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BEING INNOVATIVE FOR SURVIVING: THE ROLE OF HRM PRACTICES

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Abstract

The purpose of this paper is to study the relationship between HR practices and innovative performance in the Spanish industry. Specifically, we will focus on innovativeness, measured through the production of patents, analyzing the extent to which this innovative result is favoured by some HRM practices as investments on training and whether it is also affected by the use of full time workers. We propose the assessment of these relationships by means of the Spanish Survey of Industrial Strategic Behaviour. We focus our longitudinal analysis on the period 2001-2008, years of high economic growth in Spain during the last decades. Our findings show that the most innovative firms are also the most competitive ones in terms of added value, and they also use full time workers. Finally, training investments on new technologies, languages and data processes have an impact on innovativeness. The paper is closed with a discussion about some lessons we may learn from these wealthy years and the role played by HRM investments on firms.

Keywords: Innovativeness, HRM, Training, change environment

BEING INNOVATIVE FOR SURVIVING: THE ROLE OF HRM PRACTICES

1.- INTRODUCTION.

Organizations in the new economy are facing turbulent environments and strong competition. According to the Resource Based View of the firm (RBV) it is important to develop valuable and scarce resources and capabilities (Prahalad & Hamel, 1990), which are said to be the source of sustainable competitive advantage (Barney, 1991; Barney & Wright, 1998; Wright, McMahan and McWilliams, 1994). However, there is a question still pending: What is the role of human resource management (HRM) in creating and developing capabilities and competitive advantage?

Currently, HR managers are confronted with serious difficulties for demonstrating the relationship between their role on the firm and competitive advantage and they need to develop measures that show the importance of HRM investments in the organization (Ulrich, 1997: 303). Some authors suggest that their future is to create systems of HRM practices which were difficult to duplicate for competitors and avoid the obsolescence of HR skills and knowledge (Boxall, 1996; Guest, 1997; Lepak & Snell, 1999).

Research has analysed the role of HRM practices on the firm performance, using ROI, profits and turnover as dependent variables (Paauwe, 2009). They have assessed different models of HRM Practices, as “Commitment” or “Internal Development” vs. “Market Based” or “Buy” systems (Arthur, 1994; Dyer & Reeves, 1995; Guest, 1997; Ichniowski, Shaw and Pennushy 1997; McDuffie, 1995). However, these papers measured the contribution of HRM practices through financial and short term metrics. They did not assess the role of HRM Practices in long term outcomes –as the generation of patents is. Such type of outcome is a result of managing intangible and firm specific features, as organizational capabilities, in the way recommended by Wright et al. (1994) or, more recently, Kang and Snell (2009). Another limitation comes from the cross-sectional nature of the previous research. Innovativeness is an evolving process with a

dynamic nature which requires a longitudinal study design. The previous cross sectional studies lack of an appropriate way of measuring causality between HRM and dependent variable, and this has been considered a pitfall in the way of analyzing consequences of HRM designs (Combs, Liu, Hall and Ketchen, 2006; Paauwe, 2009).

The purpose of this paper is to analyse whether the number of patents (a way of measuring firm innovativeness) is depending on the HRM practices applied and we do study it by means of a longitudinal design, so causality may be derived from our analyses. We assess to what extent the focus on full time/permanent employment and investments on employee training are related to innovativeness and further performance. In doing so, we check a sample of Spanish firms depicting data from 2001-2008, years of an important rise in Global and Spanish economy. In such a way, our study covers a period of economic growth and, by this way some lessons could be learnt for facing later recessions.

This paper is expected to contribute to the existent literature in several ways. Firstly, by adding empirical data in the debate about the consequences of “buying” vs “making” employees (Delery & Doty, 1996). As we propose and test that employment security and training would be positively associated to innovativeness, we are implicitly assuming that the internal development of employees is preferable than “buy” or “market based” models for generating competitive advantages, something to keep in mind even in times of economic difficulties; Secondly, by including as dependent variable the number of patents, a proxy of innovativeness, and studying the contribution of HRM practices to this important source of further competitiveness (Lado & Wilson, 1994; Lopez-Cabrales, Valle and Herrero, 2006); And thirdly, by using a panel data (2001-2008) for assessing these relationships. This is worthy because is coherent with the idea of evolving and long term processes associated with innovations, and because we may infer causality with our study design (Combs et al., 2006; Wright, Gardner, Moynihan and Allen, 2005).

2.- HUMAN RESOURCE MANAGEMENT PRACTICES, INNOVATIVENESS AND PERFORMANCE: HYPOTHESES.

In the last years, a growing interest is observed in explaining how firms can increase their competitiveness and results, as a consequence of the difficulties found in different economies and stakeholders claim for more research about organizational variables leveraging business profits. According with the Resource Based View of the firm (RBV), to be innovator arising as a key issue to generate and maintain the firm competitive advantage. “Innovativeness” is one of the most relevant dynamic capabilities which enable firms to fit changes and even to provoke them (Teece, Pisano & Shuen, 1997). Hammer and Champy (1993) and Teece et al. (1997) emphasize the necessity of “creative destruction” for gaining competitive advantage. Innovativeness is necessary to carrying out new combinations of resources, methods, systems, and processes to generate new products and services that fill actual and potential needs of customers (Damampour, 1991). Firms with this ability can earn and sustain greater returns than those without it.

Innovativeness is the result of an individual and/or aggregate creative behaviour so then the knowledge, skills and abilities (KSA) of the employees are core issues related to such organizational outcome. In essence, the contribution of HRM to innovativeness is firstly associated with the value and uniqueness of the core employees’ KSAs, defining a human capital advantage (Boxall, 1996; Lepak & Snell, 1999; Lopez Cabrales et al., 2006; López-Cabrales, Pérez Luño & Valle-Cabrera, 2009). Nevertheless, any human capital advantage may decrease in the long term and even the most valuable and unique workers will decrease in their contributions without an appropriate set of causally ambiguous, socially complex and historically evolved HRM policies and practices, named Human Processed Advantage (Boxall, 1996).

Then, organizations must define and apply appropriate HRM practices for managing people and drive them to the development of innovative results. As Paauwe and Boselie (2005) suggested, HRM practices can generate innovations by influencing employee behaviour in the desired strategic direction. For being innovative, firms should first attract, retain and develop talent. What is important here is that workers are selected in function of the potential learning capacity of the individual and given a full time, permanent work. In that case, such recruits will become more

involved with and committed to the organisation the more they perceive that the organisation values their potential for bringing new knowledge to the job (Guest, 1997; Pfeffer, 1994; Shafer, et al., 2001). More recently, such proposition has been confirmed, because it has been empirically demonstrated that human capital of the organisation becomes a strategic asset for the company when employees have a certain level of employment security, and thus they generate greater innovativeness and even higher returns (Lopez-Cabrales et al., 2006; 2009; Subramanian & Youndt, 2005). Therefore, a staffing strategy of employment security, as a signal of firm commitment to employees and the expected contributions of employees in reciprocity, will be positively associated with innovativeness, as we propose on the first hypothesis:

Hypothesis 1: A HRM Practice as employment security is positively related to “Innovativeness”.

Staffing practices assure the flow of employees into the organization, but they need to be complemented by training initiatives as a form of internal development of employees –or “make” system (Delery & Doty, 1996). Firm training is necessary since it improves the technical ability for solving problems (Beatty & Schneier, 1997; Ichniowski et al., 1997). Training activities must be reorganised by the firm in ways that generate new understandings and new ideas. Thus, training in core skills is useful for innovativeness. When the organisation invests in increasing the knowledge and skills of its employees, the employees are assumed to respond by involving themselves more with the organisation; in this process, they are said to be seeking the maximum fit between their own personal objectives and priorities and those of the organisation (McElroy, 2001).

The investment in training not only improves individual performance but also encourages employees to match their knowledge and skills to the needs of the learning organization. Moreover, Minbaeva (2005) demonstrated the relevance of empowerment and the involvement in the decision taking for creating innovations, because these training and development practices favour the flow of information and knowledge within the firm. In addition, through these practices, a certain degree of discretion is given to and adopted by the individual employees in testing alternative approaches and actions in meeting the needs of the organization. Therefore, we

will expect that investments on training within firms will favour innovativeness. Then, our second hypothesis is expected.

Hypothesis 2: A HRM Practice as firm training is positively related to “Innovativeness”.

Finally, and according to the RBV literature (Barney, 1991; Li & Atuahene-Gima, 2001), innovation is one of the main sources of competitive advantages. Firms that offer products that are adapted to the needs of target customers and that market them faster and more efficiently than their competitors are in a better position to obtain higher performances and create sustainable competitive advantages (Alegre, Lapiedra & Chiva, 2006; Nonaka & Takeuchi, 1995; Prahalad & Hamel, 1990). Furthermore, given that organisational capabilities such as innovativeness can be seen as a “proxy” of competitive advantages (López-Cabrales et al., 2006; 2009), there is a very close link between innovative activity, competitive advantages and performance.

It has been proposed that the development of an innovation contributes to the performance of a company (Damanpour, 1991). That is, innovators have the potential to create markets, shape customer preferences, and even change the basic behaviour of consumers (Zhou, 2006), which in summary leads to higher profits. From the above, we argue that innovative activity represents an important capability that enhances the company’s performance. These assumptions lead us to establish our last hypothesis.

H3. Innovativeness is positively related to firm performance.

3.- METHODOLOGY

Sample

The data employed in this study consists of a longitudinal survey of Spanish manufacturing firms named Encuesta sobre Estrategia Empresarial (Survey of Industrial Strategic Behavior). The data is collected by the Fundación Empresa Pública (SEPI Foundation) and sponsored by the Spanish Ministry of Industry. The database started on 1990 and it is representative of manufacturing firms in the Spanish economy. The sample covers the population of Spanish manufacturing firms with

200 or more employees. Firms with at least 10 employees but less than 200 employees are selected by a random sampling scheme in the initial year. In subsequent years firms that drop out of the original sample are replaced every year by newly created firms, according to the sampling procedure used in the base year. Therefore, the data set reproduces the entry and exit process taking place in the population.

Within this population, we selected a sample of 1,378 firms that offered data about innovations, performance, full time workers, and training during 2001-2008, years of a high economic development in Spain. Distribution by sector of activity can be seen in Table 1, through The Spanish National Classification of Economic Activities –Clasificación Nacional de Actividades Económicas (NACE).

Table 1. Distribution of the number of firms between sectors of activity (N= 1,378).

	CNAE		Number	Percentage
Sector1	15 and 16	Food, drink and tobacco industry	188	13.40%
Sector2	17 and 18	Textiles and clothes industry	122	8.72%
Sector3	19	Leather and shoe industry	31	2.19%
Sector4	20	Timber and cork industry	121	8.60%
Sector5	21	Paper industry; publishing, graphic arts and reproduction of engravings	126	9%
Sector6	24	Chemical industry (reference category)	93	6.61%
Sector7	25	Rubber transformation and plastic materials industry	80	5.69%
Sector8	26	Other mineral, non-metallic product industries	99	7.08%
Sector9	27 and 28	Metalworking and manufacture of metal products	214	15.27%
Sector10	29	Machinery and electrical equipment construction industry	120	8.59%
Sector11	31, 32 and 33	Electrical, electronic and optical materials and equipment industry	77	5.47%
Sector12	34 and 35	Manufacturing of transport material	107	7.60%

Measurements

Control Variables. Firm size was measured by the natural logarithm of the number of employees, as in previous research (Cardinal, 2001). *Activity* is a dummy variable used to control the effect of different activities (Wall & Wood, 2005). For industrial sector, the NACE classification was adopted, distinguishing 12 sectors of activity. As this is a categorical variable, it is necessary to identify a reference category, which will not be included in the regression analysis. In our case, we chose the chemical industry sector (sector 6). The other categories in the industrial sector are introduced as dummy variables, taking the value of 1 when the firm belongs to the corresponding sector and 0 otherwise (see table 2).

Table 2. Definition and descriptive statistics of variables introduced into the regression analysis

<i>Variable</i>	<i>Definition</i>	<i>Mean</i>	<i>S.D.</i>
SIZE	Logarithm of the number of employees.	1.89	.673
Sector1	1 if food, drink and tobacco industry; 0 for any other category	.136	.341
Sector2	1 if textiles and clothes industry; 0 for any other category	.082	.282
Sector3	1 if leather and shoe industry; 0 for any other category	.021	.146
Sector4	1 if timber and cork industry; 0 for any other category	.088	.281
Sector5	1 if paper industry; publishing, graphic arts and reproduction of engravings; 0 for any other category.	.092	.286
Sector6	Chemical industry (reference category)	.064	.248
Sector7	1 if rubber transformation and plastic materials industry; 0 for any other category.	.058	.232
Sector8	1 if other mineral, non-metallic product industries; 0 for any other category.	.069	.256
Sector9	1 if metalworking and manufacture of metal products; 0 for any other category.	.156	.360
Sector10	1 if machinery and electrical equipment construction industry; 0 for any other category.	.084	.280
Sector11	1 if electrical, electronic and optical materials and equipment industry; 0 for any other category.	.054	.227
Sector12	1 if manufacturing of transport material; 0 for any other category.	.074	.265
INNOVATIVENESS: PATENTS	Number of patents	.324	5.19
STAFFING FULLT	Number of full time workers	245.84	769.53
TRAINING: TRTECH	Expenses on training on new technology.	11976.86	81703.8
TRLANG	Expenses on training on languages.	9912.52	53132.6
TRDATP	Expenses on training on data processing.	5723.59	75443.8
PERFORMANCE: ADDED VALUE	Added value	1.95e+07	6.443e7

Independent Variables. In this study, there are two independent variables each related to higher or lower *innovativeness*, *employment security* and *training expenses* (human resource management practices). Thus, following prior research, *employment security* (FULLT) is calculated as the number of full time employees in the firm (Cappelli and Neumark, 2001; Michie and Sheehan, 2005) which is supposed to be a proxy of a stable and permanent job. Concerning to the *training* HRM practice, this is calculated using three training practices: (1) as the total of expenses on training on new technology (TRTECH), (2) the total of expenses on training on languages (TRLANG), and (3) the total of expenses on training on data processing (TRDATP).

Dependent Variables. We have considered two dependent variables; there are *innovativeness* and *firm performance*. Following prior research, *innovativeness* was measured by the number of patents of the firm. Patents are probably the most commonly used objective measure of innovation (Keller and Holland, 1983; Payne, 1987, 1990; Pelz and Andrews, 1966). Related to firm performance, was measured by means of added value (AV) (Way, 2002; Wall, Michie, Patterson, Wood and Sheehan, 2004). This variable is calculated by the difference between the sum of the sales and stock variation, and the purchasing and external services.

4.- RESULTS.

Table 3 provides descriptive statistics and correlations. As we can observe all the relationships considered in the study are significant.

Table 3. Correlations between the variables ^a

	1. Patents	2. Full time Workers	3. T. New technology	4. T. Languages	5. T. Data processing	6. Added value	7. Size
1. Patents	1						
2. Full time workers	.088**	1					
3. Training new technology	.348**	.376**	1				
4. Training on languages	.090**	.498**	.428**	1			
5. Training data processing	.009	.372**	.305**	.445**	1		
6. Added Value	.112**	.921**	.383**	.470**	.343**	1	
7. Size	.102**	.558**	.248**	.306**	.147**	.546**	1

^a The dichotomic variables for the industrial sectors are omitted, ** p<.01; *p<.05.

We test our hypotheses by panel data regressions using STATA software (Hair et al, 1999). We build our panel taking into account the information about available variables each year of the target period (2001-2008; see table 1) and we apply regressions depending on the variables being involved.

Regression analysis for innovativeness as dependent variable and the number of full time workers as predictor supported hypothesis 1. The coefficients although small, are statistical significant. Results are shown on table 4.

Table 4: Regression Results for INNOVATIVENESS” (H1 & H2)

	β
Control Variables:	
Size	.228
Sector 1	-2.26**
Sector 2	-2.09**
Sector 3	-1.95**
Sector 4	-2.03**
Sector 5	-2.17**
Sector 7	-1.91**
Sector 8	-2.31**
Sector 9	-2.23**
Sector 10	-2.08**
Sector 11	-2.11**
Sector 12	-2.48**
Main variables:	
FullT	.000*
TrTech	9.41e-06**
Trlang	2.63e-06**
TrDatp	-3.89e-06**
Wald Chi2	453.61**
R-sq overall	.123

^an=1,378; Dependent: Variable : Patents; **p<.01; *p<.05

Related to the second hypothesis related to training and innovativeness, we have found significant relationships between expenses on training on new technologies, languages and training on data processing and the number of patents, then, hypothesis 2 was supported. Nevertheless, we do note that the sign of the coefficient of training on data processing is negative. Results are also shown on table 4. As control variable, sector was statistically significant meaning that all the sectors considered were less innovative than the reference category, it is chemical industry sector.

Finally, we expected a positive association between innovativeness and performance on hypothesis 3. Such hypothesis was also supported as we found strong and positive relationship among the number of patents as predictor of added value. Results are showed on table 5. To this case, the firm size although with a small coefficient, it was statistically significant, meaning that higher organizations reported higher added value.

Table 5: Regression Results for ADDED VALUE” (H3)

	β
Control Variables:	
Size	3.66e+07**
Sector 1	-327
Sector 2	-896
Sector 3	-644
Sector 4	-871
Sector 5	-400
Sector 7	-554
Sector 8	-368
Sector 9	-568
Sector 10	-265
Sector 11	-658
Sector 12	614
Main variables:	
Patents	376781.9**
Wald Chi2	699.42**
R-sq overall	.305

^an=1,378; Dependent: Variable : Added Value; **p<.01; *p<.05

5.- IMPLICATIONS AND CONCLUSIONS.

The purpose of this paper was to analyse the contribution of HRM practices to innovativeness using a longitudinal data design. We focus on innovativeness as one of the most relevant sources for gaining a sustainable competitive advantage (Lopez Cabrales et al., 2006; 2009; Zhou, 2006). Innovative results emerge from the way employees are managed, then we study the role of HRM

practices as staffing and training on such type of results. We conducted data panel regressions in order to infer causality from a longitudinal design. Therefore, this study tries to contribute to the literature going beyond the prior research limitations by assessing the role of HRM practices in long term outcomes, and using a longitudinal study design. In the following lines we are discussing implications may derive from our results.

First, we found a strong and positive relationship between innovativeness as a predictor of added value as performance metric. That is important, because it demonstrates that innovation is on the road to economic wealth. Also, as part of our measure of innovativeness includes international patents, such result can be considered as a form of globalization strategies that are strongly associated with business success. The message here is that firms must focus on innovativeness if they want to gain positive results and survive to recessions.

Second, we move to the HRM practices that assure innovativeness, taking into account two approaches: employment security and training. Our results highlighted that full time workers are related with innovativeness. The lesson learnt is that security employment strategy does favour innovativeness. That could be an interesting finding helping firms to survive in times of crisis and economic recessions. Nevertheless, we need to know more about this. For example, it would be interesting to know the desired trade-off index between contingent and permanent workers, because we do not know anything about the optimal proportion of temporary workers in the firm workforce.

Third, according to the theoretically expected, training related to technology, languages and data processes have an impact on innovativeness. This is another interesting finding because it is the generally accepted by firms about training, therefore can be the answer to many firm deficiencies.

Our study shows that training could be the response to the innovation capability, even in crisis time, firms should be pay attention to their expenses on training, for instance on kinds of training such as training on new technologies and languages. The three training practices were significant for innovativeness, but we should note that the sign of the coefficient for training on data processing was negative. These results mean that data processing is a sort of basic training need that is not adding any value to the innovation process in firms, while it is important to keep an uploaded knowledge about technologies and languages- this last skill as a necessary condition for producing innovative patents in an international context. Therefore, the important thing here is the suggestion that different types of training have different impact on innovativeness, providing managers a guideline for investing in training.

Finally, this study is also showing the importance of certain contextual variables in our debate. Specifically, innovativeness is associated with the competing sector, as our results suggest that the different industries being considered in this research innovate less than chemical firms. Also, size is relevant in terms of performance, as bigger firms showed a higher added value than smaller companies.

Despite the above-mentioned contributions, this study does have certain limitations that provide implications for future studies. In the first place, the weaknesses associated with some proxy variables, as in the case of the number of full-time workers as a proxy of employment security are a motivation for searching new variables or even ratios among them in the database. Anyway, this is a difficult issue when the study is based on panel data, because researchers are not allowed to create new variables “ad hoc”. And second, we found that some coefficients are significantly positive or negative, but very close to zero. The reason for that is our big sample size (2416

firms). Maybe a fragmentation of sample taking into account size effects could enhance our results.

In conclusion, this study demonstrates the existence of two objectives that HR managers should seek to achieve. On one side, management should incorporate HR practices that contribute to develop the job security of individual employees and training practices (training on new technology and languages), because they are associated with innovativeness and it is needed to improve the level of firm performance, as a way of surviving in recession years.

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