled workforce is reinforced with several practices related to staff selectivity. Thus, the need for a high-skilled workforce has been accepted without much scrutiny.

Recently, some research, namely in the service sector, has challenged this assumption by concluding that there is no special need for a high-skilled workforce in order to successfully implement high-performance work practices.

Following this debate, the aim of this paper is to contribute to the understanding of the role of human capital on the diffusion and implementation of high-performance work systems. To accomplish this goal, we frame the debate in the human capital and work organization theory and then follow to an analysis of Portugal and Spain, using data from the European Working Conditions Survey (EWCS).

1 Introduction

High-Performance Work System (HPWS) can be understood as a particular type of HR system made up of new forms of work organisation and flexible human resources practices based on employee involvement and empowerment. It has been gaining popularity over the last 10-15 years, and according to researchers is an outcome of an anti-Taylorist wave and the growing desire

of western companies to match the competitions from upcoming countries like China and Japan, who already showed remarkable cost-control in their production processes (Boxall & Macky, 2007; 2009; Cappelli & Neumark, 2001).

Since the processes are varied in organisations, HPWS too gradually manifested in many ways, and accordingly earned various definitions, such as holistic work models (Lindbeck & Snower, 2000), high performance work systems (Applebaum & Batt, 1994; Tomer, 2001) or high involvement management (Lawler, 1986). Nevertheless, its central aim remains the same, i.e., to increase empowerment of the employees, enhance their skills, arranging appropriate incentives, inventing ways to keep them motivated and eventually create a powerful, dedicated workforce that would keep on matching with organizational, market and social requirements (Appelbaum et al., 2000; Boxall & Macky, 2007, Gollan, 2005; Lawler, 2005).

HPWS Label	Underlying concept	Practices	Authors
High-Commitment Employment Practices	Practices that affect organisational commitment, which, in turn, assumed to influence organisational performance	Sophisticated selection and training, behaviour-based appraisal and advancement criteria, contingent pay systems, group bonuses and profit sharing	Walton (1985), Wood (1999), Ramsay, Scholarios & Harley (2000), Godard (2001a), Whitener (2001), Godard (2004), Boxall & Macky (2009)
High-Involvement Work Practices	Practices that emphasise na orientation towards enlarging employees' skills and knowledge	Teamworking/self-managed teams, information sharing, flexible jobs designs	Lawler (1986), Pil & MacDuffie (1996), Vanderberg et al. (1999), Zatzick & Iverson (2006), Boxall & Macky (2007), Macky & Boxall (2008)
Alternative Work Practices	Participatory practices that constitute alternative job designs, practices that allow employees some freedom to design their work	Work temas, job enrichment, job rotation, quality circles or problem-solving groups, cross training, and training in problem solving	Berg, Appelbaum, Bailey & Kallerberg (1996), Godard (2001b), Godard (2004), Boxall & Macky (2007)
Innovative Work Practices	Practices that enhance discretionary behaviour among employees and thus lead to innovative work behaviour in the workplace	Cross-training, flexible job designs, training in problem solving, decentralised decision making, self-managed teams	Ichniowski et al. (1996), Guthrie (2001), Guest, Michie, Conway & Sheehan (2003)

Table 1. HPWS Labels (source: adapted from Mkamwa, 2009)

Adopting such an employee-centric approach to work organization and human resources management several conditions are to be met. Early studies on the adoption of HPWS show that the characteristics of workers, namely their skills and abilities are important for a successful adoption. However, recent studies, namely on the service sector (e.g. Harley, Allen & Sargent, 2007), show that HPWS can be adopted either on a context of high skilled or low skilled workforce.

On the other hand, companies' characteristics are also important. For example, Guthrie et al (2002) shows that companies with a differentiation strategy are more likely to adopt HPWS, and

most of the literature argues that HPWS practices are more likely to be implemented in the manufacturing sector (Appelbaum et al., 2000).

Thus, the aim of this paper is to test the influence of some workers' and companies' characteristics to the adoption of HPWS. Following the discussion on the importance of skills for the adoption of HPWS, the focus will be mainly on human capital as a requisite to the adoption of several high performance work organization practices. Using data from the 4th European Working Conditions Survey, the role of human capital and other workers' and companies' characteristics will be tested in the context of Spain and Portugal.

The structure of paper is as follows. First we set the theoretical background, namely what constitutes HPWS, its main dimensions and practices, focusing on the role of human capital as an important requisite for successful adoption of HPWS. Following the methods, research goals and variable definition, we discuss the results and present some conclusions.

2 Theoretical background

Since early attempts to characterize high-performance work systems, the human capital dimension was present. Lawler's (1986) high involvement management, one of the first conceptualizations of the high-performance approach, already emphasized the human capital dimension for this kind of HR approach to take place, although the theoretical landmark of his thinking was the participative approaches to management, namely quality circles, employee survey feedback, job enrichment, work teams, and gain sharing. His main focus was on involvement of employees as a mean to promote better working conditions, but also enhanced performance; in doing so he also ends up proposing a set of HR and work practices that pervade other areas of management. Moreover, when he proposes a high-involvement management, he also calls the attention to the performance benefits that they can bring to the organization.

Lawler (1986) proposes a theoretical framework for the implementation of high-involvement management based on four principles: information, power, knowledge and rewards. Although all the dimensions are important and should fit together and affect everyone in the same way, Knowledge and Skills is, according to Lawler (1986: 26-27) at the heart of every attempt to promote participation and involvement. A deficit in knowledge and skills can compromise any attempt to involve lower-levels of the organization, because the lack of knowledge and skills can impoverish participation and decisions. Organizations can enhance the skills and knowledge of their employees through training, either on how to do their own jobs (including technical skills) or on how to work and participate in a work team (including interpersonal and leadership skills).

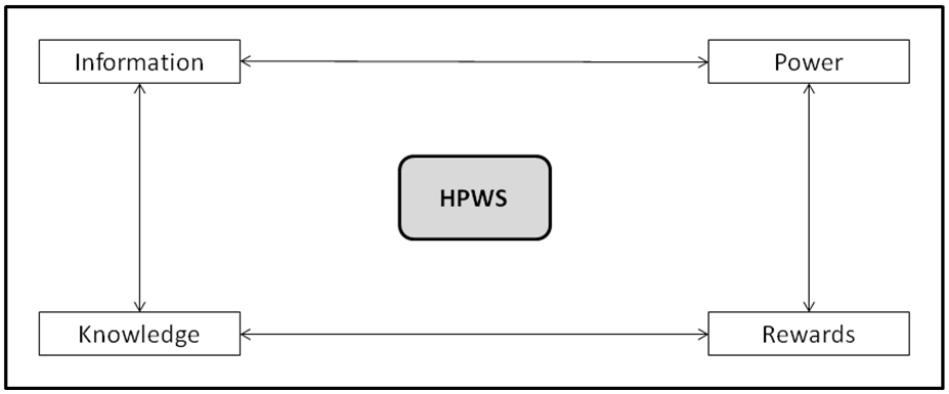

Figure 1. Principles of HPWS, according to Lawler (1986)

The strengthening of information, power, knowledge and rewards should be made through several features; but whatever those features are they should contribute to move those principles downward to the low levels of the hierarchy. Lawler (1986: 194-215) points several of those features, such as job design, problem-solving groups, reward system, personnel policies, career system, selection system and training orientation. These practices should be accompanied by the structure of the organization, namely the organizational structure, information systems, and the physical and technical design.

More recently Appelbaum et al (2000), pointed three drivers of action at the outset, like involvement, training, and incentives, before adding the fourth, i.e., support technology to make it fully compliant to the demand of modern HRM.

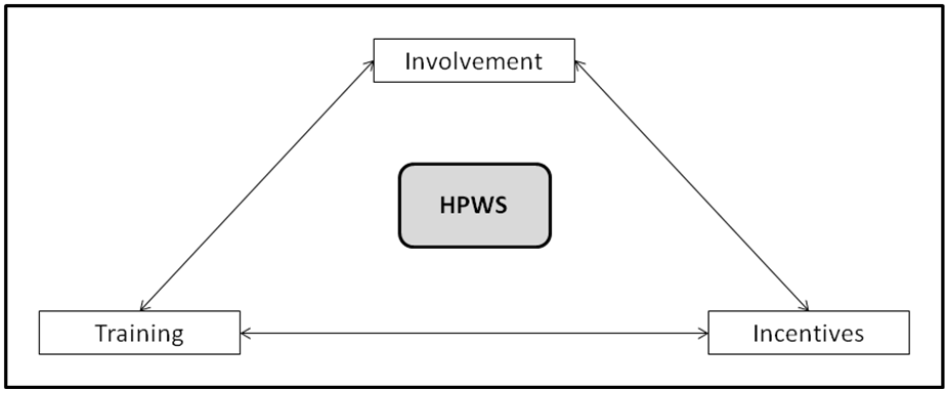

Figure 2. Principles of HPWS, according to Appelbaum et al (2000).

Involvement, the first important component of HPWS, stems from the idea of providing the employees an increased opportunity to participate in decisions (Barnes, 2001). This becomes possible by sharing information among the members of the organisation. Incorporation of this component also serves a pointer to the fact that HPWS wanted to be employee-centric right from its inception, and practically wanted to a part of the new wave of business outlook that replaced the

traditional financial and asset capital with human capital. That move too was contemporary to HPWS, when Barney's (1991) Resource-Based View started making wave and subsequently a host of researchers started providing evidences of positive correlation between company performance human resources.

The second component of HPWS, that is Training, aims to develop the knowledge and skill base of the employees on the subjects that are related to their production processes. Accordingly HPWS attempts to create and maintain a culture of 'on-site' or 'real-time' training rather than only banking on theoretical knowledge. It encourages the employees to be innovative and eager to accommodate and apply new ideas and approaches to their work. The underlying theme behind it is to enrich the organisational knowledge bank and to exploit it in the future. HPWS tries to achieve this aim by identifying the prospect of all types of job in the coming and distant future, and accordingly underpinning required set of knowledge to develop the knowledge base of potentially promising jobs. Such endeavour also demands a constant flow feedback from employees and HPWS thus ensures a smooth flow of communication with them.

The third component of HPWS is Rewards or Incentives. HPWS points at the importance of aligning the goals of the employees with the goal of the organisation by utilizing the reward system. In the process it has to work out the utility value of the existing rewards and incentive system to strengthen the connection between rewards and performance in such a way so that it brings benefits to both the company and the employees.

The combination of the above three drivers in a free flowing manner creates an egalitarian work environment that eliminates the status and power differences, and instead becomes a key driver to enhance collaboration and teamwork.

The formulation of Lawler (1986) and Appelbaum et al (2000), although present HPWS with slightly different dimensions, seem to agree on the important role played by employee's skills in a successful implementation of this HRM approach. In fact, they propose that the knowledge and ability of employees are a fundamental principle of HPWS: in Lawler's terms, "Knowledge" is a key principle, as Appelbaum et al (2000) emphasize the notion of "Training".

These approaches seem to underline the importance of a skilled workforce in order to cope with some of the demands posed by HPWS work practices. For instance, job rotation or job enrichment imply that workers are able to perform different tasks, which can call for different skills; self-managed teams, problem solving, quality circles or information sharing call for high levels of communication and interpersonal skills. This kind of thinking has lead to the conclusion that, HPWS is more likely to be successful in environments where the workforce is highly skilled.

Harley, Allen & Sargent (2007), in a study in the service sector, argue that the general argument against the applicability of HPWS in the service sector is the segmentation of employment in services. This argument flows from the high- and low-value markets in services

where the latter calls for lower skills due to its standardized nature. The low skill/low value combination is more suitable for taylorist or neo-taylorist practices, whereas the combination high skill/high value is more likely to offer more humanistic practices (Appelbaum et al., 2000). However, some research challenges the argument that market segments determine HRM practices (Wood et al., 2006) and present evidence that HPWS-style practices are being applied both to high- (Bartel, 2004) and low-skilled (Berg & Frost, 2005) service workers.

Despite this, Harley, Allen & Sargent (2007) results suggest that HPWS can be applicable either to high- or low-skilled workers. The results also suggest that the low-skilled workers can benefit from HPWS practices as high-skilled workers. Altogether, their findings challenge the assumption that HPWS can only be successfully implemented and effective with a high-skilled workforce. Moreover, it challenges the assumption that when applied to both low- and high-skilled workers, HPWS will have more positive effects on the latter.

3 Method

3.1 Research goals

The main goal of this research is to understand the relation of human capital with high performance work organisation practices. Thus it will be tested the effect that human capital has on several high performance work organization practices. Moreover, it will be tested other worker characteristics, such as age and gender.

However, since the literature is not conclusive on the importance of the sector activity, it is also a goal that will be present. Thus, it will be tested the effect of industry sector on the adoption of high performance work organization practices. It will be also tested other firms' characteristics, namely size and private/public sector.

3.2 Data and variables definition

The data used in the analysis is from the 4th European Working Conditions Survey which is developed by the Foundation for the Improvement of Living and Working Conditions and its main goal is to study working conditions in Europe. The survey has been carried out four times: in 1990/91, 1995/96, 2000 (extended to cover the 10 new member states, Bulgaria, Romania and Turkey in 2001/02) and 2005 (31 countries). The population of the present analysis is confined to respondents that are employed. Self-employed respondents were not considered.

The selected variables for HPWS are limited to high performance work organization practices. Thus, we excluded variables related to incentives and training. According to the literature, practices such as teamwork and job rotation are among the most used in empirical studies. Job enrichment refers to practices that allow workers to expand their spectrum of

autonomy and decision. Thus it includes, but is not limited to, practices such as the ability to change or choose the work methods, speed, and order of tasks.

	Teams/Teamwork	Job rotation	Job enrichment
Lawler (1986)			X
Osterman (1994)	X	X	
Macduffie (1995)	X	X	
Huselid (1995)			X
Pil & MacDuffie (1996)	X	X	
Vanderberg et al (1999)			X
Bernard & Rodgers (2000)	X		X
Ramsay et al (2000)	X		
Cappeli & Neumark (2001)	X	X	
Guthrie et al (2002)	X	X	
Way (2002)	X	X	
Ordiz-Fuertes et al (2003)	X		
Bauer (2004)	X	X	
Guerrero & Barraud-Didier (2004)	X		X
Zacharatos, Barling and Iverson (2005)	X		
Kintana, Alonso & Olaverri (2006)	X	X	
Kalleberg et al (2006)	X	X	
Osterman (2006)	X	X	
Harley, Allen and Sargent (2007)	X		
Scotti et al (2007)	X		X
Guthrie, Flood, Liu, MacCurtain (2009)	X	X	
Liu et al (2009)	X	X	

Table 2. High Performance Work Organization Practices

The independent variables represent workers' and companies' characteristics and are also the most common in the literature (Ramsay et al, 2000; Guerrero & Barraud-Didier, 2004; Macky & Boxall, 2007; Harley et al, 2007; Beltrán-Martín, 2008). The classification of the variable "Education" is based on ISCED classification, and includes the ISCED 5 (tertiary education – first

level) and ISCED 6 levels (tertiary education advanced level). The classification of activity sector was based on NACE11, and includes the manufacture and mining sector.

	Variable Name	Description	Code
High performance work organization practices (Dependent variables)	JOB_ROTATION	Job involves rotating tasks between yourself and colleagues	1="yes"; 0="no"
	ORDER_TASKS	Worker is able to choose or change your order of tasks	1="yes"; 0="no"
	WORK_METHODS	Worker is able to choose or change your methods of work	1="yes"; 0="no"
	WORK_SPEED	Worker is able to choose or change your speed or rate of work	1="yes"; 0="no"
	TEAMWORK	Job involves doing all or part of your work in a team	1="yes"; 0="no"
Workers' characteristics (Independent variables)	GEN_FEM	Respondent sex if female	1="female"; 0="male"
	AGE	Respondent age	
	EDUCATION_HE	Respondent education level Higher Education (ISCED classification)	1="higher education"; 0="others"
Companies' characteristics (Independent variables)	PRIV_SECTOR	Working in the private sector	1="private sector"; 0="others"
	FIRM_SIZE_LARGE	Firm size (large companies with more than 250 employees)	1="large"; 0="other"
	SECTOR_INDUSTRY	Company's activity sector	1="manufacture and mining"; 0="others)

Table 3. Variables used in this study

3.3 Estimation Results

Tables 4 and 5 show the results of estimating probit models proposed, in which the dependent variable is defined by the five dimensions of High performance work organization practices analyzed as a function of the explanatory variables that try to analyze the effect of the personal dimensions (gender, age and educational level) as well as those relating to the company (private/public, industry and size).

		JOB ROTATION	ORDER TASKS	WORK METHODS	WORK SPEED	TEAM WORK
	C	-0.4195	-0.0622	0.1807	0.1213	0.2712
Workers' characteristics	GEN_FEM	0.0856	-0.2160**	-0.2189**	-0.0628	-0.1910*
	AGE	0.0003	0.0072*	-0.0008	-0.0012	0.0015
	EDUCATION	0.0333	0.5087**	0.4010**	0.2280**	0.0238
Companies' characteristics	PRIV_SECTOR	-0.1370	-0.1289	-0.2686**	0.1083	-0.3761***
	FIRM_SIZE_	-0.0116	-0.0393**	0.0064	0.0034	-0.0266
	SECTOR_IND.	0.0200	-0.3753*	-0.0152	-0.1108	-0.1404
	% Pred. correctas	67.81	58.95	58.77	56.06	
	N	553				

Table 4. Estimation results for Spain. Note: * 10%; ** 5%; * 1%**

The results for the sample of Spanish workers show the positive and significant effect of education on the variables "order of tasks", "work methods" and "work speed" which would confirm the theories of early formulations of HPWS, such as Lawler (1996) and Appelbaum et al (2000) mentioned above, namely the idea that the human capital level of workers is fundamental for job enrichment, which imply that workers are able to perform different tasks, that can call for different skills. Also relevant is the negative effect observed for female workers in the variables "order of tasks", "work methods" and "teamwork". Contrary to what should be expected, "job rotation" is not affected by any of the workers' and companies' variables.

As far as the companies' variables, "private sector" has a negative impact on "work methods" and "teamwork"; firm size produces negative effects on the "order of tasks" and, finally, industry companies have a negative impact on the "order of tasks".

		JOB ROTATION	ORDER TASKS	WORK METHODS	WORK SPEED	TEAM WORK
	C	0.2565	-0.1699	0.2781*	0.6336*	0.5980**
Workers' characteristics	GEN_FEM	-0.1800*	0.1677*	0.0658	0.0367	-0.0850
	AGE	-0.0073*	-0.0020	-0.0019	-0.0022	-0.0121**
	EDUCATION	-0.2880**	0.7727***	1.1714***	0.5264***	-0.1208
Companies' characteristics	PRIV_SECTOR	-0.3497***	0.2550**	-0.0139	-0.2690**	-0.1718
	FIRM_SIZE	0.1306	0.0762	-0.0768	0.0906	0.5284***
	SECTOR_IND.	-0.1607	-0.4619***	-0.2290**	-0.6842***	0.0970
	% Pred. correctas	66.67	61.06	59.91	68.10	56.61
	N	696				

Table 5. Estimation results for Portugal. Note: * 10%; ** 5%; * 1%**

The data for Portugal are significantly different from those obtained for the sample of Spanish workers. The first and most important difference is that Education is positive and significant at the 1% in all dimensions, except for "job rotation" that is negative, and "teamwork" that is not significant. Moreover, in relation to personal variables, gender is has a negative impact on "job rotation" but has a positive impact on the "order of tasks". On the other hand, age is significant for "job rotation" and "teamwork" although it impacts negatively on these variables.

The variables concerning the company are significant in the dimensions considered in the analysis, although with different results. Firm size seems to have the less explanatory power, since it only impacts positively on "teamwork". The private sector companies produce a negative impact on "job rotation" and "work speed" and a sportive effect on the "order of tasks". Finally, and quite surprisingly, companies from the industry sector impact negatively on "order of tasks", "work methods" and "work speed".

4 Discussion

Before the discussion of the results, it should be mentioned that we should be careful in trying to extract common results from the analysis of two different countries. In fact, although Spain and Portugal are neighbour countries with several similarities, they also present their own specific characteristics that can influence the way organizations are managed.

Generally speaking, the assumption that human capital is relevant for the adoption of high performance work organization practices is supported by this analysis. With the exception of job rotation and teamwork (although for different reasons in Spain and Portugal), education has positive effects on the adoption of several of the high performance work organization practices selected for this study. Thus, these results seem to support the assumption of early formulations of HPWS, which argue for the need of a high skilled workforce in order to implement successfully high performance work organization practices (Lawler, 1986; Appelbaum et al, 2000).

However, it should be noted that this conclusion is more evident for the practices that essentially depend of individual decision, such as choose or change order of tasks, work methods or work speed. When observing practices that either involve some kind of interaction with other workers or collective decisions – such as teamwork or job rotation – the effect of human capital is less evident. Although we don't have data to further support this argument, it seems that human capital, as an individual asset, is not shared with other workers. As Bauer (2004) puts it in his study of job satisfaction, those practices (order of tasks, work methods and work speed) compose what he calls "autonomy". Thus, it seems that higher levels of human capital can produce higher levels of individual autonomy.

Another interesting result is the negative impact that industry companies have on several high performance work organization practices. Especially evident in Portugal, this evidence can indicate the prevalence of taylorist practices in the industry sector in Portugal. If it is the case, this results challenge the assumption of Appelbaum et al (2000), which states that HPWS practices are more likely to be implemented in the manufacturing sector.

Some limitations can be pointed to this analysis. Work organization practices used doesn't represent all the dimensions of HPWS. Although for analytical purposes this can be done, it should be noted that the mainstream literature on this topic states that HPWS can only effectively work as a bundle of practices and not in isolation.

On the other hand, variables selected to represent the characteristics of workers and companies may be reducing the reality. Other variables should be tested in future studies. For example, firms' competitive strategy or variables related to the environment are also considered in the literature and should be tested (Ordiz-Fuentes & Fernández-Sánchez, 2003). As for workers, it should be considered other variables beyond the demographic variables such as age and gender.

Finally, the analysis of two countries doesn't allow generalizations. There are many contingencies that are related to the reality of each country that makes generalizations complex.

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