

9 Performance and entrepreneurial orientation in small firms: the moderating effects of strategy, structure, human resource policies and information systems

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Introduction

This chapter examines the impact of Entrepreneurial Orientation (EO) on performance in small and medium-sized enterprises (SMEs) by focusing on the relationship between innovation and entrepreneurial activity. Both the entrepreneurship and strategy literatures suggest that an EO improves firms' performance, but the empirical results are mixed. Our empirical study of a sample of SMEs competing in the Spanish chemical industry shows that a main-effect analysis provides an incomplete explanation of performance. Instead, we use a multidimensional conceptualization of entrepreneurial orientation to show how strategy, organizational structure, and information systems interact with EO levels to affect performance.

The findings also offer insight into how the effects of entrepreneurial orientation are moderated by the complex balance between generic strategies and policies that protect innovation. The Entrepreneurial Orientation (EO) of a firm is defined as its predisposition to engage in behaviors that lead to change in the organization of the marketplace. An entrepreneurial organization concentrates on encouraging creative behavior among employees and thus benefits by initiating development of new products, processes or systems that maintain and increase its presence in the marketplace.

Entrepreneurial orientation concerns the "methods, practices and decision-making styles managers use" (Lumpkin and Dess, 1996: 136). An entrepreneurial orientation encourages what Birkinshaw (1997) called "dispersed" entrepreneurship, the involvement of multiple management levels in formulating and implementing entrepreneurial strategies. An entrepreneurial orientation is not created by top executives, but reflects the strategic posture exhibited by multiple layers of management.

Historically, the literature emphasized three entrepreneurial qualities: innovativeness, risk taking, and proactiveness (e.g., Miller, 1983; Covin and Slevin,

1989). More recently, Lumpkin and Dess (1996) added autonomy and competitive aggressiveness to this set in an attempt to capture the full range of behaviors that lead to change in the organization or marketplace.

Thus entrepreneurial orientation is now conceptualized as having anywhere from three to five dimensions, which vary independently (Lumpkin and Dess, 1996) and have different moderating effects on the relationship between management diversity and performance. An organization may exhibit relatively high levels of one or more dimensions and, at the same time, relatively low levels of others (Lyon, Lumpkin and Dess, 2000). Research has extended this framework in several ways. First, some researchers have refined measurement instruments both conceptually (Lyon, Lumpkin and Dess, 2000) and empirically (Brown, Davidsson and Wiklund, 2001). Second, other investigators have expanded the pioneer contribution of Miller (1983), who introduced the configurational approach to profiling organizations (e.g., Mertz and Sauber, 1995; Jambulingam, Kathuria and Doucette, 2005). Finally, more and more empirical studies have examined the impact of entrepreneurial orientation on overall firm outcomes, such as return on equity/assets/sales (Miller and Bromiley, 1990; Zahra and Covin, 1995), growth of the firm (Matsuno, Mentzer and Özsomer, 2002; Wiklund, 1999; Zahra and Covin, 1995), and innovation performance (Atuahene-Gima and Ko, 2001; Matsuno, Mentzer and Özsomer, 2002).

The empirical evidence on the effect of EO on performance is mixed; thus various researchers have explored organizational and environmental factors that might mediate or moderate the link: market orientation (Matsuno, Mentzer and Özsomer, 2002; Atuahene-Gima and Ko, 2001), access to financial resources (Wiklund and Shepherd, 2005; O'Shea, Allen, Chevalier and Roche, 2005), national culture (Marino, Strandholm, Steensma and Weaver, 2002), diversity in management teams (Richard, Barnett, Dwyer and Chadwick, 2004) or knowledge-based resources (Wiklund and Shepherd, 2003).

This chapter addresses firm-internal factors affecting the relationship between EO and performance. First, we contribute to the configurational approach by inferring different business profiles related to EO. Second, following contingency and configurational methodological approaches, we determine both the direct and the moderating effects of strategy, organizational structure, human resources practices, and information-control systems on business performance. We introduce into the traditional framework new elements like the role of patenting and the influence of information systems. We provide additional evidence on how the different dimensions influence the business performance. Finally, we contribute to the extant literature by combining primary survey data with financial accounting figures obtained from the Spanish Mercantile Register, a database of Spanish limited companies.

Previous empirical analyses have been based for the most part on surveys reporting managers' subjective opinions regarding performance. For this study, we used a sample of 138 SMEs in the chemical sector in Spain. The rest

of this chapter is organized as follows. First, we briefly review the relationship between entrepreneurial orientation and firm performance. Second, we describe the organizational factors influencing this relationship. Third, we explain the empirical setting, variables and results. Finally, we present the discussion and conclusions.

Entrepreneurial orientation and firm performance

In accord with previous research (Lumpkin and Dess, 1996), we focus on four dimensions of entrepreneurial orientation: innovativeness, proactiveness, risk taking and autonomy. We view these dimensions as interacting with strategy, organizational structure, human resource practices and information systems to affect firms' performance. Innovative companies creating and introducing new products, services and technologies generate above-average economic returns and have been considered as the engines of economic development. Innovativeness is the firm's propensity to actively support new ideas, experimentation, and creative solutions in pursuit of a competitive advantage (Lumpkin and Dess, 1996).

An innovative strategic posture is thought to improve firm performance by increasing the chances that a firm will realize first-mover advantages and capitalize on emerging market opportunities (Wiklund, 1999). Innovativeness has been recognized as a necessary (Covin and Miles, 1999) but not sufficient (Miller, 1983; Covin and Slevin, 1991; Lumpkin and Dess, 1996) condition for entrepreneurial orientation.

Proactiveness is the firm's propensity to take the initiative to compete aggressively with other firms (Covin and Slevin, 1989). Proactive companies create first-mover advantages, target premium market segments, and "skin" the market ahead of competitors (Zahra and Covin, 1995). Whereas innovativeness involves new product development, market proactiveness involves market penetration and market development. Risk taking is a firm's propensity to take business-related chances in the face of uncertainty.

Companies that take risks leading to performance variation may be more profitable in the long run (McGrath, 2001). Both risk-taking and proactiveness require a firm to make quick decisions and compete aggressively. Timeliness may be a key factor, as strategic decision speed has been linked to firm performance (Eisenhardt, 1989). Finally, autonomy is the freedom of individuals or teams to exercise their creativity: "the independent action of any individual or a team in bringing forth an idea or vision and carrying it through to completion of opportunities" (Lumpkin and Dess, 1996).

Miller (1983) emphasized the relationship between environmental characteristics and the dimensions of entrepreneurial orientation by introducing the configurational approach into this field of study. This approach assumes that firms that can align certain attributes with the characteristics of the environment outperform other firms (Ketchen, Thomas and Snow, 1993).

Firms that fail to achieve such alignment will eventually be out-competed. A limited number of configurations of firm and environmental attributes can be used to describe a large proportion of high-performing firms (Miller and Toulouse, 1986; Miller, 1996). Empirically, the configurations we are interested in can be represented as the interaction of EO with elements of structure and strategy.

Lumpkin and Dess (1996) theoretically introduced independent, moderating and mediating factors that affect the relationship between EO and performance. In this chapter, we explore empirically the internal factors that can affect the ties between EO and performance: strategy, organizational structure, human resource practices and information systems. These factors moderate the EO-performance relationship. In this analysis we use a configurational approach to the phenomenon.

Strategy

For this study we conceptualized firm strategy in three ways: generic competitive strategy, cooperative strategy and technological strategy. Porter (1980) outlines the three main strategic options open to organizations that wish to achieve a sustainable competitive advantage. Porter's analysis looked for the sources of competitive advantage by answering two questions: "Are the products differentiated in any way, or is the firm simply the lowest-cost producer in an industry?" and "Does the company target a wide market, or does it focus on a very narrow, niche market?" We focus on the first of these questions.

Firm strategy

In cost leadership, a firm sets out to become the lowest-cost producer in its industry. The sources of cost advantage are varied and depend on the structure of the industry. They may include economies of scale, proprietary technology, preferential access to raw materials, and other factors. A low-cost producer must find and exploit all sources of cost advantage. If a firm can achieve and sustain overall cost leadership, then it will be an above-average performer in its industry, provided it can command prices at or near the industry average. In a differentiation strategy a firm seeks to be unique in its industry in terms of some attribute(s) for which many buyers will pay a premium price. EO's high propensity for innovation fits better with this second strategy. However, Dess, Lumpkin and Covin (1997) found that when matched with high environmental uncertainty, a low-cost strategy can also yield high performance.

Cooperative strategy: strategic alliances

Even in today's environment of rapid technological evolution, globalization, and progressively sophisticated competitors, firms with abundant slack resources to invest can build competencies to survive and prosper. However, many SMEs do not directly control sufficient resources to make the necessary investments, and so may find themselves at a competitive disadvantage relative to their larger rivals. To compensate, SMEs may leverage strategic alliances. An organizational competency focused on forming and managing these cooperative agreements can serve as the basis for a sustainable competitive advantage (Dyer and Singh, 1998).

For example, start-up firms that form an efficient network of agreements which provide access to diverse information sources and a large amount of resources per alliance initially perform better than those that do not develop such a network (Baum, Calabrese and Silverman, 2000). And innovative firms are more likely to enter into a greater number and variety of linkages than other organizations (Ramachandran and Ramnarayan, 1993). Marino *et al.* (2002) found that firms with higher levels of entrepreneurial orientation use strategic alliances more extensively than those with a weaker entrepreneurial orientation.

Technological strategy: patenting

The protection of innovation is a controversial topic. Economic analysis of the patent system has traditionally focused on how to adjust the length and breadth of patent protection in order to optimally balance static welfare losses and dynamic welfare gains. This stream of literature used patent race models in which the firms involved were maximizing the expected revenues from future monopolies. More recently, some authors and managers have argued that the patent system promotes neither creativity nor innovation: patents typically come long after the fact and serve as a disincentive rather than an incentive to innovate.

Hall and Ziedonis (2001) present very large surveys of private R&D divisions that strongly support the hypothesis that modern companies judge patents a poor tool to protect innovation. In fact, when asked to rank different methods for protecting innovative products and processes, R&D managers usually rank patents behind industrial secrecy, lead time or the use of complementary assets. This opinion is shared by many research economists, like Harhoff and Reitzig (2002) and Hall and Ziedonis (2001), who argue for a reform of the patenting system.

This position can be affected by both the industry and the type of innovation. Patents make more sense in industries that feature high costs of development and long lead times, like the pharmaceutical industry, than in other industries where the product is obsolete by the time it gets out the door. Additionally, Gans and Stern (2003) demonstrate that patents are useful for

SMEs that can sell technologies in addition to products or services, but only in those industries where technology markets are efficient. Nerkar and Shane (2003) found that patents are crucial to induce and protect radical innovation by start-ups. Conversely, patents with wide scope are dangerous for entrepreneurship because they inhibit the exploitation of new business opportunities. The relationship among innovation protection, entrepreneurial orientation and performance remains unexplored.

Organizational structure

Covin and Slevin (1990) highlighted organizational structure as a critical condition of entrepreneurship. To recognize new opportunities and turn business ideas into realities, the firm must have an appropriate organizational structure. Defining organizational structure as the arrangement of workflow, communication, and authority relationships within an organization, they argue that all these can have a major impact on entrepreneurial activity. In order to be capable of responding to changes in a dynamic environment, entrepreneurial firms often adopt a flexible, "organic" structure characterized by low formalization and low centralization.

Formalization is defined as "the emphasis placed within the organization on following specific rules and procedures in performing one's job"; centralization refers to the amount of responsibility and authority delegated. Greater formalization and centralization produce uniformity of policy and actions lessen risks of errors by personnel who lack either information or skill, use the skills of central and specialized experts and enable closer control of operations. Conversely, less formalization and less centralization tend to lead to speedier decisions and actions at any hierarchical level, and such decisions are more likely to be adapted to individual situations.

Miles and Arnold (1991) and Russell (1999) have identified positive associations between decentralized structure and entrepreneurial orientation, and have explained these associations in terms of increased autonomy and control over resources, which enable organization members to initiate and test more innovative ventures. These authors claim that a decentralized, informal structure empowers lower-level managers, initiating increased participation from team members and thus promising innovation. Formal checks, controls and rigid structures, in contrast, tend to inhibit entrepreneurial behavior and limit individual performance.

Departmentalization or specialization generally refers to the extent to which a breadth of tasks is confined to a predetermined domain (Mintzberg, 1979). Although departmentalization is sometimes measured as the number of departments into which organizational tasks are partitioned and compartmentalized, perhaps the sheer number of departments may not matter as much as the existence (or lack) of departmental interaction – the degree of formal and informal direct contact among employees across departments.

The research described below explored the effect of a specialized organizational unit devoted to championing innovation. While it is generally believed that a greater degree of formalization and centralization is inconsistent with entrepreneurial management, this notion has received only limited empirical support (e.g., Caruana, Morris and Vella, 1998). And the effect of a specialized unit devoted to innovation is an open question.

Human resource practices

Schuler (1986) suggests that entrepreneurially oriented firms have human resource practices that explicitly foster innovative and risky behavior and that enable employees to keep up with changing technologies. Similarly, the literature on market orientation (Atahuene-Gima and Ko, 2001) suggest that market-oriented firms develop human resource practices congruent with this orientation. Thus firms that have both market and entrepreneurial orientations should exhibit not only greater direct management support for innovation, but also human resource practices that place a premium on innovative behavior. Following this logic, we expect that entrepreneurially oriented firms will have more explicit human resource strategies to enhance innovation than other types of firm (Schuler, 1986).

Control and information systems

According to Simons (2000), control systems play an important role in the management of every decision-making process. Control and information systems must balance empowerment with control, in such a way that empowerment does not lead to control failure (by, for example, enabling dysfunctional behaviors from subordinates), and that control does not lead to empowerment failure (by inhibiting an innovative, opportunity-seeking spirit). Successful implementation of those control and information systems depends on the leadership's ability to create an innovative and supportive culture that motivates organizational members to belong and contribute.

By emphasizing real-time communication and information sharing, entrepreneurs increase their organizations' ability to make decisions and take actions quickly (Nicholls-Nixon, 2005). They use information systems to enhance competencies and adapt expectations to fast-changing conditions, rather than to establish control or sanction people for failure to meet standards.

Empirical analysis

Data

Our framework is tested on a sample of firms competing in the Spanish chemical industry. The sample frame was elaborated from the SABI database, which contains financial and accounting information from the annual reports of limited businesses listed in the Mercantile Register of Spain and provides consolidated accounts. SABI lists approximately 1100 chemical firms. We sent a postal questionnaire to 1075 limited liability companies for the year 2003. This self-report questionnaire, addressed specifically to CEOs, asked qualitative questions about strategy, innovation activities, organizational characteristics, human resources policies, and information systems. The global percentage of response was around 17 percent, similar to response rates in other studies.

We merged the two data sets to combine qualitative variables with quantitative variables (sales, employment, and profitability). Sub-sectors were identifiable to within four digits of the codes in the Spanish National Classification of Economic Activities. Descriptive statistics show that most firms are mainly producers of pharmaceuticals, paints and detergents products. Our preliminary sample contained 177 firms distributed around Spanish territory.

Although we did not intentionally restrict the sample to SMEs, 86 percent of the firms included in this sample fell into this category of organization; we had 25 large firms (more than 200 workers) and 152 small and medium firms (fewer than 200 workers). We reduced our final sample to 138 firms because of missing responses on some questions and because we finally restricted the analysis to manufacturing and small and medium companies (fewer than 200 employees).

Methods

We used two different types of methods. First, we conducted a statistical descriptive analysis to configure firms into clusters with different profiles, following the procedure used by Jambulingam, Kathuria and Doucette (2005) and Mertz and Sauber (1995). We identified four clusters of firms. Univariate F-tests on each clustering variable indicated statistically significant differences across the four clusters in the coefficients for all variables except cooperation. In a second analysis, we examined the influences of EO and moderating factors over performance. We used hierarchical regressions (Wiklund and Shepherd, 2005; Bagozzi, 1984; Cohen and Cohen, 1983) to test whether the universal, contingency, or configurational model best fit the data. Specifically, we constructed the models as follows:

- Control model: Performance = f (control variables); Universal model: Performance = (EO, moderating factors);

- Contingency model: Performance = f (EO, moderating factors, EO* each moderating factor);
- Configuration model: Performance = f (EO, moderating factors, EO* each moderating factor, EO* all moderating factors).

The hierarchical approach is appropriate for analyzing multiplicative terms in regression analysis or, more generally, for analyzing highly correlated independent variables (Bagozzi, 1984; Cohen and Cohen, 1983). The validity of the procedure has been shown mathematically as well as in computer simulations. In each step of the hierarchical analysis, the next higher order of interaction is added, and incremental R^2 - and F -tests of statistical significance are evaluated.

An interaction effect exists if, and only if, the interaction term gives a significant contribution over and above the direct effects of the independent variables. The magnitude of higher-order regression coefficients (as opposed to their statistical significance) cannot be evaluated separately from that of lower-order terms. Typically, assessment of how significant interactions affect the dependent variable is done by entering selected values of the interaction terms into the regression equation.

Variables and measures

Performance

We proxy business performance by the growth in ROA (return on assets), following the consensus in the literature (Brush and VanderWerf, 1992; Chandler and Hanks, 1993; Wiklund and Shepherd, 2005). ROA growth is calculated as the percentage difference between the value of ROA in 2003 and 2004.

Entrepreneurial orientation

Following Lumpkin and Dess's (1996) definition of EO, we measure four dimensions of it on a five-point scale, except for innovativeness, where we use two dummy variables. Innovativeness equals 1 if the firm develops and introduces new products, 0 otherwise; and equals 1 if the firm develops and introduces new processes, 0 otherwise. Proactiveness measures whether the firm revises and questions the strategy process to foster innovation. Risk-taking measures, first, whether innovation projects are financed only in the short term and, second, whether the pressure for short-term results does not impede innovation.

Autonomy measures whether employees share and interchange information and use the suggestion box. In the present study, the scale achieves good reliability (Cronbach's α values of 0.86). Information about measures and simple descriptive statistics are reported in Table 9.1.

Table 9.1 Measures of variables and descriptive statistics

Scale items	Mean	Std dev.
ENTREPRENEURIAL ORIENTATION ($\alpha = 0.860$)		
Innovativeness	0.796	0.422
We develop and introduce new products		
We develop and introduce new processes		
Proactiveness	3.920	0.829
We revise and question the strategy process to enforce innovation		
Risk taking		
Innovation projects are financed only when there is a short-term return ^a	2.722	0.675
Pressure for short-term results does not impede innovation		
Autonomy		
Our employees share and interchange information and use the suggestions box	3.522	0.632
Firm strategy ($\alpha = 0.610$)		
Generic ($\alpha = 0.728$)		
Innovation objectives are leading to market orientation	4.161	0.574
Innovation objectives are leading to efficiency costs	3.224	1.011
Technology ($\alpha = 0.733$)		
Innovation is protected by patents	0.355	0.371
Innovation is protected by licenses	3.213	1.123
Organizational design ($\alpha = 0.601$)		
Unit differentiation ($\alpha = 0.833$)		
Innovation is organized using a department with its own plans and its own budget	3.550	1.125
Organic structure ($\alpha = 0.713$)		
There are no symbols of status and hierarchical levels	3.563	0.504
Workplace design is flexible		
Human resources ($\alpha = 0.873$)		
Policies ($\alpha = 0.784$)		
We have explicit policies for selection, recruiting, evaluation and recognition	3.609	0.628
Cooperation ($\alpha = 0.826$)		
We encourage our employees to cooperate and work together as a team	3.505	0.639
Information systems ($\alpha = 0.786$)		
Computerization ($\alpha = 0.842$)		
We use high levels of computerization in administrative tasks, stock, supply chain management and other activities	4.275	0.595
ERP use (mean = 64%)	0.613	0.488
We use ERP systems		
Accessibility ($\alpha = 0.688$)	3.632	0.730
Our information systems are available and easy to use		

Notes:

a All items used Likert-type five-point scales anchored by strongly disagree (1) and strongly agree (5).

b ^a denotes reverse-coded item.

Moderating factors

Firm strategy is calculated using four items aggregated to two types of strategies: generic (whether the firm's innovation objectives are addressed to market orientation/product differentiation or cost leadership-efficiency), with a Cronbach's α value of 0.73, and technological (whether innovations are protected by patents or by license agreements), with a Cronbach's α value of 0.73.

Organizational design is measured using two dimensions: unit differentiation and organic structure. Unit differentiation captures whether innovation activities are organized in a specialized department with its own plans and its own budget (Cronbach's α value of 0.83). Organic structure captures both the effect of a flexible design of the workplace and ambiguity in hierarchical levels (Cronbach's α value of 0.71). Human resources factors are measured by two items: personnel management policies and cooperation.

Policies measure the existence of explicit firm policies for selection, recruiting, evaluation and recognition (Cronbach's α value of 0.78); cooperation measures whether the firm encourages employees to cooperate and work in teams (Cronbach's α value of 0.83).

Information systems are introduced through three types of measures. Computerization indicates the level of computer use in administrative tasks, stocks, supply chain management, and other activities (Cronbach's α value of 0.84). Use of ERP systems (Enterprise Resource Planning) is measured by a dummy variable that equals 1 if the firm uses ERP systems, 0 otherwise. Accessibility is defined as ease of use and availability of the information systems (Cronbach's α value of 0.69).

Control variables

We control for the effects of age, size and environment on performance. Age is the number of years from the legal founding of the firm until 2003. To measure size, we construct three dummy variables (fewer than 50 employees, between 50 and 100, more than 100). To capture the differences in environmental effects (munificence, dynamism and hospitality) that are typically addressed in both contingency and configurational models, we define the variable industry. We use the three-digit industry classification reported in the SABI database to construct a density variable composed of 10 sub-sectors. The distribution of these sub-sectors is reported in Table 9.2, which shows that our sample are concentrated in the manufacturing chemical products sector (22 percent) and the manufacturing paint and varnish sector (20 percent).

Finally, region or geographic scope is measured as 14 dummy variables corresponding to the autonomous governments within Spain. The correlations among the variables are shown in Table 9.3.

Table 9.2 Distribution of sample according to industry

CODE	Description	Distribution %	Number
232	Petroleum components	0.7	13
240	Chemical industry	1.4	8
241	Manufacturing basic chemical products, coloring, organic and inorganic chemical components	22.5	368
242	Pesticide and agro-chemical products	3.6	24
243	Paint and varnish products	19.5	101
244	Pharmaceutical components	11.6	69
245	Detergent, soap and hygienic products	15.2	87
246	Gelatin, essential oil and glue products	15.9	72
252	Plastic materials for packaging	8	65
262	Ceramic products	1.4	30

Results

The cluster analysis allows us to affirm that small firms exhibit perceptible differences in strategy, human resources, information systems and performance. The results are displayed in Table 9.4.

Profile 3 includes young firms with a medium size, a flexible and organic structure, high profitability and an active business strategy. In this profile innovativeness, proactiveness and autonomy are very salient. The other three profiles are quite different. For example, risk taking is salient only for profile 1, composed of the largest firms within the SME group and of bureaucratic organizations with higher sales growth but lower profitability.

These firms use patenting and alliances as prominent technology strategies. Profiles 2 and 4 are both composed of very small firms with similar results for the moderating factors, but they show different signs on the EO dimensions: profile 2 firms do not exhibit any entrepreneurial attitudes, while profile 4 firms show significant proactiveness. Table 9.5 displays the results of the hierarchical regression analysis showing how EO influences performance. Column one shows the separate effects of the control variables. Column two shows the main effects of the four dimensions of EO, and also the direct effects of strategy, human resources, information systems and organizational design on the growth of ROA. This model explains 47 percent of variation in performance.

We found that the four dimensions of EO have different impacts on performance, thus our results fall on the side of multiple constructs as opposed to a single construct in the debate as to whether EO is or is not a single construct. Proactiveness and risk-taking diminish performance while autonomy enhances it. Organic structure improves performance while an efficiency cost strategy harms it. These findings indicate that we need to use alternative

Table 9.3 Correlations

	EO	ROA	Sales	Alliance	Protect.	Differ.	Efficien.	HR policies	Cooper.	Level	ERP use	Access.	Unit differ.
EO	-0.105												
ROA	0.199*	0.031											
Sales	0.370**	0.012	0.121										
Alliances	0.238**	-0.269**	0.039	0.415**									
Protection	0.249**	0.094	0.046	0.110	-0.003								
Differentiation	0.216*	0.052	-0.001	0.041	0.071	0.189*							
Efficiency	0.459**	-0.070	0.109	0.321**	0.234**	0.374**	0.316**						
HR policies	0.480**	-0.111	0.071	0.437**	0.345**	0.238**	0.217*	0.723**					
Cooperation	0.403**	-0.107	0.059	0.377**	0.180*	-0.142	0.199*	0.352**	0.388**				
Level	0.108	-0.071	0.090	0.270**	0.304**	-0.239**	-0.035	-0.173*	0.106	0.139			
ERP use	0.388**	-0.056	0.200*	0.264**	0.138	0.224**	-0.277**	0.456**	0.508**	0.385**	-0.052		
Accessibility	0.417**	-0.146	0.083	0.415**	0.346**	0.124	0.046	0.378**	0.507**	0.297**	0.347**	0.254**	
Org. structure	0.374**	0.196*	-0.001	0.252**	-0.066	0.214*	0.100	0.518**	0.438**	0.227**	-0.047	0.207*	0.310**

Notes:

a * $p < 0.05$ b ** $p < 0.01$

Table 9.4 Cluster analysis

	Profile 1	Profile 2	Profile 3	Profile 4	F
Size					
< 50 employees	-0.274	0.214	-0.206	0.254	14.29**
> 50 and ≤ 100	0.042	-0.107	0.224	-0.134	4.3*
> 100 and ≤ 200	0.302	-0.166	0.047	-0.134	9.2**
Age	-0.159	0.187	0.063	-0.063	4.8*
Performance					
Growth sales	0.334	-0.204	-0.162	-0.011	9.6**
Growth profitability	-0.167	0.065	0.173	-0.040	4.5*
Entrepreneurship orientation					
Innovativeness	0.265	-0.705	0.466	-0.020	51.11**
Proactiveness	0.088	-0.961	0.436	0.415	123.75**
Risk taking	0.551	0.003	-0.861	0.176	89.24**
Autonomy	-0.236	-0.911	1.099	0.131	215.96**
Firm strategy					
Alliances	0.801	-0.888	0.825	-0.693	458.94**
Protection	0.527	-0.613	0.372	-0.284	69.22**
Differentiation	-0.153	-0.388	0.541	0.046	33.16**
Efficiency costs	-0.679	-0.324	0.871	0.235	122.25**
Human resources					
Policies	-0.051	-0.894	0.984	0.030	177.65**
Cooperation	0.010	-0.037	-0.057	0.035	0.32
Information system					
Level	0.109	-0.837	0.564	0.173	84.18**
ERP use	0.612	-0.302	-0.079	-0.271	50.67**
Accessibility	-0.139	-0.776	0.748	0.209	100.35**
Organization design					
Unit differentiation	0.393	-0.970	0.632	-0.047	116.34**
Organic structure	-0.069	-0.596	0.551	0.143	45.48**
Number of observations	33	30	28	33	33

Notes:

a All values are standardized Z scores.

b Contingency factors using 3-digit sectors and regions included.

models to further explore the effect of EO on performance. Accordingly, we carried out a second analysis using hierarchical regressions, displayed in Table 9.6. To test the effect of EO on performance, we first added the control variables (control model), then the independent variables consisting of EO and moderating factors (universal model), then the two-way interaction terms (contingency model), and finally the three-way interaction term (configuration model).

The control model incorporating size, age, industry and geographic environment explains 23 percent of the variation in performance. The next step of

Table 9.5 Performance and EO dimensions

	ROA growth	
	Control model	Universal model
Intercept	1.796***	0.181
Size		
≤ 50 employees	0.123	-0.198**
Between 50 and 100	0.223*	-0.237
Age	-0.005***	-0.003
Entrepreneurial orientation		
Innovativeness		0.061
Proactiveness		-0.195***
Risk taking		-0.124**
Autonomy		0.141*
Firm strategy		
Alliances		0.040
Protection		0.069
Differentiation		0.099
Efficiency costs		-0.077**
Human resources		
Policies		0.022
Cooperation		-0.153
Information system		
Level		-0.095
ERP use		-0.0231
Accessibility		0.006
Organization design		
Unit differentiation		-0.030
Organic structure		0.201***
R ² /Adjusted R ²	0.23/0.05	0.47/0.22
F	5.45***	3.79***

Notes:

a * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

b Contingency factors using 3-digit sectors and regions included.

the analysis addresses the universal influence of EO, competitive strategy, human resources, organization design and information systems on small business performance over and above the base model. In the universal model the main effect of EO on performance is negative and significant.

Additionally, cooperative strategy and organic structure positively affect business performance. In this model only 46 percent of variation in performance is explained. The contingency and configuration models examine the interacting effects of EO and each moderating factor; there are no significant differences between the two regressions. In both models, EO has a positive impact on performance. In addition, when EO interacts with the strategies of cooperation and cost efficiency, business performance is enhanced.

Table 9.6 Performance: ROA growth

	Control model	Universal model	Contingency model	Configuration model
Intercept	1.796***	2.898***	-8.007*	-11.659***
Size				
≤ 50 employees	0.124	-0.147	-0.239**	-0.208*
Between 50 and 100	0.224**	-0.324**	-0.467***	-0.410***
Age	-0.004***	-0.003	-0.001	-0.001
Entrepreneurial orientation		-0.361***	3.568**	4.921***
Firm strategy				
Alliances		0.097**	-1.575***	-1.809***
Protection		0.059	1.918	2.284
Differentiation		0.074	3.552***	3.150***
Efficiency costs		-0.015	-0.915**	-0.887**
Human resources				
Policies		0.021	0.095	0.689
Cooperation		-0.189	0.419	0.218
Information system				
Level		-0.069	0.094	0.773
ERP use		-0.106	-0.871	-0.223
Accessibility		0.011	1.493*	1.633**
Organization design				
Unit differentiation		-0.049	-0.926	-0.656
Organic		0.280***	-0.314	-0.606
EO*Firm strategy				
Alliances			0.621***	0.702***
Protection			-0.735	-0.871
Differentiation			-1.216***	-1.093***
Efficiency costs			0.353**	0.340**
EO*Human resources				
Policies			-0.176	-0.380
Cooperation			-0.115	-0.042
EO*Information systems				
Level			-0.116	
ERP use			0.224	-0.355
Accessibility			-0.566**	-0.023
				-0.625***
EO*organization design				
Unit differentiation			0.333	
Organic structure			0.213	0.232
				0.309
EO*All moderating factors				0.000
R ² /adjusted R ²	0.23/0.05	0.46/0.24	0.59/0.33	0.59/0.33
F	5.45***	5.53***	3.62***	3.96***

Consistently, EO associated with a strategy of differentiation diminishes business profitability.

Discussion

Our results indicate that there are differences in the different firm profiles in the relationship between EO and firm performance, and more importantly, that firm strategy, structure, human resource practices and information systems moderate the relationship. Thus we contribute to the growing body of research that highlights that the relationship between entrepreneurial orientation and firms' performance is a complex one.

Thus research on entrepreneurial orientation needs to take both configurational and contingency tacks when examining these relations. The results also add fuel to the controversy with regard to the nature of EO as a construct. The consideration of EO dimensions separately provides evidence that they have different impact on performance. While we find strong support for the dimensions of proactiveness, risk taking and autonomy, yet we do not find support for innovativeness. Given that innovativeness has been highlighted as one of the cornerstones of EO, lack of support for innovativeness is troubling in this context.

At the very least, it suggests that the EO as a construct needs refinement. Contingency approaches might also be necessary in the context of EO. Could it be that EO manifests itself in different ways in different contexts? While that is not the intention of this research, our results certainly point to this direction. Further research is needed on this regard. Moreover, our empirical findings show that there are distinct behavioral differences in the management of SMEs.

Each profile, but especially profile 3, exhibits distinctive characteristics in terms of performance, strategy, organizational structure, information systems and use of human resources policies. Profile 3, for example, shows that while levels of risk taking are very negative, it emphasizes efficiency and alliances, as well as human resource policies and unit differentiation. This profile could be interpreted as one of a firm with a very risk-adverse organization and alliances in this context might be a mechanism for risk reduction by sharing risks with a partner.

Also interesting in the context of the ongoing conversation regarding EO is our finding that EO is not a sufficient condition for higher performance; moderating factors make necessary contributions to firm performance. The pattern of interactions is of special importance in this regard. Our moderating variables, strategy, structure, human resource policies, and information systems provide different patterns when considering different configurations of EO. Again these results call for both configurational and contingency approaches in the examination of the relationship between EO and performance. Specifically, our results for both the contingency and configuration

models indicate that EO is particularly valuable and has a strong positive effect on performance when the firm competes on costs and uses technological alliances. This result is consistent with the findings by Dess *et al.* (1997) yet since the majority of the emphasis in the literature has been on the interaction of EO with a differentiation strategy, our results confirm the argument that the effects can be as strong or stronger in the case of efficiency cost strategies.

Yet surprisingly, our results indicate a negative effect on performance of differentiation strategies and EO. This surprising result runs counter to the accepted view on EO. We do not want to overemphasize this result given that it is the result of one study, but it should be cause for pause and a re-examination of the relationship. The same is true for the relationship between firm performance and the interaction between EO and systems accessibility. Accessibility should result in a positive relation when in conjunction with EO, yet in this study we find the opposite effect.

Conclusion

One possible conclusion is that the effects of EO are different for large and small firms and that the ability to differentiate and system accessibility are not as beneficial for small as for large firms. The firm focuses on product differentiation and access to the internal information system is complex; an EO can counterbalance loss of efficiency and deficiencies in the information systems. A product differentiation strategy may not guarantee returns, because of the shortening of the product life cycle.

In general, while we confirm some of the main results of the extant literature on the relationship between EO and performance, other results provide different directions to those in the extant literature. In accord with the ideas of Lumpkin and Dess (1996), our findings suggest that there is a contingent relationship between EO and internal characteristics of the firm. This implies that the relationship between EO and performance is likely more complex than a simple main-effect-only of internal factors and EO; it also complements Covin and Slevin's (1989) finding that there is a contingent relationship between EO and the external environment.