

ON HOW TO MEASURE MANAGERIAL AND ORGANIZATIONAL CAPABILITIES

Multi-Item Models for Measuring Distinctive Competences

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ABSTRACT: This paper specifies how to construct and validate an instrument based on multi-item scales for the cataloguing and measurement of managerial and organizational capabilities on the basis of management perceptions. The construction and reduction of the scales have been reinforced by the Delphi and retesting techniques. The use of this methodology was illustrated in a sample of Spanish industrial firms. The paper enhances the value of the instruments for a resource-based view with regard to the faithful and rigorous measurement of its key concept, distinctive competences. The scales created provide consistent empirical evidence to remove doubts surrounding managerial self-evaluation, including those arising from problems of self-esteem and reinforcement effects. In addition, the paper provides empirical evidence to support the predictive ability of distinctive competences on current and long-term performance variability.

RESUMEN: Este trabajo especifica cómo construir y validar un instrumento, basado en escalas multi-item, que permita catalogar y medir las capacidades directivas y organizativas a partir de la percepción directiva. La construcción y la reducción de las escalas han sido reforzadas con las técnicas Delphi y re-test. El uso de esta metodología ha sido ilustrado en una muestra de empresas industriales españolas. El trabajo recalca el valor de los instrumentos para el Enfoque Basado en Recursos, con vistas a la medición fiable y rigurosa de su concepto clave, competencias distintivas. Las escalas creadas suministran evidencia empírica consistente para superar las dudas subsistentes sobre la validez de la autoevaluación directiva, incluyendo aquellas referentes a los problemas de auto-estima y efecto refuerzo. Adicionalmente, aportamos evidencia empírica que apoya la habilidad predictiva de las competencias distintivas sobre la variabilidad del desempeño actual y a largo plazo.

This paper specifies how to construct and validate a construct for the cataloguing and measurement of the distinctive competences derived from managerial and organizational capabilities on the basis of management perceptions, which will be valid for empirical application. The conceptualization, operationalization, and measurement of distinctive competences form an important subject in lines of research under the resource-based view (RBV). The basic reason is that distinctive competences play a critical role as a source of sustainable competitive advantages. The first generation of RBV studies defends the attainment of economic rents, and the variations in intra-industrial performance are explained by the Ricardian rents achieved due to imperfections in the factors market (Amit & Schoemaker, 1993; Barney, 1986b, 1991; Dierickx & Cool, 1989; Grant, 1991; Peteraf, 1993; Wernerfelt, 1984). A series of later streams of thought have emphasized the processes of resource creation and accumulation (Eisenhardt & Martin, 2000; Helfat, 1997; Mahoney &

Pandian, 1992; Nelson, 1995; Nelson & Winter, 1982; Teece, Pisano, & Shuen, 1997; Winter, 1995). The exploitation of strategic assets could give rise to fleeting competitive advantages that may be eliminated by processes of exploration into new combinations of resources and capabilities that lead to "Schumpeterian shocks" in the industry. This second perspective explains the variation in intra-industrial performance by Schumpeterian rents and by a lack of capacity in firms to change their stock of resources and capabilities over time (Carroll, 1993). The potential for creating sustainable competitive advantages thus lies in the firm's making use of its dynamic competences more rapidly and skillfully than the dynamic of the market itself (Eisenhardt & Martin, 2000).

The development of research in the field of strategy has given rise to a large number of constructs that attempt to characterize complex variables of the organization and its environment. All these constructs are of a multidimensional nature. Conceptualizing, operationalizing, and measuring such constructs form a difficult problem. The quantification of internally generated intangible assets, for which there are as yet no commonly recognized and validated scales of measurement, is particularly complicated. At the root of this problem lies the fact that the most valuable competences are highlighted by the RBV, intangible assets, are by their very nature not directly observable (Godfrey & Hill, 1995). A second difficulty is to find a correct valuation for them, given

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the problems of measuring attributable costs or their reasonable market value. All of these causes them to be absent from management information systems (Grant, 1991: 119; Hall, 1992: 135). Consequently, a balance sheet is not a true description of the assets of a firm (Baldwin & Clark, 1991; Itami & Roehl, 1987). Even more complicated is the quantification of managerial and organizational capabilities. Most intangible resources are subject to ownership rights (patents or trademarks), or the result of income flows to obtain them (the quality mark as the result of a process of certification). These antecedents can serve as a basis for assigning a market value. It is more difficult, on the other hand, to find indicators that will proxy the value of managerial and organizational capabilities. Tacit knowledge is a major component in managerial and organizational distinctive competences (Polanyi, 1948), and it is most difficult to measure, because it cannot be codified and often can only be “learned by doing.” The study into mechanisms to find out about and to quantify this factor therefore becomes even more urgent (Grojer, 2001). The researcher’s skill in operationalizing the constructs will condition the significance and the quality of the results of the empirical work.

The aim of this study is to conceptualize managerial and organizational capabilities and to develop a scale to operationalize and measure them. For this purpose, we have structured the paper in three parts. First, we define the domain of both the “distinctive competences based on managerial capabilities” and “distinctive competences based on organizational capabilities” constructs, on the basis of a review of the literature. We then operationalize the construct by means of Likert-type multi-item measurement scales. Finally, we validate these measurement instruments by carrying out various tests to guarantee that they meet psychometric requirements. The development of the measuring instruments followed the usual methodology in social science. The reduction phase was strengthened by the Delphi technique and pretest and retest procedures. This process resulted in two multi-item scales of measurement of distinctive competences based on managerial and organizational capabilities as perceived by management. Observation of whether the measurement scales fulfilled the psychometric properties was based on a sample of 896 firms representing the population of Spanish industrial firms. Empirical study confirmed the usefulness of the instruments according to the usual standards found in the literature, having tested positively their diagnostic power, dimensionality, reliability, and validity.

DEFINING AND MEASURING MANAGERIAL AND ORGANIZATIONAL CAPABILITIES

Identification of the Domain of the Construct

Confusion over the concept has spread to the differentiation among the multitude of terms employed: resources, capabili-

ties, distinctive competences, and core competences. To differentiate between *resources and capabilities*, we take as its starting point the definitions set out by Amit and Schoemaker (1993), Grant (1991), Leonard-Barton (1992), and Teece et al. (1997). Following Hall (1992: 136; 1993: 607), our conceptual proposal is to label resources, both tangible assets (physical and financial), and intangible assets, bearing in mind two factors: (1) that they are eligible for legal protection, and as such the firm can exercise property rights over them, and they can thus be regarded as the firm’s property or as under the organization’s control; and (2) that they can operate independently of firm members, and intervene as factors in the production process. The distinction between intangible resources and capabilities is based on some aspects: intangible resources are forms of explicit knowledge, whereas capabilities are types of tacit knowledge (Nonaka & Konno, 1998: 42); capabilities are intangible assets associated with the individuals who possess them, or with the firm as an organization, the *savoir faire* of the organization and its members. Their legal protection is impossible or, at best, most difficult to attain, because they are based on the premise of developing and interchanging information by way of the firm’s human capital so that its resources will be adequately developed. Again, few resources are productive on their own. A combination of more simple resources making more complex resources is required for the efficient development of activities to take place. Capabilities are, therefore, skills that the firm possesses to successfully carry out an activity owing to the combined and coordinated deployment of sets of resources (Amit & Schoemaker, 1993; Collis, 1994; Grant, 1991; Sánchez & Heene, 1997; Winterscheid, 1994).

Having identified the domains of the concepts of resources and capabilities, we must now turn to their distinction from the *distinctive competences* construct. It must be recognized that not all firm resources and capabilities are strategically relevant. Thus, we can differentiate between resources and capabilities, and exceptional resources and capabilities that are capable of leading to the conception and introduction both of valuable strategies and advantageous competitive positions. RBV defines the domain of the distinctive competences construct as strategically relevant assets that sustain the attainment and conservation of competitive advantages. Their strategic value derives from (1) exploitation of sets of resources and capabilities that possess the characteristics of scarcity, durability, nonsubstitutability, inimitability, and rent appropriability (Amit & Schoemaker, 1993; Barney, 1986b, 1991; Grant, 1991; Peteraf, 1993); and (2) exploration of new combinations of strategically relevant resources and capabilities that curb the erosion of the value of their assets arising from Schumpeterian shocks introduced by competitors (Eisenhardt & Martin, 2000; Kogut & Zander, 1992; Teece et al., 1997).

The distinctive competences approach sets our concept apart from that of *core competences*, thus defined by Prahalad and

Hamel (1990), and subsequently widely adopted (i.e., Eriksen & Mikkelsen, 1996; Leonard-Barton, 1992; Winterscheid, 1994). Core competences are defined as “an organisation’s collective learning, particularly those related to how to coordinate diverse production skills and integrate multiple technological currents,” which more deeply reflects what the company truly knows how to do well (Prahalad & Hamel, 1990: 82). According to our conceptual schema, the concept of distinctive competences is broader than that of core competences, which represent just one of its categories. The concept of core competences essentially alludes to the distinctive competences based on technological and production capabilities at specific points along the value chain. In contrast, distinctive competences are more broadly based, encompassing the entire value chain, its cohesion, and its renovation (Stalk, Evans, & Shulman, 1992: 66).

Lawson and Samson (2001), Fuchs, Mifflin, Miller, and Whitney (2000), and Collis (1991) have suggested that the map of distinctive competences be organized by means of a hierarchy. The first level would be made up of *functional competences* in marketing, operations, or finance, that reflect the use of management skills in different components of the value chain. The second level is composed of *interfunctional or coordination competences*, which include the capabilities linked to the integration of functional activities and the organization’s cohesion. Second-level competences are coordination competences and establish an appropriate setting for the activation and efficiency of functional competences (Kogut & Zander, 1996). The organizational capabilities include, together with static competences such as organizational routines, dynamic competences such as an organizational architecture and culture that particularly stimulate learning and innovation (Henderson & Cockburn, 1994). On the other hand, managerial dynamic competences in the exploration of new combinations of resources and capabilities are based on the firm recombinatory capabilities (Lado, Boyd, & Wright, 1992).

Very few studies have set out to clarify the domain of distinctive competences of each type (Bogaert, Martens, & Van Cauwenbergh, 1994; Lado et al., 1992). Previous literature has largely been concerned with classifying and measuring functional distinctive competences (Conant, Mokwa, & Varadarajan, 1990; Hambrick, 1983; Hitt & Ireland, 1985, 1986; Snow & Hrebiniak, 1980). In this work, we have focused on second-level or interfunctional competences, as there are no works that adequately define their domain.

Theoretical Dimensions of the Domain of the Construct

The concept of coordination distinctive competences that we have adopted includes both personal and corporate capabilities, in accordance with those defined by Turner and Crawford (1994). On one hand, it includes *managerial capabilities*, which

are understood as those held by an individual or a small group of managers, such as leadership or teamwork skills. On the other hand, it also covers *organizational capabilities*, which consist of combinations of knowledge and skills that are assimilated into organizational activities and structures, and that are absorbed by all its members, tend to remain independent from the organization members, and continue within it even though specific individuals might leave. Both types of competences are multidimensional constructs.

Distinctive competences based on managerial capabilities. These competences derive from activities involving the tacit knowledge deposited in managers. The scale of managerial distinctive competences will therefore have (1) a technical component, reflecting management know-how, and (2) a cognitive component relating to the managers’ personal attributes, codes of values, and personality profile (Nonaka & Konno, 1998: 42).

There are thus several dimensions to be considered in distinctive competences based on managerial capabilities. To classify them, we have followed the proposal put forward by Ansoff (1979). First, within managerial competences, we include the skills and the knowledge of the individuals in top management. Within this technical knowledge, we must differentiate between the capacity to solve problems and allocate resources, and the baggage of managerial skills. The “problem-solving competence/knowledge” dimension covers managerial capabilities related to creativity, the creation of opportunities through the allocation of resources, and the adoption of the most advantageous decisions. The second type of managerial competences refers to experience. Their origin may lie in the length of time in the profession, decision-making, training, international career, or the variety of previous experience. The contribution of managers’ distinctive competences to the firm’s success will depend equally on the influence they can exert on the organization (position of power) and on their propensity to make use of it (exercise of power).

Managerial distinctive competences also include managers’ leadership capabilities. Managers show leadership skills when they collaborate effectively to inspire a strategic mission, which guides the formulation and implementation of the strategy and acts as a support for all other organizational competences (Lado & Wilson, 1994; Lado et al., 1992). The competitive effects of management leadership are enhanced when the mission that it has helped to inspire is accurately communicated to the rest of the organization. The diffusion of the mission gives its members power to carry it out and permits the emergence of other competences of a basically collective character (e.g., the employees’ commitment to the objectives of the firm, or the generation of a collective mind that gives the members of the organization the capacity to act collectively) (Westley & Mintzberg, 1989). Bart and Baetz (1998) and Zucker (1987) found empirical evidence that the

establishment of a mission influences organizational performance. This effect is not direct, being moderated by the effect of the declaration of the mission on the satisfaction of the managers and on the commitment of internal stakeholders. In more pragmatic terms, the literature insists on linking competitiveness with managerial ability to develop and use the experience and the talent of the organization members, integrating and encouraging the efforts of a complex team (Osbaldeston & Barham, 1992). Managerial leadership determines the acquisition, development, and deployment of resources and capabilities, their conversion into valuable products, and the creation of value for all stakeholders (Lado et al., 1992).

The final dimension of the distinctive competences construct refers to a managerial context that stimulates change, innovation, learning, and the development of competences. This competence relies on a management team with singular skills for leading the process of change, and for orientating the organization toward the future, continuous improvement, initiative, and entrepreneurial spirit. Direct incentive for change and innovation is fundamental, as it sustains the skill for articulating a beneficial link between the organization and the environment (Hambrick & Mason, 1984). This management capability is vital for generating unique information, on the basis of which the environment can effectively be interpreted in terms of opportunities and threats, to serve as a support for the organization's strategic focus. Gersick and Hackman (1990) justify the importance of this dimension by the fact that it mitigates one of the main obstacles to exogenous change, the difficulty of processing information. This dimension was also made salient in initial works on distinctive competences (Hambrick, 1983; Hitt & Ireland, 1985; Snow & Hrebiniak, 1980). These contributions dealt with competences at the general management, defined as the ability to monitor the environment. The importance of the management's ability to scan the environment in search of opportunities was highlighted in these early works; it was seen as a vital ability to generate unique information that would give sustenance to the process of change and innovation as well as to make adequate strategic responses.

Managerial distinctive competences can be a source of sustainable competitive advantages (Barney, 1991; Hambrick, 1988). The capacity of management knowledge to generate Ricardian rents arises from their scarce, tacit nature, and help in constructing mechanisms of isolation, which hinders replication by imitation (Castanias & Helfat, 1991). In addition, the skills of management play a vital role in the capacity to generate quasi-rents, due to the wealth of firm-specific knowledge they hold. In principle, these are competences that the managers possess on an individual basis, and there is no reason they should affect the idiosyncrasy of the firm. However, the nature of managerial competences as a specific asset in-

creases with the development of other organizational competences: its social construction (social complexity) by means of complex interactions among key stakeholders (dependence on the system), and by its emphasis on learning through experience. All these features make it difficult to codify and prevent emigration of valuable management knowledge, as its value drops significantly outside the firm (Amit & Schoemaker, 1993; Dierickx & Cool, 1989; Grant, 1991; Peteraf, 1993; Reed & DeFillippi, 1990). Likewise, specificity is a barrier to duplication, as it makes imitation more difficult to carry out (Dierickx & Cool, 1989; Grant, 1991; Reed & DeFillippi, 1990).

Distinctive competences based on organizational capabilities. These competences include different specific assets of the firm. First, they include knowledge that can be transmitted and shared by several people within the organization, such as organizational routines (Collis & Montgomery, 1995; Grant, 1991; Itami & Roehl, 1987; Leonard-Barton, 1992). Second, they embrace internalized knowledge shared informally in the firm, such as ways of doing things derived from the organization history and culture. This organizational capital underlies the workings and overall behavior of the organization and gives rise to, for instance, the creation of a climate of cooperation and trust among firm members (Barney, 1986a; Fiol, 1991; Hall, 1992, 1993; Leonard-Barton, 1992). Third, these competences range over the basic principles of its organizational design, its organizational architecture (Henderson & Cockburn, 1994; Nelson & Winter, 1982), including its system of rewards and incentives. Finally, they also embody the learning skills that constitute the cognitive base for both the processes of innovation and the continuous expansion of the organization knowledge stock. In the same way that individual skills are acquired through continued practice over time, organizational routines are developed, improved, and sustained only by means of the experience gained through repeated use. Organizational capabilities are thus made up of knowledge that stems from learning based on the repeated carrying out of activities, and that arises from situations of uncertainty and complexity (Amit & Schoemaker, 1993), thus requiring social interaction to become a continuous loop to convert tacit knowledge into explicit knowledge (Nonaka, 1991). On the basis of the scarce literature available (Ansoff, 1979; Lado et al., 1992), which has attempted to exhaustively catalog the domain of organizational distinctive competences, we have identified a series of theoretical dimensions of the construct.

The construct's first group of dimensions is related to the creation of a culture of stakeholder commitment to the mission and objectives of the firm. The definition of commitment is still a matter of disagreement in the literature (Allen & Meyer, 1990; Hackett, Bycio, & Hausdorf, 1994; Iverson & Buttigieg, 1999; Meyer & Allen, 1991). However, all

conceptualizations establish a certain link between the members and the organization as a common feature (Mathieu & Zajac, 1990). Since the pioneering studies by Meyer and Allen (Allen & Meyer, 1990; Meyer & Allen, 1984, 1991), the literature (i.e., Hackett et al., 1994; Iverson & Buttigieg, 1999) has studied three perspectives: affective or attitudinal commitment, continuity commitment, and normative commitment. In this study, we have considered only the first two.

Affective commitment is defined as an emotional identification by the employees with the organization, resulting in their involvement with it, and their remaining with the organization because they feel they want to. Attitudinal commitment, as defined by Cruise O'Brien (1995), Cook and Wall (1980), and Mowday, Steers, and Porter (1979), can be understood on the basis of three concepts: (1) the acceptance and internalization by the organization members of its strategy, mission, values, and objectives; (2) the predisposition to invest personal effort as a member of the organization and a strong desire to be a member of it; and (3) loyalty to the firm, which rules out opportunistic behavior. Following the work of Allen and Meyer (1990), the most important antecedents of affective commitment would be characteristics of the organization work and culture oriented toward (1) developing the capacity for interpersonal relationships, highlighted by Grant (1991) as one of the essential competences of an organization, and (2) stimulating the capacity to work as a team, considered by Hall (1992; 1993) as a cultural capability necessary for sustaining competitive advantages. Its key base is an organizational culture of cohesion that promotes internal cooperation over individualism and eliminates internal barriers between functions and units of the organization. A shared culture guarantees that the coordination of tasks will not require excessive efforts or costs.

Affective commitment pivots on the existence and the general knowledge within the firm of elements that bring together the efforts of all its members in a shared management. These elements of cohesion include strategic decisions (mission and strategy) and cultural attributes that reflect the firm values (symbols, models, rituals). We have captured this set of competences in the dimension "existence and knowledge of information/symbols/models/rituals."

Continuity commitment places the link between stakeholders and organization in the costs to the shareholder of leaving or separating from the organization. Continuity commitment is built mainly by implementing a system of recognition, rewards, and promotion. When this system generates satisfaction and shared benefits, it makes divorce between stakeholders and organization costly and encourages both internal and external cooperation. The dimension "cooperation and satisfaction of stakeholders" captures this component.

Commitment translates into an organizational competitive capability propitiated by (1) the conservation of valuable

human resources, lessening the risk of emigration of valuable knowledge, as commitment increases its imperfect mobility, and (2) the development of collective competences that are difficult to replicate due to their social complexity and their causal ambiguity. For these reasons, authors such as Ulrich (1998) consider commitment to be the firm's most important strategic asset.

A second group of dimensions refers to the creation of a participation culture in the organization. This competence involves generating an organizational climate and labor relations that allow the members to commit personally to quality, and to carry out their tasks in coordination in order to achieve the objectives established. A participatory culture rests on mechanisms of participation in defining objectives, plans, and tasks, an infrastructure of interpersonal relations, a system of distribution of income, and shared norms that make problem-solving processes very effective. This set of attributes has been integrated into the dimension "culture of participation."

Nevertheless, this culture of participation can be reinforced by mechanisms of organizational design, which propitiate group work, collective participation, flexibility, decentralization, and debureaucratization. Participation, therefore, rests on patterns of organizational design that facilitate horizontal communication, interpersonal relations, and autonomy in work. Decisions on job definition, individual and interpersonal roles, and labor organization must be oriented toward teamwork and the interdependence of tasks. Equally useful for these purposes are participatory labor practices that make employees more willing to work in common and to accept changes in their ways of working. Participation enables these organizational routines to be contextualized as processes of improvement that do not threaten their security and their status in the organization. Also useful are horizontal and vertical communication channels, favoring the diffusion of information flows about objectives, strategies, processes, and results that are being achieved. This second set of organizational attributes has been grouped under the dimension "horizontal and flexible organizational design." A participatory culture also rests on the articulation of a power structure that allows the different stakeholders to participate in decision-making.

The "culture of participation" dimension focuses on both the processes and their motivational antecedents, and on their results. The results of employees' participation are manifest in items related to employee satisfaction (04, 024), teamwork (011, 017) and their assistance in problem solving and improvement in decision-making (016), reduction of absenteeism (023) and conflict (028), and the promotion of innovation and rejection of inhibition (015).

The existence of a commitment and participation culture could create sustainable competitive advantages. The development of collective work produced by participation leads to the development of employees' capabilities on the principle of

“learning by doing” and “learning by cooperating.” Commitment and participation give rise to firm idiosyncratic competences, which are difficult to imitate due to the causal ambiguity and the social complexity implicit in social life. This competence thus cannot be acquired by hiring members of the organization or by simply copying its norms and procedures. Furthermore, the shared participatory culture is substantial with a climate of trust in the human resources. This organizational climate makes them feel sure of their objectives and capabilities and helps to reduce the uncertainty inherent in decision-making and the transaction costs in intra-organizational relations. These corporate competences translate into combinations of capabilities embedded in the organization processes and structures, which tend to be independent of individuals and to persist in the organization when particular individuals or groups abandon it. Moreover, a culture of commitment and participation may sustain competitive advantage, as it acts as a hurdle to copying by competitors and curbs the erosion of the assets value that supports it due to their continuous improvement through innovation (Amit & Schoemaker, 1993; Barney, 1991; Grant, 1991). A cultural profile of this type is an idiosyncratic asset and one of imperfect mobility, both characteristics that strengthen the barriers to competitive imitation. In addition, by stimulating “learning by doing,” continuous improvement of organizational routines is promoted, which slows the simultaneous introduction of competences of a similar value by competitors.

Concept of Distinctive Competences as a Latent Construct

Economic and strategic literature has not clearly defined to which of the categories of multidimensional constructs distinctive competences belongs. We believe that the correct specification of managerial or organizational distinctive competences, from the theoretical perspectives adopted, is as a latent construct. Latent constructs are those abstractions that cannot be observed directly, because the concept underlies its dimensions. Distinctive competences based on managerial or organizational capabilities are inferred from the communality in the complete representation of all its dimensions.

The statistical definition of latent concept compels its dimensions to be correlated. For this reason, the latent construct is frequently estimated by means of the dimensions covariance. Therefore, the correct construct operationalization is by means of confirmatory factor analysis (Law, Wonk, and Mobley, 1998: 750). Each dimension can thus be measured for a set of indicators, which constitutes the observable variables of the model, with the latent concept being estimated from the indicators variances–covariances matrix. We start from the premise that managerial and organizational distinctive competences are a second-order latent factor, composed

of certain dimensions or first-order factors. Each indicator has a single positive factorial load in the dimension to be measured, and a zero factorial load in other factors. Figure 1 presents a graphical representation of the model.

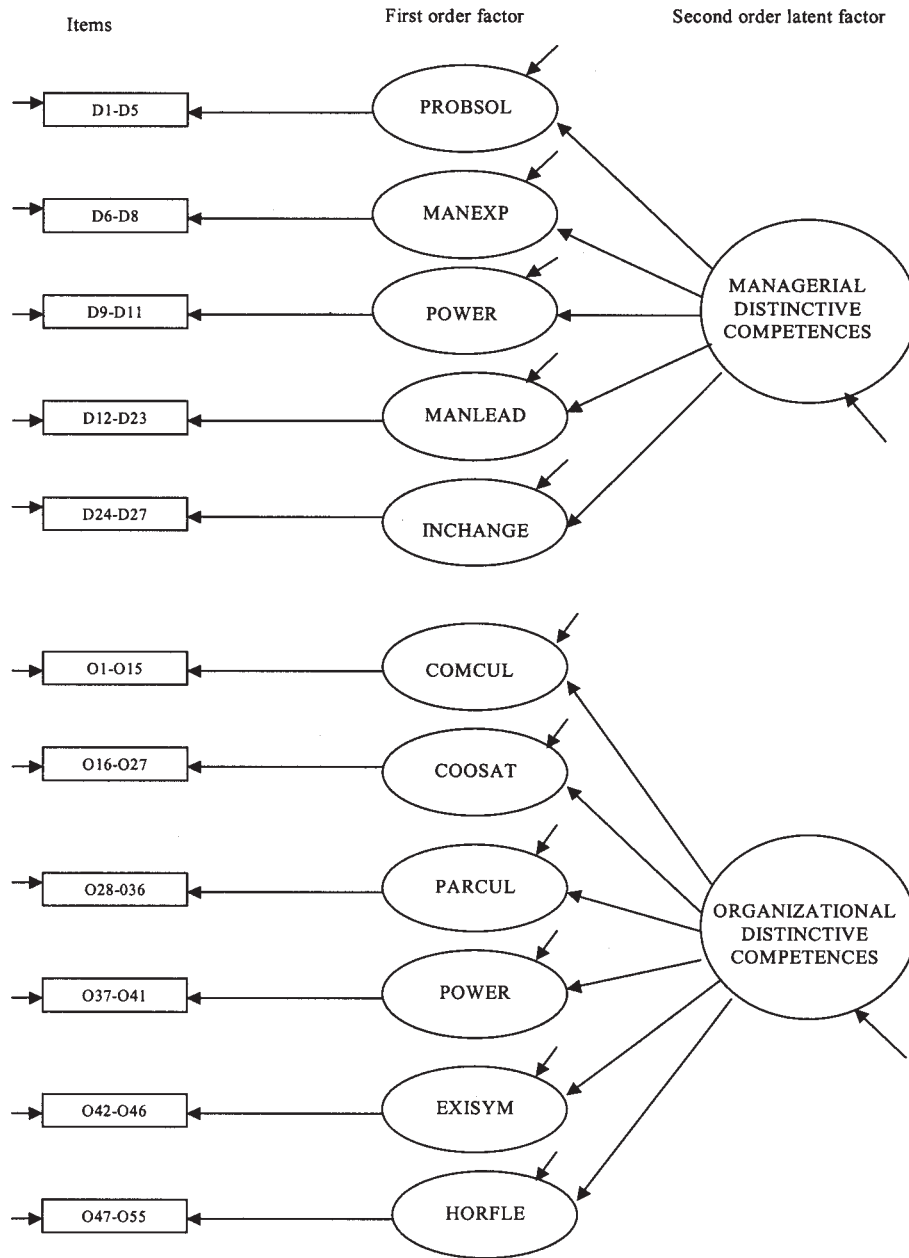
Scales for the Measurement of Distinctive Competences

We can use two approaches to measure distinctive competences: (1) by means of substitute quantitative measures (proxy variables), and (2) by means of classification scales allowing the judgment and experience of managers to be expressed in subjective measures of such intangibles through numerical or semantic scales. The literature offers three types of subjective scale for measuring distinctive competences: (1) comparing objectives and results (McGrath, MacMillan, & Venkatraman, 1995); (2) valuing their possession of the characteristics of strategic assets (Sharma & Vredenburg, 1998); and (3) comparing them with competitors (Grant, 1991: 121; Snow & Hrebiniak, 1980). In this research, we have measured managerial and organizational distinctive competences by means of a subjective semantic scale, based on the self-classification by managers of their firm in relation to its competitors. The scales required the respondents to evaluate how they perceived—good or bad—the organization’s stock of distinctive competences in each specific area in comparison with the competition. A Likert-type scale was used, with a range of five points from 1 = “much worse than our competitors,” 3 = “normal, on an average with our competitors,” to 5 = “much better than our competitors.”

Care must be taken to avoid the risk of bias (automatic, carelessly considered responses) implicit in a nonneutrally designed questionnaire, as is the case when all the items are positively drafted. To a certain extent, this problem is substantial with RBV, because we always define distinctive competences as sources of competitive advantage, and to do this, we must measure them in terms of increasing strength vis-à-vis the competitors. In this study, in order to avoid the “robot effect” in responses, we opted for a control process that consisted of formulating certain items inversely (see the Appendix).

The internal consistency of managerial behavior in the self-evaluation was verified in the convergence of measures among the control questions. For example, in the managerial competences scale, the automatic response effect was seen to have been effectively prevented in the following pairs of items: D18/D19, D21/D23, and D25/D26, which provided similar values despite having been measured using opposite directions on the scale. The same effect can be appreciated in the organizational competences scale in the following pairs of items 08/09, 08/010, 014/012, 020/019, 022/018, 029/051, 032/033, 044/046, and 054/055.

FIGURE 1
Initial Factorial Model to Measure the Constructs Distinctive Competences Based on Managerial or Organizational Capabilities



Generation of the Measuring Scale Items and Their Reduction by Means of the Delphi Study and Pretest

The scales used to operationalize distinctive competences must be developed from a set of items that reflect the managers' evaluations of certain attributes of the construct. The identification of the attributes that were to form part of the instrument followed the recommendations of the literature, taking place in two stages. The first stage was based on a review of the literature. The result was a broad sample of items, capturing the

greatest possible number of attributes configuring all the dimensions of the domain of the construct (Churchill, 1979: 67–68): 315 and 369 items in the managerial and in the organizational distinctive competences scales, respectively. Next, in order to reduce the scale, we selected only the relevant attributes that were really determinant in the evaluation, using the Delphi technique and, subsequently, a pretest questionnaire.

The aim of the Delphi method was to validate and reduce the scale according to the selection criteria of the panel, consisting of 31 experts from both academic and managerial back-

grounds. The Delphi process consisted of two rounds, after which we proceeded to eliminate items with a lower degree of agreement (average less than 4.0 on a scale of agreement increasing from 1 to 5), and to include the improvements suggested by the experts. The scale reduction process allowed the indicators initially selected to be reduced to an acceptable number for the empirical work (27 and 55 items in the managerial and in the organizational distinctive competences scale, respectively), and to enjoy a high degree of consensus. The dimensions of the two scales did not change during the Delphi process, and remained the same as those established theoretically.

Because the questionnaire was constructed without consulting the target population, we decided that a pilot test should be carried out to evaluate its workings before issuing the final questionnaire. The measuring instrument was pre-tested twice, the first time on 14 firms, one from each of the industries represented in the sample. Before determining the final format, a second pretest was performed one month after the first, and two weeks before the posting of the final version. The conclusions from the results obtained enabled the design of the final questionnaire to be adapted. The final scales resulting from these processes of refinement and reduction are shown in the Appendix, which also gives the means and the standard deviations of all the variables.

METHODOLOGY FOR THE CONSTRUCTION OF THE DATABASE

To obtain data for the first validation of the instruments created, we selected Spanish industrial firms as our population, with the exception of the energy sector. The initial sample was formed by 2,000 firms, selected from the Industrial Census of Spain by a procedure of stratified sampling, proportional to industry, size, and geographical distribution. Within each segment, the selection was made at random. The fieldwork was carried out between October 1997 and January 1998. The number of questionnaires received totaled 1,008, of which 112 were eliminated for a variety of reasons (incomplete questionnaires, inconsistencies or lack of response reliability, etc.). The final sample making up the database was of 896 firms, which implied a response rate of 44.3 percent, giving a margin of error of ± 3.3 percent, with a confidence interval of 95.5 percent.

In this empirical study, we adopted a "multi-informant" approach, which some authors (James & Hatten, 1995) regard as preferable for measuring strategy constructs, as it allows the information requested to be gathered more reliably. We then requested that the managerial distinctive competences be evaluated by the general manager, and the organizational distinctive competences by the organization or human resources manager.

VALIDATION OF SCALES

Scales Evaluation: Psychometric Requirements

A useful, faithful, and accurate instrument for measuring the distinctive competences construct must meet three requirements: dimensionality, reliability, and validity (Bagozzi & Phillips, 1982; Bollen, 1989). We used confirmatory factor analysis to demonstrate the psychometric properties scale, in accordance with Bagozzi (1981), Bentler and Bonett (1980), and Jöreskog (1969). The estimation method of the parameters used was that of maximum likelihood with robust standard indicators, recommended by Satorra and Bentler (1994; 2001). We used EQS 5.7 (Bentler, 1995) to develop the covariance models. We estimated two measurement models for the two second-order latent factors (managerial and organizational distinctive competences) and ten measurement models for the ten first-order factors, which were their dimensions.¹ The estimation of the second-order factorial models must represent each dimension with a single index, calculated as the average value of the scale.² The models initially proposed to measure each dimension included all the items of the complete scales. The goodness-of-fit measures for the structural equation models may be carried out using three types of tests: absolute fit measures, incremental fit measures, and parsimonious fit measures (Bollen, 1989; Hair, Anderson, Tatham, & Black, 1998; Jöreskog, 1969). In addition, we carried out a correlation analysis to demonstrate the convergent validity between objective and subjective measurements, and the external validity of the measurement based on managerial perception. We also performed a retest to demonstrate the scale stability.

Scale Dimensionality

To test the scale structure, we examine whether all the individual indicators of every first-order factor actually represent the same theoretical concept (condition of unidimensionality); and whether all the theoretical dimensions of each second-order factor covary to represent the same distinctive competence (condition of multidimensionality).

The analysis of the goodness-of-fit indices, of the parameters reliability, and of their statistical significance led us to the modification of these initial models, to the point where an acceptable fit of the models was reached. Specifically, to develop the first-order factorial models for each individual dimension of the two scales, certain items were eliminated from each scale, while the indicators that appear in Tables 1 and 2 were retained. This procedure resulted in two dimensions of the measurement scale of managerial distinctive competences ("managerial experience" and "position and exercise of power"), presenting fewer than four retained items.

TABLE 2
Confirmatory Factor Analysis of the Organizational Distinctive Competences Measurement Scale:
Factor Loadings, Measurement Errors, and R² Values

Variables	Factor loadings	Measurement errors	R ² values	Variables	Factor loadings	Measurement errors	R ² values
		COMCUL				POWER	
1	0.360 ^a	0.933	0.130	37	0.423 ^a	0.906	0.179
8	0.547 ^{**}	0.837	0.299	38	0.460 ^{**}	0.888	0.212
12	0.317 ^{***}	0.949	0.100	39	0.319 ^{**}	0.948	0.102
13	0.430 ^{***}	0.903	0.185	41	0.457 ^{***}	0.890	0.209
14	0.306 ^{**}	0.952	0.094				
15	0.252 ^{**}	0.968	0.064			EXISYM	
		COOSAT					
17	0.421 ^a	0.907	0.177	42	0.277 ^a	0.961	0.076
18	0.330 ^{***}	0.944	0.109	44	0.429 ^{**}	0.903	0.184
19	0.704 ^{***}	0.710	0.496	45	0.541 ^{***}	0.841	0.293
21	0.727 ^{***}	0.687	0.528	46	0.828 ^{***}	0.561	0.685
22	0.731 ^{***}	0.682	0.535			HORFLEX	
23	0.381 ^{***}	0.925	0.145	50	0.356 ^a	0.935	0.127
26	0.380 ^{***}	0.925	0.145	51	0.495 ^{***}	0.869	0.245
27	0.387 ^{***}	0.922	0.150	52	0.498 ^{***}	0.867	0.248
				53	0.597 ^{***}	0.802	0.357
		PARTCUL				Organizational distinctive competences	
29	0.447 ^a	0.895	0.200	COMCUL	0.666 ^a	0.746	0.444
31	0.352 ^{***}	0.936	0.124	COOSAT	0.625 ^{***}	0.781	0.390
32	0.425 ^{***}	0.905	0.181	PARTCUL	0.773 ^{***}	0.635	0.597
33	0.589 ^{***}	0.808	0.346	POWER	0.129 [*]	0.992	0.017
35	0.541 ^{***}	0.841	0.293	EXISYM	0.415 ^{***}	0.910	0.172
				HORFLEX	0.755 ^{***}	0.656	0.570

Notes: COMCUL—commitment culture; POWER—structure of power in the organization; EXISYM—existence and knowledge of information/symbols/models/rituals; COOSAT—stakeholders' cooperation and satisfaction; HORFLEX—horizontal and flexible organizational design; PARTCUL—participation culture; ^a parameter is equal to one to fix the scale of the latent variable; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

In these cases, degrees of freedom are equal to zero, the model is saturated, and the fit is perfect. In an attempt to resolve this problem, we designed another joint model that grouped items retained from both problematic dimensions in a new dimension that we termed “managerial experience and power” (MANEXP-POWER). This joint model established correlation between the previous two factors. The results of the estimation of this joint model confirm the existence of two separate dimensions, correlated with each other. Results of the estimated exact final models indicate the parameters have a high statistical significance. The factorial weights of each indicator are always positive in the factor to which it was theoretically assigned, and zero in other factors. The values of the estimated parameters are appropriate, and neither improper solutions nor symptoms of nonfit are appreciated in the models. Tables 3 and 4 present the fit tests for our models. On the whole, they affirm the fit quality of the first-order models. The behavior of all the fit indices enables us to affirm the unidimensionality in each of the individual scales. The model of the EXISYM dimension exceeded the maximum value of 0.80 in the RMSEA (root mean square error of approximation) index, reflecting its risk to refuse correct models (Hu & Bentler, 1999) indicated by the goodness of two additional absolute fit tests.

Once the unidimensionality of each first-order factor had been established, we proceeded to analyze the second-order factorial models of Figure 1. To develop the organizational distinctive competences factorial model with an acceptable fit, we eliminated items 037, 038, 039, and 053. The values of the standardized factorial weights of each dimension on the second-order latent factor were statistically significant and positive, and its measurement errors were not correlated (Tables 1 and 2). Estimation of the goodness of fit for the individual models is excellent (Tables 3 and 4). The fit of the second-order model to measure managerial distinctive competences only failed to meet the minimum significance level of 0.05 for the Satorra–Bentler χ^2 . This index has been criticized because of its sensitivity to big samples. This problem, taken with the fact that GFI (goodness-of-fit index) and RMSEA exceed minimum values, indicates an acceptable absolute fit. This set of statistical evidence confirms the multidimensionality of the two second-order latent constructs.

Scales Reliability

We calibrated the scales' reliability by means of two methods, each of which evaluates one of the two dimensions of reliability, stability, and internal consistency. The retest method is useful to test measurement reliability, because it provides stable results over time. It consists of repeating the measuring process with the same scale and on the same firms at two different times. We verified the stability of the scales

by a retest sent to the first 250 respondents to the survey. The time between the two measurements was approximately 45 days. The final rate of response to the retest was 70.8 percent (177 firms). The percentage of organizations that reaffirmed their first measurement (81 percent and 83 percent in the managerial and organizational distinctive competences scales, respectively) exceeded the minimum of 0.70 (Nunnally, 1978).

The second property is internal consistency, which seeks to test which items should be retained in order to guarantee a measurement scale free of errors. In a confirmatory factor analysis, Fornell and Larcker (1981) propose estimating the internal consistency of a measurement by analyzing the index of joint reliability. The results (see Tables 3 and 4) show that the observable variables are representative of the latent constructs. The PROBSOL dimension presents the lowest index of joint reliability of all the models, as it did not exceed the recommended minimum value of 0.50. In the present study, despite this problem, we chose to retain it for two reasons. First, because the factorial model for its measurement fits well, thereby confirming its unidimensionality with a high loading of all the indicators on the dimension, even though the R^2 values were low. Second, because if it were eliminated, the definition of the domain of the managerial distinctive competences construct would be impoverished.

Scale Validity

A key problem in evaluating competences is the preservation of objectivity. Certain researchers (e.g., Rangone, 1997: 209) prefer whenever possible to use quantitative substitutes to evaluate intangible elements. One basic reason for the lack of confidence in the objectivity of managerial perceptions of the distinctive competences of their firms lies in the broad margin of variation, which may lead to very serious evaluation errors (Grant, 1991: 121; Stevenson, 1976). In addition, “self-evaluation bias” has been observed in many groups of people (Compte & Postlewaite, 2003; Gramzov, Elliott, Asher, & McGregor, 2003; Squintani, 2003). Managers may be reluctant to admit weaknesses by formulating overoptimistic judgments of their performance. If this risk always occurs, self-evaluation, rather than truly reflecting managerial competences, will reflect the managers' own self-esteem. However, various reasons lead us to consider that this risk is not so high in this study. Although items do exist (D5, D10, D15, D27) with a high averaged mark, accompanied by low standard deviation, the opposite phenomenon appears in others (D3, D12, D25, D26), where a high averaged mark is accompanied by high standard deviation. A large number of items show an appreciable standard deviation, thus reflecting a wide range of responses that do not always tally with a positive self-evaluation. It is also significant that, on average, respondents evaluate themselves as weaker than their competitors

TABLE 3
Confirmatory Factor Analysis of the Managerial Distinctive Competences Measurement Scale:
Goodness of Fit and Joint Reliability

Goodness-of-fit statistics	First-order factorial individual models				Final scale (second-order factorial model)
	PROBSOL	MANEXP+POWER	MANLEAD	INCHANGE	
Satorra–Bentler χ^2	0.444	0.340	46.035	2.014	6.101
Degree of freedom	2	2	35	2	2
Significance level	0.801	0.844	0.100	0.365	0.047
GFI	0.999	0.999	0.967	0.997	0.994
RMSEA	0.000	0.000	0.046	0.029	0.062
AGFI	0.997	0.997	0.948	0.984	0.969
IFI	1.042	1.014	0.953	0.992	0.993
RCFI	1.000	1.000	0.977	1.000	0.988
NC	0.226	0.209	1.857	1.324	2.515
AIC	-3.549 (26.579)	-3.583 (104.189)	-4.991 (581.873)	-1.352 (75.947)	1.030 (421.229)
Joint reliability	0.306	0.522	0.742	0.442	0.694

Notes: The levels of acceptance recommended are: absolute fit measures—GFI \geq 0.90; RMSEA \leq 0.08; Satorra–Bentler χ^2 (statistical significance level) \geq 0.05; incremental fit measures—adjusted goodness-of-fit index (AGFI) \geq 0.90; incremental fit index \cong 1; robust comparative fit index \cong 1; parsimonious fit measures—normed $\chi^2 \leq$ 5; Akaike information criterion (AIC) = low values.

TABLE 4
Confirmatory Factor Analysis of the Organizational Distinctive Competences Measurement Scale:
Goodness of Fit and Joint Reliability

Goodness-of-fit statistics	First-order factorial individual models					Final scale (second-order factorial model)	
	COMCUL	COOSAT	PARCUL	POWER	EXISYM		HORFLEX
Satorra–Bentler χ^2	14.495	29.496	10.798	5.362	5.562	2.193	14.581
Degree of freedom	9	20	5	2	2	2	9
Significance level	0.106	0.078	0.056	0.069	0.062	0.334	0.103
GFI	0.988	0.975	0.986	0.993	0.987	0.996	0.985
RMSEA	0.040	0.049	0.073	0.070	0.102	0.036	0.046
AGFI	0.972	0.955	0.957	0.963	0.937	0.981	0.966
IFI	0.941	0.966	0.935	0.941	0.954	0.991	0.986
RCFI	0.927	0.978	0.949	0.940	0.962	0.997	0.982
NC	1.647	1.960	3.141	2.899	5.139	1.528	1.819
AIC	-3.174 (78.245)	-0.799 (525.851)	5.704 (150.897)	1.799 (54.047)	6.277 (168.054)	-0.944 (105.716)	-1.633 (512.692)
Joint reliability	0.469	0.711	0.558	0.431	0.569	0.522	0.706

Notes: The levels of acceptance recommended are: absolute fit measures—GFI \geq 0.90; RMSEA \leq 0.08; Satorra–Bentler χ^2 (statistical significance level) \geq 0.05; incremental fit measures—adjusted goodness-of-fit index (AGFI) \geq 0.90; incremental fit index \cong 1; robust comparative fit index \cong 1; parsimonious fit measures—normed $\chi^2 \leq$ 5; Akaike information criterion (AIC) = low values.

in aspects such as “popularity and charisma” and “capacity to act as a model for others”; if self-esteem were always present, it would also be reflected in relevant attributes to personal pride such as these.

One generally accepted way of checking the quality of subjective measurement is by its convergent validity with the objective measurement. To do this, we verified whether the

measurement of distinctive competences on the basis of managers’ perceptions is convergent with the objective measurement on the basis of quantitative data. For this purpose, we used objective data gathered in the empirical study, which can be considered as proxy variables for some indicators. The comparison was made between the mean of the items forming each scale dimension (first-order factors) and various ob-

TABLE 5
Convergent Validity from the Correlation Coefficients Between Subjective and Objective Measures of the Distinctive Competences

Convergence Between Objective and Subjective Measures of the Managerial Competences						
	PROBSOL	MANEXP	POWER	MANLEAD	INCHANGE	
Creativity and innovation techniques in the managerial baggage (number)	0.658	0.183	0.027	0.119	0.661	
Experience as manager (years)	0.441	0.608	0.229	0.086	0.037	
International experience in management (years)	0.102	0.795	0.226	0.246	0.200	
Influence in the organization (years as board of directors member)	0.041	0.199	0.649	0.364	0.130	
Enterprise loyalty (service years)	0.067	0.097	0.358	0.794	0.116	
Impulse to teamwork (groups number with managers as members)	0.208	0.152	0.088	0.738	0.117	
Managerial impulse of new projects (number)	0.100	0.131	0.066	0.398	0.739	
Managerial innovation (number of management innovations)	0.213	0.207	0.044	0.296	0.755	
Convergence Between Objective and Subjective Measures of the Organizational Competences						
	COMCUL	COOSAT	PARCUL	POWER	EXISYM	HORFLEX
Investment at training (percent of sales)	0.813	0.135	0.244	0.089	0.103	0.111
Teamwork (work team number)	0.798	0.169	0.307	0.102	0.099	0.364
Loyalty to the organization (average life of the workers in the enterprise)	0.410	0.688	0.361	0.132	0.082	0.103
Loyalty to the market (average life as enterprise consumers)	0.441	0.843	0.438	0.109	0.115	0.143
Job rotation and geographical mobility (percent staff)	0.517	0.219	0.638	0.077	0.083	0.164
Nonmonetary rewards (percent staff)	0.288	0.366	0.733	0.052	0.061	0.107
Weight of trade unions and workers in management teams (number)	-0.152	-0.247	-0.216	0.664	0.067	0.104
Organization cultural symbols (number)	0.249	0.096	0.137	0.058	0.724	0.113
Organization cultural rituals (number)	0.285	0.077	0.099	0.065	0.790	0.142
Lean organization (hierarchy levels number)	0.237	0.225	0.115	-0.058	0.107	0.824
Introduction of flexible and horizontal organizational forms (number)	0.241	0.186	0.164	0.071	0.108	0.861

<<note re boldface>>

jective indicators of variables that form part of this component (Table 5). Results indicate a highly significant correlation. It can be observed that the different measurements of the same variable are, with the exception of one case, all more intensely correlated with among themselves than with others. The high convergent validity of the scales is once again

demonstrated, because the factorial weights (Anderson & Gerbing, 1982; Hair et al., 1998), both in the second-order factorial models and in all the factorial models of the individual dimensions, are generally high and statistically significant (see Tables 1 and 2). Convergent validity of the scales is also observed with the measurements of incremental fit,

TABLE 6
Discriminant Validity from Chi-Square Difference Test

Managerial Distinctive Competences					
	PROBSOL	MANEXP+POWER	MANLEAD		
MANEXP+POWER	669.364				
MANLEAD	670.682	690.471			
INCHANGE	673.235	694.385	659.837		

χ^2 free model = 638.129 (183). χ^2 of table models have 184 degrees of freedom.

Organizational Distinctive Competences					
	COMCUL	COOSAT	PARTCUL	POWER	EXISYM
COOSAT	1,892.049				
PARTCUL	1,885.438	1,857.984			
POWER	1,860.655	1,859.026	1,861.387		
EXISYM	1,869.205	1,866.447	1,864.550	1,863.337	
HORFLEX	1,874.331	1,861.119	1,856.054	1,866.779	1,862.340

χ^2 free model = 1,839.002 (545). χ^2 of table models have 546 degrees of freedom.

Managerial and Organizational Distinctive Competences	
Organizational distinctive competences	Managerial distinctive competences
χ^2 free model = 8,403.551 (3238)	8,511.890 (3239)

* All values of χ^2 difference test are statistically significant at $p < 0.001$.

which exceed the recommended minimal values (Bentler & Bonett, 1980) (see Tables 3 and 4).

To analyze the discriminant validity, we used the χ^2 difference test of factorial model with two factors (Anderson & Gerbing, 1988; Bagozzi & Phillips, 1982; Jöreskog, 1971). The CALIS de SAS program was used to perform this test (Hatcher, 1994), as the EQS program cannot estimate models of this size. Results obtained (Table 6) indicate that the χ^2 difference tests for first- and second-order factorial models are statistically significant. This affirms the discriminant validity of the two measurement scales and that all factors of the first- and second-order factorial models present different constructs.

Finally, we have to verify the *criterion or external validity* of the different scales. The fundamental postulates of the RBV identify distinctive competences as basic sources of economic rents. For this reason, we selected organizational performance as the variable theoretically related to distinctive competences in order to test the criterion validity of the scales. We measured this variable by means of an indicator that expresses managers' perceptions of their firm performance in relation to their competitors. The amplitude of the scale followed the same Likert criterion used to measure the distinctive competences. In addition, we tested the correlation between managerial and organizational distinctive competences and various objective indicators of performance. The results (Table 7) in-

dicate, in all cases, that the Pearson correlation coefficients between distinctive competences and performance are positive and significant. We can indicate that, although these correlations are, in general, high, they are also lower on average (with a few exceptions) than the factorial weights of all second-order latent factorial models. This empirical result confirmed that the factors that represent managerial or organizational distinctive competences covary to a greater extent among themselves than with other theoretical concepts to which they are related.

All the data on distinctive competences and performance used to assess the external validity of the construct come from the same individual at a given moment in time. It is therefore prudent to rule out the risk of common methods variance, which is high when all data come from the same survey. Again, RBV predicts long-term effects (rents) of distinctive competences on performance. In order to rule out this risk and strengthen the empirical evidence of the scale's external validity, we correlated the distinctive competences with long-term exogenous objective measurements from some performance indicators (return on assets [ROA], return on investment [ROI], return on sales [ROS], and growth in sales). A "lagged effect" has hence been introduced in the measurement of the effect of firm distinctive competences in relation to its performance. These new data were taken from the annual accounts

TABLE 7
External Validity from the Correlation Coefficients between Performance Subjective and Objective Measures and Distinctive Competences Measured from Autoevaluation

Performance measure	Correlation coefficient with competences	
	Managerial	Organizational
Performance managerial perception ¹	0.486	0.561
Return on assets (ROA) ²	0.482	0.551
Return on assets (ROA) (book value) ³	0.579	0.594
Return on investment (ROI) ²	0.435	0.514
Return on investment (ROI) (book value) ³	0.635	0.599
Return on sales (ROS) ²	0.472	0.360
Return on sales (ROS) (book value) ³	0.590	0.613
Average gross production margin ²	0.493	0.447
Average growth in sales during the last four years ²	0.525	0.469
Growth in sales (book value) ³	0.603	0.611
Market share increase during the last four years ²	0.593	0.573
Labor productivity (ratio added value/average total personnel) ²	0.550	0.415
Wealth creation (ratio market value/book value of the company) ²	0.546	0.586

Notes: ¹ Performance subjective measures; ² current performance objective measures based on internal information (questionnaire to managers); ³ long-term performance objective measures based on external information (book value from outside databases), 1997–2002 period.

deposited with the Spanish Mercantile Register. The group of companies making up the final sample of Spanish industrial firms (896) for which exogenous data were obtained came to a total of 509. The dates to which this information referred were the same as those taken as a reference for the self-evaluation. The data were taken as the average value from the 1997–2002 period. The correlation coefficients with the exogenous objective performance measurements remained high (Table 7).

DISCUSSION

The main result of this study was to construct and validate two scales to measure the distinctive competences based on managerial and organizational capabilities. Both constructs have been rigorously conceptualized and operationalized, and their psychometric properties were empirically tested. The scales created may be considered to be useful in the continued progress of the problem of conceptualization, operationalization, and measurement of the core constructs in RBV.

This methodological proposal to identify and measure managerial and organizational capabilities displays several important advantages, thus providing grounds for the added value of our contribution. First, we have based the definition of the domain and dimensions of the two constructs on a review of the existing literature, including as many elements as possible from earlier instruments so as to bring a more concise yet exhaustive approach to the research. The way is thus opened for the comparison of the results from subsequent research and the accumulation of knowledge. Second, the definition of distinctive competences has followed the

latest contributions of the RBV. We have therefore considered both the static competences that can generate competitive advantages at a given moment in time, and the dynamic competences that enable them to be constantly regenerated and maintained. A further major advantage of the instruments created here is disaggregation. Synthesizing both distinctive competences in a single scale has the advantage of creating instruments that are succinct and almost certainly more easily applied. However, the faithful measurement and complete coverage of firm competences requires their multi-dimensional structure to be taken into account. Both reasons require us to consider the valuation of each competence and their dimensions by means of multi-item scales. Finally, the contribution made by the Delphi panel of experts in reducing the scales was most valuable. It noticeably refined and improved the scales, as well as reduced them, achieving an instrument with a notable degree of simplicity in view of the complexity of the construct to be measured. The initial size and the magnitude of the reduction achieved by rigorous procedures place the instrument in the top category (reserved for exemplary measurements) as defined by Robinson, Shaver, and Wrightsman (1991: 12–13).

Internally generated intangible assets are extremely difficult to recognize and quantify. The main problems are that they are difficult to observe, and the costs attributable to them or their reasonable market value are difficult to measure. These problems reinforce the interest of the procedure for measuring distinctive competences through the self-classification by a firm's managers in relation to its competitors. These instruments have adopted a qualitative scale of classification, which

allows managers' experience and opinion to be translated into subjective measurements of intangible assets. The usefulness of managerial perception is too often based on the absence of objective data on many types of distinctive competences, and to syntheses of the firm's distinctive competences portfolio in one single index. Besides, self-evaluation by managers of organizational and managerial competences is shown empirically to be a variable with proven capacity to explain business success. The fundamental postulates of the RBV, which identify distinctive competences as the basic sources of economic rents, find here solid empirical support.

It is important to underline the discriminant validity of the scales of managerial and organizational distinctive competences. χ^2 difference tests indicate that these (and the dimensions of each one) are distinct constructs and are not interchangeable. Empirical studies indicate that the correlations between distinctive competences and performance are greater than the correlations between distinctive competences. Individually, managerial and organizational distinctive competences are positive predictors of performance, and there is no significant association between the two that would indicate the presence of cumulative effects or covariations or orthogonality problems. In terms of structural equation models, it can be posited that a reciprocal relationship does not exist between managerial and organizational distinctive competences. This empirical evidence could suggest that an organization does not need to have competences in completely different arenas. However, this interpretation is in conflict with the extensive theory available and previous empirical evidence that show that organizational capabilities cannot be efficiently deployed when managerial competences have been poorly developed. Management capabilities are of key importance for configuring a competitive organizational architecture and culture, and vice versa: managers' knowledge and value systems are strongly influenced by the organizational context. There exists, therefore, an attractive line of research to confirm the role of the different types of distinctive competences in explaining organizational performance, and the nature of the associations among them.

A unidimensional definition of the scales would lead us to think that a firm has managerial or organizational distinctive competences when it possesses all the capabilities measured by the items integrated in the construct scale, and not only some of them. This was not our theoretical conception. We have theoretically defined each distinctive competence as a multidimensional construct, distinguishing its various components in its measurement scale. The validation of the dimensionalization proposed indicates that there are groups of certain resources and capabilities that covary together in a certain dimension, forming a homogeneous set. Each of the dimensions can then be formulated as a competence with autonomous and differentiated behavior within the overall la-

tent construct. The idea of "homogeneous sets of resources" is theoretically attractive and may be useful in explaining the question of the competences teams possessed by a firm and how they interact. The empirical evidence can be explained by the hypothesis that firms have distinctive competences in some of the dimensions (homogeneous sets of resources) and not necessarily in all the indicators of the scale. We hope to examine this question in greater depth in future research, through an investigation of the theoretical bases of these causal relationships.

The methodology developed here may also serve as a reference in the process of conceptualization and measurement of all the other basic constructs in strategic management (i.e., performance or environment). All of these are of a multidimensional nature, and, hence, are difficult to measure accurately. The problems underlying the empirical study of such variables and of their interrelationships, derived from the difficulty of measurement, find some useful working proposals in our study. We hope to extend our future research along these lines through the use of the methodology confirmed in this paper.

However, as these are exploratory instruments, we see the need for a subsequent study to refine and empirically test the instrument. We are aware that the measurement of both managerial and organizational distinctive competences can be improved. The list of indicators selected for measuring is the result of a process of theoretical review and reduction with contributions both from experts and from our own statistical work. New contributions may help to better describe the variables that form the exhaustive domain of each construct, thus maintaining the succinct nature of the instruments. In particular, with regard to its use in future research, the need to improve the measurement scale of the PROBSOL dimension must be highlighted, due to its low joint reliability index. It must also be pointed out that the reduction of the scale is necessary in order to attain an acceptable fit of the measurement models for first-order factors. This has led to a substantial reduction of many items on the scale of distinctive organizational competences; above all in relation to the COMCUL and HORFLEX dimensions. Last, a considerable amount of work remains to be done to define and measure dynamic competences. Special consideration should be given to creating a specific scale for measuring competences in learning, which we dealt with implicitly through the stimulus to learning derived from the culture and architecture of the organization.

NOTES

¹ Figure 2 includes 11 first-order factors, but two of these (MANEXP and POWER) have been joined together, as is later explained, in order to calculate their respective models.

² Without any doubt, it would have been a preferable and more parsimonious approach to establish a sole structural model. Nevertheless, EQS has severe limitations in the calculations of models of this complexity while wanting to maintain the whole of its structure. This forced us to represent each dimension with a sole index calculated as the mean value of the scale. This procedure has precedents in the literature (see Venkatraman, 1989).

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APPENDIX
Instrument for Measuring Managerial Distinctive Competences

Distinctive competences	Average	Standard deviation	
Problem-solving competence/knowledge (PROBSOL)			
D1	Our managers' basic skills are of an entrepreneurial nature.	2.88	1.55
D2	Our managers are essentially equipped with administrative management techniques for daily routines.*	3.25	1.38
D3	Resource allocation by our managers is focused toward the creation of opportunities.	3.50	1.40
D4	When solving problems, our managers adopt a creative approach supported by analysis.	2.81	1.82
D5	Our managers are capable of analyzing and selecting the best decisions.	3.25	0.89
Managerial experience (MANEXP)			
D6	Our managers have acquired their skills both through experience and through formal education.	3.41	1.06
D7	Our managers have acquired their management capabilities in multinational companies or in international management tasks.	2.90	1.65
D8	Our managers possess the capacity to manage with a global outlook stemming from their multicultural understanding.	2.83	1.82
Position and exercise of power			
D9	Our managers have the capacity to influence the board of directors.	3.40	0.79
D10	Our managers do not have the capacity to influence the organization.*	3.63	0.53
D11	Our managers are willing to use their power for the good of the organization.	3.47	0.98
Managerial leadership (MANLEAD)			
D12	Our directors' management style is oriented toward the firm objectives.	3.60	1.34
D13	Our directors have the capacity to inspire members of the organization to accept change.	3.50	0.98
D14	Our managers show empathy and have a capacity for communication.	3.14	0.68
D15	Our managers are loyal to the firm and to their own commitments.	3.71	0.29
D16	Our managers' power base is located in (is shared by) the group.	3.36	1.04
D17	Our managers do not delegate authority.*	3.70	0.83
D18	Our managers show an incapacity to integrate and mobilize all the members of a team.*	3.69	0.57
D19	Our managers are skilled in teamwork.	3.79	0.99
D20	Our managers continually support employees' initiatives and suggestions.	3.52	0.27
D21	The members of our organization do not regard the managers as role models whose behavior they would follow.*	2.54	1.66
D22	Our managers are skilled in inspiring consensus.	3.50	0.75
D23	Our managers have the charisma to be at the center of attention and provide a lead for members of the organization.	2.63	1.72
Incentive for change and innovation (INCHANGE)			
D24	Our managers approach conflict resolution as an opportunity for self-evaluation and continuous improvement.	3.00	1.54
D25	Our managers are oriented toward adopting initiatives and taking on risks.	3.51	1.29
D26	Our managers are not willing to accept major risks in new projects.*	3.49	1.04
D27	Our managers accept and actively promote change.	2.73	1.87
Commitment culture (COMCUL)			
O1	Stimulus toward leadership is not spread throughout the entire organization.*	2.92	1.52
O2	There is a general acceptance of commitment in the achievement of the organization objectives by all its members.	3.14	1.61
O3	Members of the company identify with its strategy.	2.93	1.04
O4	Our employees are satisfied with the design of the organization.	3.02	0.49
O5	Our employees are satisfied with the quality of their working life.	3.19	1.14

O6	There is an interest in the training and development of the members of the organization.	3.65	1.13
O7	The company is committed to the welfare of its employees.	3.11	0.47
O8	The organization internal communication is closed and not very transparent.*	3.35	1.21
O9	Vertical communication in the organization is strictly from the top down.	3.18	0.89
O10	Horizontal and interfunctional communication in the organization is intense.	3.21	0.83
O11	The organization encourages teamwork.	3.55	0.75
O12	The organization's members respect its traditions.	3.24	0.95
O13	The organizational climate is active and highly stimulating.	3.30	1.26
O14	The organization's members unconditionally respect and accept formal authority.*	3.17	1.39
O15	The organization stimulates and rewards employees' initiative and innovation.	3.69	0.64

Stakeholder cooperation and satisfaction (COOSAT)

O16	Decision-making processes are shared among the members of the organization.	3.45	0.74
O17	Interpersonal relationships within the organization are typified by cooperation.	3.65	0.86
O18	The organization has a record of honesty in its relations with all its stakeholders.	3.15	1.22
O19	The company has a record of loyalty in its relations with its customers.	3.34	1.17
O20	The company is not particularly committed to its customers' satisfaction.*	3.83	0.69
O21	The company is committed to the needs and expectations of its social environment.	3.17	0.83
O22	The company public image in the market is bad or irrelevant.*	3.22	0.91
O23	Absenteeism among our employees is low.	3.50	1.17
O24	Our employees are loyal to the organization.	3.45	0.81
O25	Our employees are satisfied with their work because they are able to fulfill their personal objectives (self-fulfillment).	3.16	0.86
O26	The organization has introduced formal and informal systems of long-term commitment (to guarantee employment) to its employees.	2.07	0.97
O27	The organization applies promotion systems based on its employees' commitment and dedication rather than on length of service in the company.	3.37	0.80

Participation culture (PARCUL)

O28	There are no employment conflicts in our firm.	3.53	0.94
O29	The objectives, plans, and tasks are determined in our organization without any employee participation.*	3.18	1.32
O30	Our employees accept task rotation and geographical mobility.	3.09	1.18
O31	Our employees do not feel a sense of personal commitment to quality.*	3.23	0.94
O32	Our employees do not participate in the results of the firm.*	3.37	1.12
O33	Our employees accept the remuneration and incentives policy of the firm.	3.52	0.96
O34	The organization regards nonfinancial reward as important.	3.26	1.41
O35	Our employees are aware of and accept the company criteria for evaluation, promotion, and reward.	3.36	0.68
O36	Clear, well-defined norms and standards of behavior exist in our organization for all employees and processes.	3.60	1.20

Structure of power in the organization (POWER)

O37	Trade unions have no influence or powers of negotiation in the organization.	3.25	1.10
O38	Informal power groups exist within the organization.	3.33	0.63
O39	The company is vulnerable to the influence of the public authorities.*	2.96	1.57
O40	Our employees have a direct influence in the organization.	3.39	0.66
O41	There are economic and social institutions that have an influence on the organization.	3.40	0.94

Existence and knowledge of information/symbols/models/rituals (EXISYM)

O42	Our personnel are aware of the history and importance of the firm's achievements.	2.80	1.67
O43	Our personnel are aware of the company's mission and objectives.	3.06	1.49
O44	There are few positive symbols in our company that only its employees would know or understand.*	2.67	1.38
O45	In our company, clearly identified behavior models exist to be adopted by employees.	2.83	1.55
O46	Our company has continuous well-organized rituals that positively reflect the organizational values.	2.38	1.35

(continues)

APPENDIX
Continued

Distinctive competences	Average	Standard deviation
Horizontal and flexible organizational design (HORFLEX)		
O47 Organizational processes are elastic and flexible.	3.38	1.24
O48 Tasks are structured in a coordinated way.	3.25	0.73
O49 The company has introduced flexible ways of organizing.	2.59	1.41
O50 Work decentralization in our company is low.*	3.04	1.10
O51 Our employees participate in the definition of task content and the way processes are performed.	3.23	1.05
O52 Our employees participate in the definition and introduction of strategy.	2.47	1.44
O53 The organization has a low number of hierarchical levels between top management and production line employees (lean organization).	2.39	1.06
O54 The company defines job content as basic tasks.*	2.94	1.54
O55 The organization has introduced systems to enrich the experience of working, such as variety in the work, autonomy in the preparation and undertaking of the work, information about results of the work, extension of tasks, or rotation of jobs.	2.85	1.73

* These items were formulated in a reverse scale.