

THE MEDIATING ROLE OF ENTREPRENEURIAL ORIENTATION IN THE TASK ENVIRONMENT-PERFORMANCE RELATIONSHIP: A META-ANALYSIS

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ABSTRACT

Despite the importance of the external task environment for firm performance little is known about the mechanisms that enable firms to benefit from a specific environmental setting. We argue that firms adjust their entrepreneurial orientation (EO) to the external environment and use it as a mechanism to transform the advantages provided by the environment into above-average performance levels. Specifically, we use meta-analysis supplemented by structural equation modeling to explore the links between environmental munificence, hostility, dynamism and complexity, EO, and firm performance in a mediation model. Our results suggest that environmental munificence, dynamism and complexity affect EO and, in turn, firm performance. We discuss our meta-analytical findings with respect to their theoretical contribution and their practical implications.

INTRODUCTION

The impact of a firm's external environment on its performance has been the subject of extensive research in the theoretical and empirical management literature. Firms seem to be highly dependent on the environment, particularly with regard to resources and information, but also with respect to the existence of opportunities that can be explored and exploited (Eisenhardt & Schoonhoven, 1990). Numerous scholars have argued that the external environment affects firm performance (Bain, 1956; Rumelt, 1991; Schmalensee, 1985), but empirical research on the environment-performance relationship has generated inconclusive results. The relationship between the external environment and firm performance seems to be highly complex.

Furthermore, the environment may not affect firm performance directly; rather, it may stimulate firm-specific strategic behaviors which, in turn, influence firm performance (Porter, 1980). In short, the precise means by which firms utilize opportunities and resources provided by the environment in order to enhance their performance remain unclear.

Through which mechanism can firms benefit from specific environmental conditions? The resource exchange relationship between firms and their external environment is complex. Firms need to acquire resources from their external environment and turn them into products and services, exploring and exploiting opportunities provided by the environment. In this complex relationship, entrepreneurial orientation (EO) is a critical factor because it influences specific strategic decisions and resource allocations (Atuahene-Gima & Ko, 2001) which favor opportunity exploration and exploitation (Miller, 1983). Only those firms that apply the appropriate strategic orientation in a specific environment may be able to transform advantages provided by the environment into above-average performance levels.

Hence, the aim of this paper is to discover whether EO is the missing link in the task environment-performance relationship. To answer this question, we conduct a meta-analysis which builds on 30 years of empirical research. Because we aim to develop a meaningful theoretical mechanism by which the environment affects firm performance via EO, we combine the meta-analysis with a structural equation model. This approach allows us to compare the proposed theoretical mechanism with a model in which the environment and EO both directly affect performance. Moreover, meta-analysis allows us to correct for statistical artifacts (e.g. sampling error, measurement error) giving us the opportunity to obtain an accurate estimate of the proposed mediator model. Our analyses show that EO mediates the relationship between three dimensions of the task environment and firm performance. This result provides guidance

for theory building because previous research on the topic has mainly adopted contingency views of EO, task environment and firm performance.

Specifically, we make three contributions to the literature. First, we contribute to the EO literature by providing a full model of EO including environmental dimensions as crucial antecedents of EO and firm performance. Whereas a fundamental body of knowledge exists regarding the performance impact of EO (for a discussion see Rauch, Wiklund, Lumpkin & Frese, 2009) we know little about the antecedents of EO. Because the task environment provides resources and opportunities necessary for entrepreneurial strategies, specific characteristics of the environment are likely to trigger or hinder EO (Covin & Slevin, 1991; Miller, 1983). In turn, EO leads to enhanced performance by enabling the firm to successfully translate those resources and opportunities into financial performance.

Second, we contribute to the literature on the performance effects of the environment. Because our study aims to identify causes of inter-firm differences in EO and performance, we focus on the most appropriate dimensions of the environment: those that address how firms interact with customers, competitors, suppliers, and other stakeholders (the so-called “task environment”: Castrogiovanni, 1991). Focusing on the task environment, we adopt a different perspective of the environment than do studies on industry structure (e.g., McGahan & Porter, 1997; McNamara et al., 2005; Rumelt, 1991; Schmalensee, 1985; Short et al., 2007). Because the task environment affects decisions, actions, and the performance of organizations it arguably offers a more relevant perspective than the more aggregated concept of industry structure as an antecedent of EO and firm performance (Covin & Slevin, 1991; Miller, 1983).

Third, our approach uses a multi-dimensional conceptualization of the environment. As such, it goes beyond previous empirical research, for example on the industry structure-

performance relationship. After a comprehensive literature review, we identify four key dimensions of a firm's task environment: munificence, hostility, dynamism and complexity (Dess & Beard, 1984). Whereas most previous studies have used a single dimension of the environment (e.g., Covin & Covin, 1990), we can give more detailed information about which environmental dimensions influence EO and firm performance – and how.

Our paper is organized as follows. First, we draw on prominent theoretical arguments and prior empirical evidence to derive hypotheses about the mediating relationships between environmental dimensions, EO and firm performance. We then describe the study location process, the coding procedure and the methods of analysis. Subsequently, we test our hypotheses using a structural equation model which builds on a meta-analytically derived correlation matrix. We present and then discuss our empirical results with reference to their theoretical and practical implications, and finally point out limitations of our study and recommendations for future research.

THEORETICAL BACKGROUND AND HYPOTHESES

EO as the Mediator between Environmental Munificence and Performance

Environmental munificence describes the favorability of the firm's task environment in terms of the existence of opportunities and the availability of resources (Aldrich, 1979; Dess & Beard, 1984; Pfeffer & Salancik, 1978; Staw & Szwajkowski, 1975). The implementation of an EO helps firms to translate both of these aspects of a munificent environment into increased financial performance levels.

The existence of opportunities is related to loci of change, rapid industry growth, and early stages in the industry life-cycle (Eckhardt & Shane, 2003; Shane & Venkataraman, 2000).

Such an environment enables the exploitation of new opportunities and facilitates innovativeness (Klepper, 1997). In order to explore and exploit opportunities, firms need to adopt pro-active and innovative strategies. Because EO emphasizes innovativeness and pro-activity and the exploration and exploitation of new products and processes (Lumpkin & Dess, 1996), it is a legitimate response to a munificent environment and increases the chances of attaining competitive advantage and superior performance in such an environment. The exploitation of opportunities as a means of gaining competitive advantage also entails risk. Thus, the risk-taking dimension of EO can also be argued to have a positive mediating effect. Only by taking on the risks associated with exploration and exploitation activities can firms transform opportunities provided by the environment into competitive advantage and above-average performance levels.

Furthermore, an EO helps firms to turn the second advantage of a munificent environment – the availability of resources – into above-average performance levels. Firms with a high degree of EO will pro-actively seek to acquire resources provided by the environment. These resources can then be allocated towards pro-active and innovative projects which enable the firm to explore and exploit the rich opportunities associated with a munificent environment. Slack resources in the environment enable firms that have not been able to build slack resources in the past (because, for example, they were founded only recently) to pursue a highly resource-intensive EO (Covin & Slevin, 1991). Firms can also pro-actively create innovative resource combinations which enable them to further explore and exploit opportunities. As a consequence, they are more likely to generate competitive advantages and reach higher performance levels. At the same time, the existence of rich opportunities in the external environment enables firms to absorb potential losses associated with an EO (Wiklund & Shepherd, 2005). Thus, we posit that

an EO helps firms to transform the advantages of a munificent environment into superior performance levels.

H 1: EO is positively related to environmental munificence and mediates the relationship between environmental munificence and firm performance.

EO as the Mediator between Environmental Hostility and Performance

Hostility is an unfavorable environmental condition that implies competition for scarce resources and opportunities (Covin & Slevin, 1989; Miller, 1983). Hostility can be considered as being at the opposite pole to industry concentration, which has been in the focus of IO scholars as a key determinant of corporate performance (Bain, 1951; Datta & Narayanan, 1989). From a conceptual point of view, hostility is more comprehensive than a pure concentration measure. In addition to competition, environmental hostility refers to legal, political and economic constraints (Miller, 1987), low customer loyalty (Covin, Slevin, & Heeley, 2000) and severe consequences of wrong strategic decisions (Covin, et al., 2000).

Intense competition for resources and opportunities, as well as other constraints associated with a hostile environment, decrease profit margins and limit strategic options (Miller & Friesen, 1983). Thus, a hostile environment requires strategic discipline (Porter, 1980) as wrong strategic decisions could even endanger the survival of a firm. In addition, firms operating in hostile environments face difficulties in acquiring resources such as financial and human capital. Such resources are needed to pursue entrepreneurial strategies in firms with a high EO. Therefore, in order to perform well in hostile environments, firms should implement a strategic orientation characterized by low risk-taking and experimentation. Accordingly, EO may be an inefficient response to hostility, but a legitimate strategic orientation in non-hostile environments. For example, a firm that engages in a product innovation strategy under the

condition of intense price-based competition may fail because the innovation does not meet demand and the firm suffers from an unwillingness of customers to value innovations with a price-premium (Zahra & Bogner, 2000). Thus, firms in hostile environments are expected to exhibit lower EO and, in turn, inferior financial performance. The above theoretical arguments, as well as previous empirical evidence, suggest the following hypothesis:

H 2: EO is negatively related to environmental hostility and mediates the relationship between environmental hostility and firm performance.

EO as the Mediator between Environmental Dynamism and Performance

Environmental dynamism refers to both the uncertainty and the unpredictability of future market changes and developments (Khandwalla, 1972; Miller & Friesen, 1983; Thompson, 1976). Uncertainty can occur in many ways; for example, it can manifest itself as changes in customer needs; shifts in the behavior of competitors and suppliers; or as technological discontinuities. Thus uncertainty arises from a lack of information about future events and their consequences, as well as responses to them (Khandwalla, 1972).

Rapid change and the unpredictability of future events provide ample opportunities for firms. For example, shifts in demand allow firms to exploit new customer needs, and technological discontinuities offer opportunities along a new technological trajectory (Utterback, 1994). At the same time, in dynamic environments where technology, demand, and competitor behavior change quickly, existing opportunities and resources can quickly become redundant. Whereas dynamic environments create difficulties for strategic decision-making, firms that explore and exploit opportunities in such environments can outperform their rivals. The rapid rate of change and difficulty in predicting future events requires a high degree of pro-activity. Pro-activeness helps firms to explore and exploit new resources that are required, in turn, for the

successful exploration and exploitation of new markets (Lumpkin & Dess, 2001). In a dynamic environment, resource allocations towards innovations triggered by firms' EO enable firms to explore and exploit opportunities in a similar way as they do in munificent environments.

Moreover, an EO has a further advantage in a dynamic environment. The pro-active introduction of new products and services makes firms less vulnerable to the danger that their existing knowledge and competencies become obsolete (Leonard-Barton, 1992; March, 1991). Firms with a high degree of EO will continuously improve or even alter their resource base. This prevents them from creating rigidities within the firm (Leonard-Barton, 1992) – a dangerous condition for firms operating in dynamic environments. Firms in dynamic environments can only be viable in the long run if they manage to retain a highly flexible resource base. Thus, a dynamic environment triggers the implementation of an EO that embodies a focus on resource flexibility. For the above-described reasons, EO is a legitimate answer to dynamic environments, relative to stable environments which do not require complex and risky explorative strategies (Aldrich, 1979). Thus, a dynamic environment results in superior performance through the adoption of an EO which leads firms to focus on innovative strategies and the flexibility of their resource base. Therefore, we propose the following:

H 3: EO is positively related to environmental dynamism and mediates the relationship between environmental dynamism and firm performance.

EO as the Mediator between Environmental Complexity and Performance

Complexity refers to the amount and diversity of information, knowledge, resources and capabilities needed to successfully operate in an environment (Mintzberg, 1979). Complexity can result from environmental heterogeneity or the production and commercialization of complex customized products. Complexity requires intensive internal differentiation, which makes

integration difficult (Lawrence & Lorsch, 1967). Heterogeneity as one aspect of complexity can be defined as the degree of non-similarity between elements of the environment in which a firm is operating (Thompson, 1976).

Complex environments require the monitoring of diverse information, call for intensive co-ordination efforts, and can make strategic decisions difficult (Child, 1972). However, firms can benefit from a complex environment by adopting a high degree of EO. Firms need to be pro-active in their attempts to support organizational learning and the application of newly acquired knowledge to different contexts. Firms that fail to apply new knowledge and resources to different contexts and thereby leverage learning efforts are prone to underperformance. Moreover, resource and differentiation requirements tend to be high in complex environments. Firms therefore need to pro-actively seek new combinations of resources that can be applied to different contexts in order to transform the opportunities associated with complex environments into above-average performance levels. Such resource combinations require a high degree of innovativeness (Schumpeter, 1934). Furthermore, the diversity of customer needs, as well as the number of different market segments served by firms, creates new opportunities for innovations. Firms with a high degree of EO will be better placed to explore and exploit these opportunities and, thus, translate the advantages of a complex environment into increased financial performance.

If complexity occurs in single businesses, due, for example, to a complex product that serves very specific customer needs, it is usually associated with high entry barriers for potential competitors. Thus, single businesses operating in a complex environment can increase their performance in the long run by continuously innovating and, thus, sustaining entry barriers

against other firms. Because an EO is an adequate response to a complex environment in the case of single as well as heterogeneous businesses, we propose the following:

H 4: EO is positively related to environmental complexity and mediates the relationship between environmental complexity and firm performance.

METHOD

Literature Search

The goal of the study-identification process was to gather a sample of published and unpublished studies that are representative of the literature on environmental dimensions, EO and firm performance. A special characteristic of this meta-analysis is that numerous studies include environmental characteristics as control variables when seeking to explain firm performance. Such studies are difficult to locate because they do not appear in computerized keyword searches. Other studies focused on environmental effects on performance as their main research question. In order to capture as many studies as possible and limit biases caused by the study-identification process, we relied on two procedures: computerized keyword searches in the databases *Business Source Premier* and *EconLit*; and a manual search in relevant journals including the *Academy of Management Journal* (1980-2010), *Journal of Business Venturing* (1985-2010), *Journal of Management* (1980-2010), *Journal of Management Studies* (1980-2010) and *Strategic Management Journal* (1980-2010). The latter offered the opportunity to include studies that use environmental dimensions as control variables, which do not usually show up in keyword searches. In turn, this approach decreases the file-drawer problem identified by Rosenthal (1979), which suggests that research exhibiting insignificant results is less likely to get published. Researchers that include environmental dimensions as control variables do not face

problems publishing their research if these variables do not have significant effects. Hence, by including a large number of studies that consider environmental dimensions as controls, we decrease a potential publication bias.

We used a variety of keywords to identify performance (growth, market valuation, performance, profitability, success); the dimensions of the environment (munificence, industry growth, hostility, concentration, dynamism, (in)stability, turbulence, complexity, heterogeneity); and EO (entrepreneurial orientation, strategic posture, corporate entrepreneurship). For each meta-analysis of our hypothesized relationships that led to one cell in the correlation matrix, we relied on a combination of keywords. For example, for the meta-analysis of the link between environmental munificence and firm performance, we combined the keywords for munificence (munificence, industry growth) with the above-mentioned keywords for firm performance. As a third step in the study-identification process, we searched the reference sections of articles for further studies that we may have overlooked by relying on the two procedures described above. For the meta-analysis of the EO-performance link, we checked the reference section of the meta-analysis by Rauch et al. (2009).

Scope of the Study and Selection Criteria

In order to be included in the meta-analysis, studies had to fulfill several selection criteria which frame the scope of our study. First, studies had to assess performance at the organizational level; i.e., we only considered research that studied the performance effects of EO and environmental characteristics for separate legal entities to ensure a common level of analysis. This includes organizations that are economically dependent on a parent firm, such as joint ventures (e.g., Luo, 2002, 2007) or foreign subsidiaries (Luo & Peng, 1999). In addition, EO had

to address the strategy-making process at the organizational level. Thus, studies testing individual-level entrepreneurship were excluded from the meta-analysis. Moreover, the literature on the EO of firms shows that different variants of instruments were used to operationalize the construct. In order to be able to conduct a meaningful meta-analysis, we only included studies that used either the Miller (1983) or the Covin & Slevin (1986) measurement instruments, or those that explicitly developed refined alternatives to these scales.

Furthermore, the measures of the environment needed to be in line with our definitions of the four environmental dimensions: munificence, hostility, dynamism and complexity (Table 1). We included archival as well as perceptual measures of the four environmental dimensions, but excluded studies which used measures that combined two or more of these dimensions (e.g., Chandler & Hanks, 1994; Frese, Brantjes & Hoorn, 2002).

In addition, we did not consider qualitative research. Quantitative work is required to report statistics that can be converted into our effect size r . Several articles did not satisfy this criterion. We also excluded studies that based their bivariate correlation analyses on firm-year observations. Such analyses were excluded because the data points in these cases are not independent and so could introduce bias into our correlation analyses.

We also accounted for the issue of overlapping samples. Whenever the same sample of firms was used in more than one article, we only included the results of this research once, in order to avoid a bias caused by the overrepresentation of samples. If different publications used the same samples, we included the study with the largest number of firms. In addition, we noticed that there may be biases caused by potentially overlapping samples used by different authors who selected their sample from the same population of firms. For example, several authors use the Fortune 500 list to identify companies for their field study. Because the vast

majority of these articles are based on survey studies, we can still expect the samples to be sufficiently different. However, we performed post hoc analyses to check the robustness of our findings with respect to potentially overlapping samples derived from the same population. For these analyses, we ensured that each population was only included once per effect size.

Our analyses build on samples from published and unpublished studies. These studies focus on the relationship between environmental variables and EO, the EO-performance link and the relationship between environmental variables and firm performance. The separate meta-analyses used to build the inter-correlation matrix are based on different numbers of underlying studies, from $k=8$ for the relationship between environmental hostility and complexity, to $k=83$ for the relationship between environmental dynamism and firm performance. The appendix contains an overview of the studies included.¹

Coding

Prior to the analyses, we coded the studies for our key constructs: environmental munificence, hostility, dynamism and complexity, EO and performance. Table 1 describes the key constructs of the meta-analysis, the theoretical definitions of the key constructs and examples of measures belonging to the key constructs. We coded environmental characteristics into the four classes that we derived from theory: munificence, hostility, dynamism and complexity. In order to be able to distinguish between categories, we did not include measures that represented more than one dimension of the environment, such as industry profitability. Industry profitability is an indicator for a munificent environment; however, industry profitability also increases with declining hostility. Thus, no clear classification is possible in this case. We coded munificence if measures operationalized industry and market growth, industry

sales against time, perceived munificence, and perceived opportunities. Industry competition ratios, the number of competitors, margin/volume pressure, perceived hostility and perceived rivalry were coded as hostility. Dynamism was coded for indicators of perceived dynamism, measures that addressed the variability of sales over time, and industry beta. Perceived complexity, perceived heterogeneity, and technological breadth were coded as complexity.

There has been debate about the dimensionality of the EO construct (Lumpkin & Dess, 1996). Since the majority of studies in the domain of EO have conceptualized EO as a uni-dimensional construct (Rauch et al., 2009), we coded an overall value of EO per study.

Insert Table 1 about here

Although the explanation of performance differences is a core task in strategic management, no consensus has been reached regarding the conceptualization and measurement of the performance construct. In the past, researchers have used a variety of measures to assess the performance construct, often without justification (Brush & Vanderwerf, 1992; Hult et al., 2008; Murphy, Trailer & Hill, 1996). Meta-analyses of the relationship between different indicators of performance have converged on three main entities: profitability, growth and capital-market performance (Combs, Crook, & Shook, 2005). In addition, we considered a fourth category: subjective performance. Researchers frequently use subjective performance measures, especially when archival data is not available; for example, in the case of small firms or new ventures (Dess & Robinson, 1984). Even though subjective performance measures may be prone to various reporting biases, they exhibit relatively high correlations with objective measures (Dess & Robinson, 1984). Thus, we also coded whether researchers used a subjective measure of financial performance such as ratings of growth or profitability compared to competitors.

In addition to the key constructs, we coded a potential moderator of the relationships between environmental dimensions, EO and firm performance for post hoc analyses: firm size. Employment data is usually used as a criterion to distinguish large firms from small and medium enterprises, but the cut-off point varies across countries. Most frequently, a distinction is made at 250 employees, as in the European Union, or 500 employees, as in the US (OECD, 2002). Because most of the research was conducted in US firms, we coded studies as “small and medium-sized” if they included businesses with less than 500 employees on average, and as “large” if the average firm in the sample had more than 500 employees (cf., Miller & Cardinal, 1994; Rauch et al., 2009). Whenever there was no information about the average number of employees of the firms in a sample, we checked for additional information that would enable us to code firm size. For example, we coded studies stating that authors use samples of “the largest manufacturing firms in the U.S. in Business Week’s top 1000 companies” (Goll & Rasheed, 2004) or Fortune 500 firms (Keats & Hitt, 1988) as research on large enterprises. Studies that did not provide such information were not coded with respect to firm size and were thus excluded from the post hoc analysis.

Meta-Analytical Procedure

In a first step, we used a technique suggested by Hunter and Schmidt (2004) to integrate bivariate statistics across studies. For each studied variable, we conducted separate meta-analyses with respect to its relationship with all other studied variables. Before aggregating them, we corrected effect sizes for sampling error. In addition, we corrected for reliability and, thus, accounted for measurement errors in the underlying studies (Hunter & Schmidt, 2004). To this end, we averaged Cronbach’s alphas across studies. To detect whether correlations among two

constructs were significant, we calculated a 95%-confidence interval. A confidence interval not including zero indicates a significant effect.

We used a combination of structural equation modeling and meta-analytic techniques to test our hypothesized mediation model (Viswesvaran & Ones, 1995). This type of approach to theory testing has been recommended by a number of researchers (e.g., Colquitt, LePine & Noe, 2000; Shadish, 1996; Viswesvaran & Ones, 1995). Using the above-described bivariate techniques, we created a meta-analytical inter-correlation matrix of all variables (Table 2). Each cell in the matrix was obtained from a separate meta-analysis. The mean reliability of each construct is reported in the main diagonal of the correlation matrix. In a second step, the inter-correlation matrix was analyzed path-analytically using maximum-likelihood estimation (LISREL 8; Joereskog & Soerbom, 1996). Since the sample sizes differed across the cells, we had to determine an overall sample size, and we therefore used the harmonic mean to calculate the matrix sample size (Colquitt et al., 2000; Parker et al., 2003; Viswesvaran & Ones, 1995). We evaluated the model fit by calculating the root-mean-square error of approximation (RMSEA) and the comparative fit index (CFI; Bentler, 1990) along with the standard chi-square statistic.

RESULTS

The correlation matrix (Table 2) serves as the basis for a path analysis but also gives some first indications about the relationships between the constructs. For example, it demonstrates that the reliability-corrected relationship between the four environmental constructs ranges between -0.23 and 0.39. According to Cohen (1988), these effect sizes can be considered small to medium in strength. Munificence and hostility are related negatively ($r_c = -.23$); however, the rather low

effect size indicates that they are distinct dimensions of the environment. The same is true of the relationships between all of the other environmental constructs. Thus, the four environmental conditions need to be considered as separate dimensions of the environment, despite assertions to the contrary that can sometimes be found in the literature.

 Insert Table 2 about here

The bivariate results show that – apart from the hostility-EO link – all relationships between environmental dimensions and EO as well as between EO and firm performance are statistically significant. This is because the 95%-confidence interval does not include zero. In addition, the magnitude of the effect size varies between the four environmental dimensions in relation to EO. Environmental munificence has the strongest effect on EO with a reliability-corrected mean effect size of $r_c=.43$. Yet, dynamism and complexity also show comparatively strong links to EO. Finally, the estimated relationship between EO and performance ($r_c=.26$) is comparable to that reported by Rauch et al. (2009) ($r_c=.24$), indicating that the inclusion of more recent studies has not altered the results dramatically.

In order to estimate the relationship between environmental dimensions, EO and performance, we compared a structural equation model which includes the direct effects between environment and EO on performance, with a structural equation model of the proposed mediator model (Table 3). Model 1 includes direct relations of the environmental dimensions and EO on performance. The fit statistics of Model 1 are poor. When testing the hypothesized mediator Model 2 (Figure 1) the model shows a good model fit (RSMEA = .04, $p<.96$; CFI = .99), indicating support for our mediator hypotheses (Frazier, Tix & Barron, 2004).

 Insert Table 3 about here

The path coefficients of the mediation model demonstrate that environmental munificence is significantly related to EO ($\beta = .37, p < .01$) (Figure 1, Empirical Results). The path coefficient between hostility and EO is not significant ($\beta = -.01, n.s.$). However, both dynamic ($\beta = .18, p < .01$) and complex environments ($\beta = .09, p < .01$) are significantly related to EO. Finally, EO has a positive influence on firm performance ($\beta = .26, p < .01$).

In order to test the specific mediator hypotheses, we calculate direct, indirect and total effects (Brown, 1997). The direct effects are the effects of the environmental attributes on firm performance unmediated by other variables. The indirect effects are computed as the product of the paths from the environment to EO and from EO to performance. The total effects account for the direct and indirect effects. The indirect effect of munificence on performance via EO is positive and significant ($\beta = .09, p < .01$), supporting Hypothesis 1. Hypothesis 2 stated that EO mediates the relationship between hostility and performance. Since the indirect effect of hostility is not significant ($\beta = .00, n.s.$), Hypothesis 2 is rejected. Next, we find an indirect effect of dynamism on performance, mediated by EO ($\beta = .05, p < .01$). This finding supports Hypothesis 3. Finally, the effect of complexity on performance is mediated by EO ($\beta = .02, p < .01$). This supports Hypothesis 4.

Insert Figure 1 about here

Several previous meta-analyses have suggested that effect sizes may differ for certain firm-size categories. For example, Rauch et al. (2009) found the relationship between EO and performance to be stronger in micro-businesses than in small businesses. Thus, for a first set of post hoc analyses which refer to moderating effects of firm size, we divided the full sample into

sub-samples of studies examining small and medium sized enterprises and a second set of studies examining large firms. We then calculated an inter-correlation matrix for each sub-group and path-analyzed it. Studies that could not be coded for firm size due to data restrictions were excluded from this analysis. Model 1 (Table 4) displays the results for small and medium sized enterprises. The model indicates a reasonable model fit (RMSEA = .08, $p = .01$; CFI = .98) while the structural relationships are quite similar to those of the overall model (Figure 1). The model of the sub-group of studies including large firms (Model 2, Table 4) reveals a comparable model fit (RMSEA = .08, $p = .02$; CFI = .97). Yet, in the case of large firms, complexity is associated with reduced EO, indicating a negative indirect effect, whereas hostility seems to increase EO in large firms. Thus, firm size seems to affect two of the structural relationships proposed in the overall revised model: the effect of specific attributes of the environment on EO seems to differ depending on firm size.

 Insert Table 4 about here

Similarly, the role of different performance criteria has been a controversial issue in the literature (Richard, Devinney, Yip & Johnson, 2009). As a result, several meta-analyses have examined their results across different performance measures (e.g., Boyd, 1991; Dalton, Daily, Ellstrand & Johnson, 1998; Gooding & Wagner III, 1985; Rauch et al., 2009). To this end, we once again divided our overall sample into sub-samples of studies that looked at profitability, growth and subjective performance. Subsequently, we calculated an inter-correlation matrix per sub-sample that we then path-analyzed. When we estimated separate models for profitability, growth, and subjective performance, all three models fitted the data well (Table 4). Although we were not able to test the relationship for capital-market performance as the fourth performance

dimension due to a lack of data in the underlying studies regarding the link between EO and performance, we conclude that our results are robust with regard to different performance criteria.

For the second set of post hoc analyses we created a sub-sample of studies that had no overlap regarding the populations that were used to draw the sample, i.e. we excluded studies that derived their sample from the same population. As a consequence, each population is only included once per effect. When we replicated the analyses above controlling for samples selected from overlapping populations, the meta-analytical path analyses revealed that our results are robust and not affected by this potential bias.²

DISCUSSION

This paper examines how firms can use EO to deal with opportunities associated with their external environment and transform them into superior financial performance. Despite compelling theoretical arguments as to how and why firms adjust their EO to the requirements of the environment (Covin & Slevin, 1991; Miller, 1983), to date empirical research has largely neglected mediating relationships and has instead focused on contingency frameworks (e.g., Lumpkin & Dess, 2001; Wiklund & Shepherd, 2005; Zahra & Covin, 1995). Thus, our results provide empirical evidence for a missing link in the literature, identifying EO as a key mechanism by which the task environment can influence a firm's performance. Specifically, we have found that firms benefit from environmental munificence, dynamism and complexity if they implement a high level of EO. The strong influence of several environmental dimensions on EO suggests that the environment also needs to be taken into account, as an antecedent in a model of strategic orientation and firm performance.

Most theorizing on EO has conceptualized it as an independent variable that influences performance more or less in specific settings (e.g., Lumpkin & Dess, 1996). Our results question this approach, because the degree of EO itself may be dependent on the business environment. This argument is consistent with Miller (1983) and Covin and Slevin (1991), who suggested that both external and internal variables determine EO in a firm. Hence, neglecting the antecedents of EO can lead to oversimplified models of firm performance. Therefore in order to fully uncover the complex nature of the relationships between environment, EO and performance, researchers need to account for the antecedents of EO.

Compared with previous work, this study has taken a very detailed look at the firm's task environment. Our distinction between different environmental dimensions has generated some novel insights which extend our knowledge in several ways. First, our bivariate analyses suggest that the various environmental dimensions studied in this paper are distinct. In particular, a clear distinction can be made between munificence and hostility as well as between dynamism and complexity - in contrast to previous arguments in the literature about the validity and soundness of combining different aspects of the environment. Second, environmental munificence appears to have the strongest impact on EO and firm performance, whereas hostility does not seem to affect EO. Thus, it is not industry that matters per se. Rather it seems that firms align their EO to different characteristics of the task environment and as a consequence reach higher performance levels. Thus, rather than looking broadly at a single aspect of the environment, such as favorable rather than unfavorable environments for example, studies need to address the multidimensional nature of the environment. Third, studying indirect links between environmental dimensions and firm performance has shed light on the mechanisms by which environmental dimensions enhance or decrease firm performance.

Out of the four dimensions of the task environment studied in this analysis, only hostility is not related to EO and performance. The insignificant coefficient for the path between environmental hostility and EO suggests that firms do not align their strategic posture to the hostility of the environment. In fact, there has been a controversy in the literature as to whether hostility has a positive (e.g., Covin & Slevin, 1991; Miller, 1983) or negative effect on EO (Miller & Friesen, 1983, Wiklund et al., 2009). One of the reasons for the controversial results could be attributed to different types of hostility. For example, Zahra & Bogner show that the effects of price hostility on the innovation-performance relationship differ from those of non-price hostility. While innovation is less successful in price-hostile environments, non-price hostility increase the success derived from innovation.

Furthermore, our post hoc analysis suggests that the presence of moderators may account for the different effects reported in the literature, indicating that certain groups of firms enhance their EO if hostility increases, while other firms decrease it. Our post hoc analyses reveal that hostility does not have a significant effect on EO in small and medium-sized enterprises, but significantly increases it in large firms. Large firms have more resources that can be used to pursue entrepreneurial strategies, even in hostile environments. For example, firms are more likely to take risks if they possess the resources to absorb potential losses. In addition, large firms benefit from greater market shares and higher volumes, which make it easier for them to compete in hostile environments with intense competition for resources and opportunities. In particular, this applies to price-hostile environments where large firms rely on economies of scale due to high volumes. They may then even increase their EO to enhance their position in the market, while small firms lack the resources to do so. Thus, small firms avoid pro-active and risk-taking

strategies in hostile environments because they lack resources, which makes them vulnerable to risks associated with entrepreneurial strategy-making.

In complex environments, small firms increase their EO whereas large firms seem to decrease it. This may reflect the different organizational structures found in firms of different sizes. While small and medium-sized firms may become more innovative and pro-active to utilize the advantages associated with a complex environment, bureaucratic structures and inertia may hinder large firms from implementing an EO in the same type of environment. Being faced with a lot of heterogeneity, a large information flow and a complex internal structure with increased coordination needs, managers may shift their objectives to reaching short-term financial goals instead of focusing on long-term and risky entrepreneurial strategies (Baysinger & Hoskisson, 1989). Thus, EO may decrease with environmental complexity if managers at various organizational levels are not willing to support entrepreneurial strategy-making.

LIMITATIONS AND IMPLICATIONS

As with every meta-analysis, this study has its limitations. Some of these limitations are inherent in the primary studies. For example, all studies included in our meta-analysis exclusively examine surviving firms and none corrected for survival bias. It seems likely that some firms operating in unfavorable environments have exited the market. In general, we assume that this bias works against the proposed relationships, because the bias would also decrease the variance in success.

Similarly, most studies used cross-sectional designs in order to test the effects of environmental dimensions on EO and firm performance. However, it may take some time before environmental conditions affect EO and, in turn, firm performance. Furthermore, Porter (1991)

assumes that changes in the external environment are partly subject to managerial actions. Moreover, Miller and Friesen (1982) as well as Covin & Slevin (1991) argued for bidirectional relationships with EO possibly affecting the environment. For example, the introduction of disruptive innovations implies environmental dynamism. We hope that future research will incorporate these time-lag and causality issues in their design.

Limitations inherent in our meta-analysis include the “file drawer problem” (Rosenthal, 1979), a problem that occurs when researchers are more likely to submit and editors more likely to accept significant findings. We tried to avoid this problem through the inclusion of studies that focused on other determinants of EO and firm performance, and which included environmental characteristics only as control variables. We also included studies that have not been published in academic journals. Thus, we believe that our sample is more representative than the papers hitherto published. In order to detect a potential publication bias we calculated the “fail-safe N” – i.e. the number of samples with insignificant results needed to make our meta-analytical results insignificant. For the significant main effects that assess the relationships under focus in this study we obtained fail-safe Ns between 126 (environmental complexity – EO) and 21,110 (EO – performance). Because all of these numbers exceed the critical number of studies $k_{crit} = 5 * k + 10$ (Rosenthal, 1991), we find no indication for a publication bias in our analysis.

Moreover, there may be additional mediators to the relationship between environmental characteristics and firm performance as described above. We focused on EO as a variable comprehensively describing the strategy-making process, yet EO influences specific strategic decisions and resource allocations (Atuahene-Gima & Ko, 2001). Thus, future research should reveal whether EO mediates the relationship between environmental attributes and specific strategies and resource allocations that lead to competitive advantage. Such research should lead

to a more detailed picture of the relationships between a firm's environment, strategy-making and firm performance. Potential variables include Porter's generic strategies (Porter, 1980), internationalization, M&A, and diversification strategies. Future research could address their role as mediators in the relationship between environment, EO, and firm performance.

In addition, context-related variables should be included in our model. Although post hoc analyses showed that our findings are robust with respect to performance measurement and firm size, the latter analyses also suggested that environmental dimensions may generate different effects with respect to small and large firms. This indicates that the path model is affected by moderator variables. Examining moderator variables was beyond the scope of this study. However, the fact that we found crossed interactions in our post hoc analyses indicates that future research should test moderated mediation (James & Brett, 1984; Judd & Kenny, 1981). For example, while we have focused on the environment as an antecedent of EO, we acknowledge that it may act as both an antecedent and moderator variable. The latter is suggested by contingency theory. For instance, a munificent environment increases EO while at the same time innovativeness, pro-activity and risk-taking may be more successful in an environment characterized by growth and the presence of ample resources and opportunities. Other potential context-related moderators may include firm-level variables, such as the quality and flexibility of resources a firm possesses, or its organizational structure as well as individual-level variables associated with the entrepreneur or the top management, such as the willingness of top decision makers to take risks. Such variables may moderate the relationship between environmental dimensions and EO, but also between EO and firm performance or even both. Thus, entrepreneurship research needs to reconsider models of the role of third variables in the relationship between EO and performance.

Moreover, it is widely recognized that more studies need to address the causal relationships between antecedents and consequences of EO (e.g., Lumpkin & Dess, 1996; Rauch et al., 2009). For example, it is possible that performance provides access to the resources necessary to pursue innovative opportunities (Zahra & Covin, 1995). Our mediator approach reinforces this call for longitudinal studies. Defining EO as a process aspect of entrepreneurship suggests the need to address the antecedents of EO; factors that increase or decrease the level of EO; and the consequences of increased or decreased EO (Madsen, 2007). In order to tackle these issues, studies based on longitudinal data need to be conducted because it is likely that firms align their EO to the environment whereas the environment acts as a moderator to the EO-performance relationship at a later point in time.

In their seminal work, Covin and Slevin (1991) provided a comprehensive conceptual framework for a model of EO. Future research can build on these ideas and test more comprehensive and dynamic models of EO, its antecedents and consequences. Such research is necessary due to the complex nature of the interrelationships between environment, strategic orientation, other internal characteristics of firms and their performance.

Practically, industry choice is an influential strategic decision at founding (Eisenhardt & Schoonhoven, 1990). It is also relevant when firms extend their business activities in other areas, because this choice has consequences for their strategic orientation. A munificent environment increases the potential for EO and thus for pro-active, risky and innovative strategy-making which increases firm performance. Our analysis shows that munificence has the strongest effect on EO and, in turn, on firm performance. Thus, munificence seems to be the most favorable environmental condition, although firms can also succeed in dynamic and complex environments. However, they need to align their EO to dynamism and complexity. That means

that entrepreneurs and managers should scan their environment carefully before implementing a strategic orientation which is in line with the specific environmental dimensions. That way, they may be able to take advantage of opportunities in the environment and generate above-average performance levels for their firms. For example, if an environment contains ample opportunities and resources, they should adopt suitable entrepreneurial strategies that enable their firms to explore and exploit those opportunities.

Yet, an EO is not necessarily required in every environment. Rather, environments characterized by low munificence, low dynamism and low complexity facilitate low innovativeness, risk-taking and pro-activeness. Entrepreneurs who try to implement an EO in such environments will be less successful, simply because such environments are more conducive to standardization and routines. For example, firms in mature industries with low munificence are less likely to implement new product innovations than firms that operate in growing industries (Klepper, 1997). Therefore, if entrepreneurs choose innovative strategies in mature industries, they must invest more effort to do so, because such a strategy is not facilitated by the environment.

Furthermore, politicians may try to create a favorable environment for entrepreneurs. For example, the availability of resources is an important aspect of a munificent environment which enhances EO and, in turn, firm performance. By improving access to resources, policy-makers can generate a favorable environment for firms. Decision-makers in firms, on the other hand, can engage in corporate political activity in order to prompt politicians to change laws, provide resources and reach other decisions that shape the environment in a favorable way for the firm (Lux, Crook & Woehr, 2011). Entrepreneurs, investors, and practitioners advising entrepreneurs

and managers can improve their decisions by looking at whether or not the environment facilitates entrepreneurial strategy-making processes.

In conclusion, we have sought to identify the causal mechanism through which entrepreneurs can benefit from specific environmental dimensions. We have proposed a model that views EO as the missing link in the environment-performance relationship. Our results show that EO mediates the relationship between at least three environmental dimensions (munificence, dynamism and complexity) and the performance of firms. These results open the door to additional future research. Thus far, most of the literature on EO has adopted contingency frameworks, whereas the role of EO as a mediator between external and internal factors on one hand and firm performance on the other hand has been neglected. Future research can advance theory building in this area by considering EO as both an outcome and a predictor variable in mediation models.

REFERENCES

- Aldrich, H. E. 1979. *Organizations and environments*. Englewood Cliffs, NJ: Prentice-Hall.
- Allred, B. B., & Swan, K. S. 2005. The mediating role of innovation on the influence of industry structure and national context on firm performance. *Journal of International Management*, 11(2): 229-252.
- Atuahene-Gima, K., & Ko, A. 2001. An empirical investigation of the effect of market orientation and entrepreneurship orientation alignment on product innovation. *Organization Science*, 1(2): 54-74.
- Bain, J. S. 1951. Relation of profit rate to industry concentration: American manufacturing, 1936-1940. *Quarterly Journal of Economics*, 65(3): 293-324.

- Baum, J. R., & Wally, S. 2003. Strategic decision speed and firm performance. *Strategic Management Journal*, 24(11): 1107-1129.
- Baysinger, B., & Hoskisson, R. E. 1989. Diversification Strategy and R&D Intensity in Multiproduct Firms. *The Academy of Management Journal*, 32(2): 310-332.
- Bentler, P. M. 1990. Comparative fit indexes in structural models. *Psychological Bulletin*, 107: 238-246.
- Bourgeois III, L. J. 1980. Strategy and Environment: A Conceptual Integration. *Academy of Management Review*, 5(1): 25-39.
- Boyd, B. K. 1991. Strategic planning and financial performance: A meta-analytic review. *Journal of Management Studies*, 28(4): 353-374.
- Boyd, B. K., Dess, G. G., & Rasheed, A. M. A. 1993. Divergence between archival and perceptual measures of the environment: Causes and consequences. *Academy of Management Review*, 18(2): 204-226.
- Bruno, A. V., & Tyebjee, T. T. 1982. The environment for entrepreneurship. In C. A. Kent, D. L. Sexton and K. H. Vesper (Eds.), *Encyclopedia of entrepreneurship*: 288-307. Englewood Cliffs, NJ: Prentice-Hall.
- Brush, C. G., & Vanderwerf, P. A. 1992. A Comparison of Methods and Sources for Obtaining Estimates of New Venture Performance. *Journal of Business Venturing*, 7(2): 157-170.
- Caloghirou, Y., Protoyerou, A., Spanos, Y., & Papagiannakis, L. 2004. Industry-Versus Firm-specific Effects on Performance: Contrasting SMEs and Large-sized Firms. *European Management Journal*, 22(2): 231-243.
- Castrogiovanni, G. J. 1991. Environmental munificence: A theoretical assessment. *Academy of Management Review*, 16(3): 542-565.

- Chandler, G. N., & Hanks, S. H. 1994. Market Attractiveness, Resource-Based Capabilities, Venture Strategies, and Venture Performance. *Journal of Business Venturing*, 9(4): 331-349.
- Child, J. 1972. Organizational Structure, Environment and Performance: The Role of Strategic Choice. *Sociology*, 6(1): 1-22.
- Cohen, J. 1988. *Statistical Power Analysis for Behavioral Science* (2nd ed. ed.). Hillsdale, NJ: Erlbaum.
- Colquitt, J. A., LePine, J. A., & Noe, R. A. 2000. Toward an Integrative Theory of Training Motivation: A Meta-Analytic Path Analysis of 20 Years of Research. *Journal of Applied Psychology*, 85(5): 678-707.
- Combs, J. G., Crook, T. R., & Shook, C. 2005. The Dimensionality of Organizational Performance and its Implications for Strategic Management Research. In D. Ketchen and D. Bergh (Eds.), *Research Methodology in Strategy and Management*: 259-286. San Diego, CA: Elsevier.
- Covin, J. G., & Covin, T. J. 1990. Competitive aggressiveness, environmental context, and small firm performance. *Entrepreneurship Theory and Practice*(Summer): 35-50.
- Covin, J. G., & Slevin, D. P. 1986. The development and testing of an organizational-level entrepreneurship scale. In R. Ronstadt, J. A. Hornaday, R. Peterson and K. H. Vesper (Eds.), *Frontiers of entrepreneurship research - 1986*: 628-639. Wellesley, MA: Babson College.
- Covin, J. G., & Slevin, D. P. 1989. Strategic management of small firms in hostile and benign environments. *Strategic Management Journal*, 10: 75-87.

Covin, J. G., & Slevin, D. P. 1991. A conceptual model of entrepreneurship as firm behavior.

Entrepreneurship Theory and Practice, 16(1): 7-25.

Covin, J. G., Slevin, D. P., & Heeley, M. B. 2000. Pioneers and followers: Competitive Tactics,

Environment, and Firm Growth. *Journal of Business Venturing*, 15(2): 175-210.

Dalton, D. R., Daily, C. M., Ellstrand, A. E., & Johnson, J. L. 1998. Meta-analytic reviews of board composition, leadership structure, and financial performance. *Strategic*

Management Journal, 19(3): 269-290.

Datta, D. K., & Narayanan, V. K. 1989. A Meta-Analytic Review of the Concentration-

Performance Relationship: Aggregating Findings in Strategic Management. *Journal of Management*, 15(3): 469-483.

Dess, G. G., & Beard, D. W. 1984. Dimensions of organizational task environments.

Administrative Science Quarterly, 29: 52-73.

Dess, G. G., & Robinson, R. B. 1984. Measuring Organizational Performance in the Absence of Objective Measures: The Case of the Privately-held Firm and Conglomerate Business

Unit. *Strategic Management Journal*, 5(3): 265-273.

Dickson, P. H., & Weaver, K. M. 2008. The role of the institutional environment in determining firm orientations towards entrepreneurial behavior. *International Entrepreneurship and*

Management Journal, 4: 467-483.

Eckhardt, J. T., & Shane, S. A. 2003. Opportunities and entrepreneurship. *Journal of*

Management, 29(3): 333.

Eisenhardt, K. M., & Schoonhoven, C. B. 1990. Organizational Growth: Linking Founding

Team, Strategy, Environment, and Growth among U.S. Semiconductor Ventures, 1978-1988. *Administrative Science Quarterly*, 35(3): 504-529.

- Frazier, P. A., Tix, A. P., & Barron, K. E. 2004. Testing moderator and mediator effects in counseling psychology research. *Journal of Counseling Research*, 51(1): 115-134.
- Frese, M., Brantjes, A., & Hoorn, R. 2002. Psychological success factors of small scale businesses in Namibia: The roles of strategy process, entrepreneurial orientation and the environment. *Journal of Developmental Entrepreneurship*, 7(3): 259-282.
- Goll, I., & Rasheed, A. A. 2004. The Moderating Effect of Environmental Munificence and Dynamism on the Relationship Between Discretionary Social Responsibility and Firm Performance. *Journal of Business Ethics*, 49(1): 41-54.
- Gooding, R. Z., & Wagner III, J. A. 1985. A meta-analytic review of the relationship between size and performance: The productivity and efficiency of organizations and their subunits. *Administrative Science Quarterly*, 30: 462-481.
- Hult, G. T. M., Ketchen Jr, D. J., Griffith, D. A., Chabowski, B. R., Hamman, M. K., Dykes, B. J., Pollitte, W. A., & Cavusgil, S. T. 2008. An assessment of the measurement of performance in international business research. *Journal of International Business Studies*, 39(6): 1064-1080.
- Hunter, J. E., & Schmidt, F. L. 2004. *Methods of meta-analysis: Correcting error and bias in research findings* (2nd ed. ed.). Thousand Oaks, CA: Sage.
- James, L. R., & Brett, J. M. 1984. Mediators, moderators and tests for mediation. *Journal of Applied Psychology*, 69: 307-321.
- Joereskog, K. G., & Soerbom, D. 1996. *LISREL 8 User's Reference Guide*. Chicago: Scientific Software International.
- Judd, C. M., & Kenny, D. A. 1981. Process analysis: Estimating mediation in treatment evaluations. *Evaluation Review*, 5: 602-619.

- Keats, B. W., & Hitt, M. A. 1988. A causal model of linkages among environmental dimensions, macro organizational characteristics, and performance. *Academy of Management Journal*, 31(3): 570-598.
- Khandwalla, P. N. 1972. Environment and its impact on the organization. *International Studies of Management & Organization*, 2(3): 297-313.
- Klepper, S. 1997. Industry Life Cycles. *Industrial & Corporate Change*, 6(1): 119-143.
- Lawrence, P., & Lorsch, J. 1967. *Organization and environment*. Homewood, IL: Irwin.
- Lee, C., Lee, K., & Pennings, J. M. 2001. Internal capabilities, external networks, and performance: A study on technology-based ventures. *Strategic Management Journal*, 22(6/7): 615-640.
- Lee, S.-H., & Makhija, M. 2009. Flexibility in internationalization: is it valuable during an economic crisis? *Strategic Management Journal*, 30(5): 537-555.
- Leonard-Barton, D. 1992. Core Capabilities and Core Rigidities: A Paradox in Managing New Product Development. *Strategic Management Journal*, 13: 111-125.
- Li, H. 2001. How does new venture strategy matter in the environment-performance relationship? *Journal of High Technology Management Research*, 12(2): 183-204.
- Lin, H.-C., & Shih, C.-T. 2008. How Executive SHRM System Links to Firm Performance: The Perspectives of Upper Echelon and Competitive Dynamics. *Journal of Management*, 34(5): 853-881.
- Lumpkin, G. T., & Dess, G. G. 1996. Clarifying the entrepreneurial orientation construct and linking it to performance. *Academy of Management Review*, 21(1): 135-172.

- Lumpkin, G. T., & Dess, G. G. 2001. Linking two dimensions of entrepreneurial orientation to firm performance: The moderating role of environment and industry life cycle. *Journal of Business Venturing*, 16(5): 429-451.
- Luo, Y. 2002. Contract, cooperation, and performance in international joint ventures. *Strategic Management Journal*, 23(10): 903-919.
- Luo, Y. 2007. Are joint venture partners more opportunistic in a more volatile environment? *Strategic Management Journal*, 28(1): 39-60.
- Luo, Y., & Peng, M. W. 1999. Learning to Compete in a Transition Economy: Experience, Environment, and Performance. *Journal of International Business Studies*, 30(2): 269-295.
- Lux, S., Crook, T. R., & Woehr, D. J. 2011. Mixing Business With Politics: A Meta-Analysis of the Antecedents and Outcomes of Corporate Political Activity. *Journal of Management*, 37(1): 223-247.
- Madsen, E. L. 2007. The significance of sustained entrepreneurial orientation on performance of firms – A longitudinal analysis. *Entrepreneurship & Regional Development: An International Journal*, 19(2): 185 - 204.
- March, J. G. 1991. Exploration and exploitation in organizational learning. *Organization Science*, 2(1): 71-87.
- McGahan, A. M., & Porter, M. E. 1997. How much does industry matter, really? *Strategic Management Journal*, 18(S1): 15-30.
- McNamara, G., Aime, F., & Vaaler, P. M. 2005. Is performance driven by industry- or firm-specific factors? A response to Hawawini, Subramanian, and Verdin. *Strategic Management Journal*, 26(11): 1075-1081.

- Miller, C. C., & Cardinal, L. B. 1994. Strategic Planning and Firm Performance A Synthesis of More Than Two Decades of Research. *Academy of Management Journal*, 37(6): 1649-1665.
- Miller, D. 1983. The correlates of entrepreneurship in three types of firms. *Management Science*, 29(7): 770-791.
- Miller, D. 1987. The structural and environmental correlations of business strategy. *Strategic Management Journal*, 8(1): 55-76.
- Miller, D., & Dröge, C. 1986. Psychological and Traditional Determinants of Structure. *Administrative Science Quarterly*, 31(4): 539-560.
- Miller, D., & Friesen, P. H. 1982. Innovation in Conservative and Entrepreneurial Firms: Two Models of Strategic Momentum. *Strategic Management Journal*, 3(1): 1-25.
- Miller, D., & Friesen, P. H. 1983. Strategy-making and environment: The third link. *Strategic Management Journal*, 4(2): 221-235.
- Miller, D. J. 2006. Technological diversity, related diversification, and firm performance. *Strategic Management Journal*, 27(7): 601-619.
- Mintzberg, H. 1979. *The structuring of organizations*. Englewood Cliffs, NJ: Prentice-Hall.
- Murphy, G. B., Trailer, J. W., & Hill, R. C. 1996. Measuring Performance in Entrepreneurship Research. *Journal of Business Research*, 36(1): 15-23.
- OECD. 2002. *OECD Small and Medium Enterprise Outlook*. Paris: OECD Publishing.
- Osborn, R. N., & Hunt, J. G. 1974. Environment and organizational effectiveness. *Administrative Science Quarterly*, 19: 231-246.

- Parker, C. P., Baltes, B. B., Young, S. A., Huff, J. W., Altmann, R. A., Lacost, H. A., & Roberts, J. E. 2003. Relationships between psychological climate perceptions and work outcomes: a meta-analytic review. *Journal of Organizational Behavior*, 24(4): 389-416.
- Peng, M. W., & Luo, Y. 2000. Managerial ties and firm performance in a transition economy: The nature of a micro-macro link. *Academy of Management Journal*, 43(3): 486-501.
- Pfeffer, J., & Salancik, G. R. 1978. *The external control of organizations*. New York: Harper & Row.
- Porter, M. E. 1980. *Competitive Strategy: Techniques for Analyzing Industries and Competitors*. New York: Free Press.
- Porter, M. E. 1991. Towards a dynamic theory of strategy. *Strategic Management Journal*, 12: 95-117.
- Rauch, A., & Frese, M. 2007. Let`s put the person back into entrepreneurship research: A meta-analysis of the relationship between business owners' personality traits, business creation and success. *European Journal of Work and Organizational Psychology*, 16(4): 353-385.
- Rauch, A., Wiklund, J., Lumpkin, G. T., & Frese, M. 2009. Entrepreneurial orientation and business performance: Cumulative empirical evidence. *Entrepreneurship Theory and Practice*, 33(3): 761-788.
- Richard, P. J., Devinney, T. M., Yip, G. S., & Johnson, G. 2009. Measuring Organizational Performance: Towards Methodological Best Practice. *Journal of Management*, 35(3): 718-804.
- Rosenthal, R. 1979. The “file drawer problem” and tolerance for null results. *Psychological Bulletin*, 86: 638-641.
- Rosenthal, R. 1991. *Meta-analytical procedures for social research*. Newbury Park, CA: Sage.

- Rumelt, R. P. 1991. How much does industry matter? *Strategic Management Journal*, 12(3): 167-185.
- Schmalensee, R. 1985. Do Markets Differ Much? *American Economic Review*, 75(3): 341-351.
- Schumpeter, J. 1934. *Theorie der wirtschaftlichen Entwicklung (Theory of economic growth)*. München: Von Duncker und Humbolt.
- Shadish, W. R. 1996. Meta-Analysis and the Exploration of Causal Mediating Processes: A Primer of Examples, Methods, and Issues. *Psychological Methods*, 1(1): 47-65.
- Shane, S., & Venkataraman, S. 2000. The promise of entrepreneurship as a field of research. *Academy of Management Review*, 25(1): 217-226.
- Short, J. C., Ketchen Jr, D. J., Palmer, T. B., & Hult, G. T. M. 2007. Firm, strategic group, and industry influences on performance. *Strategic Management Journal*, 28(2): 147-167.
- Skaggs, B. C., & Youndt, M. 2004. Strategic positioning, human capital and performance in service organizations: A customer interaction approach. *Strategic Management Journal*, 25(1): 85-99.
- Slater, S. F., & Narver, J. C. 2000. The positive effect of a market orientation on business profitability: A balanced replication. *Journal of Business Research*, 48: 69-73.
- Spanos, Y. E., & Lioukas, S. 2001. An examination into the causal logic of rent generation: Contrasting Porter's competitive strategy framework and the resource-based perspective. *Strategic Management Journal*, 22(10): 907-934.
- Staw, B. M., & Sz wajkowski, E. 1975. The Scarcity-Munificence Component of Organizational Environments and the Commission of Illegal Acts. *Administrative Science Quarterly*, 20(3): 345-354.
- Thompson, J. 1976. *Organizations in action*. New York: McGraw-Hill.

- Tosi, H., Aldag, R., & Storey, R. 1973. On the Measurement of the Environment: An Assessment of the Lawrence and Lorsch Environmental Uncertainty Subscale. *Administrative Science Quarterly*, 18(1): 27-36.
- Utterback, J. 1994. *Mastering the dynamics of innovation*. Cambridge, MA Harvard Business Press.
- Van Gelderen, M., Frese, M., & Thurik, R. 2000. Strategies, uncertainty and performance of small business startups. *Small Business Economics*, 15: 165-181.
- Venkatraman, N., & Ramanujam, V. 1986. Measurement of Business Performance in Strategy Research: A comparison of Approaches. *Academy of Management Review*, 11: 801-814.
- Viswesvaran, C., & Ones, D. S. 1995. Theory testing: Combining psychometric meta-analysis and structural equation modeling. *Personnel Psychology*, 48: 865-885.
- Wiklund, J., Patzelt, H., & Shepherd, D. A. 2009. Building an integrative model of small business growth. *Small Business Economics*, 32(2): 351-374.
- Wiklund, J., & Shepherd, D. 2003. Knowledge-based resources, entrepreneurial orientation, and the performance of small and medium sized businesses. *Strategic Management Journal*, 24: 1307-1314.
- Wiklund, J., & Shepherd, D. 2005. Entrepreneurial orientation and small business performance: a configurational approach. *Journal of Business Venturing*, 20(1): 71-91.
- Worren, N., Moore, K., & Cardona, P. 2002. Modularity, strategic flexibility and firm performance: A study of the home appliance industry. *Strategic Management Journal*, 23(12): 1123-1140.
- Zahra, S. A. 1991. Predictors and financial outcomes of corporate entrepreneurship: An exploratory study. *Journal of Business Venturing*, 6: 259-285.

- Zahra, S. A. 1996. Governance, ownership, and corporate entrepreneurship: The moderating impact of industry technological opportunities. *Academy of Management Journal*, 39(6): 1713-1735.
- Zahra, S. A., & Bogner, W. C. 2000. Technology Strategy and Software New Ventures' Performance: Exploring the Moderating Effect of. *Journal of Business Venturing*, 15(2): 135-173.
- Zahra, S. A., & Covin, J. G. 1995. Contextual influences on the corporate entrepreneurship performance relationship: A longitudinal analysis. *Journal of Business Venturing*, 10(3): 43-58.
- Zahra, S. A., Neubaum, D. O., & Huse, M. 2000. Entrepreneurship in medium-size companies: Exploring the effects of ownership and governance systems. *Journal of Management*, 26(5): 947-976.

FOOTNOTES

- ¹ A table of studies including effect size, sample size, a description of the sample and the codings is available from the authors upon request.
- ² The results of this set of analyses can be delivered on request.
- ^a CI: 95% confidence interval
k: number of independent samples
N: total sample size
r: sample-size corrected mean effect size
r_c: sample-size and reliability corrected mean effect size
- ^b PC: path coefficient
Sd: standard error

* $p < .05$

** $p < .01$

*** $p < .001$

^c Article was excluded in post hoc analysis due to overlapping population.

TABLE 1**Description of Key Constructs**

Key construct	Definition	Sample measures
Environmental munificence	Availability of resources and existence of opportunities (Aldrich, 1979; Dess & Beard, 1984; Pfeffer & Salancik, 1978; Staw & Szwajkowski, 1975)	Coefficient of a regression of industry sales against time (Keats & Hitt, 1988) Industry growth (e.g., Peng & Luo, 2000) Perceived market growth (Slater & Narver, 2000) Perceived industry technological opportunities (Zahra, Neubaum & Huse, 2000) Perceived munificence (e.g., Baum & Wally, 2003; Lin & Shih, 2008)
Environmental hostility	Degree of threat (Covin & Slevin, 1989; Khandwalla, 1972) that stems from the competition for scarce resources and opportunities (Miller & Friesen, 1983)	Number of competitors (e.g., Lee, Lee & Pennings, 2001; Lee & Makhija, 2009) Industry concentration ratios (reversely coded) (e.g., Allred & Swan, 2005; Caloghirou, Protogerou, Spanos & Papagiannakis, 2004) Margin/volume pressure (Worren, Moore &

		<p>Cardona, 2002)</p> <p>Perceived hostility (e.g., Covin, et al., 2000; Khandwalla, 1972; Miller & Friesen, 1983)</p> <p>Perceived competitive rivalry (Spanos & Lioukas, 2001)</p>
Environmental dynamism	Degree of change and unpredictability of future developments in an environment and their consequences (Khandwalla, 1972; Miller & Friesen, 1983; Thompson, 1976)	<p>Standard error of the slope in a regression of industry sales against time (Keats & Hitt, 1988; Tosi, Aldag & Storey, 1973)</p> <p>Industry beta (Skaggs & Youndt, 2004)</p> <p>Perceived dynamism/uncertainty (Miller & Dröge, 1986; Miller & Friesen, 1983)</p>
Environmental complexity	Level of diverse knowledge needed to operate in an environment (Mintzberg, 1979) that can occur in single businesses or stem from heterogeneity (Khandwalla, 1972; Miller & Friesen, 1983)	<p>Industry technological breadth (Miller, 2006)</p> <p>Perceived complexity (Van Gelderen et al., 2000)</p> <p>Perceived heterogeneity (e.g., Miller & Friesen, 1983)</p>

<p>EO</p>	<p>Multidimensional construct that describes the strategy-making process at the organizational level and includes dimensions such as pro-activity, innovativeness, risk-taking, competitive aggressiveness, autonomy (Lumpkin & Dess, 1996), strategic renewal, and venturing (Zahra, 1996)</p>	<p>Perceived entrepreneurial orientation (e.g., Covin & Slevin, 1989) Perceived corporate entrepreneurship (e.g., Zahra, 1991, 1996)</p>
<p>Firm performance</p>	<p>Multidimensional construct that describes the extent to which organizations meet financial objectives (Venkatraman & Ramanujam, 1986). It consists of profitability, growth and capital market performance dimensions (Combs et al., 2005) and can be assessed using objective or perceived measures.</p>	<p>Profitability dimension: ROA, ROE, ROS, operating margins Growth dimension: sales growth, employment growth and growth in market share Capital market dimension: Tobin's q, stock price premium, market-to-book value, stock returns Perceived performance scales (e.g., Wiklund & Shepherd, 2003)</p>

TABLE 2**Correlations between Independent, Mediator and Dependent Variables^a**

	(1)	(2)	(3)	(4)	(5)	(6)
(1) Performance	0.84					
(2) EO	r=0.21 r _c =0.26 N=17,935 k=73 CI: 0.18:0.24	0.79				
(3) Environmental munificence	r=0.13 r _c =0.16 N=18,168 k=47 CI: 0.10:0.16	r=0.34 r _c =0.43 N=8,384 k=16 CI: 0.28:0.40	0.79			
(4) Environmental hostility	r=-0.04 r _c =-0.05 N=17,608 k=48 CI: -0.07:-0.01	r=-0.04 r _c =-0.06 N=3,045 k=20 CI: -0.11:0.03	r=-0.17 r _c =-0.23 N=6,431 k=15 CI: -0.33:-0.02	0.72		
(5) Environmental dynamism	r=0.03 r _c =0.03 N=25,092 k=83 CI: -0.00:0.05	r=0.21 r _c =0.29 N=8,547 k=35 CI: 0.17:0.25	r=0.11 r _c =0.15 N=11,028 k=28 CI: 0.05:0.17	r=0.00 r _c =0.00 N=12,633 k=31 CI: -0.06:0.06	0.73	
(6) Environmental complexity	r=0.06 r _c =0.07 N=3,584 k=20 CI: -0.02:0.13	r=0.21 r _c =0.27 N=1,712 k=9 CI: 0.08:0.34	r=0.22 r _c =0.28 N=1,982 k=10 CI: 0.07:0.37	r=0.25 r _c =0.33 N=838 k=8 CI: 0.17:0.32	r=0.29 r _c =0.39 N=2,765 k=20 CI: 0.18:0.38	0.76

TABLE 3**Model Estimation Results: Environmental Dimensions, EO and Performance^b**

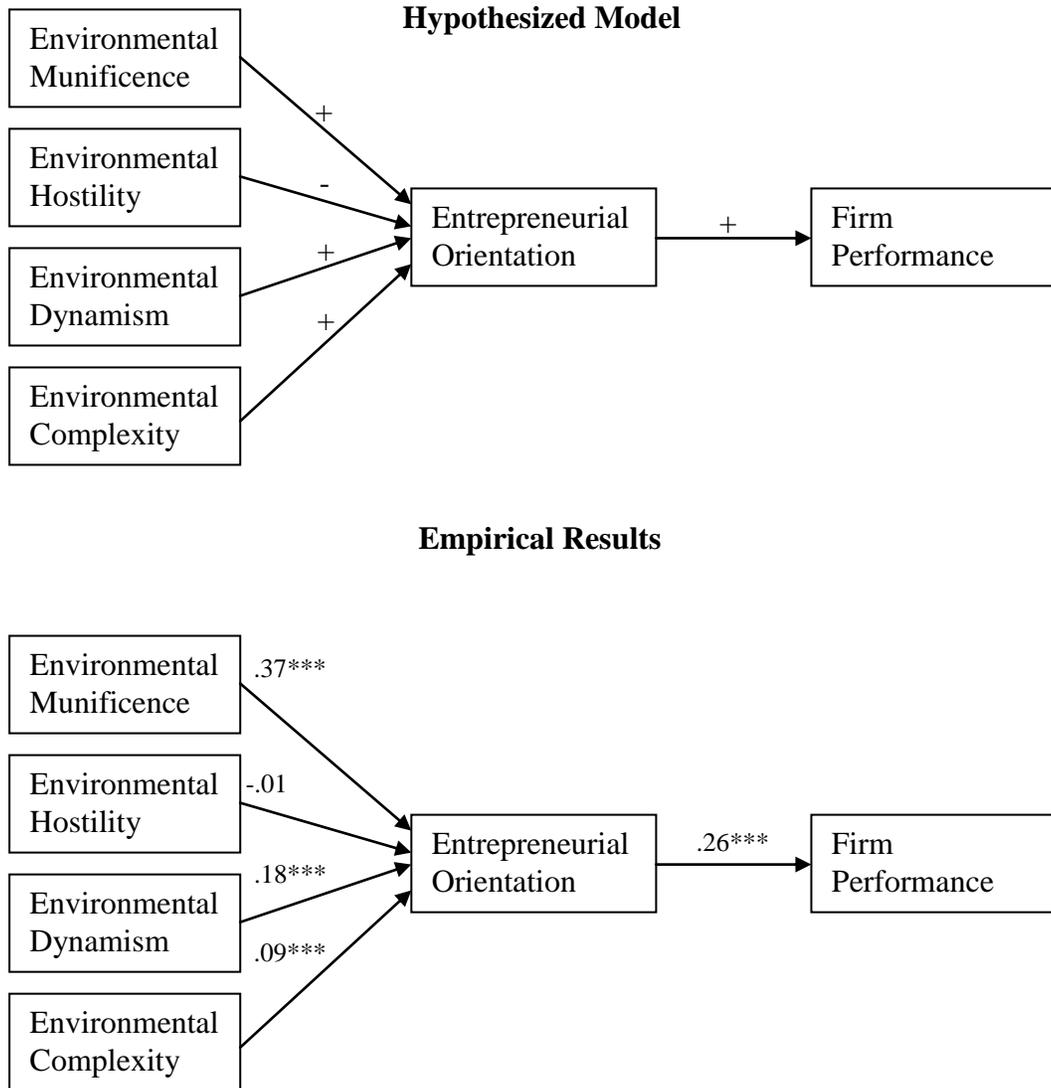
	1 Direct effects of environment, EO			2 Full mediation environment, EO		
	PC	Sd	t-value	PC	Sd	t-value
Munificence – EO				.37	.02	23.09***
Hostility – EO				-.01	.02	-.31
Dynamism – EO				.18	.02	11.75***
Complexity – EO				.09	.02	5.29***
Munificence – Performance	.05	.02	2.62**			
Hostility – Performance	-.03	.02	-1.90			
Dynamism – Performance	-.05	.02	-2.96**			
Complexity – Performance	-.02	.02	1.01			
EO – Performance	.25	.02	15.81***	.26	.02	16.57***
Chi (df)	873.18 (4)			21.93 (4)		
Sig Chi	.00			.00		
RMSEA (p of RMSEA)	.24 (.00)			.04 (.96)		
CFI	.63			.99		

TABLE 4

Model Estimation Results (Post hoc Analyses): Environmental Dimensions, EO and Performance^b

	1. Small and medium			2. Large			3. Profit			4. Growth			5. Subjective		
	PC	Sd	t-value	PC	Sd	t-value	PC	Sd	t-value	PC	Sd	t-value	PC	Sd	t-value
Munificence – EO	.34	.02	18.92***	.49	.02	19.79***	.37	.02	19.95***	.37	.02	16.74***	.37	.02	21.14***
Hostility – EO	-.01	.02	-.38	.21	.03	8.16***	-.01	.02	-.27	-.01	.02	-.22	.00	.02	.00
Dynamism – EO	.15	.02	8.31***	.31	.02	12.59***	.18	.02	10.15***	.18	.02	8.53***	.19	.02	10.75***
Complexity – EO	.25	.02	12.76***	-.15	.03	-5.39***	.09	.02	4.57***	.09	.02	3.84***	.09	.02	4.85***
EO - Performance	.24	.02	13.39***	.26	.03	10.24***	.15	.02	8.06***	.21	.02	9.46***	.29	.02	16.81***
χ^2 (df)	66.58 (4)			36.87 (4)			17.15 (4)			31.51 (4)			91.37 (4)		
pvalue χ^2	.00			.00			.00			.00			.00		
RMSEA (p of RMSEA)	.08 (.01)			.08 (.02)			.03 (.93)			.06 (.19)			.09 (.00)		
CFI	.98			.97			.99			.98			.97		

FIGURE 1
Hypothesized Relationships and Empirical Results



APPENDIX

Overview of Studies Included in the Meta-Analysis

Authors, Year	Journal	Authors, Year	Journal	Authors, Year	Journal
Akgün, Keskin & Byrne, 2007	JOCM	Katsikeas, Samiee, & Theodosiou, 2006	SMJ	Rauch, Frese, Wang & Unger, 2010	TR
Allred & Swan, 2005	JIM	Kaya & Seyrek, 2005	JAAB	Rauch, Frese, Wang & Unger, 2010	TR
Anand & Ward, 2004	POM	Keats & Hitt, 1988	AMJ	Rauch, Frese, Wang & Unger, 2010	TR
Andersen, 2005 ^c	WP	Kellermanns & Eddleston, 2008	ETP	Rhee, Park, & Lee, 2009	T
Arbaugh, Cox, & Camp, 2005	JEC	Kemelgor, 2002	ERD	Richard, Wu, & Chadwick, 2009	IJHRM
Atuahene-Gima & Ko, 2001	OS	Kreiser, Marino, & Weaver, 2002	FER	Richter, 1999	MT
Baker & Sinkula, 2009	JSBM	Lau, Man & Chow, 2004	IJEI	Russell & Russell, 1992	JM
Bamford, Dean, & McDougall, 1997	FER	Lee & Makhija, 2009	SMJ	Sarkar, Echambadi, & Harrison, 2001 ^b	SMJ
Barrett & Weinstein, 1998	ETP	Lee & Miller, 1996	OrgStud	Shani, Perner, & Grant, 1989	AOM
Barringer & Bluedorn, 1999	SMJ	Lee & Miller, 1999	SMJ	Simerly & Li, 2000	SMJ
Baum & Wally, 2003	SMJ	Lee, Lee, & Pennings, 2001	SMJ	Simon, Elango, Houghton, & Savelli, 2002	JSBM
Becherer & Maurer, 1997	ETP	Lepak, Takeuchi, & Snell, 2003	JM	Simsek, Heavey, & Veiga, 2010	SMJ
Becherer & Maurer, 1999	JSBM	Lester, Certo, Dalton, Dalton, & Cannella, 2006	JSBM	Simsek, Lubatkin, Veiga & Dino, 2009	JBR
Bercovitz & Mitchell, 2007	SMJ	Li & Atuahene-Gima, 2002	SMJ	Skaggs & Youndt, 2004	SMJ
Bhuiyan, Menguc, & Bell, 2005	JBR	Li & Greenwood, 2004	SMJ	Slater & Narver, 2000	JBR
Birley & Westhead, 1990	SMJ	Li & Tang, 2010 ^c	AMJ	Slater & Olson, 2000	SMJ
Bloodgood, Sapienza, & Almeida, 1997	ETP	Li, Guo, Liu & Li, 2008	JPIM	Smart & Conant, 1994	JABR
Caloghirou, Protogerou, Spanos, & Papagiannakis, 2004	EMJ	Li, Huang & Tsai, 2009	IMM	Song, Droge, Hanvanich, & Calantone, 2005	SMJ
Caruana, Ewing, & Ramaseshan, 2002	SIJ	Li, Poppo & Zhou, 2008	SMJ	Spanos & Lioukas, 2001	SMJ
Ceccagnoli, 2009	SMJ	Li, Tse & Zhao, 2009	IJHTA	Stam & Elfring, 2008	AOM
Chandler & Lyon, 2009	ETP	Li, Wei, & Liu, 2010	JMS	Stetz, Howell, Stewart, Blair, & Fottler, 2000	FER
Chow, 2006	SAM	Li, Zhao, Tan & Liu, 2008	JSBM	Stone, & Tudor, 2005	ACR

Chowdhury, 2009	JBV	Lichtenthaler, 2009	AMJ	Su, Xie & Li, 2009	APJM
Colton, Roth & Bearden, 2010	JIMark	Lin & Germain, 2003	SMJ	Swan, Kotabe & Allred, 2005	JPIM
Covin & Covin, 1990	ETP	Lin & Shih, 2008	JM	Swierczek & Ha, 2003	IJEI
Covin & Slevin, 1986	FER	Lin, Peng, & Kao, 2008	IJM	Tallmann & Li, 1996	AMJ
Covin, Slevin, & Heeley, 2000	JBV	Ling, Simsek, Lubatkin & Veiga, 2008	SMJ	Tan & Tan, 2005	SMJ
De Clercq, Dimov & Thongpapanl, 2010	JBV	Lubatkin, Simsek, Ling & Veiga, 2006	JM	Tan, 1996	ETP
Dess, Lumpkin, & Covin, 1997	SMJ	Lumpkin & Dess, 2001	JBV	Tan, Luo & Shenkar, 2005	IJEIM
Dickson & Weaver, 1997	AMJ	Luo & Park, 2001	SMJ	Tang & Rothenberg, 2009	JEC
Dimitratos, Lioukas, & Carter, 2004	IBR	Luo & Peng, 1999 ^c	JIBS	Tang, Tang, Marino, Zhang & Li, 2008	ETP
Dollinger & Golden, 1992	JM	Luo, 2002	SMJ	Tegarden, Sarason, Childers & Hatfield, 2005	JBS
Durand & Coeurderoy, 2001	JBV	Luo, 2007 ^c	SMJ	Thornhill & Amit, 1998	FER
Dyer & Ross, 2008	JDE	Madsen, 2007	ERD	Tokman, Richey, Marino & Weaver, 2007	JBL
Eisenhardt & Schoonhoven, 1990	ASQ	Makhija, 2004	SMJ	Urban, 2008	JDE
Elbanna & Child, 2007	SMJ	Manev, Gyoshev & Manolova, 2005	IJEIM	Van Gelder, 1999	MT
Frank, Kessler & Fink, 2010	SBR	Marino, Strandholm, Steensma & Weaver, 2002	ETP	Venkatraman, 1989	MS
Frishammar & Hörte, 2007	TASM	Mauri & Sambharya, 2001	IBR	Vitale, Giglierano, & Miles 2003	WP
Fuentes-Fuentes, Albacete-Saez, & Llorens-Montes, 2004	Omega	McArthur & Nystrom, 1991	JBR	Waldman, Ramirez, House, & Puranam, 2001 ^c	AMJ
Galetic & Milovanovic, 2008	TR	McDougall, Covin, Robinson & Herron, 1994	SMJ	Walter, Auer & Ritter, 2006	JBV
Garg, Walters & Priem, 2003	SMJ	Merlo & Auh, 2009	ML	Wang, 2008	ETP
Gelderen, Frese & Thurik, 2000	SBE	Miles, Arnold, & Thompson, 1993	JABR	Wiersema & Bantel, 1993	SMJ
George, Wood & Khan, 2001	ERD	Miller & Toulouse, 1986	MS	Wijbenga & van Witteloostuijn, 2007	JEP
Geroski, 1995	WP	Miller, 2006	SMJ	Wiklund & Shepherd, 2003	SMJ
Gilley & Rasheed, 2000	JM	Mishina, Pollock & Porac, 2004	SMJ	Wiklund & Shepherd, 2005	JBV
Goll & Rasheed, 1997	SMJ	Monsen, 2005	Diss	Worren, Moore, & Cardona, 2002	SMJ
Gomez-Mejia, 1992	SMJ	Morgan & Strong, 2003	JBR	Yoo, 2001	FER
Harms & Ehrmann, 2003	FER	Mueller, Mone & Barker, 2007	OrgStud	Yusuf, 2002	IJCM
Hart & Banbury, 1994	SMJ	Naman & Slevin, 1993 ^c	SMJ	Zahra & Bogner, 1999	JBV
Heavey, Simsek, Roche, & Kelly, 2009	JMS	Newbert, 2008	SMJ	Zahra & Covin, 1993	SMJ
Hmieleski & Baron, 2009	AMJ	Park & Luo, 2001	SMJ	Zahra & Garvis, 2000	JBV
Hmieleski & Ensley, 2007 ^c	JOB	Payne, Kennedy & Davis, 2009	JSBM	Zahra & Hayton, 2008	JBV
Hopkins & Hopkins, 1997	SMJ	Peng & Luo, 2000	AMJ	Zahra & Neubaum, 1998	JDE

Hoskisson, Cannella, Tihanyi & Faraci, 2004	SMJ	Perez-Luno, Wiklund, & Valle Cabrera, 2010	JBV	Zahra, 1991	JBV
Hsu & Boggs, 2003	MBR	Poon, Ainuddin, & Junit, 2006	ISBJ	Zahra, 1995	JBV
Hughes, Hughes & Morgan, 2007	BJM	Priem, Rasheed, & Kotulic, 1995	JM	Zahra, 1996a	JBV
Hult, Hurley & Knight, 2004	IMM	Ramaswamy, 2001	SMJ	Zahra, 1996b	AMJ
Hult, Hurley, & Knight, 2004	IMM	Ramos-Gorza, 2009	JBR	Zahra, Neubaum & El-Hagrassey, 2002	ETP
Huselid, Jackson & Schuler, 1997	AMJ	Rauch & Frese, 1998	FER	Zahra, Neubaum & Huse, 2000	JM
Irwin, Hoffman, & Geiger, 1998	IJOA	Rauch, Frese, Wang & Unger, 2010	TR	Zhan & Luo, 2008 ^c	MIR
Jantunen, Puumalainen, Saarenketo, & Kyläheiko, 2005	JIE	Rauch, Frese, Wang & Unger, 2010	TR	Zhang, 2006	JMI
Jauch, Osborn, & Glueck, 1980	SMJ				

ACR=Advances in Competitiveness Research, AMJ=Academy of Management Journal, AOM=Academy of Management Best Paper Proceedings, APJM=Asia-Pacific Journal of Management, ASQ=Administrative Science Quarterly, BJM=British Journal of Management, Diss=Dissertation, EMJ=European Management Journal, ERD=Entrepreneurship and Regional Development, ETP=Entrepreneurship Theory & Practice, FER=Frontiers of Entrepreneurship Research, IBR=International Business Review, IJCM=International Journal of Commerce and Management, IJEI=International Journal of Entrepreneurship and Innovation, IJHTA=International Journal of Hospitality and Tourism Administration, IJM=International Journal of Management, IJOA=International Journal of Organizational Analysis, IJHRM=International Journal of Human Resource Management, IMM=Industrial Marketing Management, ISBJ=International Small Business Journal, JAAB=Journal of the American Academy of Business, JABR=Journal of Applied Business Research, JBE=Journal of Business Ethics, JBL=Journal of Business Logistics, JBR=Journal of Business Research, JBS=Journal of Business Strategies, JBV=Journal of Business Venturing, JDE=Journal of Developmental Entrepreneurship, JEC=Journal of Enterprising Culture, JEP=Journal of Economic Psychology, JIBS=Journal of International Business Studies, JIM=Journal of International Management, JIMark=Journal of International Marketing, JM=Journal of Management, JMI=Journal of Managerial Issues, JMS=Journal of Management Studies, JOB=Journal of Organizational Behavior, JOCM=Journal of Organizational Change Management, JPIM=Journal of Product Innovation Management, JSBM=Journal of Small Business Management, MBR=Multinational Business Review, MIR=Management International Review, ML=Marketing Letters, MS=Management Science, MT = Master's Thesis, OS=Organization Science, OrgStud=Organization Studies, POM=Production and Operations Management, SAM=SAM Advanced Management Journal, SBE=Small Business Economics, SBR=Schmalenbach Business Review, SIJ=Service Industries Journal, SMJ=Strategic Management Journal, T=Technovation, TASM=Technology Analysis & Strategic Management, TR=Technical Report, WP=Working Paper.