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Entrepreneurial Orientation and International Performance: The Moderating Effect of Decision-Making Rationality

Abstract

This research examines how entrepreneurial orientation (EO) influences international performance (IP) of the firm taking into account the moderating effect of decision-making rationality (DR) on the EO-IP association. Such an investigation is significant because it considers the interplay of strategic decision-making processes supported by the bounded rationality concept in the entrepreneurship field. Drawing from a study on activities of 216 firms in the USA and UK, the evidence suggests that DR positively moderates the EO-IP association. The findings suggest that managers can improve IP by combining EO with rational (analytical) processes in their strategic decisions.

Keywords

Entrepreneurial orientation, strategic decisions, decision-making rationality, international performance, moderation effect

Introduction

How does being rational (analytical) when making major decisions affect the entrepreneurial firm's performance? Practitioner writings tend to be rather ambivalent on this answer. On the one hand, rationality can 'reduce waste of time, money and potential' that would be spent on unsuccessful solutions; but, on the other hand, intuitiveness may be associated with powerful motivation, generation of creative solutions and potentially huge wins of entrepreneurial firms (e.g. Meyer, 2013; Wali, 2013). The objective in this paper is to provide evidence on this issue that has significant managerial and research implications.

The strategic decision-making literature (Dean and Sharfman, 1996; Elbanna and Child, 2007; Walter et al., 2012) approaches 'procedural rationality' as an organizational process that top management may undertake to come up with solid decisions. The emphasis in this literature is on high-level managerial involvement in major (strategic) decisions that involve substantial commitment of resources. These decisions have seemingly remained unexplored in the entrepreneurship field that has attempted primarily to identify how entrepreneurs, rather than top management teams, seek to identify opportunities (e.g. Shane, 2012). Nonetheless, following the identification of opportunities, firms should also evaluate different strategic decisions collecting information and evaluating dissimilar options. Thus, there appears to be a void in the entrepreneurship literature on the influence of organizational processes that impact on the entrepreneurial orientation (EO) – performance association (Lumpkin and Dess; 1996; Slevin and Terjesen, 2011; Wiklund and Shepherd, 2003). EO in this study encompasses

the three variables that are typically used to capture entrepreneurial orientation, namely innovativeness, proactiveness and risk-taking (Rauch et al., 2009).

One major organizational process is decision-making rationality (DR). Strategic decision-making process study draws from research on bounded rationality (Simon, 1978), which considers rational choice in the decision-making process. In the entrepreneurship field, Brinckmann et al. (2010: 25) state that ‘there appears to be a planning euphoria in the entrepreneurship domain’, suggesting that the combination between EO and rationality could influence the performance of the firm. The context of the current examination is the international activities of the firm since these normally present a high level of complexity to management of the firm, rendering the role of strategic decision-making particularly crucial. Wrong strategic decisions in the internationalization context can be detrimental given the lack of knowledge and likely high risk for the firm. Therefore, we study how the EO-DR combination affects international performance (IP) of the firm. DR is operationalized through the degree to which the top management of the firm searches and analyzes relevant information when making strategic decisions for its ventures abroad; and, employs a systematic process with quantitative techniques in these decisions (Dean and Sharfman, 1996).

The present study contributes to the entrepreneurship literature in that it links EO to the bounded rationality notion associated with DR. Rationality effectively serves as the process moderator affecting the EO-IP association; and, its use enriches the ‘strategic process consideration’ (Covin et al., 2006: 72) that may be implemented to a larger extent to advance understanding of EO (Lumpkin and Dess, 2001). In essence, this examination

argues that the value of EO for IP of the firm depends also on the level of rationality top management employ. In doing so, the current investigation is seemingly the first study that identifies DR as a missing link between EO and IP for strategic decisions in the entrepreneurship literature. This study extends the emerging theme of opportunity alertness and identification in the entrepreneurship field.

This paper is structured as follows. The second section investigates the research background to this study related to DR and advances its two research hypotheses. The third section explores methodological details. The fourth section presents the results of the analysis, while the fifth section discusses the findings. The concluding section outlines the implications of this study for theory and management practice; and, its limitations and future research directions.

Theoretical background and research hypotheses

The concept of decision-making rationality

The strategic decision-making process literature draws from the behavioral theory of the firm (Cyert and March, 1963), which stresses the multiple goals of top managers in setting objectives for their firm. DR has attracted a significant share of attention in this field (Elbanna, 2006; Elbanna and Child, 2007; Klingebiel and De Meyer, 2013; Papadakis et al., 1998). Definitions of rationality used in these studies vary. The neoclassical economics view, which considers the top management team as actors possessing full information, is challenged by the *bounded rationality* comprehension of

rationality. Bounded rationality violates this information and utility maximization assumption, and links DR to behaviors that are legitimate in pursuing goals ‘which are good enough rather than the best’ (Eisenhardt, 1997: 1). Bounded rationality can involve aspects of rationality such as sequential attention to objectives, quasi-resolution of conflict and satisficing (Simon, 1947, 1957). The acknowledgment of the bounded rationality concept shifts emphasis from the study of neoclassical economic models to that of organizational settings and essentially a more realistic portrayal of strategic decision-making.

In line with this bounded rationality approach in strategic decision-making process (Dean and Sharfman, 1996; Elbanna and Child, 2007; Walter et al., 2012), the current study uses procedural rationality to measure DR, which is the extent to which the decision-making process makes the best decision possible under given circumstances. Procedural rationality reflects the synoptic formalism or comprehensive planning model (Anderson, 1983; Grant and King, 1979). The opposite of a rational strategic decision-making process is the purely intuitive one. Intuition is ‘a mental process based on a “gut feeling” as opposed to explicit, systematic analysis, which yields an intuitive insight or judgment that is used as a basis for decision-making’ (Elbanna et al., 2013: 150).

The entrepreneurship literature has paid considerable attention to how opportunities are discovered. Some researchers suggest that opportunities become apparent to entrepreneurs who possess knowledge on acquiring, translating and employing sources of information (Anokhin et al. 2011; Eckhardt and Shane 2003). However, other scholars assert that entrepreneurs realize opportunities through active

search (Sarasvathy et al., 2003; Shane 2003). Social interaction with entrepreneurial stakeholders has a predominant role in this search (Chiles et al., 2007). Nonetheless, it may be that opportunities are both found and enacted (Venkataraman et al., 2012), and thus, these two viewpoints are not mutually exclusive. During this opportunity discovery process, entrepreneurs can engage in both causation and effectuation processes (Sarasvathy, 2001). This literature seemingly underlines solely what individual entrepreneurs, rather than top management teams, do in order to become alert to opportunities; and, more significantly, tends to disregard what happens to decision-making following the identification of opportunities, notably how such teams make strategic decisions when substantial level of resources are involved. This is especially true for small enterprises that face a liability of smallness and the resources they possess are limited.

In a similar vein, the international entrepreneurship and international business studies do not pay considerable attention to the *evaluation* of critical opportunities, notably strategic decision-making abroad. Researchers acknowledge that EO can be instrumental to the exploitation of opportunities, its strategy and performance abroad (McDougall and Oviatt, 2000; Oviatt and McDougall, 2005). EO is a strategic orientation that reflects the organizational processes (such as DR), which the firm employs when acting entrepreneurially (Lumpkin and Dess, 1996; Wiklund and Shepherd, 2003). A part of the international business literature, for example the transaction-cost approach, is largely influenced by neoclassical economics when it comes to strategic decisions abroad (Aharoni et al., 2011; Buckley et al., 2007). However, in line with the bounded rationality approach, it is acknowledged that personal values and cognitive capabilities of the top

management team substantially affect whatever rational point of view is adopted (Hutzschenreuter et al., 2007). Attempting to test explicitly the rationality concept in the internationalization context, Wennberg and Holmquist (2008) report evidence that entrepreneurial firms follow a bounded rationality process that is triggered by performance feedback. Despite the decisive role of management teams to enterprise internationalization (Coombs et al., 2009; Wheeler et al., 2008), there is seemingly insignificant emphasis on how rational their strategic decision-making processes should be (Aharoni, 2010; Nielsen and Nielsen, 2011).

Decision rationality and international performance

Empirical studies in the strategic decision-making field generally report a positive relationship between DR and firm performance (Fredrickson and Mitchell, 1984; Goll and Rasheed, 1997; Priem et al., 1995). Miller (2007) posits that this may be because rational processes assist decision makers cope effectively with the complexity associated with strategic decisions, reduce some of the impacts of cognitive biases and enhance implementation motivation among the top management team. The positive association between rationality and effectiveness is also established in strategic decision-making studies that use decision effectiveness rather than performance of the firm as the unit of analysis (Dean and Sharfman, 1996; Elbanna and Child, 2007). Internationalized firms that engage in analytical planning are likely to have the ability to achieve an alignment between organizational resources and critical opportunities (Shoham, 1999). A relatively

recent literature review in the small firm internationalization field (Wheeler et al., 2008) further suggests a strong link between DR and IP. Consequently:

Hypothesis 1: DR is positively associated with IP.

Entrepreneurial orientation, decision rationality and international performance

Recent literature reviews suggest that EO enhances performance of the firm in general (Rauch et al., 2009) and in the international marketplace in particular (Covin and Miller, 2013). However, it may be that this positive relationship is not universal; and, in particular contexts it can be non-significant or even negative (e.g. Frank et al., 2010). This consideration begets the need for the simultaneous examination of other variables affecting this relationship. As regards DR, Slater and Narver (1995) support the view that systematic rational analysis is likely to enhance performance of entrepreneurial firms in two ways. First, it reduces the chances that these firms will move too quickly to exploit subsequent critical opportunities without reaping all benefits linked to their current opportunities. Second, it also increases the prospects for generative learning that encourages more radical innovative products and services. In addition, Shane and Delmar (2004) find that entrepreneurial firms are less likely to fail if they engage in detailed analysis and planning before commencing strategic activities. This is because the time span between planning and feedback in entrepreneurial firms is much shorter than that in conservative organizations. Covin et al. (2006) further suggest that entrepreneurial firms have more chances to analyze and capture information about what should be done to

successfully make new critical efforts, and apply effectively the lessons learned in the future. It appears that when entrepreneurial firms offering innovative products follow rational routines they can achieve superior market performance (Hammedi et al., 2011). Even when firms choose to stay with an old technology they may behave entrepreneurially and proactively toward competition if they perform a rational analysis (Adner and Snow, 2010). In a nutshell, all this evidence supports the argument that strategic entrepreneurial activities can lead to enhanced performance when they are facilitated by rational decision-making (Chwolka and Raith, 2012).

DR in international entrepreneurial firms is also important inasmuch as it facilitates internalization of information on external markets required for the small firm to be successful abroad (Liesch and Knight, 1999). This internalization of information reduces uncertainty encountered in the international environment as far as strategic decisions are concerned. Jones et al. (2011) in their recent literature review on international entrepreneurship further argue in favor of a positive involvement of analytical decision-making on effective internationalization. Hence:

Hypothesis 2: DR moderates the association between EO and IP: IP increases with EO but at a faster rate for those firms distinguished by DR.

Methodology

Sample and data quality

A two-country mail survey was carried out in the USA and UK, which are two large markets characterized by Anglo-Saxon cultural values (Hofstede, 2013). Target firms should have employed between 10 and 250 persons; have been indigenously owned (not be subsidiaries of foreign firms); and, have international sales through exporting, joint venture or wholly owned subsidiary modes. The *Dun and Bradstreet* database was employed as the sampling frame to randomly select internationalized firms. This database is customarily used for firms that operate in these two countries.

To minimize potential effects of sample differences that are not relevant to the purposes of the study, efforts were made to ensure that the samples from the two countries were equivalent in terms of variables other than the ones under examination (Schaffer and Riordan, 2003). Our strategy was to ensure equivalence in key firm characteristics, namely age, industry and international experience as these characteristics could influence the variables under investigation (Ryan et al., 1999). To achieve this, we compared the profiles of firms in the US and UK sampling databases across these characteristics. The analysis of the means suggested homogeneity across these variables. Consequently, our efforts focused on reducing sampling bias by randomly selecting 750 firms from each country. Moreover, acknowledging that differences between samples may remain after applying a matching strategy, we statistically controlled for these characteristics (Greer and Stephens, 2001).

Data were gathered in the two countries during the same period and were collected through a structured questionnaire mailed to the CEO of the firm. The CEO was asked to complete the questionnaire or hand it to that manager who was best informed on

international activities of the firm. Managers were not required to state their names on completed questionnaires to protect anonymity. To safeguard interrater reliability, a second manager in the same firm was asked to fill the questionnaire in 10% of the sample, notably 22 firms.

Since data collection was carried out in two countries, a sequence of steps suggested by Johnson (1998) was followed to ensure that the procedures used for the execution of the survey were equivalent for the two countries. First, cultural experts from both the USA and UK were employed as judges for evaluating the appropriateness of specific survey items within their culture. Second, 'good question' wording practices were adopted to increase questionnaire comprehensiveness such as the use of specific rather than general terms and the employment of active rather than passive voice. The questionnaire was additionally pretested by twelve academics and managers to assess its clarity prior to the launch of the survey. The managers that participated in the pretesting were from the USA and UK and were similar to the respondents of the survey. To increase response rates, a cover letter, which was the same in the two countries, was included explaining the objectives of this research project and requesting cooperation. Also, a second wave of questionnaires was mailed to the firms three weeks after the dispatch of the first wave. Follow-up phone calls were conducted in between the two mailings.

The effective response rate was 15% (115 firms) in the USA and 13% (101 firms) in the UK. This yielded 216 firms as the total number of observations. To assess non-response bias in each country, comparisons of respondent firms with firms in the sample

across organizational characteristics, namely age, industry and international experience were conducted. The t-tests results yielded non-significant p - values ranging from 0.23 to 0.48. Furthermore, respondents to the first mailing were contrasted to respondents of the second mailing across these same organizational demographics for both countries. Again, no statistically significant differences were found as the p -values were above 0.31, thereby suggesting that non-response bias was not likely to be an issue (Armstrong and Overton, 1977).

To mitigate potential memory recall bias, respondents were asked to provide information on 'key internationalization projects' that took place within the last three years. These activities were defined as those ventures that involved significant commitment of resources abroad. Examples given in the questionnaire were *active* involvement in a *new* foreign country; or, transition to another foreign market servicing mode such as a joint venture and wholly owned subsidiary. The questionnaire was addressed to the manager who was best informed about the firm's international activities. Apart from owners, respondents were CEOs; and, general, export, international operations, marketing or sales managers. These respondent job titles, which are in line with those that Kumar et al. (1993) call 'major participants', indicate that respondents were involved in the strategic decision-making process of international activities. Checks of responses across different job titles showed no evidence of inconsistencies of responses. Data were also tested for consistency by comparing the responses between the two managers in the firms where a second key respondent completed the questionnaire. In these responses, 91% were within one interval or less, a result that provides evidence for strong interrater reliability between the two managers (Shortell and Zajac, 1990).

To further control for common method variance, the suggestions of Podsakoff et al. (2003) were followed. To analyze, the questionnaire items were based on previously developed scales; the order of the questions was reversed for some of the items; and, twelve academics and managers had checked the items. The questions pertaining to EO, DR and IP were placed in different sections and pages of the questionnaire so that respondents could not make a connection between independent and dependent variables. In addition, modeling in this study considers interaction effects, which rendered it difficult for the respondent to make any link between variables (Chang et al., 2010). A post-hoc investigation, Harman's one-factor analysis was additionally employed. Out of the five factors that emerged, the largest factor could explain only 24% of the variance, suggesting the absence of a single factor (Podsakoff et al., 2003). As shown in the Appendix, exploratory (EFA) and confirmatory factor analyses (CFA) further verified the construct validity for all perceptual measures. Collectively all these actions indicate that common method bias was not likely to be a source of concern in the current study.

Measures

The measures used for this model and the sources from which they are drawn from are presented in the Appendix. In relation to the dependent variable IP, we relied on subjective rather than objective measures for two reasons. First, subjective assessments capture more accurately the multidimensional character of performance as opposed to financial ratios that represent more narrow measures (Venkatraman and Ramanujam, 1986). Second, it is very difficult to access objective performance data in small firms

(Escriba-Esteve et al., 2008). This is particularly true for international performance data since firms are not required to publicly report separately their international activities. In a recent review on EO, Rauch et al. (2009) report that self-perceived performance indicators are not problematic and common method bias is not a concern when capturing performance. Nevertheless, to validate subjective performance measures, we collected international sales ratios from the *Dun and Bradstreet* database for a subsample of the firms that participated in the study (63 firms or 29%). The strong significant correlation coefficient of 0.52 attests to the positive association between objective and subjective international performance measures.

Seven control variables were employed in this study. The first two variables were firm size and age, which are likely to influence IP (Bausch and Krist, 2007; Moen, 1999). Size was measured by the logarithm of the number of employees, while age by the logarithm of the number of years in operation. Two other control variables were used to account for the degree of internationalization of the firm, which is a multifaceted construct (e.g. Sullivan, 1994). These were international experience of the firm that was measured by the logarithm of the number of years the firm had international activities; and, the mode of international market activities, which was a binary variable indicating whether the firm used only exports (coded as 0) or also advanced entry modes (licencing/franchising, joint venture/strategic alliance, wholly owned subsidiary; all coded as 1) in its foreign markets. Two other control variables pertained to dimensions of the environment of the firm, namely environmental dynamism and hostility. These can influence IP of the firm (Cadogan et al., 2009; Luo and Peng, 1999). The operationalization of these variables appears in the Appendix. The last control variable

captured whether the firm operated in manufacturing (coded as 0) or services (coded as 1) sectors. The inclusion of this variable is in accord with the evidence suggesting that activities in different sectors may affect IP (e.g. Contractor et al., 2003).

Results

Measurement invariance

To ensure that it is suitable to apply the measures used in this study to both countries involved, multi-group CFA was conducted to assess measurement invariance (Hult et al., 2008; Steenkamp and Baumgartner, 1998). This analysis allowed us to remove the national-level variance from the conceptual model, and thus, test a culture free theoretical model (cf. Cadogan, 2010). In the context of the multi-group CFA, configural and metric invariance of all constructs were examined (cf. Steenkamp and Baumgartners, 1998). We found similar patterns of factor loadings and adequate model fit in the two countries for all examined constructs. The model fit was assessed through four indices, notably the comparative fit index (CFI), the non-normed fit index (NNFI), the standardized root mean square residual (SRMR) and the root mean square error of approximation (RMSEA) (Hu and Bentler, 1999). Larger values of CFI (0.90) and NNFI (0.90) as well as smaller values of SRMR (0.08) and RMSEA (0.06) indicate a better level of model fit. The results of this analysis, which suggest the existence of configural invariance, are presented in Table 1.

Insert Table 1

The base model was a configural invariance model with no equality constraints, whereas the obtained model was a metric invariance model in which constraints were set so that the factor loading matrix could be invariant across the two countries. No significant increase was reported between the configural and the metric invariance model for all the constructs examined. The results of this examination, which suggest the existence of metric invariance, are summarized in Table 2.

Insert Table 2

Overall, the results of the undertaken analyses indicate the existence of measurement invariance for all multi-item variables of this study. As regards the construct validity of these variables, we followed the process suggested by Spanos and Lioukas (2001), which involved tests of unidimensionality (Appendix), reliability and convergent validity (Table 3), and discriminant validity (Table 4). The results of this process overall suggest satisfactory construct validity. To verify the unidimensionality, we examined the significance of factor loadings in both EFA and CFA and the model fit in CFA for each construct. Factor loadings and model fit values in the Appendix are significant for all constructs. Construct reliability, which was assessed by computing the composite reliability estimates and the Cronbach's alpha coefficients, is deemed satisfactory (Table 3). Moreover, convergent validity was examined by calculating the indexes of variance extracted, that is the amount of construct variance relative to measurement error. All constructs exceed the benchmark value of 50%, which provides evidence of convergent validity (Fornell and Larcker, 1981). Also, discriminant validity was assessed by comparing two CFA models, notably one constrained model and one

unconstrained model, which pertained to the same conceptual domain (in our case the environment, Venkatraman, 1989). Significant difference in the X^2 of the two models provides support for discriminant validity. Table 4 shows that " X^2 is significant at $p < 0.01$.

Insert Tables 3 and 4

Descriptive and correlation statistics, and hypotheses testing

Table 5 reports the descriptive statistics and correlation coefficients for all variables of this study. The results suggest that multicollinearity is not an issue in this study given that all correlation coefficients are below 0.392; the values of the variance inflation factors are lower than the threshold value of 10; and, the tolerance values for all regression variables are higher than the threshold value of 0.10 (as suggested by Hair et al., 1998).

Insert Table 5

The hypotheses of this research were tested through OLS hierarchical regression models. The results of the current study are shown in Table 6. Model A analyzes the effect of control variables and DR on IP, Model B considers the extra effect of EO, while Model C examines the additional interaction effect between EO and DR. All models are statistically significant and the addition of extra variables considerably improves the variance explained as indicated by " R^2 .

Insert Table 6

DR has a significantly positive coefficient ($p < 0.01$) in all models. It appears that engagement in intensive information analysis and search in strategic decision-making is crucial to enhanced IP. This evidence provides support to Hypothesis 1. EO has also a consistently positive effect on IP ($p < 0.05$), which indicates that firms that exhibit an innovative, risk-taking and proactive behavior can enjoy high levels of IP. The addition of the EO*DR interaction term in Model C is associated with a positive effect on IP ($p < 0.01$). In order to evaluate this moderating effect, we plotted the simple slopes of the interaction. Figures 1 illustrates this interaction effect by showing the regression lines between EO and IP for low DR ($-1 \times \text{Standard Deviation}$) and high DR ($+1 \times \text{Standard Deviation}$). Following Aiken and West (1991), these slopes were computed from the coefficients derived from the regression equation $IP = b_1 + b_2 \times EO + b_3 \times DR + b_4 \times \text{interaction}$. The slopes are highly significant ($p < 0.001$). Collectively, this evidence provides strong support to Hypothesis 2. Entrepreneurial firms that pursue rational decision-making in strategic decisions are more likely to achieve enhanced IP than those following intuitive processes. To the best of our knowledge, this is the first study providing evidence in favor of such a relationship.

Insert Figure 1 here

There are two control variables that present consistently highly significant results in the regression analysis. First, younger firms are associated with higher IP ($p < 0.05$), which is a finding likely to be attributed to their increasing focus on growth (Zhou et al., 2010). Second, international experience exhibits a positive effect on IP ($p < 0.05$). As

internationalized firms accumulate more experience abroad, they are more likely to become successful in the international marketplace (Johanson and Vahlne, 1997)

Robustness analysis

As EO is facilitated through the rational decision-making process, it may be that the EO effects on performance are channeled through these decision-making process characteristics. In the complex internationalization context, EO may influence IP through DR. Therefore, we investigated a model where DR mediates the EO-IP relationship. To assess this model, we followed Baron and Kenny's (1986) methodology for testing for mediation effects. These authors stipulate three criteria for testing these effects, which in our case are: 1) EO has a significant effect on IP, 2) EO has a significant influence on the mediating variable DR, and 3) a previously significant EO-IP relationship is no longer significant in the presence of DR. These criteria were tested using OLS regression analysis as shown in Table 7. Model A indicates a positive and significant effect of EO on IP ($p < 0.05$), which is in line with our earlier finding. EO has a significant and positive effect on DR ($p < 0.05$) in Model B. However, Model C indicates that the third criterion is not valid. The EO effect on IP is still significant ($p < 0.05$) in the presence of DR. These findings suggest there is no sufficient evidence that DR mediates the EO-IP relationship, and so, this result strengthens the finding of Hypothesis 2 linked to the investigated moderating effect.

Insert Table 7

Discussion

The findings of our research support both our hypotheses. DR is positively associated with IP (Hypothesis 1) in line with the premise of the bounded rationality concept. At first sight, this evidence might appear to contradict some findings that analytical decision-making is problematic as it can slow down entrepreneurial action and hinder identification of opportunities (Allinson et al., 2000; Kor et al., 2007). Nevertheless, it appears that DR, when examined in the context of *evaluation* of critical opportunities, enhances performance of the small firm abroad. This positive effect is found despite that DR is likely to be constrained by uncertainty, problem complexity, limited information-processing capacity and social interaction of the managers. In the entrepreneurship literature there is some evidence concerning these restricting factors to DR, such as social interaction (e.g. Lechler, 2001); and, the present research adds to this evidence.

Moreover, our findings suggest that when EO is coupled with DR, performance of the firm is enhanced (Hypothesis 2). Entrepreneurial firms that pursue rational decision-making in strategic decisions are more likely to achieve enhanced IP than those following intuitive processes. In that respect, our results illuminate the entrepreneurship theory through the argument that the match of EO, which can be viewed as a bundle of fundamental resources and capabilities of the firm, with appropriate processes is valuable to the attainment of the firm (Thorgren et al., 2012; Welter, 2011). To the best of our knowledge, this is the first time that this assertion is made in the entrepreneurship

literature in relation to the combination of EO *and* DR that proves to be a strategic process affecting positively performance of the firm. Going one step further, the evidence of the insignificant mediation results strengthens the view that DR is not the channel toward performance but rather the facilitator of performance in entrepreneurial firms.

By endorsing bounded rationality of the top management team in small firms, the findings of the present study further allude to the fact that when it comes to the critical opportunity evaluation stage it is the group of managers that has to be taken into account. Traditional entrepreneurship research still considers EO and performance of the small firm as predominantly the manifestation and achievement of a sole entrepreneur (Chowdhury, 2005). The impact of the sole entrepreneur is obvious in many works in this field (Groves et al., 2011; Kisfalvi, 2002). Moving away from this research emphasizing the role of individual entrepreneurs in decision-making process, our results are in line with those of some recent articles that it is the top management team of the small firm rather than the entrepreneur that make crucial decisions (Chowdhury, 2005; Lechler, 2001; West, 2007). Viewed in this light, the findings of the present research argue that when it comes to evaluation of critical opportunities it is entrepreneurial teams, rather than sole individuals, who have to implement analytical group decision-making processes. This is what the strategic decision-making process literature would posit, hence enriching the entrepreneurship field. This result is however derived from activities of small firms, and so, it complements the strategic decision-making process field that has emphasized the activities of large organizations.

Conclusions

The findings of this study inform the entrepreneurship literature as they provide evidence in favor of the implementation of DR in strategic decisions of the entrepreneurial firm. Extending the current opportunity literature, we investigated what happens after major opportunities have been identified; and, seemingly for the first time makes a plea for top management teams rather than individual entrepreneurs to act rationally (analytically) when evaluating these opportunities. Also, the current study contributes to the understanding of the appropriate strategic decision-making context that facilitates EO. Viewed in this light, it enlightens the entrepreneurship literature that makes pleas for such contextual investigations (Covin et al., 2006).

In relation to the international entrepreneurship field, the employment of the bounded rationality concept in entrepreneurial firms follows the pleas that related concepts and theories have to be included to a higher extent to explicate enterprise internationalization (Coviello et al., 2011; Jones et al., 2011). This also addresses the request that strategic decision-making concepts should be used in major decisions of internationalized firms (Dimitratos et al., 2011; Nielsen and Nielsen, 2011).

Managers of entrepreneurial firms are advised to involve analytical processes in strategic decision-making. The findings suggest that investing resources, effort and time to collect and scrutinize information when making strategic decisions in these enterprises does not 'create waste'; but is a valuable activity. Such a systematic analysis of critical opportunities facilitates the benefits of EO by enabling top managers to evaluate effectively major opportunities identified.

A limitation of the present research that future studies can address refers to the fact that it occurred at a single point in time. Such an examination cannot uncover cause-and-effect associations between variables. The investigation of the moderating effect of DR on the EO-IP relationship may benefit from a longitudinal research design. In addition, given that this research did not occur at the time strategic decisions were made to actually observe the decision-making process might introduce recall bias to the findings. Future study is likely to use techniques including experimental design and simulation to possibly overcome this bias.

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Table 1. Confirmatory factor analysis for the USA and UK

		df	X ²	CFI	NNFI	SRMR	RMSEA
<i>EO</i>							
	USA	20	71.489	0.917	0.944	0.076	0.050
	UK	20	62.550	0.915	0.941	0.077	0.046
<i>DR</i>							
	USA	2	7.482	0.982	0.945	0.025	0.055
	UK	2	15.745	0.901	0.904	0.064	0.052
<i>IP</i>							
	USA	5	64.299	0.902	0.895	0.076	0.060
	UK	5	59.076	0.923	0.911	0.070	0.058
<i>Environment</i>							
	USA	8	21.891	0.964	0.933	0.057	0.060
	UK	8	19.593	0.971	0.946	0.049	0.045

Table 2. Comparisons between configural and metric models

	df	χ^2	<i>p</i> -value
EO	7	9.093	0.246
DR	3	0.042	0.998
IP	12	19.808	0.071
Environment	4	1.805	0.772

Table 3. Reliability and convergent validity tests

	Construct reliability	Cronbach's alpha	Variance extracted
EO	0.840	0.820	0.520
DR	0.820	0.843	0.638
IP	0.826	0.866	0.587
Env Dynamism	0.728	0.775	0.516
Env Hostility	0.709	0.700	0.473

Table 4. Discriminant validity

Pair of Constructs ($\lambda = 1$)	
Environment	
Dynamism vs. Hostility	χ^2 (df=12)=32.102 ($p^1=0.005$)
Base Model (Unconstrained)	χ^2 (df=8)= 17.101

¹Denotes the significance of χ^2 difference between the constrained and the unconstrained model

Table 5. Descriptive statistics and correlations among variables

Variable	Mean	S.d.	1	2	3	4	5	6	7	8	9
1. IP	3.16	0.803	1								
2. EO	3.01	0.705	0.208***	1							
3. DR	3.56	0.922	0.335***	0.314***	1						
4. Size (log)	1.74	0.424	0.201***	0.088	0.194***	1					
5. Age (log)	1.45	0.307	-0.043	-0.130	0.001	0.357***	1				
6. Intl Experience (log)	1.27	0.282	0.096	-0.060	0.092	0.290***	0.352***	1			
7. Intl Mode	0.44	0.498	0.127*	0.193**	0.158**	0.094	-0.244***	-0.196***	1		
8. Env Dynamism	2.85	0.725	0.100	0.392***	0.194***	0.024	-0.081	0.024	0.307***	1	
9. Env Hostility	2.93	0.743	-0.029	-0.018	0.024	0.083	0.000	0.026	0.284***	0.258***	1
10. Sector	0.26	0.442	0.145**	-0.015	0.010	-0.005	-0.183***	-0.156**	0.216***	0.173**	0.129

*** $p < .01$ level (two-tailed); ** $p < .05$ level; * $p < .10$ level.

Table 6. Hierarchical OLS regression on IP

	Model A	Model B	Model C
Size	0.115*	0.105*	0.108*
Age	-0.269**	-0.248**	-0.256**
Intl Experience	0.223**	0.217**	0.211**
Intl Mode	0.033	0.021	0.012
Env Dynamism	0.004	-0.037	-0.027
Env Hostility	-0.128*	-0.100*	-0.102*
Sector	0.129*	0.152**	0.145*
DR	0.258***	0.238***	0.225***
EO		0.115**	0.170**
EO*DR			0.304***
<hr/>			
R ²	0.196	0.221	0.259
Adjusted R ²	0.163	0.190	0.218
” R ²		0.025**	0.038***

*** $p < .01$; ** $p < .05$; * $p < .10$; standardized regression coefficients are reported

$n = 216$

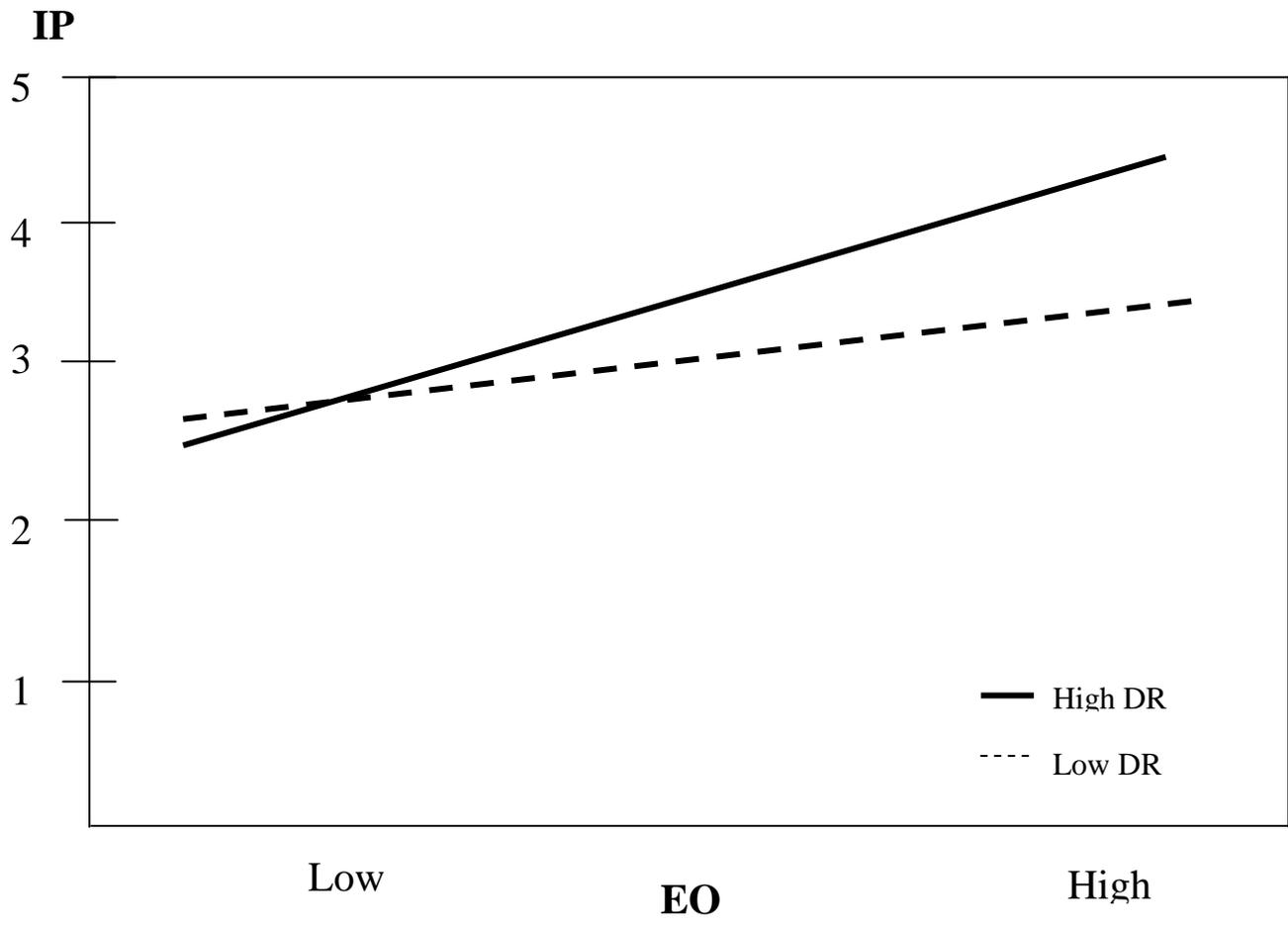
Table 7. OLS regression analysis – testing for DR mediation

	IP	DR	IP
	Model A	Model B	Model C
Size	0.149*	0.188**	0.105*
Age	-0.279**	-0.132*	-0.248**
Intl Experience	0.262***	0.189*	0.217**
Intl Mode	0.040	0.081	0.021
Env Dynamism	-0.004	0.136*	-0.037
Env Hostility	-0.120*	-0.042	-0.100*
Sector	0.147*	-0.020	0.152**
EO	0.162**	0.197**	0.115**
DR			0.238***
<hr/>			
R ²	0.153	0.164	0.221
Adjusted R ²	0.136	0.124	0.190

*** $p < .01$; ** $p < .05$; * $p < .10$; standardized regression coefficients are reported

$n = 216$

Figure 1. The moderating effect of DR on the EO-IP association



Appendix.

Measures (and tests of unidimensionality for the overall sample) conducting Exploratory Factor Analysis (EFA)^[1]

	Variables				
	Entrepreneurial Orientation	International Performance	Rationality	Dynamism	Hostility
Sales level	.248	.688	.190	-.040	.210
Market share	.264	.694	.185	-4.65E-006	.231
Return on investment	-.038	.879	.076	.060	-.167
Profitability	-.085	.824	.074	.088	-.316
Overall satisfaction with performance relative to objectives set	.113	.815	.183	-.062	.022
Favors the marketing of tried and tested products vs. research and development, technological leadership and innovations	.600	-.030	.080	.308	-.246
Favors very few product introductions vs. very many product introductions	.641	-.099	-.007	.245	-.253

^[1] With the exception of the international performance variable, in all variables we dropped one item to adapt the original scales taking into account the idiosyncrasy of our sample. Specifically, in entrepreneurial orientation we dropped the item 'Favors cautious decisions vs. bold decisions in international markets', in decision rationality the item 'Characterize the whole decision-making process as intuitive', in environmental dynamism the item 'Demand and customer preferences are fairly easy to forecast (e.g. milk companies) vs. demand and customer preferences are almost unpredictable (e.g. high fashion goods)' and in environmental hostility the item 'Rich in investment and marketing opportunities vs. very stressful, exacting, hostile, very hard to keep afloat'. These items present low factor loadings (below .500) in both EFA and CFA. The remaining items present high factor loadings (above .500) while they also load lower on other factors than the threshold of .320 that Tabachnick and Fidell (2001) reported to be a good rule of thumb for the minimum cross-loading of an item.

Favors minor changes in product or service lines vs. major changes in product or service lines	.700	.137	-.054	.055	-.108
Favors low risk projects vs. high risk projects	.643	-.031	.229	.183	.160
Favors incremental-ranging behaviours vs. wide-ranging behaviours	.688	.065	.260	-.024	.021
Follows the moves of the competitors vs. initiates the moves of the competitors	.718	-.006	.114	.110	-.012
Seldom introduces new products vs. often introduces new products	.737	.232	.122	.043	.155
Follows a 'live-and-let-live' posture vs. an 'undo-the-competitors' posture	.763	.055	.022	.122	.255
Search relevant information (regarding competition, industry trends, customers, suppliers and collaborating firms at home or abroad) in making decisions	.175	.121	.864	.121	-.064
Analyze relevant information (regarding competition, industry trends, customers, suppliers and collaborating firms at home or abroad) before making decisions	.111	.101	.883	.074	-.054
Use quantitative techniques (e.g. budgeting) in making decisions	.016	.165	.707	-.071	.125
Are effective in taking into consideration relevant information (regarding competition, industry trends, customers, suppliers and collaborating firms at home or abroad)	.165	.123	.741	.137	.044
The firm rarely changes its competitive practices to keep up with the market and competitors vs. the firm must change its competitive practices extremely frequently (e.g. semi-annually)	.294	.125	.129	.660	.085
The rate at which products/services are becoming obsolete in the industry is very slow (as in e.g. basic metal like copper) vs. the rate of obsolescence is very high (as in e.g. fashion	.259	.008	.057	.711	.081

goods and semi-conductors)					
Actions of competitors are quite easy to predict (as in some primary industries) vs. actions of competitors are unpredictable	-0.034	-0.079	-0.002	.613	.024
The production/service technology is not subject to very much change and is well-established (e.g. in steel production) vs. the modes of production/service change often and in a major way (e.g. advanced electronic components)	.110	.069	.070	.756	.120
Very safe, little threat to the survival and well-being of the firm vs. very risky, one false step can mean the firm's undoing	.116	-.158	.148	.246	.768
An environment that the firm can control and manipulate to its own advantage, such as a dominant firm faces in an industry with little competition and few hindrances vs. a dominating environment in which the firm's initiatives count for little against the tremendous political, technological and competitive forces	-.239	.001	-.141	.222	.670

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

Measures (and tests of unidimensionality for the overall sample) conducting Confirmatory Factor Analysis (CFA)

Construct (source)	Items	First-order factor loadings
International performance (Sullivan, 1994)	Please rate the firm's international performance compared with that of your direct competitors over the past three years in terms of (1: much inferior ...5: much superior):	
	Sales level	0.791 ¹
	Market share	0.814
	Return on investment	0.831
	Profitability	0.750
	Overall satisfaction with performance relative to objectives set	0.753
Model Summary Statistics: $\chi^2 (5) = 3.245$; $p < 0.001$; CFI = 0.994; NNFI = 0.997; SRSR = 0.024; RMSEA = 0.015		

All loadings are significant at $p < .01$

¹Loading fixed to 1 for identification purposes

Items		
Entrepreneurial orientation	Please rate the extent to which the firm in the international marketplace... (1: the first sentence is valid ...5: the second sentence is valid):	
	Favors the marketing of tried and tested products vs. research and development, technological leadership and innovations	0.690 ¹
Innovativeness (Miller and Friesen, 1982)	Favors very few product introductions vs. very many product introductions	0.701
	Favors minor changes in product or service lines vs. major changes in product or service lines	0.639
Risk attitude (Naman and Slevin, 1993)	Favors low risk projects vs. high risk projects	0.653
	Favors incremental-ranging behaviours vs. wide-ranging behaviours	0.671
Proactiveness (Covin and Covin, 1990)	Follows the moves of the competitors vs. initiates the moves of the competitors	0.798
	Seldom introduces new products vs. often introduces new products	0.797
	Follows a 'live-and-let-live' posture vs. an 'undo-the-competitors' posture	0.797
Model Summary Statistics: $\chi^2(20) = 100.99$; $p < 0.001$; CFI = 0.933; NNFI = 0.970; SRSR = 0.075; RMSEA = 0.054		

All loadings significant at $p < .01$

¹Loading fixed to 1 for identification purposes

Items		
Decision	Please rate the extent to which management of the firm during the whole decision-making process in 'key internationalization projects'... (1: not at all ...5: very much):	
rationality		
	Search relevant information (regarding competition, industry trends, customers, suppliers and collaborating firms at home or abroad) in making decisions	0.903 ¹
	Analyze relevant information (regarding competition, industry trends, customers, suppliers and collaborating firms at home or abroad) before making decisions	0.924
	Use quantitative techniques (e.g. budgeting) in making decisions	0.661
(Dean and	Are effective in taking into consideration relevant information (regarding competition, industry trends, customers, suppliers and collaborating firms at home or abroad)	0.668
Sharfman, 1993)		
Model Summary Statistics: $\chi^2(2) = 6.652$; $p = 0.036$; CFI = 0.998; NNFI = 0.998; SRSR = 0.010; RMSEA = 0.006		

All loadings significant at $p < .01$

¹Loading fixed to 1 for identification purposes

		Items	
Environment	With regard to the environment in which the activities of your firm occur... (1: the first sentence is valid ...5: the second sentence is valid):		
Dynamism	The firm rarely changes its competitive practices to keep up with the market and competitors vs. the firm must change its competitive practices extremely frequently (e.g. semi-annually)		0.716 ¹
	The rate at which products/services are becoming obsolete in the industry is very slow (as in e.g. basic metal like copper) vs. the rate of obsolescence is very high (as in e.g. fashion goods and semi-conductors)		0.762
	Actions of competitors are quite easy to predict (as in some primary industries) vs. actions of competitors are unpredictable		0.655
	The production/service technology is not subject to very much change and is well-established (e.g. in steel production) vs. the modes of production/service change often and in a major way (e.g. advanced electronic components)		0.737
(Miller and Friesen, 1984)			
Hostility	The environment within which your firm functions is... (1: the first sentence is valid ...5: the second sentence is valid):		
	Very safe, little threat to the survival and well-being of the firm vs. very risky, one false step can mean the firm's undoing		0.740 ¹
	An environment that the firm can control and manipulate to its own advantage, such as a dominant firm faces in an industry with little competition and few hindrances vs. a dominating environment in which the firm's initiatives count for little against the tremendous political, technological and competitive forces		0.631
(Khandwalla, 1977)			

Model Summary Statistics: $\chi^2(13) = 33.222$; $p = 0.002$; CFI = 0.904; NNFI = 0.900; SRSR = 0.067; RMSEA = 0.055

All loadings significant at $p < .01$

¹Loading fixed to 1 for identification purposes

