Top management team’s vision and human resources management practices in innovative Spanish companies

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The objective of the article is to analyse whether the strategic vision of the top management team (TMT) and the way employees working in teams are rewarded and assessed affect companies’ innovation performance. The study was carried out on a sample of 97 Spanish companies belonging to the three most innovative sectors based on number of patents registered. The results indicate that the top management team’s strategic vision alone does not explain a company’s innovation performance. Innovation also requires the existence of compensation practices based on the ideas generated and developed by project teams. These results offer relevant implications for the TMT and the managers of the research and development (R&D) and human resources (HR) functions about the way teams should be rewarded and supported in order to improve the company’s innovation efforts.

Keywords: assessment; compensation; group; innovation; top management team’s vision

Introduction

A significant amount of research has been devoted to analysing the direct impact of the vision and perspectives of a company’s top management team (TMT) on various decisions and results relating to its activities such as innovation (Hambrick and Mason 1984; Bantel and Jackson 1989; Wiersema and Bantel 1992; Bantel 1993; Hambrick, Seung and Ming-Jer 1996; Thamhain 2003). However, recent research has revealed deficiencies in this type of approach, yielding contradictory and inconclusive results (Romanelli and Tushman 1986; Murray 1989; Smith et al. 1994; Knight et al. 1999; Richard and Shelor 2002). In parallel to this, two new lines of research have emerged. The first line emphasises the use of work teams to improve innovation performance (McAdam and McClelland 2002; Sethi, Smith and Park 2002). The second line analyses the system of human resources management (HRM) practices that enhance the performance of the company through the congruence between management practices and the strategy of the company (Schuler and Jackson 1987; Balkin and Gomez-Mejia 1990; Stoker, Looise, Fisscher and Jong 2001).

With respect to the first perspective, previous research studies have focused attention mainly on the analysis of characteristics that teams should have to be innovators, such as diversity, cohesion, autonomy, willingness to take risks and good communication. However, beyond the features of effective teams, we are proposing HRM as another instrument that, together with teamwork, can motivate the creativity of individuals working in groups, and can thus enhance the company’s innovation
performance. In relation to the second new line of research, previous studies have analysed the fit between the HRM practices and the strategy of the company and the incidence of these practices on the organizational performance (Balkin and Gomez-Mejia 1990).

However, these studies have not considered the joint relationship between the HRM practices and the strategic vision of the TMT from which this strategy emanates. Similarly, past research studies analysing the design of HRM practices have been dominated by the criterion of improving the overall financial performance of the company, and there are far fewer studies that consider HRM impact on other measures of performance such as innovation. As stated by Raursen and Foss (2003, p. 244), ‘there is a lack of theoretical and empirical treatment of how new HRM practices affect innovation performance’. From the relatively few studies that analyse the relationships between HRM practices and innovation, we can identify compensation and individual assessment as being considered the practices most directly related to the achievement of company objectives in innovation (Coombs and Gomez-Mejia 1991; Gomez-Mejia, Balkin and Cardy 2001, 2004; Sarin and Mahajan 2001; Barczak and Wilemon 2003).

Compensation is a key management tool for promoting certain behaviours and attitudes; therefore, the appropriate design of this practice or policy can increase the creativity of individuals working in teams (Ponzellini 1992). Most of the studies considering its impact on innovation have been centred on the rewards for managers and chief executive officers (Galbraith and Merrill 1991; Balkin, Markman and Gomez-Mejia 2000), while analysis at the individual and team/group levels has been neglected (Zingheim and Schuster 1995). As stated by Currie and Procter (2003), the impact of rewards on team effectiveness is unclear and there is little research or specific guidance for designing rewards in team-based environments. Furthermore, although a theoretical relationship has been established in the literature between compensation and innovation, empirical research establishing evidence for this relationship is almost nonexistent (Bonache 2004).

With respect to performance assessment, we believe that this is an essential requirement for an innovative company since this is the practice that provides managers with information on the strengths and weaknesses of the company’s principal asset, its human resources (Gomez-Mejia, Egatz and Larraza 2004).

However, very little research has been done on this practice and its application to innovative companies. It is also significant that assessment is a practice that must be set up and implemented jointly with compensation, with the object of ensuring that their congruence facilitates the achievement of management’s desired results.

For these reasons, the objective of this article is twofold. The first is to analyse whether the strategic vision of the top management team (TMT) influences firms’ innovation performance; the second is to establish the joint effect on innovation of the TMT vision and the practices of assessment and compensation, based on the performance of teams and of individual employees. Our findings provide empirical evidence about the impact of the TMT’s vision on innovation, not only as an individual factor but also jointly with the systems for the assessment and rewarding of teams. The majority of earlier studies that have analysed the effect of the two variables – vision and practices – on innovation have considered them separately (Hambrick and Mason 1984; Bantel and Jackson 1989; Wiersema and Bantel 1992; Bantel 1993; Hambrick et al. 1996; Raursen and Foss 2003; Thamhain 2003), and although there have been some theoretical studies arguing that both perspectives are necessary in the study of innovation, there have been few empirical studies to validate this (Balkin and Gomez-Mejia 1990).
This article is organized in five parts. After this brief introduction, we outline the innovation dimension to be analysed. In the third section, we develop the theoretical approaches that explain the impact of the TMT’s vision and practices of compensation and assessment on companies’ innovation performance. In this section, we propose the research hypotheses to be tested. The following sections describe the sample, establish the variables and present the data analysis and results. Finally, we summarize the most relevant conclusions drawn from our analysis.

Innovation performance

The nature of innovation is not always clear, and there have been different approaches to this concept in the literature (Rowe and Boise 1974; Wolfe 1994). Due to its multidisciplinary character, there exist different definitions of innovation that put the emphasis on different aspects of the concept. As Johannessen, Olsen and Lumpkin (2001) state, this difficulty and variety in the determination of the concept has made the specific measurement of innovation and the general understanding of the phenomenon much more difficult.

Among the best known definitions of the term is that of Tushman and Nadler (1986), who define it as the creation of a product, service, or process that is new for a particular business unit. Damanpour (1996, p. 126) points out that ‘innovation involves the adoption of an idea that is new for the organization that adopts it,’ so that the term refers to both the creation and acquisition of a product or service that is new for the unit adopting it. Robertson (1967) conceives of innovation as a process from which arise new ideas, procedures or things that are qualitatively different from those existing, and that must take concrete shape in reality.

In general, three dimensions underlying this concept can be identified: innovation in terms of results, which entails the creation of a product that is new for the business unit (Tushman and Nadler 1986; Damanpour 1996); innovation in terms of process (O’Sullivan 2000); and innovation as an attribute of organizations, hence, innovative firms (Kimberly 1981; Bantel and Jackson 1989).

Bantel and Jackson (1989) suggest that these different approaches to the concept of innovation may be different aspects of a single reality such that an innovative process would lead to an innovative result, whether in products or in processes, and both would cause firms to be regarded as innovative. This plural nature of innovation means that we need to centre on partial or restricted aspects of the variable to make it operative and hence be able to study it.

In our current research we have opted to focus on product innovation, i.e. on the material result of the innovation, which, according to the Oslo Manual (1992), includes both goods and services, whether totally new or improved with respect to previously existing models. A product is regarded as new if its technological characteristics or uses differ significantly from those previously offered by the firm. These innovations may include radically new technologies, may be based on a combination of existing technologies applied to new uses, or may derive from the use of new knowledge (Oslo Manual 1992). On the other hand, a product is regarded as being improved if it is an existing product from the firm when better components or materials are used in its manufacture, or one of its physical parts is improved (Oslo Manual 1992).

Innovation, strategic vision and compensation and assessment policies

Influence of strategic vision on innovative performance

The strategic vision can be defined as the set of aspirations that the TMT has for its organization. It constitutes the managers’ model of the future strategy that the firm should follow (Nonaka and Takeuchi 1995; Schwarz and Nandhakumar 2002). Shoemaker (1992)
states that the managers constantly debate questions such as: What might give us continued competitive advantage? What new product should we make? What markets should we enter and how? These questions go to the heart of the firm’s strategic vision. In short, strategic vision is shared understanding of what the firm should be and how it must change (Shoemaker 1992, p. 67). Thus the strategic vision determines the strategic orientation that the company intends to adopt (Hubert and Xuereb 1997).

If the TMT’s set of aspirations is dynamic, ambitious and innovative, in the sense of demonstrating proactive attitudes and a capacity to respond to market changes and needs, these aspirations will materialize in strategic orientations and specific strategies that drive dynamism and innovation in the firm (Itami and Numagami 1992).

The scope for a firm to undertake productive and innovative activities is governed by the opportunities open to it. These include productive possibilities that the firm’s TMT is able to perceive and exploit (Penrose 1959). There will be fewer opportunities for innovation if the managers are unable to perceive them, do not wish to exploit them, or are unable to respond to them. Managers’ specialization in knowledge and skills is not in itself a serious restriction to innovation in firms. However, when the TMT is not sufficiently interested, is static, unimaginative and unambitious, or the managers’ mental structures are not characterized by variability or flexibility, these characteristics impede innovation (Penrose 1959).

Some authors argue for the existence of a direct relationship between the differences of perceptions, values and attitudes to risk that different top management teams may possess, and their management styles and strategic decisions (Hoffman and Hegarty 1993; Daellenbach, McCarthy and Shoeneker 1999; Wu, Chiang and Jiang 2002). In these studies it is argued that, although innovation is affected by both internal and external factors, the management is the factor that most directly affects the company’s commitment to innovation (Flood et al. 1997).

This argument constitutes one version of the Upper Echelon Theory, which states that TMTs exert a fundamental influence on strategic choice in their organizations and hence in their results (Finkelstein and Hambrick 1990; Wiersema and Bantel 1992). In this theoretical framework, it is argued that the leaders’ cognitive bases are the mental guidelines that support their decisions and condition the firm’s tendency to innovate and renew itself (Wiersema and Bantel 1992; Smith et al. 1994; Hambrick et al. 1996; Daellenbach et al. 1999; Knight et al. 1999; Pegels, Song and Yang 2000). In short, the premise sustained is that if the TMT develops an innovative strategic vision, it will lead the firm to search for opportunities that may arise in the future beyond the domains of its traditional products such that a real incentive is created to develop the option of innovation (Pavitt 1991; Meyer and Utterback 1993; Kim and Kogut 1996; Nobeoka and Cusumano 1997).

However, there are alternative arguments to those presented above. Upper Echelon Theory is undergoing an enriching process relative to its traditional viewpoint, the fruit of an emerging critical line of thinking based on the contradictory, weak or non-significant results of empirical research. Some authors have firmly criticized the direct link this theory posits between the cognitive and perceptive bases of the managers and organizational performance (Smith et al. 1994; Lawrence 1997; Knight et al. 1999; Richard and Shelor 2002), arguing that there are neglected organizational factors that can weaken or even nullify the direct relationships established between the cognitive bases of the TMT and the organizational results (Pitcher and Smith 2001). This argument is supported by Hegarty and Hoffman (1990), who suggest that an appropriate role for top management is to guide and influence innovation as part of the strategy-making processes rather than to delve into the detailed innovation activities.
The existence of opposing positions with respect to the influence of the vision of the TMT on company results in terms of innovation leads us to put forward the following two hypotheses:

**Hypothesis 1a:** The innovative strategic vision of the top management team does not have a direct influence on the company’s innovation results.

**Hypothesis 1b:** The innovative strategic vision of the top management team has a direct influence on the company’s innovation results.

**Joint influence on company innovation of the TMT’s strategic vision and of compensation and assessment practices based on team performance**

In order to allow for the existence of opposing theoretical approaches to the incidence of the TMT’s strategic vision on the choice of corporate strategy to follow, the study has been widened to include other factors implicated in the first relationship proposed. In the particular case of innovation, such a strategy can only be put into practice if the organizational context is appropriate for it. The approach proposed by Nonaka and Takeuchi (1995) and other researchers within the Knowledge-Based Theory school summarizes the thesis defended here (Bowen, Clark, Holloway and Wheelwright 1994; Leonard and Sensiper 1998; Helfat and Raubitschek 2000). This model is based on the premise that any company starting out on a strategy of innovation must have a dynamic strategic vision of its future, and must positively desire to change and renew itself. The role of the TMT consists of outlining a framework for action to guide the company toward the future it desires. This constitutes the articulation of the so-called ‘organizational vision’ that stimulates and encourages the management of the company toward the development of new knowledge that will enable them to construct the company’s future (Prahalad and Hamel 1994).

However, the members of the TMT must also establish mechanisms for introducing the changes necessary for the design of their organization. One of the central organizational design factors established in the literature is the creation of work teams. Work teams constitute a basic instrument for making an organization capable not only of the creation of new knowledge at the group level but also the effective application of this new knowledge within the organization, which will give rise to successful innovations (Grant 1996; Leonard and Sensiper 1998; Jassawalla and Sashittal 1999; Helfat and Raubitschek 2000; Lovelace, Shapiro and Weingart 2001; McAdam and McClelland 2002; Sethi et al. 2002). Correctly managed work teams will work on a succession of related products derived from a combination of new and established technologies. Thus, in the development of succeeding generations of products, the team members become in effect the vehicles and guardians of a system of integrated knowledge, by means of which they seek to transform new ideas that may arise from one or several individuals into something useful. Through such processes, a company arrives at the conceptualization of prospective new products (Iansiti 1993; Leonard and Sensiper 1998). Therefore, as stated by Swink (2000), the support given by the company’s management and the creative functioning of teams are the fundamental factors in the development of new products.

In the literature on work teams, research has mainly focused on the characteristics that such teams should present, with the object of enhancing their propensity to generate new ideas and knowledge and thus to initiate the development of innovations (Woodman, Sawyer and Griffin 1993; Campion, Medsker and Higgs 1993; Jackson, May and Whitney 1995; Sethi et al. 2002). However, little attention has been paid to the management of human resources in the context of work groups aimed at ensuring that the group’s objectives coincide with those of the top management. The company needs to manage its
human resources appropriately to be able to motivate, reward and manage properly the
achievements and activities of the work teams and the individuals comprising them.
The establishment of HRM practices that facilitate the efficient development of these
organizational units could constitute a key policy for the company’s top management, with
the object of obtaining high yields from its strategic choices. The contingent approach
argues that the HRM practices need to count on the full support of the company’s TMT in
order to be effective. The concept of fit in strategic management of human resources is
essential, because it is this that ensures that efficient strategies, and consequently efficient
practices, of human resources can be designed (Delery 1998; Ferris et al. 1998).
In particular, the vertical fit ensures that the HRM practices are congruent with the
business strategy defined by the TMT. Although there have been numerous studies that
relate these two topics (Balkin and Gomez-Mejia 1990), the literature analysing the effect
of HRM practices related not to the strategy but rather to the vision of the TMT from
which that strategy is derived is almost nonexistent (Camelo, Fernández and Martínez
2006). It seems both opportune and logical to expect that some of the practices applicable
to the management of teams should contribute to objectives of innovation when coupled
with and supported by the innovatory vision of the TMT.

Among the various HRM practices identified in the literature as strengthening
innovative activity, such as job design, compensation, assessment, career planning, etc.
(Schuler and Jackson 1987; Beatty and Schneier 1997; Laursen and Foss 2003; Valle
2004), this study will focus on compensation and assessment based on the performance of
teams. Both practices are key management tools for promoting creativity in work
teams and their members (Balkin and Logan 1988; Gomez-Mejia et al. 2001; Sliedregt,

In the literature, it is argued that flexible or organic compensation strategies are the
most appropriate for strengthening innovation in work teams. In particular, the systems of
assessment and compensation based on performance seem be associated with higher levels
of innovation, while traditional methods of compensation and assessment, based on other
classic criteria like length of service or job specification, do not seem to strengthen
innovation (Schuler 1986; Gomez-Mejia and Welbourne 1988; Gomez-Mejia, Balkin and
Welbourne 1990b; Montemayor 1996; Saura 1997; Laursen and Foss 2003).

In the design of these practices, there are two factors that play a fundamental
role. The first factor is the level at which the compensation and assessment should be
applied. The second factor is the type of performance that should be considered.

With respect to the first design variable, Balkin and Logan (1988), Gomez-Mejia and
Saura (1996) and Gomez-Mejia et al. (2001, 2004) state that the incentives for work teams
should be applied at two levels: the level of the group as a team and the level of the individuals
comprising the team. The assessment and compensation based on the performance of the
individuals is necessary to stimulate and recognize individual effort and personal
achievement, and thus to encourage creativity (Sarin and Mahajan 2001). However, systems
of compensation and assessment based only on individual performance can generate problems
such as: conflicts associated with competition between the workers in a group (Harris 2001;
Hollenbeck, DeRue and Guzzo 2004); problems of performance measurement (Larraza
2004); and the lack of internal equity. By its nature R&D work must be performed
collectively, with the team functioning as an integrated unit, some employees may be
de-motivated if their individual contribution to the team’s activity and results is assessed and
rewarded below the level of their colleagues, either individually or collectively. To avoid
these problems, the company must also establish a process of compensation and assessment at
the level of the group. Zingheim and Schuster claim that ‘teams operating with some portion
of their rewards based on the team’s results outperform teams where only individual rewards are used’ (1995, p. 6). Group-based assessment and compensation are not only necessary to alleviate the problems inherent in the inevitable differences in productivity between the individual team members, but they are also required because they constitute a key mechanism for stimulating positive behaviours and innovation (Fong and Shaffer 2003). Incentives based on group or team assessments help to reinforce teamwork and innovation, for the team is the work unit where creative and innovative ideas tend to arise (Coombs and Gomez-Mejia 1991; Ledford, Lawler and Mohrman 1995; Diaz and Gomez-Mejia 1997; Paulus 2000; Currie and Procter 2003; Laursen and Foss 2003). Thus, innovation can be considered to depend on the rewards that are offered collectively at the group level, where cooperation and cohesion among team members are essential for success (Gomez-Mejia, Balkin and Milkovich 1990a; Milkovich and Wigdor 1991; Zárraga and Bonache 2003). As stated by Gomez-Mejia and Welbourne, ‘using group performance as a basis for pay is recommended when corporate goals or the nature of work demand close cooperation in the workforce’ (1987, p. 176).

The second relevant factor in the design of incentives is the consideration of the performance that is to be assessed and rewarded. Innovative companies have to assess and reward both the tangible and intangible results of employees’ work. The need to apply both criteria simultaneously is the result not only of the variety of tasks and the impossibility of quantifying certain kinds of results but also of the fact that in most jobs performance cannot be measured by tangible criteria alone (Sastre and Aguilar 2003). The actual ideas generated and developed by the work team and its members can be considered extremely difficult to quantify for this purpose. With respect to the intangible measures of performance, innovative companies usually reward behaviour of the following types: behaviour directly associated with innovation and creativity, willingness to take risks, cooperative and interactive behaviour, the results in the long term, alertness to changes of all kinds and tolerance of ambiguity (Balkin and Logan 1988).

From these arguments we put forward the following research hypotheses and sub-hypotheses:

Hypothesis 2a: The joint effect of an innovative strategic vision of the top management team, and assessment and compensation practices based on ideas generated by the work teams, has a positive influence on companies’ innovation results.

Hypothesis 2b: The joint effect of an innovative strategic vision of the top management team, and assessment and compensation practices based on the creative behaviours of the work teams has a positive influence on companies’ innovation results.

Hypothesis 2c: The joint effect of an innovative strategic vision of the top management team, and assessment and compensation practices based on ideas generated by the individual members of the work teams, has a positive influence on companies’ innovation results.

Hypothesis 2d: The joint effect of an innovative strategic vision of the top management team, and assessment and compensation practices based on the creative behaviours of the individual members of the work teams, has a positive influence on companies’ innovation results.

Figure 1 shows the relationships postulated in each hypothesis.

Methodology
The sample for this study was obtained from the Dun & Bradstreet database (2000). The population consists of firms with more than 50 employees belonging to the three sectors of the Spanish economy with the largest number of registered patents, according to the survey on technological innovation of companies, carried out by the National Institute of Statistics of Spain (960 firms). The sectors identified are: manufacture of industrial and
agricultural machinery; manufacture of electrical and electronic machinery and material; and manufacture of basic chemicals. Responses received, as completed questionnaires, totalled 97. By selecting these innovatory sectors, we ensure that our sample includes companies that are undertaking innovation in products. We are thus able to analyse if they are affected by the variables considered in the analysis.

To collect the data, we were guided by the extant literature and designed two questionnaires that were completed via telephone interview. The first was directed at the TMTs and consisted of 13 items (see Appendix I). Its objective was to obtain information to use in determining the TMT’s strategic vision (Knight et al. 1999). To collect relevant information from the firms’ management teams, we established the minimum requirement of receiving at least four completed questionnaires from managers in each firm, including the chief executive. From the responses received, 97 were considered valid. Thus, in this part of the research we analyse the strategic vision of 97 top management teams.

The second questionnaire consisted of 11 items and was completed by telephone interview held with the director responsible for R&D or, by default, with the director responsible for production. Since the work teams that operate in the area of R&D tend to be temporary in character, the director of the R&D function is likely to be the most informed. Although the design of the systems of assessment and compensation may fall within the competence of the manager responsible for the department of human resources, it is the manager responsible for the R&D department who is likely to have the knowledge needed to establish what kinds of performance, behaviour, and results should be evaluated and rewarded with the object of promoting innovation in the company (see Appendix 2). We obtained 10% more responses from the R&D directors/managers than from the TMTs. Nevertheless, we have used only the cases in which we obtained responses from both the TMT and the R&D directors in order to be able to carry out the two levels of analysis jointly.

This questionnaire comprised two parts. The first was intended to collect information on the systems of assessment and compensation based on the performance of the work teams and the individuals that comprised them, considering performance measures of both tangible character, such as ideas generated and approved, and intangible character, such as behaviour. The second part, composed of three items, was aimed at obtaining information on the results of innovation of the companies. The items of this second part of the questionnaire, addressed to the director responsible for R&D, were devised utilizing

Figure 1. Strategic vision and human resources management practices: results of their effect on innovation.
questions previously considered in other studies in the literature (Gomez-Mejia and

The questionnaires were tested on 10 firms to establish their content validity in the
Spanish context.

**Measurement of the variables**

**Innovation**

As has been stated, the companies of the sample belong to sectors that can be considered
innovatory, according to the data provided by the Spanish National Institute of Statistics.
However, the result and the degree of innovation achieved by the companies within each
sector are likely to be different. In fact, each company will be unique in this respect. In this
part we establish a measure of innovation in products to enable us to differentiate the
companies in respect of their results in product innovation, with the object of analysing
the impact of the independent variables considered.

To measure innovation in the sample firms, we used three variables that are directly
proportional to innovation performance: number of new products, number of improved
products, and number of patents registered. These three variables have been utilized in
numerous studies as indicators of innovation in companies, and their positive correlation
has been sufficiently demonstrated (Cordero 1989; Ministry of Industry and Energy 1994;
Coombs, Narandren and Richards 1996). The least innovative companies were classified
with a value of 0, and the most innovative with a value of 1. Using the statistical method of
principal components, it can be seen that the established indicators comprise a construct
that evaluates innovative results in companies.

As can be seen in Table 1, the weighting coefficients of the first component are
all positive and statistically significant (z1 = 0.358776*Npatents + 0.661255
*Nprodexist + 0.658803*Nnewprods). All the variables have a positive weight, but the
number of patents is the least influential. This component can be denominated ‘innovatory
result,’ representing the output – that is, the number of new and improved products that
the company obtains from the process of innovation. High values in the three initial
variables will correspond to high values in the first principal component. Thus, through
this first component, companies can be classified as innovative (high innovation result) or
less innovative (low innovation result). This first principal component is the best one-
dimensional linear predictor of the original data, meaning that no other linear combi-
nation of the original variables exists to explain more clearly the total variability of the
observations. The second component contrasts the innovation variables ‘number of
new products’ and ‘number of improved products’ with the variable ‘number of patents.’
The weight obtained is different (z2 = 0.93335*Npatents − 0.245306*NExistprods −

<table>
<thead>
<tr>
<th>Principal components analysis</th>
<th>Table of component weights</th>
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<tr>
<td><strong>Component number</strong></td>
<td><strong>Eigenvalue</strong></td>
</tr>
<tr>
<td>1</td>
<td>1.61642</td>
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<tr>
<td>2</td>
<td>0.909</td>
</tr>
<tr>
<td>3</td>
<td>0.474579</td>
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Note: Npatents = Number of patents; NExistprods = Number of improved products; Nnewprods = Number of new products.
This component shows how innovation variables have an internal dimension in which the previous effects are put forward. We find companies with a high number of patents but with few new or improved products, and vice versa. This variable does not define innovative results, but is better defined as a type of innovation. It shows us, therefore, two different forms of innovation: with or without patents. The third component explains little, and should not be considered (eigenvalue $= 0.474579 < 1$).

Thus, the final dimension of the data is reduced to two principal components. This study will consider only the first component, the result of innovation, which therefore constitutes the subject of its research. As established in the theoretical framework, this study will focus on the analysis of technological innovation in products – the material result of innovation – which includes both goods and services, whether completely new or improved with respect to the existing products of the company, as proposed in the Oslo Manual (1992). Figure 2 shows the distribution of the results of innovation of the companies included in the sample.

It can be seen that the right-hand side of the histogram is asymmetrical; therefore, a greater percentage of less innovative companies can be expected. The companies with a value below the average comprise 65% of the sample, and we can consider the companies which are above average to be innovative. However, we could equally well demand a greater degree of innovation (the average plus a percentile). We have decided to take the first principal component and consider the top 30% as the more innovative companies and the bottom 70% as the less innovative companies. So as to be sure that this classification is correct, we have made some checks assuming the top 40% to be the more innovative companies and the bottom 60% the less innovative companies: this gives similar results. Therefore, we consider Value 1 as representing the more innovative companies, comprising only 30% of the sample, with the highest scores in the principal component, with all the other companies, represented by Value 0, being less innovative. This differentiation allows us to be ambitious and restrictive with respect to the companies that we consider to be innovators, so that we can obtain more relevant results regarding the factors by which they are affected.

Innovative strategic vision

We aim to determine the extent to which the top management team shares a common strategic vision of an innovative nature. For this, we use the 13 items measured by a 5-point Likert scale borrowed from the questionnaire used by Knight et al. (1999) that unequivocally...
identifies the innovative nature of the TMT’s strategic vision. These items were chosen because we are interested in analysing the importance managers attach to strategic attitudes and actions oriented toward innovation, proactivity, risk and so on. To calculate this variable we took the mean of the responses given to each of the 13 items, and calculated a global mean from them (Alpha = 0.7416). The r(WG(J)) index (James, Damaree and Wolf 1984) was also calculated, and this confirms that the aggregation was adequate.

This measure constitutes a direct estimator of the degree to which the TMT shares an innovative strategic vision. We must emphasize that this measure is not an objective evaluation of the firm’s current strategy, but rather a proxy that attempts to measure the TMT’s perception of the degree to which the organization’s strategic stance is innovative in nature (Knight et al. 1999, p. 453).

Compensation and assessment of performance

The measurement of the variables for compensation and assessment based on the performance of the work teams was adopted from the studies of Gomez-Mejía and Welbourne (1988) and Gomez-Mejía and Balkin (1992). Eight questions were asked referring to different measures of performance by means of which the companies could be assessing and remunerating the work teams, both at the group level and with respect to the individual contribution of their members. In particular, the performance measurements covered the number of ideas generated and successfully developed (tangibles results) and the behaviours at both the team and individual levels (intangible results).

A Likert scale of 5 points was utilized (1 = in total disagreement, 5 = in total agreement). The Cronbach’s Alpha obtained was $\alpha = 0.9151$.

Analysis of data and results

The descriptive statistics for each of the variables are shown in Table 2.

To test the first and second hypotheses (H1a, H1b), which established two alternative and opposite relationships between the strategic vision of the company and its innovativeness, a logistic regression analysis has been performed, as shown in Table 3. In this analysis, the dependent variable is the innovation result and the independent variable is the strategic vision of the TMT.

As can be seen in Table 3, the model is not significant, meaning that the hypothesis H1a is confirmed: this proposed that the strategic vision of the TMT does not directly affect the results of the company in respect to innovations. Thus, the opposing hypothesis, H1b, is not confirmed.

With the object of testing the hypotheses proposing the joint effect of the vision with the practices of assessment and compensation on the company’s innovation (H2a, H2b, H2c, H2d), four logistic regression analyses have been performed.

As can be seen in Table 3, the models corresponding to hypotheses H2b and H2d are not significant; these relate both the strategic vision and the assessment and compensation practices based on innovatory behaviours of the teams and of their individual members with company innovation. Neither is the model corresponding to hypothesis H2c significant; this proposes the relationship between both the strategic vision and the assessment and compensation practices based on ideas generated and developed by individual team members, and company innovation.

The only model of relationship that shows a significant result is that proposed in Hypothesis 2a. The results are shown in Table 4. The variable of the model found to be significant is the term postulating interaction between the innovative strategic vision of
the TMT and compensation practices based on the tangible results of the work teams (compensation practices based on ideas generated). Three goodness-of-fit measures (the likelihood ratio test, the pseudo-R², and the percentages of concordant pairs) are shown. The X² model is highly significant ($X^2 = 11.328; p = 0.079$), suggesting that the variables

Table 2. Descriptive statistics.

<table>
<thead>
<tr>
<th>Variables</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Innovation</td>
<td>97</td>
<td>0</td>
<td>1</td>
<td>0.24</td>
<td>0.428</td>
</tr>
<tr>
<td>Team compensation based on tangible performance</td>
<td>74</td>
<td>1</td>
<td>5</td>
<td>2.16</td>
<td>1.272</td>
</tr>
<tr>
<td>Team assessment based on tangible performance</td>
<td>74</td>
<td>1</td>
<td>5</td>
<td>3.11</td>
<td>1.350</td>
</tr>
<tr>
<td>Team compensation based on intangible performance</td>
<td>74</td>
<td>1</td>
<td>5</td>
<td>2.70</td>
<td>1.496</td>
</tr>
<tr>
<td>Team assessment based on intangible performance</td>
<td>73</td>
<td>1</td>
<td>5</td>
<td>3.51</td>
<td>1.314</td>
</tr>
<tr>
<td>Individual compensation based on tangible performance</td>
<td>96</td>
<td>1</td>
<td>5</td>
<td>2.39</td>
<td>1.379</td>
</tr>
<tr>
<td>Individual assessment based on tangible performance</td>
<td>96</td>
<td>1</td>
<td>5</td>
<td>2.85</td>
<td>1.429</td>
</tr>
<tr>
<td>Individual compensation based on intangible performance</td>
<td>96</td>
<td>1</td>
<td>5</td>
<td>2.88</td>
<td>1.481</td>
</tr>
<tr>
<td>Individual assessment based on intangible performance</td>
<td>96</td>
<td>1</td>
<td>5</td>
<td>3.44</td>
<td>1.390</td>
</tr>
<tr>
<td>Strategic innovative vision</td>
<td>97</td>
<td>2.03</td>
<td>4.85</td>
<td>3.58</td>
<td>0.498</td>
</tr>
</tbody>
</table>

Table 3. Logistic regression analysis.

<table>
<thead>
<tr>
<th>Hypothesis: $H1a$, $H1b$, $H2b$, $H2c$, $H2d$</th>
<th>Chi-squared</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>$H1a$ and $H1b$: INNOV = f(SIV)</td>
<td>0.585</td>
<td>0.444</td>
</tr>
<tr>
<td>$H2b$: INNOV = f(TCI, TAI, TCIxSIV, TAIxSIV, TCIxTAI)</td>
<td>10.253</td>
<td>0.114</td>
</tr>
<tr>
<td>$H2c$: INNOV = f(ICT, IAT, SIV, ICTxSIV, IATxSIV, ICTxIAT)</td>
<td>6.154</td>
<td>0.406</td>
</tr>
<tr>
<td>$H2d$: INNOV = f(ICI, IAI, SIV, ICIxSIV, IAIxSIV, ICIxIAI)</td>
<td>6.278</td>
<td>0.393</td>
</tr>
</tbody>
</table>


Table 4. Logistic regression analysis Hypothesis 2a.

<table>
<thead>
<tr>
<th>$H2a$: INNOV = f(TCT, TAT, SIV, TCTxSIV, TATxSIV, TCTxTAT)</th>
<th>Coefficient ($B$)</th>
<th>Wald statistic</th>
<th>Exp($B$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TCT</td>
<td>0.588</td>
<td>0.328</td>
<td>1.800</td>
</tr>
<tr>
<td>TAT</td>
<td>0.329</td>
<td>0.043</td>
<td>1.390</td>
</tr>
<tr>
<td>SIV</td>
<td>-0.757</td>
<td>0.354</td>
<td>0.469</td>
</tr>
<tr>
<td>TCT $\times$ SIV</td>
<td>0.161</td>
<td>3.055</td>
<td>1.175***</td>
</tr>
<tr>
<td>TAT $\times$ SIV</td>
<td>0.083</td>
<td>0.034</td>
<td>1.086</td>
</tr>
<tr>
<td>TCT $\times$ TAT</td>
<td>-0.474</td>
<td>2.412</td>
<td>0.623</td>
</tr>
<tr>
<td>Constant</td>
<td>0.127</td>
<td>0.001</td>
<td>1.135</td>
</tr>
</tbody>
</table>

Note: *Sig. 1%; **Sig.5%; ***Sig. 10%.

INNOV: Innovation; TCT: Team compensation based on tangible performance; TAT: Team assessment based on tangible performance; SIV: Strategic innovative vision.
in the models do indeed have joint significance. The logic of pseudo-$R^2$ indicates how well
the data fit the presumed underlying theoretical distribution. Pseudo-$R^2$ is computed as a
$X^2$ model divided by the number of observations minus the number of variables plus one,
plus the $X^2$ model. The value of pseudo-$R^2$ is 0.22. Also, we detail the percentage predicted
correctly by both models (63.5% predicted correctly).

Discussion, conclusions and limitations
The aim of this research has been to analyse how the top management team’s strategic
vision, together with the application of certain assessment and compensation practices,
impact the results of companies in terms of innovation. In developing our analysis of these
questions, we have proposed two working hypotheses.

The most relevant conclusions of this work are the following: (1) the vision of the
TMT does not directly affect the innovation results of companies; (2) the strategic vision
of the TMT only affects the innovation results if it is supported by compensation practices
based on the performance of the work teams; (3) the compensation practices that influence
innovation results should be determined by the tangible results achieved by the work
teams; that is, the output of ideas the team generates and develops.

With respect to the first of our conclusions, the results supported theoretically and
empirically by this study are also endorsed by other research. Studies carried out under the
Upper Echelon Theory have demonstrated the lack of empirical findings that support a
direct relationship between the cognitive bases of the TMT and strategies and results
linked to innovation or to strategic change (Bantel and Jackson 1989; Wiersema and Bantel
1992; Daellenbach et al. 1999; Tihanyi, Ellstrand, Daily and Dalton 2000). Although this
research did not involve measuring the perception or vision of the TMT by means of
demographic variables, but rather through the direct perceptions of the managers surveyed,
the theoretical foundations that are supported are the same; hence some of the previous
results obtained within this line of research could be comparable with our findings.

As a consequence of the lack of findings from this line of research, a few studies have
recently appeared in which it has been considered relevant to analyse the impact on
innovation of the TMT’s strategic vision jointly with other factors, at the levels both of the
management team and of the organization generally (Hoffman and Hegarty 1993; Smith
Knight et al. (1999) obtained a very significant model, introducing into their analysis of the
diversity of the TMT various group processes such as interpersonal conflict and the search for
agreement in these teams. Camelo, Hernandez and Valle (2005), after introducing the
mediating effect of the processes of search for agreement in the top management team,
presented a clearly improved model that explained the incidence of demographic diversity on
innovation. For their part, West and Anderson (1996) introduced as inputs to their model
contextual factors that, together with the TMT’s vision, affected the innovation of companies;
these contextual factors included the climate for innovation, the support given to the work
teams, the resources available, and the size of the organization. Their results demonstrate that
the support given to the work teams affects the degree of innovation of companies.

Thus, a first conclusion of this article is that the vision of the TMT does not appear to be a
sufficient condition to enable companies to obtain better results in innovation. Actually
making the innovation a material fact requires the existence of other design mechanisms such
as the use of properly managed work teams. Our hypothesis H1b is thus confirmed by this.

Our second finding again supports the conclusions derived from H1b. With H2a, we
can confirm that other factors need to be present. Thus, the innovatory vision of the TMT
affects the innovation result when it is accompanied by compensation practices that are based on ideas generated and developed by the work teams. The theoretical foundation for this interaction rests on the very essence of the strategic process of companies. The strategic vision of the TMT is a guide leading to the formulation and implementation of management practices, in this case compensation at the group level, that are intended to produce the achievement of the strategic objective for the company pursued by its TMT – innovation. These findings amplify the contributions of Balkin and Gomez-Mejia’s (1990), analysis of the relationship between the compensation practices and the strategy of the company without considering the vision of the TMT as a discrete variable. Thus, an important conclusion of this study is the confirmation that ‘when properly designed, the reward system of an organization can be a key contributor to the accomplishment of its strategic objectives’ (Balkin and Gomez-Mejia 1990, p. 154).

In respect to the conclusions regarding the design of the compensation system, the results indicate that compensation should be based on the tangible performance of the teams, and hence only a system that rewards the ideas generated and developed has this positive effect on company innovation. This conclusion confirms the arguments of several authors who defend the need to implement policies of group-level compensation because the R&D team represents the basic unit of analysis for innovative companies, both because the innovation result depends on cooperation, and because cooperation promotes creativity (Gomez-Mejia and Welbourne 1988; Coombs and Gomez-Mejia 1991; Milkovich and Wigdor 1991; Ledford et al. 1995; Zingheim and Schuster 1995; Appelbaum and Mackenzie 1996; Diaz and Gomez-Mejia 1997; Paulus 2000; Gomez-Mejia et al. 2001; Laursen and Foss 2003).

Moreover, at the group level, it is more feasible to measure results than behaviours. An incorrect measurement of the team’s performance could constitute a source of demotivation (Camelo 1995). On this point, Baker (1992) indicates that the principal problem of incentives lies in determining clearly the performance that is to be measured and rewarded. Thus, when selecting the determining factors for assessment and remuneration, company management should avoid performance measures that could lead to an increased error of estimation.

However, despite the above arguments defending the position that the design of group-level incentives affects innovation, the evidence from our study is that this relationship is not a direct one since it is also necessary that the vision of the TMT should act jointly toward the same objective. The results thus enrich previous theoretical contributions (Gomez-Mejia and Welbourne 1988; Zingheim and Schuster 1995; Appelbaum and Mackenzie 1996) and empirical contributions (Balkin and Gomez-Mejia 1984; 1990; Welbourne and Cable 1995; Saura 1997; Zenger and Marshall 2000).

Finally, we have not found evidence that the assessment practices themselves influence the innovation results. The lack of empirical studies centred on analysing the relationship between assessment practices and innovation means that we cannot compare our results with those of other investigations. Most previous studies have centred on analysing the connection between the assessment practices and the financial performance of the company (Arthur 1994; Huselid 1995; Becker and Gerhart 1996; Delaney and Huselid 1996; Younbd, Snell, Dean and Lepak 1996; Wright, Gardner and Moynihan 2003). Only in the study of Delery and Doty (1996) is it established that companies that implement prospective strategies and are intensively engaged in processes of innovation utilize systems of assessment based on results. One possible explanation for this lack of effect could be that assessment is a common and generalized practice in work groups and for this reason may not constitute a variable that would affect the results achieved by organizations in terms of more or less innovation. In short, companies need to assess their
R&D work groups continuously to ensure that they are functioning correctly without this necessarily having any positive or negative effect on the groups’ output, if these assessments are not utilized as a mechanism for motivation through remuneration.

To conclude, we are proposing a future line of research that would entail the inclusion in the analysis of other HRM practices, such as training or job design, enabling the human resources system to offer a more robust relationship with innovation. In line with this Laursen and Foss (2003, p. 257) state that, ‘the adoption of individual practices of human resources is expected to have a positive impact on innovation, and the adoption of a package of complementary human resources practices is expected to affect innovation more strongly’.

Acknowledgements
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References


### Appendix 1

**Strategic vision of the TMT:**

- We believe that unstable and fast-changing business conditions provide more opportunities than threats.
- Our competitive priority is to develop new products.
- Speed in the development of products in relation to our competitors is a priority for us.
- The sector in which the company operates is characterized by rapid changes in the technology of production.
- The sector in which the company operates is characterized by rapid changes in products.
- We put great emphasis on R&D, technological leadership and innovation.
- We define our strategic objectives in the long-term (over five years).
- We introduce completely new products rather than products that simply incorporate modifications to those already existing.
- We evaluate in the long-term the implications that technological changes may hold for our products and services.
- We seek advantages from all the functional areas when we make important strategic decisions.
- We frequently get ideas for new products and processes from customers and suppliers.
- When we see a business opportunity we can evaluate it faster than our competitors.
- We evaluate the potential of our strategic resources for competing in the future.

### Appendix 2

**Compensation and assessment practices**

<table>
<thead>
<tr>
<th>Source: Disagreement</th>
<th>Agreement*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 2 3 4 5</td>
</tr>
</tbody>
</table>

*The remuneration of our work teams is based on:*

New ideas generated and developed by the team 1 2 3 4 5
Innovatory behaviours demonstrated by the team 1 2 3 4 5

*The assessment of our work teams is based on:*

New ideas generated and developed by the team 1 2 3 4 5
Innovatory behaviours demonstrated by the team 1 2 3 4 5

*The remuneration of the individual members of our work teams is based on:*

New and positively valued ideas generated by the individual in the team 1 2 3 4 5
Innovatory behaviours demonstrated by the individual in the team 1 2 3 4 5

*The assessment of the individual members of our work teams is based on:*

New and positively valued ideas generated by the individual in the team 1 2 3 4 5
Innovatory behaviours demonstrated by the individual in the team 1 2 3 4 5

1 = In total disagreement; 5 = In total agreement.