

COMMITMENT TO EMPLOYEES, LABOR INTENSITY, AND LABOR PRODUCTIVITY IN SMALL FIRMS: A NON-LINEAR APPROACH

ABSTRACT

Purpose - The purpose of this study is to analyze the potential existence of a concave downward curve between Organizational Commitment to Employees (OCE) and labor productivity in small firms. The moderating effects of labor intensity on this curvilinear relationship are also examined.

Design/methodology/approach - We use a sample of 819 manufacturing small firms from the Spanish Ministry of Industry and Energy's *Survey on Business Strategies*, and apply hierarchical regression analysis to test our hypotheses.

Findings – The results support a non-linear association between OCE investments and labor productivity: the higher the level of OCE, the lower its positive impact on organizational outcomes will be. Our results also support the contingent view of strategic human resource management, so that an investment in OCE is more effective in some contexts than in others.

Practical implications - We conclude that managers and investors should be aware of the fact that investments in OCE are not always correspondingly beneficial. In the small firm setting, not all firms with large profits apply OCE. A high level of OCE investment may be counterproductive.

Originality/value - The strategic human resource management literature usually assumes a linear relationship between OCE and organizational outcomes; very few empirical studies have considered a nonlinear approach.

Keywords - Commitment to employees, curvilinear relationship, labor intensity, organizational outcomes, small firms.

Paper type - Research paper.

INTRODUCTION

Numerous studies in the strategic human resource management literature have analyzed the high-commitment management model (e.g., Arthur, 1994), high-performance work systems (e.g., Huselid, 1995) or the organizational commitment to employees (OCE) model (e.g., Lee & Miller, 1999). These terms are used to denote a system of human resource practices that enhance employees' skills and knowledge, their commitment, and consequently, their labor productivity, thereby turning them into a source of competitive advantage for firms. This study focuses primarily on the investment aspect of OCE. Companies committed to their employees typically invest more than similar firms in progressive human resource practices such as education and training, good working conditions, and in the total package of compensation (Arthur, 1994; Huselid, 1995; Miller & Lee, 2001). Quantifying investments is useful in that it allows investors and other outside actors to analyze and understand the OCE model, about which they often have only poor, piecemeal information (d'Arcimoles, 1997).

At the organizational level of analysis, most empirical studies of progressive human resource practices have shown that these can lead to better organizational outcomes. However, these studies have centered on large firms. A growing number of researchers (e.g., Hayton, 2003; Storey, 2002) have identified the need for similar research in small firms. These authors argue that because small firms are not simply "scaled-down" versions of large firms, human resource practices that are effective in large firms may not automatically work in small firms. In this vein, Cappelli and Neumark (2001) and Godard (2004) argue that although investment in progressive human resource practices generates substantial benefits, it also involves costs, which are particularly significant in small firms (Sels et al., 2006; Way, 2002). The same authors also state that these costs offset the benefits, and may even outweigh them, which may imply that OCE has a negative effect on organizational outcomes. Consequently,

managers of small firms face a key question: are human resource practices and organizational outcomes positively or negatively associated? The few empirical studies that have examined this issue provide contradictory results (e.g., Sels et al., 2006; Storey, 2002; Way, 2002), which prompted Muse et al. (2005) to call for additional empirical studies to help clarify the exact nature of the relationship between OCE and organizational outcomes in small firms.

In this respect, Aiken and West (1991) and Barnett and Salomon (2006) note that when opposing theoretical proposals forecast relationships where two variables have different signs, and when empirical studies produce mixed results, the possibility should be considered that the relationship between these two variables might be curvilinear (i.e. nonlinear). In this case, a point of inflection (maximum and minimum of the curve) is seen where the change of sign occurs, and therefore a negative relationship can coexist with a positive relationship. Although some researchers have shown that the relationship between human resource practices and organizational outcomes can be nonlinear (e.g., Becker et al, 1997; Chadwick, 2007; Chi & Lin, 2010), most scholars still adopt a linear relationship. By adopting a nonlinear approach in this paper, we propose that the significant costs generated in small firms cause a curvilinear relationship between OCE investments and organizational outcomes in that the higher the level of OCE, the lower its positive impact on organizational outcomes will be, to the point that it may become negative. Previous studies have not yet examined the potential existence of a curvilinear relationship in the small firm setting. The main purpose of this study is to bridge this gap.

In addition, Boxall and Purcell (2000), Datta et al. (2005) and Way (2002) indicate that progressive human resource practices will be more beneficial in high labor intensive contexts. The positive performance deriving from these practices is more likely to occur in contexts in which the employees, rather than equipment or technology, add value to the product or service offered. In this study, we propose that OCE investments and labor intensity

interact positively, and organizational outcomes increase as a result. Previous empirical studies have not examined the possibility that labor intensity may be acting as a moderator variable in the relationship between OCE and organizational outcomes in small firms. Prior studies only consider labor intensity as a control variable (e.g., Sels et al., 2006; Way, 2002), which prevents them from analyzing whether small firms with high and low labor intensity require different (or similar) levels of OCE. This is the second objective of our research.

ORGANIZATIONAL BENEFITS AND COSTS OF OCE

OCE is a multifaceted concept because an organization can exhibit commitment to its employees in many ways. From a psychological approach, OCE may be regarded as a process of social exchange between managers and employees designed to create a facilitative climate of organizational support, trust and helpfulness (e.g., Eisenberger, et al., 1986; Wayne et al., 1997). When employees realize that their organization takes their needs into account and pays attention to their observations, those employees are far more likely to develop positive affective attachments to their employer. OCE is expected to create useful emotional bonds between an organization and its employees. From a management approach, OCE may be reflected by factors such as a company's care for its employees' well being and satisfaction, ensuring good working conditions, and in its investment in training and competitive compensation (Lee & Miller, 1999; Miller & Lee, 2001; Muse et al., 2005). These aspects of OCE will be critical to enlisting employees' best efforts and dedication at work.

The logical connection between OCE and benefits to the organization is supported by research from scholars such as Miller and Lee (2001) and Muse et al., (2005). These authors base their reasoning on both the human capital theory and the resource-based theory to argue that investment in OCE contributes to building a human capital pool and to stimulating a social climate of mutual commitment between the firm and its employees. In economic terms,

such factors are valuable, scarce and difficult to imitate. The initiatives and investments designed to improve the firm's human capital represent a highly significant competitive advantage since they help the firm build up a specialized work force which constitutes an inimitable asset. Likewise, firm investments oriented toward encouraging employee commitment are a source of competitive advantage since the greater employee collaboration, the higher their labor productivity will be. This situation leads to increased creativity and organizational learning capacity, which in turn will allow innovation and the capacity to respond effectively to increased competitive intensity in today's markets. Furthermore, this social climate of mutual commitment is supported within a network of social relationships that are not easy to identify and are therefore difficult to imitate.

Despite these benefits and the apparent evidence supporting the implementation of OCE, not all researchers appear to be entirely convinced. For example, Godard (2004), Guest et al. (2003) and Cappelli and Neumark (2001) maintain that the usefulness of progressive human resource practices is overrated because certain costs involved in its implementation have not been taken into account. OCE has a "dark side" which negatively affects organizational outcomes. In this respect, Cappelli and Neumark (2001) and Youndt et al. (1996) note that although greater investment in progressive human resource practices is likely to lead to higher income, at the same time it undoubtedly increases labor costs and, therefore, the net effect on organizational outcomes is uncertain. This argument is particularly valid in relation to the higher salaries required by OCE implementation. Likewise, increasing employees' job security may prove relatively costly, especially for firms facing highly fluctuating product demands or operating in relatively rigid labor markets with high dismissal costs (Amuedo-Dorantes, 2001; Rodríguez-Gutiérrez, 2007). Cappelli and Neumark (2001) provide empirical evidence that OCE increases sales per employee but, at the same time,

because of the magnitude of the labor costs involved, no positive effect of OCE is noted on sales per unit of labor cost.

The above benefits (pros) and costs (cons) may be extrapolated to small firms (Sels et al., 2006). On the benefits side, authors like Mayson and Barret (2006), Muse et al. (2005) and Way (2002) stress that the ability to adequately provide qualified employees with effective training, secure jobs, and offer competitive compensation are key factors in achieving competitive success in small firms. This means that employees' knowledge, skills and motivation, encouraged by investments in OCE, become a strategic asset—valuable, rare and inimitable—and a source of sustainable competitive advantage for small firms. With regard to OCE costs, Baron and Kreps (1999) state that OCE involves a lot of hard work for small firms because it requires constant attention and investments that can add to organizational overheads. Several researchers pay particular attention to OCE costs in small firms. Godard and Delaney (2000) demonstrate that OCE implementation is actually difficult and is a major concern for small firms since it involves high labor costs, which in economic terms are only feasible in large firms that are able to spread the costs effectively. This opinion is shared by Sels et al. (2006) and Way (2002), who argue that the costs of investing in OCE probably outweigh the benefits it brings to small firms, since they cannot exploit economies of scale to the same extent as large firms.

In addition, small firms have to bear other costs that extend the “dark side” of OCE, and consequently, enhance the negative effect of OCE on organizational outcomes. Mayson and Barret (2006) indicate that despite the view that one of the great strengths of small firms is their informal human resource practices, this informality can lead to diminishing returns. Poor planning often leads to a lack of coordination among the different human resource practices and hinders the consideration of employees as a valuable asset. In this respect, Wood (1995) emphasizes that firms should be successful in implementing OCE when the

human resource management function is “taken seriously”, that is, when the firm has clear objectives to meet and has integrated OCE investments into its established financial program. Another drawback is that many small firms offer their products and services in a local market, which means their options for increasing sales by investing in OCE are very limited (De Grip & Sieben, 2006). A stronger investment in OCE will not increase organizational outcomes because the limited scope of the market they cover restricts any chances of increasing sales. The most feasible alternative for small firms to increase their labor productivity is to reduce the number of employees or their labor costs, which weakens motivation among employees, and consequently the potentially positive effect that OCE may have on organizational results.

These increased costs have prompted some researchers to suggest explicitly that the conventional positive relationship between OCE and organizational outcomes is less likely to arise in small firms. The few empirical studies carried out in small firms offer contradictory results. For example, Storey (2002) supports the traditional theory that implementing OCE has a positive impact on organizational outcomes, although they conclude that this positive effect is relatively weaker in small firms. Other studies such as those by De Grip and Sieben (2006) and Way (2002) conclude that OCE has no significant effect on organizational outcomes. In particular, Way (2002) reveals that the sales improvements resulting from OCE are offset by the increased labor costs derived from their implementation. Finally, Sels et al. (2006) use different indicators of organizational outcomes and reach the conclusion that OCE may have positive and negative impacts on organizational outcomes. These authors show that while OCE increases the ratio of value added to hours worked, the extent of the labor costs incurred produces a negative effect that significantly reduces the ratio of value added to labor costs.

In summary, while some studies show a positive effect, others find a negative effect, and yet others conclude that OCE has no significant effect whatsoever on organizational

results. If we follow the arguments of Aiken and West (1991) and Barnett and Salomon (2006) in the OCE theoretical framework, we may conclude that the origin of these discrepancies lies in the existence of a curvilinear relationship between OCE and organizational outcomes in small firms. In other words, the effect of OCE on organizational outcomes is different at different levels of OCE. Chadwick (2007) supports this proposal when he maintains that a standard assumption in organizational performance modeling is that the marginal utility of investments in organizational assets drops once a certain level has been reached. This notion of decreasing marginal returns implies that the positive effect of OCE investments falls as the level of OCE increases, and eventually may become negative when OCE is implemented extensively, if the costs of additional OCE investments exceed the benefits they generate. A drop in marginal utility may occur if employers first utilize the most effective types of human resource activities included in OCE (Chadwick, 2007). He illustrates this by explaining how investments in training may lead to decreasing returns if decision makers initially choose the type of training that has the biggest impact on organizational outcomes.

Similarly, Chi and Lin (2010) argue that an additional investment in OCE made at a high implementation level produces a slight or null marginal utility given the significant magnitude of the associated labor costs. In short, the effect of OCE on organizational outcomes will be more positive in a low level than a high level implementation context. This curvilinear proposal is more likely to be seen in small firms as a result of the high costs involved in implementing OCE. Kotey and Slade (2005) also follow this line in recommending small firms to maintain a certain balance when setting up OCE so as to reach an intermediate implementation level and thereby take full advantage of the benefits without incurring excessive costs. Consequently, we adopt a nonlinear perspective in the relationship between OCE and organizational outcomes in small firms to propose:

Hypothesis 1. OCE and organizational outcomes have a concave downward curvilinear relationship.

The moderator role of labor intensity

The benefits and costs associated with OCE may vary depending on conditions that differ from one firm to another (Godard, 2004). In this respect, Youndt et al. (1996) also postulate that OCE must be integrated into the production process if the firm is to take full advantage of its potential. Specifically, the level of labor intensity is an important variable that can moderate the effect of OCE on organizational results (Datta et al., 2005; Godard, 2004; Guest et al., 2003). Labor intensity may be defined as the ratio of labor costs to the value of the firm's plant and manufacturing equipment. A high degree of labor intensity implies relatively lower plant and machinery costs relative to staffing expenses. Specifically, OCE offers more benefits in a context of high labor intensity (Datta et al., 2005). A less labor-intensive firm, characterized by a mechanized production system, offers few opportunities to its employees to improve their labor productivity levels through greater commitment and dedication in their jobs. Conversely, labor intensive production systems provide employees with more opportunities to make suggestions and innovations. Terpstra and Rozzell (1993) note that less labor intensive firms cannot take full advantage of their workers' skills and knowledge because of their highly automated production systems. Thus, workers in more labor intensive firms play a greater role in the production process. In this more labor intensive context, employees are an especially valuable strategic asset which proves difficult to substitute (Boxall & Purcell, 2000; Way, 2002). Youndt et al. (1996) also maintain that the higher the potential for employee contribution in a firm, the more likely the firm will be to invest in OCE, and that this investment will lead to higher individual productivity and firm performance. When labor costs represent a larger share of total expenses, firms might anticipate greater benefit from their OCE investment. Furthermore, Youndt et al. (1996)

recognize that implementing OCE in a context of low labor intensity may even have a negative impact on organizational outcomes. According to these authors, the technological advances and automated production systems in place in most industrial companies require employees with few qualifications who earn relatively lower salaries. OCE investment costs are rarely justified in such contexts since the benefits they bring tend to be of limited utility. Based on this argument, a firm with a low level of OCE may be more effective if it is less labor intensive. In sum, if we adopt a global perspective that considers both the firm's level of OCE and its degree of labor intensity, we would expect that the higher the OCE level and the lower the labor intensity, the lower the positive effect of the OCE investments will be on organizational outcomes. Consequently, we posit:

Hypothesis 2. OCE and labor intensity interact in predicting organizational outcomes: the concave downward curvilinear relationship between OCE and organizational outcomes is stronger when labor intensity is high.

METHODOLOGY

Sample

Our research was carried out on a sample of Spanish firms. If one is looking for a country in which to analyze OCE in small firms, Spain provides a representative case study. The Spanish economy is dominated by small firms, with fifty-five per cent of the labor force employed in companies with no more than 100 employees (Rigby & Lawlor, 2001). Studies on the Spanish workplace indicate that the set of practices associated with the OCE model are seldom encountered in practice and their incidence has not increased very much in recent years. Some systemic factors account for this, including "short term" human resource management and adversarial industrial relations traditions. In Spain it is very difficult to

convince small firm managers of the longer-term investment arguments for expenditure on employees' well being (Rigby & Lawlor, 2001).

The data to empirically test our theoretical hypotheses come from the Survey on Business Strategies (*Encuesta sobre Estrategias Empresariales*, ESEE). Financed by the Spanish Ministry of Industry and Energy, the SEPI Foundation is responsible for the Survey's design and administration through the Economic Research Program. The ESEE complements the information from two essential statistical sources that have traditionally been available for analyzing Spanish industry: the Industrial Survey published by the Spanish National Statistics Institute, and the Bank of Spain's Central Balance Sheet Data Office. The ESEE reference population consists of firms with 10 or more workers in manufacturing industries, excluding industrial activities related to oil refining and the treatment of fuels. We use data from 2002 since this was the most recent full survey at the time of our study. Given the wide variations in the definition of a small firm according to country or geographical area (Mayson & Barret, 2006), we used the criterion proposed by Sels et al. (2006) and Way (2002): firms with a maximum of 100 employees, thus enabling comparisons of our results with those of previous studies. Our final sample included 819 small firms. Table 1 shows distribution by sector using the Spanish National Classification of Business Activity (*Clasificación Nacional de Actividades Económicas* 'CNAE') and the Standard Industrial Classification system (SIC).

Insert Table 1

Measures

Control variables. Following previous research (e.g., Huselid, 1995; Muse et al., 2005), we included five control variables: firm age, firm size, share capital held by other firms, sector of activity and innovation intensity. Firm age was calculated as the number of years

from the company's foundation to the time of the survey. Firm size was defined as the logarithm of the number of employees. The third control variable was defined as the percentage of share capital held by another firm. The industrial sector was based on the CNAE classification. Finally, innovation intensity was calculated as the percentage coefficient between R&D spending and the firm's sales.

Independent variables. We used Schmenner's (1986) measure of labor intensity: the ratio of labor costs to the firm's total net fixed assets. Following Lee and Miller (1999) and Muse et al., (2005), we used an aggregated index of various human resource practices that configure OCE on the system level. As Chadwick (2010) notes, the most common multivariate methodology for operationalizing human resource practices on the system level is also simple: the additive index. An additive index focuses on bundles of human resource management practices and reflects their synergistic nature. Additive indices allow researchers to determine the aggregated effects of a group of variables without assuming that significant interactions occur amongst the component variables (Chadwick, 2010). This method is particularly suitable in small firms since in this setting, individual practices examined in isolation are not likely to have much influence on organizational outcomes (Drummond & Stone, 2007; Storey, 2002). We calculated this index as the mean of the standardized scores of three equally weighted variables: compensation per employee, training expenditures and proportion of permanent employees.

Similarly to Muse et al., (2005), compensation per employee was calculated as the ratio of labor costs to the total number of employees. In Spain, labor costs include wages and salaries, compensation fees, national insurance contributions, pension scheme payments and other social expenditures. Muse et al., (2005) state that their measure is similar to that of the study by Lee and Miller (1999), who used two 5 point Likert scales asking CEOs to rate their organizations on OCE. The first one (OCE1) covers the employees' overall satisfaction at

work and well-being, and the second one (OCE2) covers total dollars invested in employee compensation and in training and development. The two scales clearly measured different aspects of the commitment to employees construct (Lee & Miller, 1999; Miller & Lee, 2001). We therefore consider it appropriate to introduce a further two indicators that complement the employee's compensation factor. These are, firstly, the ratio of training expenditures to total number of employees as an indicator of the organization's investment in training and development of their employees; and secondly, the proportion of workers without temporary contracts as a measure of job security. Temporary employment has been suggested as an indicator of objective operationalization of job insecurity (De Witte & Näswall, 2003; Pearce, 1998). This could be important, because there has been extensive research showing that job insecurity is associated with a range of negative outcomes affecting satisfaction at work and employees' well-being (Guest, 2004). This is particularly true in the Spanish context. Most temporary employees contracted by Spanish firms typically have a lower educational level, precarious job position, and are clearly involuntary (Amuedo-Dorantes, 2001; Rodríguez-Gutiérrez, 2007). These aspects indicate that, in Spain, temporary work contracts are characterized by higher job insecurity and poorer working conditions than those of permanent work contracts (Caballer et al., 2005; Rodríguez-Gutiérrez, 2007).

Dependent variables. Datta et al. (2005) and Muse et al., (2005) advocate focusing on labor productivity to assess organizational outcomes because it indicates the extent to which employees are efficiently creating output and isolates them to a certain extent from external variations in capital and product markets. Consequently, it allows comparison of organizational outcomes among different industries. This is highly advisable when, as in our case, an intersectoral sample of firms is being used. As in previous studies (e.g., Muse et al., 2005), we use the logarithm of the ratio of sales to employees as a measure of labor productivity. Nonetheless, this measure has a critical limitation: it does not include the OCE

implementation-related labor costs and, therefore, the positive effect that OCE has on labor productivity may be overestimated (Cappelli & Neumark, 2001; Way, 2002). In order to overcome this limitation, we also used the measure of labor productivity proposed by Way (2002), namely the logarithm of the ratio of sales to labor costs.

ANALYSIS AND RESULTS

Table 2 shows the descriptive statistics and correlations between the study variables. We followed Aiken and West's (1991) recommendations in examining our theoretical hypotheses. This involved centering the independent variables to avoid multicollinearity problems between the interaction terms and the variables that constitute them. We used a hierarchical regression analysis to select the model which best accounts for labor productivity and to test the hypotheses. In the left-hand panel of Table 3, the regression analysis results are shown when sales per employee is the dependent variable. The significant difference in explained variance between Models 1 and 2 confirms a curvilinear relationship. In Model 2, OCE are significantly and positively related to sales per employee ($b = 0.432$) and the squared OCE variable is significantly and negatively related to sales per employee ($b = -0.114$). We provide empirical evidence for a concave downward curve between OCE and sales per employee, thus confirming Hypothesis 1. In particular, using Aiken and West's (1991) terminology, there is a predominantly positive concave downward curvilinear relationship between these variables. However, Hypothesis 2 is not confirmed because the introduction of the interactions between OCE and labor intensity into Model 3 does not lead to a significant increase in the explained variance from Model 2. The higher order interaction involving the quadratic OCE variable is not significantly related to sales per employee ($b = -0.010$). In short, Model 2 best explains sales per employee.

Insert Table 2

Insert Table 3

The right-hand panel in Table 3 shows the regression results when sales per unit of labor costs is the dependent variable. The results do not confirm Hypothesis 1, as the squared OCE term in Model 2 is not significantly related to sales per unit of labor costs ($b = 0.021$) and consequently no significant increase in the explained variance is noted from Model 1 to Model 2. Paradoxically, when the interactions between OCE and labor intensity are introduced into Model 3, a significant increase in the explained variance is noted. The meaning of the interaction involving the OCE term ($b = 0.118$) is that the strength of the relationship between OCE and sales per unit of labor costs varies according to labor intensity. The meaning of the interaction involving the quadratic OCE term ($b = -0.122$) is that the shape of the curvilinear relationship between OCE and sales per unit of labor costs varies according to labor intensity. We can corroborate that a firm's labor intensity acts as an important moderator variable which affects both the strengths and shape of the curvilinear relationship between OCE and sales per unit of labor costs.

Insert Table 4

To better understand these results, Table 4 shows the simple regression equations and Figure 1 and 2 represent the relationship between OCE and labor productivity. Figure 2 shows the simple regression equations characterizing this curvilinear relationship for low and high values of labor intensity. According to Aiken and West (1991), this involves dichotomizing

the labor intensity variable, choosing one standard deviation below (-27.886) and one above (27.886) the corresponding mean value. We can observe that OCE shows a predominantly positive concave downward curvilinear effect on sales per unit of labor costs at a high level of labor intensity, but a predominantly negative concave upward curvilinear effect at a low level of labor intensity. We can therefore confirm that the positive concave downward curvilinear relationship is more pronounced with a high level of labor intensity, as predicted in Hypothesis 2.

Insert Figure 1

Insert Figure 2

Aiken and West (1991) explain that when the curve is concave upward it is expedient to calculate the minimum of the curve, in other words, the value of OCE at which labor productivity takes on its low value. When we analyze sales per labor costs in a low labor intensity context, the minimum is 0.767. When the curve is concave downward we can find the value of OCE implementation at which labor productivity reaches its highest value, the maximum of the curve. This optimal level is 0.907 when we analyze sales per labor costs in a high labor intensity context, and 5.318 when we select sales per employee. At these points of inflection (maximum and minimum) the effect of OCE investments on labor productivity is equal to zero and a change of sign in this effect (positive vs. negative) occurs. This is not appreciated in the figures since they fall outside the meaningful range of OCE values which, following Aiken and West (1991), are set at one standard deviation below (-0.682) and one above (0.682) the mean value.

DISCUSSION AND CONCLUSION

This study attempts to clarify whether investment in OCE actually produces greater firm performance. Some authors have recently begun to show some skepticism about this assertion, arguing that these investments can have harmful effects which are particularly significant for small firms. Recent empirical studies have lent support to this skepticism. Against this background, the presence of a curvilinear or nonlinear relationship between OCE and organizational outcomes provides a satisfactory solution to the growing debate among researchers who defend the positive effects of OCE on organizational outcomes and those who find no significant effect whatsoever, and still others who claim that OCE has a negative effect. The confirmation of a curvilinear relationship allows these divergent postures to be reconciled, since the fundamental cause of these discrepancies may lie in the different range or level of OCE in the samples of firms used in previous studies. The present research focuses on this possibility and undertakes an in-depth study of the nature of the relationship between OCE and two different measures of labor productivity in the small firm setting. Our approach allows us to highlight some basic theoretical implications and to provide an answer to a range of practical questions in human resource management.

Our results support the thesis put forward by Becker et al. (1997), Chadwick (2007) or Chi and Lin (2010) that a nonlinear relationship may exist between human resource practices and organizational outcomes. Rather than taking a linear relationship between these two variables as an initial premise, traditionally the case in the human resource management literature, it should be considered as a relevant hypothesis that needs to be confirmed empirically. More specifically, as we have noted in our study, it would be advisable to introduce the OCE quadratic term in empirical studies as a factor to explain organizational

results. If this quadratic term had been omitted, nonlinearity would not have been detected even when it does exist (Aiken & West, 1991).

On the other hand, as Becker et al. (1997) discuss, confirming a nonlinear relationship between OCE and organizational outcomes supports the contingent view of strategic human resource management. This contingent approach has been used to defend the notion that an investment in OCE is more effective in some contexts than in others (Chang & Huang 2005; Youndt et al., 1996). Although this perspective has normally been applied to examine how a competitive strategy moderates the effect of progressive human resources practices on organizational outcomes, Chang and Huang (2005), Guest et al. (2003) and Youndt et al. (1996) recommend using another series of firm variables that match human resource management more closely by examining the potential and complex interactions among them. This indication is fully justified in this research work since it demonstrates that the level of OCE and the labor intensity in a firm act as moderator variables.

Our results confirm Hypothesis 1 when the ratio of sales per employee is taken as a dependent variable, that is, the higher the level of OCE in a firm, the lower the positive effect of OCE on sales per employee will be. Conversely, the second hypothesis is confirmed when we select the ratio of sales per labor costs as the dependent variable, that is, the higher the level of OCE and the lower the level of labor intensity, the lower the positive effect of OCE on sales per unit of labor costs will be. As Cappelli and Neumark (2001) and Sels et al. (2006) point out, it is highly probable that these different results are due to the varying nature of these two labor productivity indicators. Although implementing OCE may possibly increase company income (sales per employee), it might also increase labor costs, with uncertain consequences for sales per unit of labor costs. In other words, there is a possibility that investment in OCE increases sales per employee without this necessarily leading to greater

sales per unit of labor costs. This situation, shown in the empirical studies of Cappelli and Neumark (2001) and Sels et al. (2006), is also seen in our research.

Furthermore, a curvilinear relationship, not foreseen in our theoretical framework, emerged in the context of firms with a low level of labor intensity, that is, a predominantly negative concave upward curvilinear relationship between OCE and sales per unit of labor costs. This means that the labor costs in an initial phase of OCE implementation are particularly high and outweigh the benefits gained. It is only when a high level of OCE implementation is reached that benefits offset labor costs. Our results seem to support Youndt et al. (1996) when they argue that, in many cases, heavy investments in the firm's plant and machinery to automate the production process (firms with low labor intensity) have in fact resulted in systems that require and promote low qualified employees, poor training opportunities and with lower employee remuneration (firms with a low OCE level). In these firm contexts, investments in OCE may have a negative effect on organizational outcomes.

Implications for practice

All these theoretical inferences have important consequences for practitioners. Firstly, and in line with Becker et al. (1997) and Chi and Lin (2010), the confirmation of a curvilinear relationship between OCE and organizational outcomes should prompt managers of small firms to not only take into account the benefits derived from OCE, but also their implementation costs, with a view to finding the optimum level of OCE. Secondly, the confirmation of a contingent view shows us that OCE is extremely idiosyncratic and its implementation must be carefully assessed in accordance with each firm's individual circumstances. Heavy investment in training, a low number of temporary contracts, and high salaries are not practices that guarantee greater organizational outcomes for any type of firm (Boxall & Purcell, 2000; Orlitzky & Frenkel, 2005). Specifically, Godard and Delany (2000) indicate that excessive investment in and implementation of progressive human resource

practices in small firms may be counterproductive. These authors reflect that if OCE implementation in large firms was as beneficial as has always been claimed, we would also find these human resource practices widely employed in small firms. Yet the real business situation reveals a completely different picture: a fairly heterogeneous introduction. In the small firm setting, what Orlitzky and Frenkel (2005) argue appears to be confirmed, namely, that not all firms with large profits apply OCE.

Thirdly, OCE always has a positive effect on both sales per employee and sales per unit of labor costs in small firms with high labor intensity. It is therefore clear that these firms should attempt to invest more in OCE, as this will increase their labor productivity. These results therefore coincide with previous studies in the small firm setting (e.g., Hayton, 2003; Rauch et al., 2005), which confirm that investments in employees' abilities and motivation increases organizational outcomes. For small firms with low labor intensity, this is not such a clear-cut decision because conflicting objectives appear. Thus, while increased investment in OCE increases sales per employee, at the same time it reduces sales per unit of labor costs. The small firm's strategic orientation in the product market may have a bearing on how to resolve this dilemma. If the small firm adopts an aggressive posture and its main priority is to increase its market share, even at the expense of becoming less efficient and obtaining lower profitability, it could opt to increase its investment in OCE. Conversely, if the small firm adopts a defensive posture in which its main priority is to maintain its market share as efficiently as possible, the most appropriate action would be to invest less in OCE. On the other hand, an underinvestment in OCE may also be considered as a temporary means of weathering severe economic downturns; however these firms should increase their investment in order to improve their market share and to remain viable in the long term.

Finally, our quantitative perspective on measuring OCE enables investors to evaluate human resource management company decisions. If the human resource system can really

make a difference to firm performance, managers and investors should be given the means to understand it. If not, the habitual conditioning of cutting costs and short-term pressures could tempt them to ignore or distort human resource practices (d’Arcimoles, 1997; Godard, 2004). However, this option restricts the possible range of its human resource practices to a relatively short list of easily quantifiable indicators, thus omitting the more subjective aspects of work organization such as the social exchange between managers and employees. The ESEE does not include any qualitative indicators. This limitation is common in European databases of this type used in previous studies, such as the “French Company Personnel Report” utilized by d’Arcimoles (1997). On the other hand, because the ESEE centers on industrial firms, the results cannot therefore be generalized to service firms. As Guest et al. (2003) point out, the relationship between progressive human resource practices and organizational outcomes is different in these two sectors of business activity. Future lines of research could examine the potential existence of a curvilinear relationship in service firms. Unquestionably, future studies that examine this possibility will help us assess more accurately whether, or under what circumstances, implementing OCE is truly beneficial for firms.

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TABLE 1**Distribution of firms by sectors of activity (*N* = 819)**

SIC	CNAE	Number	Percentage
20 and 21	DA. Food, drink and tobacco industry	104	12.7%
22 and 23	DB. Textile and clothing industry	89	10.9%
31	DC. Leather and footwear industry	33	4.0%
24 and 25	DD. Timber and cork industry	34	4.2%
26 and 27	DE. Paper industry; publishing, graphic arts and reproduction of engravings	70	8.5%
28	DG. Chemical industry	28	3.4%
30	DH. Rubber transformation and plastic materials industry	55	6.7%
32	DI. Other mineral, non-metallic product industries	56	6.8%
33 and 34	DJ. Primary metal industry and manufacturing of metal products	130	15.9%
35 and 36	DK. Machinery and electrical equipment manufacturing industry	61	7.4%
38	DL. Electrical, electronic and optical materials and equipment industry	57	7.0%
37	DM. Manufacturing of transportation equipment industry	27	3.3%
39	DN. Miscellaneous manufacturing industries	75	9.2%

TABLE 2
Correlations and Descriptive Statistics

Variables	Mean	s.d.	1	2	3	4	5	6	7	8
1. Firm age	18.432	15.997	1							
2. Firm size (log)	1.440	0.258	0.123**	1						
3. Share capital held by other firms	14.090	32.603	0.109**	0.404**	1					
4. Innovation intensity	0.332	1.295	0.082*	0.113**	0.091**	1				
5. Labor intensity	5.130	27.886	0.042	-0.094**	-0.029	-0.017	1			
6. OCE	0.000	0.682	0.270**	0.173**	0.337**	0.154**	0.002	1		
7. Sales per employee (log)	11.340	0.738	0.169**	0.272**	0.383**	0.088*	-0.035	0.475**	1	
8. Sales per labor costs (log)	1.378	0.604	0.037	0.174**	0.225**	0.013	-0.046	0.105**	0.853**	1

Notes: ** $p < 0.01$; * $p < 0.05$; (bilateral significance)

TABLE 3

Results of hierarchical regression analyses ^a

Variables	Sales per employee			Sales per labor costs		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Firm age	0.028	0.012	0.012	-0.017	-0.014	-0.013
Firm size	0.115**	0.119**	0.127**	0.096**	0.095**	0.107**
Share capital held by other firms	0.182**	0.174**	0.169**	0.155**	0.156**	0.153**
Food, drink and tobacco industry	0.086*	0.080*	0.075*	0.160**	0.161**	0.152**
Textile and clothing industry	-0.153**	-0.152**	-0.159**	-0.059	-0.059	-0.070
Leather and footwear industry	0.028	0.033	0.036	0.113**	0.112**	0.117**
Timber and cork industry	0.033	0.030	0.034	0.072*	0.073*	0.080*
Paper industry	0.003	-0.012	-0.015	0.001	0.004	-0.002
Chemical industry	0.084**	0.076*	0.076*	0.100**	0.102**	0.101**
Rubber transformation and plastic industry	0.010	0.002	-0.003	0.039	0.041	0.034
Other mineral, non-metallic product industries	0.031	0.027	0.022	0.051	0.052	0.044
Machinery and electrical equipment manufacturing industry	-0.044	-0.055 ⁺	-0.062 ⁺	-0.093*	-0.091*	-0.095*
Electrical, electronic, optical and equipment industry	-0.036	-0.044	-0.049	-0.050	-0.048	-0.050
Manufacturing of transportation equipment industry	-0.005	-0.006	-0.010	-0.006	-0.005	-0.010
Miscellaneous manufacturing industries	-0.044	-0.049	-0.054	-0.006	-0.005	-0.013
Innovation intensity	0.016	0.012	0.013	0.008	0.008	0.009
Labor intensity	-0.003	-0.005	-0.040	-0.015	-0.015	0.047
OCE	0.366**	0.432**	0.455**	0.062	0.050	0.072
OCE squared		-0.114**	-0.108 ⁺		0.021	-0.065
OCE x Labor intensity			0.088*			0.118**
OCE squared x Labor intensity			-0.010			-0.122 ⁺
<i>R</i> ² (ΔR^2 for model)	0.345**	0.354** (0.009)**	0.358** (0.004)	0.131**	0.132** (0.000)	0.147** (0.015)**

Notes: Standardized regression coefficients. ** $p < 0.01$; * $p < 0.05$; + $p < 0.10$ (bilateral significance)

TABLE 4**Simple regression equations of the effect of OCE (X) on labor productivity (Y)**

<i>Sales per employee (Model 2)</i>	<i>Sales per labor costs (Model 3)</i>
$Y = -0.044^{**} X^2 + 0.468^{**} X + 10.828$	High labor intensity: $Y = -0.228^{+} X^2 + 0.414^{**} X + 0.918$ Low labor intensity: $Y = 0.187^{*} X^2 - 0.287^{*} X + 0.975$

Notes: ** $p < 0.01$; * $p < 0.05$; + $p < 0.10$ (bilateral significance)

FIGURE 1

Effect of OCE on sales per employee

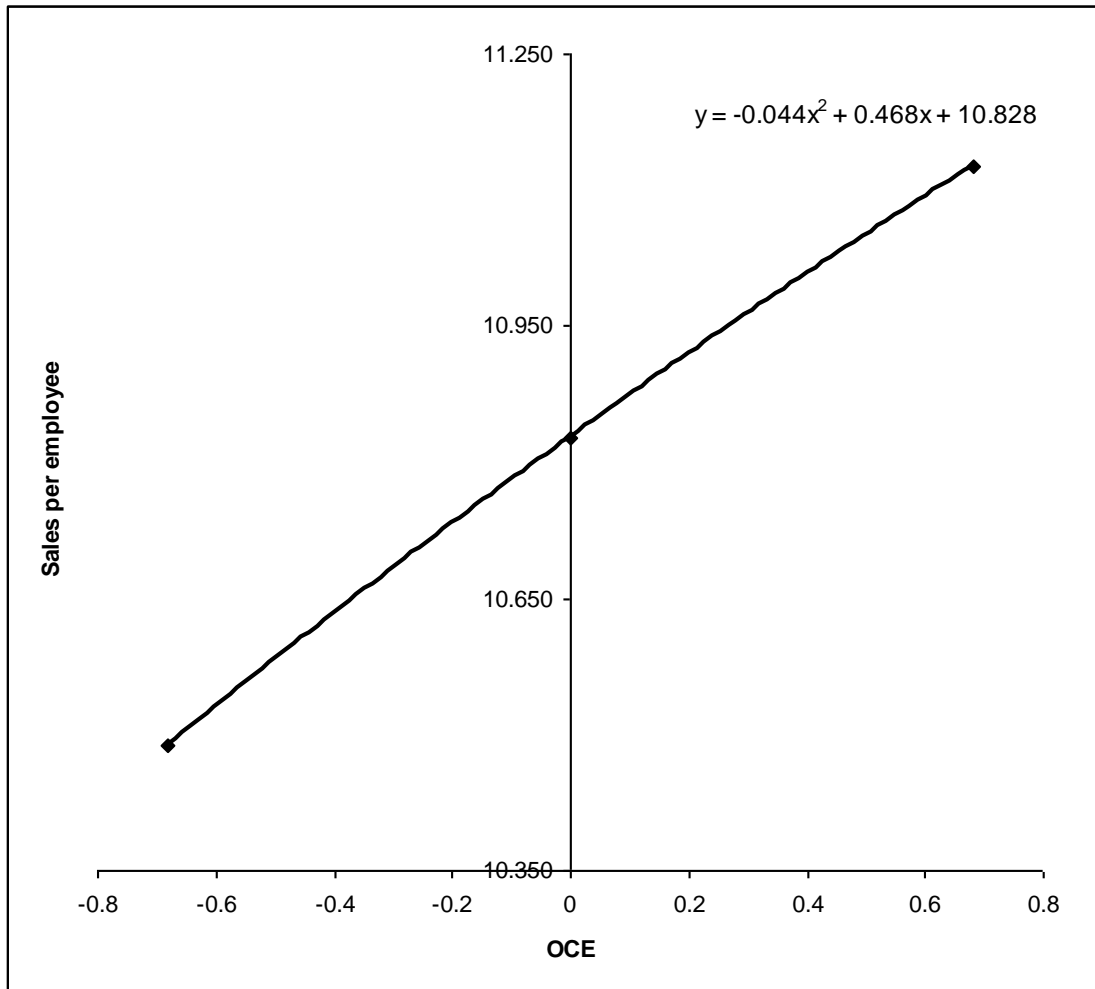


FIGURE 2

Effect of OCE on sales per unit of labor costs according to labor intensity

