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Jacques Liouville, Mohamed Bayad*

Human Resource Management and Performances. Proposition and Test of a Causal Model**

This research aims at clarifying the links which may exist between human resource management practices and economic performance of firms. To this end, a theoretical model of an exploratory nature is proposed, based on the hypothesis of the existence of cascading relationships between three categories of performance: social, organizational and economic.

The model is applied to a sample of almost 300 French small and mid-sized firms. The principal hypotheses put forth within the context of this study are to a large degree validated. This allows the formulation of interesting recommendations for managers and opens new ways for scholars pursuing this line of research.

Der vorliegende Beitrag will die möglichen Beziehungen zwischen den Praktiken des Human Resource Managements und der wirtschaftlichen Leistung der Unternehmen klären. Dazu wird ein theoretisches Erklärungsmodell vorgestellt, das auf kaskadenhaften Beziehungen zwischen sozialer, organisatorischer und wirtschaftlicher Leistungskategorien basiert.

Dieses Modell wird auf ein Sample von fast 300 französischen Klein- und Mittelbetrieben angewendet. Die hier vorgetragenen Hauptthesen konnten zu einem hohen Grad bestätigt werden. Dies erlaubt interessante Empfehlungen an die Managementpraxis und eröffnet neue Forschungsperspektiven in diesem Bereich.

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Introduction

In the past, human resource management (HRM) was rarely mentioned as factor of performances (Lenz 1981). According to the survey carried out by Fritz (1992), HRM is today mentioned in 50% of research papers concerned with the factors of success. Moreover, HRM's contributions to the explanation of gaps in performance is far from marginal. For instance, through the analysis of 144 firms representative of German industry, Fritz (ibid) noted that, contrary to his hypothesis, HRM choices better explain the variability of performances than do marketing decisions. Clearly, the increasing ability of HRM to explain gaps in performances is tied to the fact that less and less research contributions ignore this variable. One of the sources of this evolution can be traced to analyses of the German and Japanese „economic miracles". Indeed, these studies demonstrated that the performances of German and Japanese firms are partly due to their particular models of industrial relations and of HRM (Hayes/Abernathy 1980; Pascale/Athos 1981; Prais 1981; Limprecht/Hayes 1983; Weiss 1984; Maurice/ Sorge 1989). Consequently, HRM is considered today as a potential source of competitive advantage (Fombrun, Devanna/Tichy 1984; Baird/Meshoulam 1988; Barney 1991; Wright, McMahan/McWilliams 1994) and this fact explain the increasing interest in HRM.

However, the empirical results concerning the link between HRM practices and performances are often of contradictory nature. For instance, Miller/Monge (1986) Wagner/Gooding (1987) and Cotton et al. (1988) have traced several dozen studies with conflicting conclusions as to the effects that employee participation and job satisfaction have on performance. A hypothesis emerged to explain the conflicting conclusions. This hypothesis leads to distinguish two particular systems of HRM. The first system, known as „control " (Arthur 1994) or „technical" (Huselid et al. 1997) consists of considering workers as a source of costs, which are to be minimized (Rosen/Quarrey 1987; Kravetz 1988; Hansen/Wernerfelt 1989; Grinyer et al. 1990). The second system, known as „commitment" (Arthur, ibid) or „strategic" (Huselid et al., ibid), is based on the perception of people as a „resource" or „value" to develop and to motivate, in order to achieve the goals of the organization. These two contrasting approaches have been described recently by a variety of authors (see for example Storey 1992; Mahoney/Watson 1993; Guest 1995; Tsui et al. 1995; Garnjost/Wächter 1996). But several empirical studies have not confirm the superiority of the strategic system of HRM to obtain satisfacting performances (Mayer/Schoorman 1992; Day 1996). Contradictory conclusions are equally obtained in Europe. For instance, in Germany, one of the principal tools of the „strategic" perspective of HRM, the co-management, appears to be an ambivalent instrument. Indeed, according to Gaugler (1986), co-management has a positive influence on the performance of thriving firms but tends to amplify difficulties of firms going through a crisis. Likewise, contrasting conclusions are formulated in Germany on the impact employee profit sharing has on performance (Wächter/Koch 1993). As for the French case, research by Reyes Garcia (1985), Savall/Zardet (1987) and Liouville/Bayad (1993) confirm the hypothesis of the positive

impact of strategic HRM on performance, whereas the results of Allouche/Krausz (1984), d'Arcimoles (1992) and Schmidt (1993) do not lead to similar conclusions.

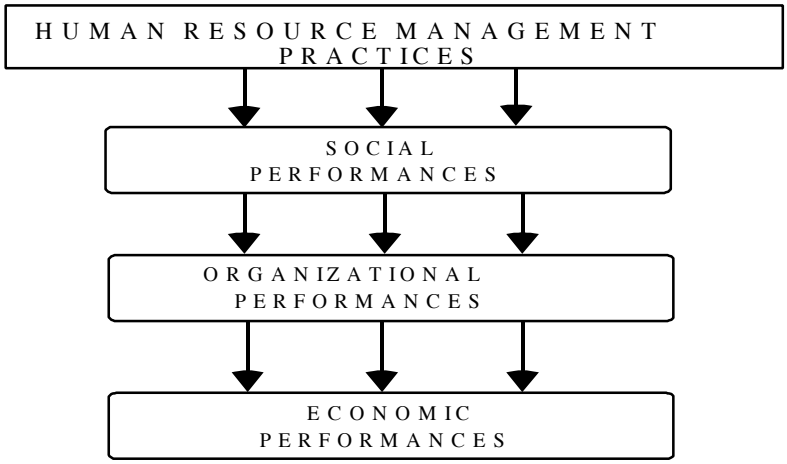
Thus, with the aim of clarifying this question, the first part of the study presents a theoretical model. The second part discloses the research methodology and the third part exposes the empirical results obtained which are then commented.

1. Framework for a model

The non-convergence of conclusions as to the impact of HRM systems on performances is partly due to the fact that the indicators considered are not always identical. Moreover, when different authors use the same indicator the measurement mode of the indicator varies from one study to another (Leana et al. 1990). In an attempt to resolve the problem of indicators, a testable model distinguishing several levels of performance is proposed.

The elaborated model depicts three levels of performance. The model is based on the hypothesis of the existence of links between these three levels (see Figure 1). The presumed links are the following: organizational performances are dependent on social performances which are in turn determined by HRM practices. The underlying hypothesis is that the aforementioned are driven by employee motivation, this last factor having a significant impact on the level of services delivered by the personnel and thus on economic performances, by way of organizational performances. In short, this model is coherent with works concluding that the motivation and implication of employees contribute to the efficiency of the firm (Côté/Sega 1980; Gelinier 1984; Kieser/Kubicek 1992).

Figure 1: Modelization of the impact of HRM practices on performances



The model allow to test which HRM practices brings about social performance improvements and in turn, have a positive influence on organizational performances. By way of the cascade effect, economic performances should also be improved contributing thus to a greater competitiveness for the firm by way of investment policy (de Woot 1988; Zahra/Covin 1993). In Summary, this model contrasts with the traditional view of the link between HRM and economic performances. The present model adheres to the socio-economic view and suggests that there is not a direct interdependence between HRM and economic performances.

Finally, this model must be tested to see if it corresponds to the reality, with the results leading to the formulation of recommendations for management.

2. Methodology

2.1 Selection and construction of variables

So as to identify different HRM systems twelve items are pooled derived from a variety of sources, including Hornsby/Kurato (1990), Osterman (1994), Pfeffer (1994), Arthur (1994), Huselid et al. (1997). This 12 items allow to make the distinction between the practices that reflect the technical and the strategic perspectives of the HRM. Six items described the strategic approach and six items the technical approach.

The strategic HRM variables are:

- employee education and training
- empowerment
- communication
- employee participation
- promoting personnel and managing careers
- improving working conditions.

The technical HRM variables are:

- compensation (wages)
- personnel planning
- recruitment
- assessing employee attitudes and performance appraisal
- minimizing absenteeism
- developing the flexibility of the personnel.

With the aim of analyzing the influence of HRM on performances, the performances are traced at each level through the aid of several variables, with consideration of possible biases, thus avoiding the risk associated with reliance on one single variable (Kaplan/Norton 1992).

In evaluating social performances, which in the model play the role of motivation and implication indicators, three variables are selected: employee turnover, absenteeism and job satisfaction, with a distinction being made for this last variable between the managers and the rest of the employees. The choice of personnel turnover is justified by the fact that a negative and significant correlation is generally observed between intrinsic satisfaction and this variable (Lucas et al. 1987). The inclusion of absenteeism is explained by the fact that it is another classic indicator of job satisfaction (Weber et

al. 1993). These two variables, extracts of social data are complimented by a variable of satisfaction of the employees.

Organizational performances are measured through productivity, quality and new product development (innovation-product). Productivity as a cost indicator is a classic variable of organizational performance (Prais 1981). Moreover, at a time when competition from countries with low wages is on the increase, growth in productivity becomes a condition of survival of firms. According to the model's hypotheses if logically one considers productivity as a determinant of economic performances then clearly this variable is influenced by social performances. In this way, an increase in yield is not only hindered by absenteeism (Prais 1981; Weiss 1984), but also by a high turnover which has an effect on personnel qualification and experience as well as on productivity.

The choice of quality of production, as evaluated through the capacity of products and services to satisfy clients, and through costs associated with inefficient production (hidden costs as described by Savall and Zardet, ibid.), is justified by the fact that it is another classic factor of organizational performance (Budde et al. 1982). Just as a lack of implication could have negative effects on quality, a general concensus exists today as to the decisive role played by product quality in acquiring competitive advantage favorable to a rise in profitability and market share (Jacobson and Aaker 1987; Kaplan and Norton ibid.; Tarondeau 1993; Wildemann 1993).

With consideration to today's shortened product life cycle (Gemünden 1992; Tarondeau, ibid.; Wildemann, ibid.), a firm that does not develop its capacity for innovation runs the risk of marketing only products in the phase of decline and thus generating a total revenue tending toward zero. Consequently it seems coherent to select the variable „new products on the market" to evaluate the performance of the organization and more generally the capacity of the organization to guarantee its survival. The influence of product-innovation on economic performance is less apprehensible to the extent that the profits generated from resources allocated to innovation are dependent in part on entry barriers set up by the innovator (Schewe 1992). Despite this observation, it is possible to adhere to the hypothesis of the existence of a positive link between the volume of innovations and economic performance (for an inventory on this subject see Gierl and Kotzbauer 1992).

As for the indicators of economic performances, the three variables most often used in the business world (Buckley et al. 1988) are selected: profitability, rate of growth of sales, clients and market share.

2.2 Presentation of sample

The sample analyzed is composed of small and mid-sized industrial firms situated in Eastern France having accepted to participate in the study. Initially 650 small and mid-sized firms (between 6 and 500 employees) representative of regional industries of small and mid-sized firms (randomly selected and categorized according to size) were contacted. Approximately 300 firms replied and for the purpose of creating a homogenous sample, 271 of these were retained. Interviews were conducted with the

general managers of these firms. These general managers where asked on their HRM practices and on the performances of their firm.

The majority of these small and mid-sized industrial firms are of a modest size as 81% of the firms of the sample had between 6 and 99 employees, the others having between 100 and 500 employees.

As for the principle activity, 42 % of the companies were classified in the sector of consumer non food goods, 29 % in the intermediary goods sector and 21% in machinery and equipment while the remaining firms belonged to the agriculture and food sector.

Finally 75% of the firms were independent and considered themselves as family firms whereas the rest were subsidiaries of French or foreign groups.

These characteristics contribute to the portrayal of a relative homogeneity between firms of the sample (same geographic environment, proximity in size and belonging to the same secondary sector) which is conducive to confirming the stability of the results.

The focus on SME's is due to the fact that within large firms different groups implement human resource activities in many factories. This implies that heteregeneous HRM practices may be applied in different parts of these firms (Snell and Dean 1992). Consequently, the data collected in such firms may not reflect this complex reality. In contrast, the risk that such biases appear in collecting HRM data of SME's (which have often a single factory) is lower.

2.3 Modalities of Performance Measurement

According to the proposed theoretical model, 4 categories of variables were selected (see Annex 1). On the basis of the replies obtained, a score is calculated for each of the categories, the objective being to design a synthetic indicator of HRM practices as well as a synthetic indicator for each category of performances (see Annex 1). In fact a firm's score, for each one of these indicators, corresponds to the sum (not normalized) of the values affected to each modality of response (see Table 1). This procedure is justified by the desire to avoid results derived from a single variable and most notably to give a certain homogeneity and comparability to the performances indicators.

In order to verify the consistency of the synthetic indicators, tests were conducted using Cronbach's alpha method. This method is used to evaluate the coherence existing between the components of each synthetic indicator (notions of compatibility and representativeness of the indicator components). Table 1 indicates that the values recorded by the alpha coefficient of Cronbach are greater than 0.7 and likewise lead to the conclusion that the synthetic indicators developed within the frame of this study quite closely resemble the variables selected. Indeed the threshold generally used to judge the robustness of results is set at 0.6.

Table 1. Statistics on the scores of variables in the study

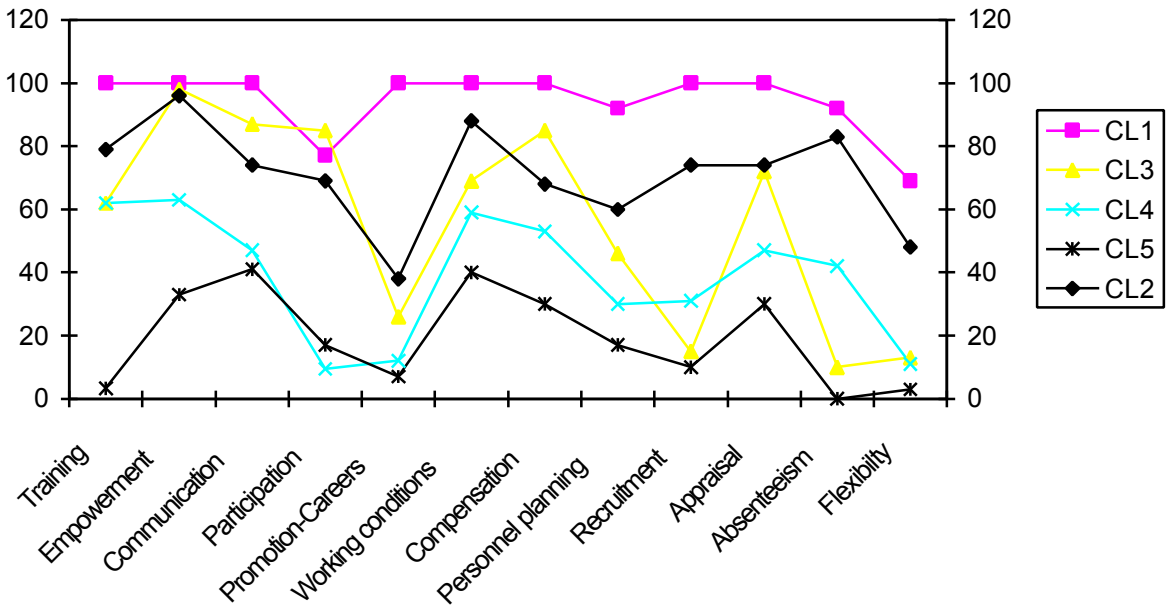
	Mean	Standard Deviation	Cronbach's Alpha
HRM practices	30.27	6.34	0.89
Social performances	11.32	2.41	0.78
Organizational Performances	11.81	2.36	0.72
Economic performances	11.47	2.22	0.81

3. Principal results

3.1 The Typology of HRM Strategies

The typology of HRM practices of firm general managers (HRM systems) is obtained by using in the software SAS-STAT the ascending classification hierarchy (ACH) according to Ward's method. Using optimal dividing (pseudo F value and cubic criteria), the ACH lead to a typology composed of five classes, illustrated in the following figure.

Figure 2 Profiles of the Typology of HRM practices
(HRM practices of general managers (CEO) : percentage of responses „quite" or „very important" in each class)



This typology reveals the variety of combinations of HRM practices of general managers which does not emerge through a flat treatment of the data. The typology contrasts with the extremes of class 1 (including 13 firms or 5% of the total analyzed) to those of class 5 (integrating 30 firms or 11% of the sample). More precisely, class 1 is that which has general managers who establish a HRM system based on the twelve practices (for each practice the answer mode is „quite important" or „very important"). In contrast, class 5 groups together firms of which the general managers assign little importance to HRM practices (a single item among the twelve proposed items accounted for 50% of the replies for the „quite important" or „very important" modalities).

Among the intermediary classes (classes 2, 3 and 4), the HRM practices are not homogeneous either. For example, in class 2 (representing 95 firms or 35% of the sample) the general managers are sensitive to questions about „training", „compensation", „motivation" but less interested in „personnel planning" or „career management". The general managers essentially interested in the development of employee „empowerment" are those in class 3. Finally, class 4 corresponds to those general managers principally interested in issues concerning working conditions and training. This would seem to indicate that the general managers perceive productivity development from a technical point of view but make little effort to promote the motivation of employees.

3.2 Relations between HRM strategies and performances

The first stage consisted of researching the existence of a linear correlation between the indicators (see Pearson's test, Table 2). The results indicate that the HRM practices (dealt with through the synthetic variable method) are in particular connected with the synthetic criteria of social performances and with economic performance (significant to 1%). An association appears as well with organizational performances but to a much lesser degree as the correlation coefficient is significant to 10%. Furthermore, Table 2 illustrates the close links between the synthetic criteria of economic performances and all the other criteria (less than 1% significance). Of particular interest is that the lowest-rated correlation is that which is recorded between the indicator of economic performances and organizational performances.

Table 2: Correlation between the variables of the study

	1	2	3	4
HRM practices	1.000			
Social performances	0.250***	1.000		
Organizational Performances	0.117*	0.145**	1.000	
Economic performances	0.350***	0.323***	0.515***	1.000

Significance levels: *** = $p<0.01$, ** = $p<0.05$, * = $p<0.10$

Although the initial results concord with the starting hypotheses, they are insufficient in evaluating the impact of HRM systems on performances. To this end, an analysis of variance to a factor (ANOVA) was carried out in a second stage. The hypothesis on which this analysis is based considers that the proposed HRM typology plays the role of the independent variable in explaining performances.

The results of Table 3 indicate a significant influence of HRM on performances. These results confirm more particularly that HRM exert a strong influence on the synthetic indicator of economic performances (significant to 1%) and on social performances (significant to 5%).

In the aim of clarifying the results, Duncan's comparison test are conducted (see Table 3). The recorded results confirm that firms in cluster 1 (high sensitivity to all components of „personnel mix“) had economic results superior to those in other classes. Furthermore, the firms in clusters 2 and 3 of which the general managers demonstrated a certain interest in the „strategic approach“ to HRM obtained better economic performances than did the firms in clusters 4 and 5 which were more inclined to implement a technical approach to the management of employees.

Table 3: ANOVA Tests on the classes of the HRM typology

	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5	*F*	*Duncan test*
HRM concerns	44.00 (4.81)	34.60 (5.73)	30.33 (6.31)	27.00 (6.49)	20.70 (6.47)	183.1 ***	1/2/3/4/5
Social performances	13.67 (1.85)	13.11 (2.37)	11.14 (2.15)	10.58 (2.35)	10.45 (2.73)	4.3 **	1,2 / 3,4,5
Organizational performances	12.25 (2.33)	11.83 (2.31)	11.47 (1.79)	11.43 (2.22)	10.27 (2.32)	2.8 *	1 / 5
Economic performances	13.31 (1.49)	11.97 (2.36)	11.76 (2.09)	10.71 (2.32)	10.00 (2.34)	8.1 ***	1/2,3,4,5 2,3 / 5 2 / 4

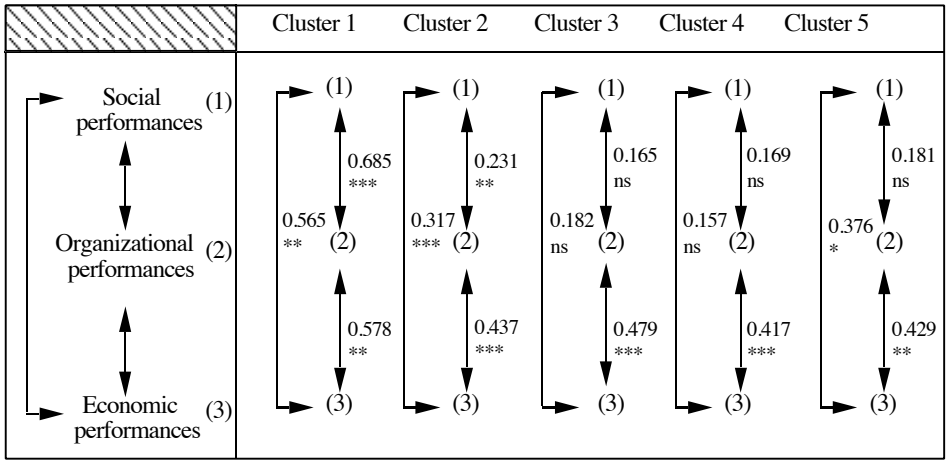
Significative levels : *** = p<0.01, ** = p<0.05, * = p<0.10.
Duncan test p<0.05.

In a third phase, to reinforce the explicative character of the present study, the correlation analyses are conducted within each of the five clusters of the typology (see Table 4). The objective of such a procedure is to verify the existence of links between the different levels of performances within each of the identified HRM systems.

The results clearly indicate that firms in clusters 1 and 2 (strong strategic HRM orientation) have the characteristic of being the ones where the correlation are the clearest. In firms of clusters 3 and 4, the correlations are less obvious and clear links do not exist between the synthetic indicator of social performances and that of economic performances. In these clusters, the economic performances is essentially conditioned

by the organizational performances. The analysis of cluster 5 firms reveals more ambiguous results. It should be noted that within this cluster (such in clusters 3 and 4) there is an absence of link between the synthetic indicator of social performances and that of organizational performances. But inversely, in cluster 5 a weak link emerges between the synthetic indicators of economic and social performances. In fact although this hypothesis remains to be verified, it seems that within this class the economic results determine in part the social policy.

Table 4: Correlation between performances within each of the clusters of the typology



Significative levels : *** = p<0.01, ** = p<0.05, * = p<0.10, ns = non-significative

Conclusion

Despite the fact that the first analyses require further explanation, the results of the present study confirm that a large number of hypotheses related to the proposed model have been supported by proof of facts. The model can be considered relatively validated which attributes a certain consistency to the lessons which can be derived from it. These lessons are of two types.

Firstly, considering that it has been shown that economic efficiency is dependent on organizational performances, the question at hand is how to bring about satisfactory organizational performance.

Table 4 indicates that there exists only one scenario to explain the implication of personnel in contributing to carry out this objective. On the one hand, a strong HRM system (one concerned with both strategic and technical HRM) allows, with a high probability, the bringing about of high organizational performances, which in turn is a guarantee of economic performance. In this way, firms in classes 1 and 2 demonstrating such a concept of HRM benefited from a meshing effect. The chosen HRM options

brought about innovations to competitive costs, what is a good way to achieve sustainable leadership in an industry (Porter 1985).

On the other hand, in classes 4 and 5, where CEO did not implement a strong HRM system, this is a source of social dysfunction, detrimental to economic success.

The second lesson to be retained from this study is derived from the analysis of class 3 where the adopted social strategy corresponds to an impoverished version of participative management (with the exclusion of dynamic dimensions such as career management). In this case, organizational efficiency is also disconnected from HRM choices. It would be thus advisable for CEO of the firms of this class to focus on their HRM choices in order to raise organizational performances. These choices are founded primarily on personal convictions out of phase with the aspirations of people. Consequently, this lack of coherence can be explained by obtained results vastly contrasting to those desired. This implies in particular that CEO should be encouraged to verify if their cognitive schemas are in phase with the reality perceived by the employees.

Finally, this study suggests that the effectiveness of the HRM is the highest when the staff implements a mixed system, including technical and strategic HRM activities of high-quality. This conclusion means that, in opposition to the theoretical hypothesis of Arthur (1994), the firms have to develop both technical and strategic HRM activities to achieve higher performances. This evidence may be explain by the fact that in our sample (French SME's), the firms generally compete in environments characterized by lower levels of institutionalization for technical HRM activities. Thus, as suggested by Huselid et al. (1997), improvements in this field may be a means to gain competitive advantage. Furthermore, this first assertion leads us to consider that in such contexts (with low technical HRM) the firms may have to achieve at least moderate practices of technical HRM to have the foundation needed to implement strategic HRM activities. This result can explain the contradictory nature of conclusions based on the distinction between technical and strategic practices of HRM.

Moreover, despite the fact that our analyses need more in depth investigation in order to make strong recommendations to managers, this article empirically operationalizes and tests central tenets of HRM theory. The article suggests how the HRM systems influences the economic performances of the firm, and the „waterfall performance approach" could be a useful pathway for scholars pursuing this line of research.

In addition, one should note that the results obtained encourage the continuation of this work. A first extension should be to develop and test other hypotheses in order to better understand how the HRM activities lead the firms to success. In this way the test of the set of hypotheses with longitudinal or panel data represents a challenge for future work. Another important extension of this work would be to consider not only the perceptions of managers but to introduce data reflecting the „effective" perceptions of employees, which means that they should be asked directly.

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Annex 1: Description of Study variables and of their mode of measurement

CONCEPTS	VARIABLES	MEASUREMENT
HRM SYSTEMS	**HRM practices** *(qualitative variables)*	12 items on a 4 pt. Likert scale (not, little, quite or very important)
		global score : min. 12 - max. 48 pts.
SOCIAL PERFORMANCES	**Satisfaction of managers**	1 item on a 5 pt. Likert scale
	Satisfaction of employees *(qualitative variables)*	1 item on a 5 pt. Likert scale (very poor, poor, average, good, very good moral)
	Turnover *(departures/total no. of employees)*	transformation to a 4 pt. scale
	Absenteeism *(rate)* *(quantitative variables)*	transformation to a 4 pt. scale (divided into quartiles)
		global score : min. 4 - max. 18 pts.
ORGANIZATIONAL PERFORMANCES	**Productivity** *(total revenue/ total no. of employees)*	transformed to a 4 pt. scale
	Quality 1 *(cost of flaws)* (divided into quartiles)	transformed to a 4 pt. scale
	Product innovation *(no.of new products marketed during the yr.)* *(quantitative variables)*	transformed to a 3 pt. scale (divided according to the no.: none, 1-2 or more than 2 new products)
	Quality 2 *(client satisfaction with respect to firm)* *(qualitative variable)*	1 item on a 5 pt. Likert scale (very weak, weak, average, strong, very strong)
		global score : min. 4 - max. 16 pts.
ECONOMIC PERFORMANCES	**Evolution of no. of clients**	1 item on a 5 pt. Likert scale
	Evolution of market share	1 item on a 5 pt. Likert scale
	Evolution of total revenue	1 item on a 3 pt. scale (low, stable, high)
	Evolution of profit *(qualitative variables)*	1 item on a 3 pt. scale (indebted, balanced, profitable)
		global score : min. 4 - max. 16 pts.