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RESEARCH NOTES AND COMMUNICATIONS

RATIONAL DECISION-MAKING AND FIRM PERFORMANCE: THE MODERATING ROLE OF ENVIRONMENT

IRENE GOLL[1]* and ABDUL M. A. RASHEED[2]
[1]*School of Management, University of Scranton, Scranton, Pennsylvania, U.S.A.*
[2]*College of Business Administration, University of Texas at Arlington, Arlington, Texas, U.S.A.*

This study investigates the moderating roles of environmental munificence and dynamism in the relationship between process rationality and organizational performance. Based on a sample of 62 manufacturing firms, the study found that environmental munificence and dynamism moderate the relationship between rationality and performance. Further, the study found that rationality is strongly associated with performance in environments high in munificence and dynamism. © 1997 by John Wiley & Sons, Ltd.

The relationship between rationality in strategic decision processes and firm performance has been a subject of continuing controversy in the strategic management field. One school of thought favors the 'rational comprehensive' approach (Ansoff, 1965). Another feels that an 'incremental political' approach offers better descriptive accuracy and normative validity (Quinn, 1980). In recent years, the emphasis has moved away from a search for universal relationships that juxtapose these two ideal types to a focus on the context specificity of the rationality–performance relationship. Empirical research on the performance implications of the comprehensiveness of decision processes has yielded conflicting results. In a recent review of this literature, Rajagopalan, Rasheed, and Datta point out that 'most previous studies have focused on one aspect of the environment, namely, uncertainty or rate of change. However, there are two other critical aspects of a firm's operating environment, namely complexity and munificence which have received relatively little attention' (1993: 358).

This paper attempts to address this gap in past empirical research by investigating (a) the moderating role of environmental munificence, (b) the moderating role of environmental dynamism, and (c) the joint effect of munificence and dynamism in the relationship between rationality in strategic decision processes and organizational performance.

THEORETICAL BACKGROUND

Rationality–performance relationship

Organizational environment is a major source of contingencies faced by a firm (Tosi and Slocum, 1984). Environmental characteristics or properties have major implications for all aspects of management including strategy, structures, process,

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* Correspondence to: Professor Irene Goll, School of Management, University of Scranton, Scranton, PA 18510, U.S.A.

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and outcomes. Several theoretical arguments have been advanced suggesting that environmental context is a key determinant of the appropriateness of rational strategic decision processes. For example, Fredrickson and Mitchell (1984), Fredrickson (1984), and Fredrickson and Iaquinto (1989) advocate adoption of rational comprehensive processes in stable environments and their abandonment in dynamic environments. According to them, in a dynamic or uncertain environment, comprehensiveness is doomed to failure since the data are not available, relationships are not obvious, and the future is unpredictable. Comprehensive processes are time-consuming and in a fast-changing environment a slow decision-making process would be clearly inappropriate. Fredrickson (1984) and Fredrickson and Mitchell (1984) empirically demonstrated that rationality, represented by the comprehensiveness of the planning process, is positively related to performance in an industry with a stable environment and negatively related to performance in a dynamic environment. In a subsequent study of the same firms in the same two industries, Fredrickson and Iaquinto (1989) found that these relationships are stable over time and that comprehensiveness exhibits considerable inertia.

Theoretical arguments which suggest a precisely opposite set of relationships involving the moderating role of environmental dynamism in the rationality–performance relationship have been advanced by several authors. For example, Miller and Friesen argue that 'a dynamic environment must be studied more carefully and diligently to afford executives with an adequate degree of mastery' (1983: 223). Similarly, Eisenhardt (1989) found that successful decision-makers in high-velocity environments use more information, consider more alternatives, and seek a greater amount of advice. Instead of departing from the analytical requirements of comprehensive decision-making, they accelerate their cognitive processes. The quick decisions resulting from comprehensive decision processes lead to better performance. Further empirical support for this position is provided by Judge and Miller (1991), and Priem, Rasheed, and Kotulic (1995).

Although past empirical research has recognized the context specificity of the rationality–performance relationship, most of the theoretical interest and empirical effort have been focused on a single environmental dimension, namely dynamism or uncertainty. It is possible that some of the contradictions encountered in prior research are due to the failure to consider other equally important environmental dimensions such as environmental complexity and munificence (Dess and Beard, 1984). For example, environmental complexity may require the firm to employ greater rationality in its analysis in order to understand the numerous environmental elements and their interconnectedness. Research on cognitive processes suggests that high environmental complexity may lead to greater use of cognitive simplification processes such as selective perception, heuristics, and analogies, which in turn may affect strategic decision processes by potentially restricting the range of alternatives considered and the information used to evaluate them. Similarly, in munificent environments, organizations may have the resources needed to engage in comprehensive decision processes, but the decision-makers themselves may perceive less need to do so.

The contradictions encountered in the rationality–performance relationship are similar in many respects to the lack of consensus on the relationship between formal planning and financial performance (Pearce, Freeman, and Robinson, 1987). Formality of the planning system may often be indicative of the comprehensiveness of the planning process as well as rationality in decision-making processes. Recent meta-analyses (Miller and Cardinal, 1994; Schwenk and Shrader, 1993) show that the overall relationship between formal planning and performance across studies is positive and significant. Both of the studies, however, indicated that in order to explain the variance in the size of the effects, other moderating variables such as environmental characteristics may also be necessary. The preponderance of the results supporting a planning–performance relationship viewed in conjunction with the contradictory results on the comprehensiveness–performance relationship leads us to the following hypothesis:

Hypothesis 1: There is a positive relationship between decision rationality and firm performance.

Environmental munificence

As Rajagopalan et al. (1993: 359) point out, 'uncertain environments that are also munificent

(e.g., high growth industries in initial stages of industry evolution) are very different from uncertain environments which are far less munificent (e.g., mature industries with declining demand or increasing competition). Hence, the performance effects of comprehensiveness are likely to be different across these environments.'

Munificence refers to an environment's ability to support sustained growth of an organization (Aldrich, 1979; Dess and Beard, 1984). Castrogiovanni (1991) distinguishes among three different kinds of munificence: capacity, growth/decline, and opportunity/threat. Although empirical research investigating the impact of environmental munificence on organizational strategies, structures, and processes is limited, past research clearly points to its importance. Firms in nonmunificent environments have been found to be more likely to commit illegal acts (Staw and Swajkowski, 1975). Yasai-Ardekani (1989) found that under conditions of low munificence, firms respond to perceived environmental pressures by making structural changes. Similarly, Koberg (1987) found that greater environmental scarcity causes frequent administrative, personnel, and strategic changes as well as the adoption of organic structures. McArthur and Nystrom (1991) found environmental munificence to be a significant predictor of the strategy–performance relationship. Similar results are reported by Covin and Slevin (1989) who, in a study of small firms, found that in hostile environments an organic structure and an entrepreneurial strategic posture are positively associated with firm performance.

In hostile or nonmunificent environments, firms require the devotion of greater analytical effort to understand and master threats (Khandwalla, 1973). However, the scarcity of resources leads firms to avoid excessive risk-taking and pay greater attention to the conservation of resources. Miller and Friesen (1983) report that organizations respond to increased environmental hostility through strategy-making characterized by greater analysis and reduced innovation. The pervasive influence of munificence on organizational processes, structures, and strategies is thus well supported in research. This, combined with the well-established moderating role of environmental dynamism, leads us to the following hypothesis:

Hypothesis 2: Environmental munificence and dynamism moderate the relationship between process rationality and organizational performance.

One of the central debates in organizational theory and strategic management has revolved around the role of managerial choice (Astley and Van de Ven, 1983). The population ecology and resource dependence perspectives hold that organizational outcomes are mostly determined by environmental and inertial factors and managerial choices do not make a significant difference (Hannan and Freeman, 1977). On the other hand, proponents of the strategic choice perspective argue that managerial choices do make a difference to organizational outcomes (Child, 1972). Hrebeniak and Joyce (1985) suggested that choice and determinism are independent characteristics of the environment. Thus, there are environments which allow managers a high degree of choice and those that do not. In a similar vein, Hambrick and Finkelstein (1987) suggested the concept of managerial discretion. According to them, organizational environments vary in terms of the extent of managerial discretion they permit. In low-discretion environments, managerial decisions do not make much of a difference, but in high-discretion environments managerial decisions and actions can have a significant impact on organizational performance.

One of the major factors that determines the extent of managerial discretion is the degree to which the environment allows variety and change (Hambrick and Finkelstein, 1987). Recent empirical work suggests that the extent of managerial discretion may be constrained by the environment. Haleblian and Finkelstein (1993) found that the relationship between top management team (TMT) size, CEO dominance, and firm performance is significant in high-discretion environments but not in low-discretion environments. Similarly, Finkelstein and Hambrick (1990) found that TMT tenure is more strongly related to strategies and performance in high-discretion industries than in low-discretion industries. In their study of organizational growth in the semiconductor industry, Eisenhardt and Schoonhoven (1990) found that in environments that are simultaneously munificent and dynamic, managerial actions and decisions make the most difference. Finkelstein and Hambrick (1990) suggest that high-discretion environments are characterized, among several

other factors, by high demand growth rate and demand instability. A high demand growth rate corresponds to a high degree of environmental munificence and demand instability suggests environmental dynamism. In other words, environments characterized by high degrees of environmental munificence and dynamism can be viewed as high-discretion environments. Therefore in such environments, managerial decisions and actions, including a rational decision-making process, can be expected to have a greater impact on organizational performance. This leads us to our next hypothesis.

Hypothesis 3: Organizational rationality is more strongly associated with performance in high-discretion environments (that is high munificence and high dynamism) than in other types of environments.

METHODOLOGY

Sample and procedures

The sample for this study included the 645 largest manufacturing firms in the United States as identified in *Business Week* (1985). A survey approach was used to measure top management's emphasis on rational decision-making. All other data were collected from secondary data sources. A questionnaire was mailed to the Human Resource Vice President or, if unavailable, to the CEO in each firm. We reasoned that as a member of the dominant coalition, this executive is very familiar with the company's philosophy and might be more inclined to respond to a survey than, for instance, the CEO. The respondent was identified in Standard and Poor's (1985) and in Dun and Bradstreet (1985). Following a second mailing 4 weeks later, we received usable and completed questionnaires from 159 firms. Thus, the response rate was 25 percent. Responding and nonresponding firms were compared to test for the generalizability of the findings. There were no statistically significant differences between responding and nonresponding firms ($p > 0.05$) for the following: industry, profitability measured as return on sales and return on assets, and size measured as assets.

We then selected a subsample of our responding firms that were single and dominant businesses to control for industry effects. Compustat was then used to identify firms whose sales in one business segment were 70 percent or more of the total sales for the company. Out of the 159 responding firms, we identified 62 companies that were single or dominant businesses. Compustat was also used to identify the primary 4-digit SIC code for each of the 62 firms in our subsample.

Operationalization of variables

Rational decision-making

Respondents were asked to report on a scale of one (strongly disagree) to five (strongly agree) the extent to which the company explicitly emphasizes the following: (1) a systematic search for opportunities and problems, and a systematic consideration of costs and benefits when planning; (2) the strategic and long-term importance of participative decision-making at management levels; (3) the application of operations research techniques; (4) the explanation of proposed changes to those affected by them; (5) participative consensus-seeking decision-making with feedback; and (6) open channels of communication (Cronbach's alpha = 0.85). Our rational decision-making scale was adapted from Goll and Zeitz (1991) and Goll and Sambharya (1995). The scale reflects a conceptualization of rationality that goes beyond formal systematic planning and views rationality as a strategy-making mode.

Environmental munificence and dynamism

Following Dess and Beard (1984) and Rasheed and Prescott (1992), we measured munificence as the growth rate in the value of shipments which was operationalized as the regression slope coefficient of the value of shipments for the period 1975–84. Dynamism was measured as the variability in the value of shipments and operationalized as the standard error of the regression slope coefficient of the value of shipments divided by the industry mean for the period 1975–84. This operationalization corresponds to Milliken's (1987) notion of state uncertainty. Dynamism and munificence were calculated using industry-level data since both are industry-level constructs. The data used for these calculations was obtained from the *Census of Manufactures* (1987).

Firm performance

Firm performance was measured as return on assets (net income from continuing operations, excluding extraordinary items, divided by assets) and return on sales (net income from continuing operations, excluding extraordinary items, divided by sales) and collected from *Business Week* (1986, 1987) and Standard and Poor's *Stock Reports* (1986, 1987). The average ROA was computed for 1985–86 to avoid the possibility of erroneous inferences based on a single year's profit performance.

Analyses

We used moderated regression analysis and subgroup analysis to test our hypotheses. Our analyses follow the procedures for identifying moderator variables outlined by Prescott (1986). We controlled for size of the firm measured as sales for 1985 as this variable may be related to firm performance.

RESULTS

Table 1 shows the means, standard deviations, and Pearson product–moment correlations for all the variables. The correlations between rational decision-making and the performance measures are positive but not significant. Although this does not support Hypothesis 1, it suggests the need to examine the role of contextual factors as potential moderators of the relationship.

Next, we conducted a moderated regression analysis to determine if there is a significant interaction between the hypothesized moderators and predictor variables. Table 2 shows the moderated regression analysis for ROA. Model 1 shows the main effects whereas Model 2 adds the two-way interactions. The results for Model 1 show that the main effects are significant. Dynamism shows a significant negative relationship to ROA. Model 2 shows clear support for the moderating effect of environment on the relationship between rational decision-making and ROA. The R^2 increases from 0.20 (Model 1) to 0.54 (Model 2). Following Cohen (1968), we tested this increase in R^2 from Model 1 to Model 2 and found it to be highly significant ($p < 0.01$). Table 3 shows the moderated regression analysis results for ROS. The main effects in Model 1 were not significant. Again, the results show clear support for the moderating effect of environment as the R^2 increases from 0.12 (Model 1) to 0.26 (Model

Table 2. Results of regressing ROA on munificence, dynamism, and rational decision-making

	Beta coefficients	
Independent variables	Model 1	Model 2
Rational decision-making	−0.02	0.04
Munificence	−0.24	−7.06***
Dynamism	−0.35*	0.45
Rdm · Munificence	–	6.75***
Rdm · Dynamism	–	−0.68
Munificence · Dynamism	–	0.24
Size	0.22	−0.15
R^2	0.20	0.54
F	3.12*	7.99***

*$p \leq 0.05$; **$p \leq 0.01$; ***$p \leq 0.001$

Table 1. Means, standard deviations, and correlations

Variable	Mean	S.D.	1	2	3	4	5
1. Rational decision-making	3.75	0.78					
2. Munificence	2203.02	3641.25	−0.05				
3. Dynamism	0.01	0.01	0.14	0.44**			
4. Return on assets	0.03	0.12	0.20	−0.15	−0.18		
5. Return on sales	0.02	0.11	0.07	−0.03	−0.16	0.93**	
6. Size (sales)	5759.14	15263.87	0.20	0.39**	0.37**	0.06	0.05

*$p \leq 0.05$; **$p \leq 0.01$

Table 3. Results of regressing ROS on munificence, dynamism, and rational decision-making

Independent variables	Beta coefficients	
	Model 1	Model 2
Rational decision-making	0.22	–0.27
Munificence	–0.05	–3.14*
Dynamism	–0.30	–0.63
Rdm · Munificence	–	3.73**
Rdm · Dynamism	–	0.46
Munificence · Dynamism	–	–0.57
Size	0.10	–0.08
R^2	0.12	0.26
F	1.80	2.36*

*$p \leq 0.05$; **$p \leq 0.01$

2). Following Cohen (1968), we tested this increase and found it to be significant ($p < 0.05$).

In the second step of the moderated regression analyses, the relationships between the moderator variables (munificence and dynamism) and performance were examined. Table 1 shows no significant correlations between environment and performance, suggesting that environmental munificence and dynamism act as moderator variables that influence the form of the relationship between the predictor and criterion variables (see Prescott, 1986), thus lending support to Hypothesis 2. In the third step, we examined the relationships between rational decision-making and the moderator variables. If a significant relationship exists, rational decision-making acts as an antecedent variable (Prescott, 1986). Table 1 shows that these correlations are not significant. These findings further support environmental munificence and dynamism as moderators.

Finally, we developed subgroups by splitting the sample at the median on munificence and dynamism. Tables 4, 5, and 6 show the results for ROA and ROS. Table 4 shows a significant positive relationship between rational decision-making and both ROA and ROS in high-dynamism environments. Table 5 shows a positive relationship between rational decision-making and ROA ($p < 0.05$) and ROS ($p > 0.05$) in high-munificence environments. Consistent with Hypothesis 3, Table 6 shows a significant positive relationship between rational decision-making and

Table 4. Correlations between rational decision-making and firm performance broken down by high–low dynamism

High dynamism		Low dynamism	
ROA	ROS	ROA	ROS
0.52** (n = 29)	0.41* (n = 29)	–0.01 (n = 26)	0.04 (n = 27)

*$p \leq 0.05$; **$p \leq 0.01$

Table 5. Correlations between rational decision-making and firm performance broken down by high-low munificence

High munificence		Low munificence	
ROA	ROS	ROA	ROS
0.58** (n = 28)	0.32 (n = 29)	–0.15 (n = 27)	–0.12 (n = 27)

*$p \leq 0.05$; **$p \leq 0.01$

ROA as well as ROS in environments that are high in both munificence and dynamism, thus lending further support to Hypothesis 3.

DISCUSSION AND IMPLICATIONS

The results of our analyses provide support for the role of environmental munificence as a moderator of the relationship between strategy-making processes and organizational performance. Empirical results supported two of the three hypotheses. The results of this study, however, have to be interpreted bearing in mind some important limitations. The choice of data, research design and inference procedures involve several inevitable trade-offs. The strategy-making process is measured using the survey method which is not as fine-grained as in-depth case studies (Eisenhardt, 1989) or scenario construction (Fredrickson, 1984). However, the use of a large sample which includes a variety of industries enhances the generalizability of our findings. The sample was limited to large manufacturing firms. Hence the results may not necessarily be gen-

Table 6. Correlations between rational decision-making and firm performance broken down by munificence and dynamism

	Dynamism			
	High		Low	
Munificence	ROA	ROS	ROA	ROS
High	0.61** (n = 19)	0.52* (n = 19)	–0.27 (n = 9)	–0.05 (n = 10)
Low	0.10 (n = 10)	0.04 (n = 10)	–0.02 (n = 17)	–0.03 (n = 17)

*$p \leq 0.05$; **$p \leq 0.01$

eralizable to either service businesses or small firms. The study has relied on single respondents from each firm. Finally, the research design is cross-sectional. Causal inferences must, therefore, be based on *a priori* theory as well as rejection of alternate explanations.

The results of this study have a number of important implications for further research. First, in order to develop better insights into the moderating role of environmental munificence, it is necessary to investigate the relationship between other modes of strategy making (Hart, 1992) and performance. Second, the development of a more comprehensive understanding of the context specificity of the rationality–performance relationship requires the simultaneous examination of multiple environmental dimensions. By considering dynamism and munificence simultaneously, this study has made a significant beginning in this direction. The finding that rational decision processes are most strongly associated with performance in high-discretion environments lends further support to Hrebeniak and Joyce's (1985) conceptualization of strategic choice and determinism as two independent dimensions than as polar opposites.

Third, this study does not take into consideration the role of organizational capabilities. The use of ostensibly rational processes does not necessarily imply that the organization is doing an effective job of scanning, planning, analysis, and communication. Finally, economic outcomes may be influenced by a variety of factors other than process rationality. Cause–effect relationships between rationality and performance are at best tenuous and a broader conceptualization of effectiveness which incorporates both process-related and economic-related measures may be more appropriate (Venkatraman and Ramanujam, 1986).

In conclusion, this study points clearly to the need for moving research on environment–organization interrelationships beyond preoccupation solely with environmental dynamism or uncertainty to the consideration of additional environmental dimensions such as complexity and munificence. The incorporation of environment as a multidimensional construct in research design promises to provide a richer and more comprehensive understanding of environment's role in organizational phenomena.

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