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The Moderating Role of Information Technology on the Relationship Between Competitive Intensity and Centralization of Multinational Firms

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Abstract

The relationship between centralization and decision-making in multinational corporations (MNC) has been an important structural component (Egelhoff, 1988) of organizational design. The degree of centralization or decentralization has typically been examined in relation to the environmental conditions facing the MNC. Under the information-processing model of MNC's, Egelhoff (1988) has shown that organizations centralize-decentralize in response to environmental conditions such as strategic complexity, size, and the level of information-processing required for environmental control. Centralization is thus one of the several mechanisms available to the organization to increase its information-processing capacity. Therefore, MNC's are considered to decentralize in response to environmental complexity and the competitive intensity they face in global markets. In this study we show that the relationship between environmental complexity and centralization is moderated by the degree of use of IT. MNCs with a high level of IT implementation show a lower level of centralization than do firms with low levels of IT use, in response to environmental competitive intensity.

Introduction

Methods of MNC organization and management have been extensively examined in the literature. Classical studies such as those by Davis (1976) have described differences in MNC structures (functional, product, global matrix) in terms of the degree of international presence and the posture of the firm towards international markets. With respect to the nature of changes in organizational structure, the assumption is always that strategy precedes structure or that organizational structure is inherently a tool to implement a selected organizational strategy.

Hutchinson (1976) attempted to explain the variety of organizational structures found in MNCs by linking them to a specific global strategy. Thus if the main focus of the corporation is on rapid growth, then a worldwide product division is deemed appropriate. If intimate knowledge of local operations is required, then area divisions are the most effective. The clear explication of an organization's area of concern is thus needed before an appropriate organizational form may be selected.

The above relationships were empirically examined by Egelhoff (1988) in his information-processing theory of MNC's. In this theory, instead of viewing centralization as a means to achieve higher performance, it is visualized as one method that organizations select to enhance their information-processing capability. As noted by Galbraith (1973), vertical centralization is one of the basic coordination or information-processing mechanisms available to organizations. Thus, when environmental complexity increases, MNCs tend to decentralize decision making. This proposition was formally tested by Egelhoff in a sample of fifty MNCs. He found that increasing product diversity, product modification differences between subsidiaries, significant levels of outside ownership in foreign subsidiaries, and growth through foreign acquisitions create pressures to decentralize decision making. This happens because an increasingly complex environment requires broader and more varied information which challenges the increasingly limited capacity available as decisions move up the hierarchy.

The role of IT in MNC's, especially with regard to its relationship between centralization, has been mostly ignored. For example, IT applications may provide the coordination mechanism that MNC's need to increase their information processing capabilities. Generally, the relationship between IT and organizational structure has been debated (Markus & Robey, 1988) and IT, and has been found to both centralize and decentralize authority (Robey, 1981). Several contingencies have been proposed in order to examine this complex relationship. For example, Robey (1977) observed that computing appeared to support an existing decentralized structure in organizations with uncertain environments. In simpler environments, IT appeared to

strengthen a centralized authority structure. Thus, Robey suggested that IT be viewed as a moderating variable, affecting the strength of a causal relationship between environmental and organizational structure.

We follow the above reasoning in this study and note that IT can provide a coordination mechanism in MNCs. We propose that the need for centralization to increase information-processing may be offset by the use of IT. Thus, we formally test the hypothesis that the extent of use of IT in MNC moderates the relationship between competitive intensity and centralization.

Research Study

Data was collected using a mail questionnaire sent to IT Directors of 281 organizations, of which 143 were U.S.-based and 138 were non-U.S.-based MNCs. One hundred fifty final questionnaires representing 20 countries and 25 industries were received for a response rate of 53%. A non-response bias test was conducted by comparing the characteristics of firms that responded to the final questionnaire (150) with those who did not (131 firms). This test showed that firms that did not respond had lower sales and fewer subsidiaries than the firms that did respond. There were no statistical differences in the number of employees and the number of countries between the two categories of firms.

The measurement scales for the study are described below.

Centralization

Centralization was operationalized based on Egelhoff [2], who examined twenty-two decisions that have to be made as a part of the management and operation of most foreign subsidiaries. He measured the degree of centralization in a parent-subsidiary relationship by asking the respondents which hierarchical level in the organization would have to actually approve a decision. Egelhoff's set of twenty-two decisions was used in this study with modifications to reflect decisions regarding both products and services, and five new decisions added based on a literature review. Egelhoff's classification of the twenty-two decisions was into three categories - marketing decisions, manufacturing decisions, and financial decisions - was retained. The five new decisions were labeled as "Other Decisions." Cronbach's alpha values for the four sets of decisions were 0.91, 0.80, 0.80, 0.80 respectively.

Competitive Intensity

Competitive Intensity refers to the extent to which global "triggers" are present in the MNC's environment. We used the set of ten triggers identified by Morrison (1990). The ten items were factor analyzed and four factors were retained. These were labeled - standardized markets, intense competition, scale economies, and factor differences across countries.

Information Intensity

The extent of use of IT in MNC's was measured by dividing the number of countries the MNC conducted business in by the number of countries the MNC had IT departments in. This scale was used to split the study sample into two groups using a median split.

Table 1. Study Correlations

	Marketing		Manufacturing		Financial		Other	
	Low-IT	High-IT	Low-IT	High-IT	Low-IT	High-IT	Low-IT	High-IT
Standard Products	0.06	0.25	0.19	0.21	0.01	0.23	0.07	0.01
Intense Competition	-0.09	-0.24	-0.01	-0.14	0.39	-0.09	0.25	0.11
Scale Economies	0.04	-0.22	-0.01	0.18	-0.05	-0.11	0.05	-0.15
Factor Costs	0.23	0.17	-0.01	-0.06	0.21	-0.06	0.06	-0.01

(Correlations above 0.18 are significant at $p = 0.05$)

Results and Conclusion

Table 1 provides the correlation coefficients between the four scales of centralization and competitive intensity for the low- and high-IT groups. The following observations can be made from this table:

- The correlation between standardized markets and marketing centralization is significant in the high-IT group but not in the low-IT group;
- The correlation between intense competition and marketing centralization is significant (negative) in the high-IT group but not in the low-IT group; and
- The correlation between factor differences and marketing centralization and with "other centralization" factors is significant for the low-IT group, but not for the high-IT group.

Given the significant differences between centralization and competitive intensity factors, it is safe to conclude that a moderating effect of IT intensity is present in the current sample of multinational corporations. This implies that IT can provide an adequate coordination mechanism for global operations and may be used to offset the limitations of centralization.

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