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William R. Bigler, Jr.
Southern Methodist University

A FRAMEWORK FOR FORMULATING RESPONSE TO ENVIRONMENTAL COMPLEXITY: A TOOL TO MANAGE DIVERSITY

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by

William R. Bigler, Jr.

William R. Bigler, Jr.
Assistant Professor
Edwin L. Cox School of Business
Southern Methodist University
Dallas, Texas 75275
214/692-3789

Abstract

This paper makes the position that environmental complexity: abundance, diversity and dynamism and environmental turbulence: the degree of interconnectedness among diverse environmental elements, can be explained. This explanation, however partial, can then form the basis for understanding a portion of strategy formulation and top management perceptual processes. This is the first of a two-paper series that advances certain themes of one of the founders of strategic management, Igor Ansoff (see Ansoff, 1984 for current thinking). It also serves as a middle-range theory to be the conceptual underpinning for current empirical research being done in the Texas banking industry. This empirical work is forthcoming.

A FRAMEWORK FOR FORMULATING RESPONSE TO ENVIRONMENTAL COMPLEXITY: A TOOL TO MANAGE DIVERSITY

There are the beginnings of an integrated and systemic picture of how the firm might think through responding to environmental complexity. The notion of environmental complexity that the writer subscribes to is a particular confluence of:

1. Dynamism — Variability of critical environmental contingencies that leads to unpredictability of change;
2. Diversity — The number and concentration of critical elements in the environment;
3. Abundance — The richness and amount of critical input resources.

Essentially, more of all of the above produce what the writer calls complex environments. Complex environments produce certain problems or threats for the firm: future and even current environmental contingencies are not fully understood. When this occurs, top management must work to align their goal preferences with their perceptions of the riskiness of the strategies and tactics that are to be employed to achieve the goals (Donaldson and Lorsch, 1983: 21). If complex environments make management perceive that their intended strategies and tactics are foolhardy (out of bounds of normal risk taking), management may change or lower their goal preferences. If management has perceived too much complexity for what was actually present (and thereby lowered its goal preferences), it may be penalized by various stakeholders for being too conservative. Alternatively, management may respond by matching external complexity with internal strategic and structural diversity (Ashy, 1956). Let's assume that there is a greater than one benefit/cost ratio in this checking complexity with requisite diversity. In other words, the added benefits of strategic complexity outweigh the added costs of strategic diversity

and the requisite necessity of added integration (Lawrence and Lorsch, 1967). This condition is the desired outcome of any complex strategic and structural adaptation. However, management may have created such a diverse portfolio of divisions, projects, departments and campaigns that the portfolio eventually cannot be managed properly. Complex environments then are indeed problematic for top management teams. However, due to cleavages that are formed by shifts in environmental dynamism, diversity and abundance, much of the time unforeseen by management, certain niches that represent opportunity are formed. These resulting niches that arise from the shifts still offer then the opportunity for classic strategic and tactical maneuvering. Turbulent environments appear to be a different matter altogether. According to Emery and Trist (1965) and recent interpretation of their work by Aldrich (1979), complex environments turn into turbulent environments when the amount of "interconnectedness" of critical environmental elements increases. This tight coupling produces a situation where one perturbation may set off chain reactions, the net effect of which is usually only dimly seen by management -- if seen at all by them (see Aldrich's (1979) ping-pong ball example). In turbulent environments, the ground from which normal assumptions, premises and expectations is so "shaken" (Emery and Trist, 1965; Terreberry, 1968) that the congruence between "normal" risk taking, goal preferences and their appropriate strategies cannot be made. So we could have the situation in a turbulent environment where a firm volleys with normal strategic and tactical offerings and is then swamped with myriad unintended negative consequences, totally unforeseen by management. The strategic response for such turbulent environments, as suggested by Aldrich (1979) and Pfeffer and Salancik (1978) includes such actions as:

1. Coalition activity (Horizontal relationships short of merger and joint venture).

2. Trade association activity (Allowing the trade association to "concentrate" problematic and unfavorable environments).

3. Interlocking directorates.

The attempts to make more certain competitor and other stakeholder actions and to hold down unforeseen perturbations, go to help check turbulent environments or at least hold them in abeyance.

To sum up to this point, we have presented two generic types of environments, with two types of generic strategic response:

1. COMPLEX ENVIRONMENTS -- Where traditional strategic and tactical responses are appropriate. (See Lorsch and Allen, 1973; Hambrick, 1981; Lenz, 1980; Miles and Snow, 1978; and Miller and Friesen (1977, 1978, 1980) for examples.)

2. TURBULENT ENVIRONMENTS -- Where more "perturbation dampening" activity is appropriate.

If we can accept this categorization that some sort of strategic and tactical response is possible in both complex and turbulent environments (see Aldrich, 1979 for an argument that strategic choice is a fiction and that evolutionary forces select fit firms) then how can we begin to think through responding to such environments and managing complexity and turbulence? The cumulative evidence in the literature, and this author's recent work, suggests that the dimensions of industry structure, market power position and perceived environmental complexity can at once supply:

1. The dimensions within which to describe the likely amounts of environmental dynamism, diversity and abundance in objective or actual terms. (See Figure 1.)

2. The mapping of the perceived amounts of dynamism, diversity and abundance onto the likely amount of objective or actual complexity. Here, we can get a congruence of the actual and the perceived. This congruence or lack of congruence is held by the writer to be one of the inputs to making strategic choice.

3. Cybernetic theory tells us that internal firm strategic complexity should match environmental complexity for high performance. This prescription is moderated perhaps by market power position, however, but a firm's position in the cube could suggest:

a. The appropriate amount of strategic complexity the firm should offer to the environment.

b. When management should be aware of "reflexivity." The notion here is that in highly complex and turbulent environments, management must know the intent and gestalt of their attempts to provide strategic and structural complexity and integration as it relates to the actual and perceived amounts of environmental complexity. This is not to say that management needs to have a crystal ball and be all knowing. It suggests that management must be aware and have a mindset that disposes them to ponder the congruence between goal structures and actual and perceived strategy and structure and risk preferences, as they relate to environmental complexity. This "reflexivity" is not an "Olympian Vantage Point" (Andrews, 1980), but an awareness and sensitivity that gives rise to flexibility and adaptiveness.

The following exposition will begin to develop in more detail the outline presented above.

LITERATURE REVIEW

It is necessary to briefly review the main research streams in the management literature that will help us get a grasp on assessing organizational environments. The author will attempt to make the argument that environmental complexity and turbulence, both actual and perceived, form one of the most pervasive and ubiquitous set of forces with which top management has to come to terms.

A. Environments As Viewed From the Organization Theory Literature

Emery and Trist (1965), in one of the best known articles on focal organizational-environmental (change) relationships, have developed a typology of organizational environments. The four generalized environmental types, which they labeled "causal textures," grow from simple to complex, poorly to richly joined and the level of mutual causality becomes higher from Type I to Type IV environments (Trist, 1980). The four types of environments are placid random (Type I), placid clustered (Type II), disturbed reactive (Type III),

and turbulent (Type IV). The principal thread running through this continuum is the "system connectedness" among environmental elements or the amount of interdependence among firms. As stated above, complex environments exhibit high degrees of Diversity, Abundance and Dynamism. Turbulent environments are characterized by high degrees of diversity, abundance and dynamism also, but by the time the environment has reached Type IV status, certain forces have acted to produce a high degree of interdependence and interconnectedness among environmental elements and firms. The literature is virtually silent on what these forces are that lead to interconnectedness or even what interconnectedness really is. In a simplistic sense, we can think of interconnectedness as a network of mutual buying and selling and other consortium sort of activities. The question might arise though of what is so problematic about this condition? How do we get from a benign, perhaps oligopolistic like condition to a condition like that described by Aldrich (1979:76) in his ping pong ball example? An answer can be supplied by positing what these forces are that drive interconnectedness in the first place, and then overlaying these forces on the bedrock of a complex environment: high levels of diversity, dynamism and abundance. Recall that a complex environment is a necessary but not sufficient ingredient for a turbulent environment. In general, we can posit that the essential force that pushes interconnectedness is the desire on the part of management to make complex environments more certain. We can posit then the following settings where we would expect to find high interconnectedness. Interconnectedness is a function of:

a. Maturity of Industry Structure -- In mature settings, firms will have had the time to become acquainted and, ceteris paribus, build up networks.

b. Concentration of Industry Structure -- While this setting could be related to (a) above, we can think that it would be easier to form a network among fewer players.

c. Degree of Polarization of Existing Players — If some environmental contingency has forced polarization of the existing players into distinct groups (large versus small firms as happended when the Banking industry was deregulated or forces causing the development of strategic groups [Porter, 1980:129]), then the degree of networking will likely increase within the groups that have formed.

As we have said, these settings may appear to be benign. But, if we overlay these settings on a complex environment (one of high diversity, dynamism and abundance), then what we may have produced is a network that is built on quicksand. No sooner has a network been formed then some element of the environmental complexity threatens the order. Uncertainty on the part of top management teams is ever present in turbulent environments. Miles [1980:191] has stated, "...the essence of contemporary environmental turbulence is the rush of unpredictable, undecipherable, seemingly isolated but in many cases interconnected events." This position and the concomitant notion that networks may be built on quicksand implies that turbulent environments will never be at a stable state or point of equilibrium. Add to this menagerie Ansoff's [1979, 1984] position that the following trends have increased complexity and turbulence:

1. The growth of the novelty of change.
2. The growth of the "intensity of environmental contingency." That is, we have seen some recent environmental contingencies literally bringing a company to bankruptcy in a very short order. The Johns-Manville response to the charge that they knowingly let workers be exposed to fiberglass particles and the resulting legal suit was to file for Chapter 11 Bankruptcy. This situation had gone on for thirty years but the forces acting in today's environment created a groundswell of public and legal opinion against the firm. From this one can gain an appreciation for the perplexity that complex and turbulent environments can engender.

The crucial question arises though as to how does management deal with complexity and turbulence with respect to decision making and fashioning strategy. The writer has interpreted a recent school of thought which says that management can:

1. React to the objective, known features of complex environments. Here, matters are complex and problematic but management adjusts their goal preferences to coincide with the perception that normal risk taking is being made. Here known environmental complexity is matched with a concomitant internal strategic diversity. The matching process in this case is done within normal bounds of perceived uncertainty and risk taking.

2. In turbulent environments, where the very "ground" of tried and true premises and assumptions "is in motion" (Emery and Trist, 1965:28) and where they cannot be taken for granted, management must respond to their level of perceived environmental complexity. By definition of a turbulent environment, management cannot adjust goal preferences and perceived risk so that they form a closure or sense of integrity.[1]
(See Nisbett and Ross, 1980; and Weick, 1979 for elaboration of cognitive dynamics.)

On this interpretation, Pfeffer writes:

> "Change, variation and a dynamic environment may all be capable of being predicted in which case there is no uncertainty; so, it is not the stability of the organization's environment that matters, then it is the unpredicted change of variables that affect critical organizational dependencies." [1978:133]

Given this position, in turbulent environments management responds to the degree of the perceived complexity. So the particular relation to be studied is the one between the degree of perceived environmental complexity and the range of strategic and tactical responses that are appropriate and that lead to high performance.

To conclude this section then, we can say that both the objective level of complexity (diversity, dynamism and abundance) and turbulence are important in understanding environments. However, the real catalyst for strategic decision making in complex and certainly turbulent environments is the amount of perceived complexity and turbulence that infuses top management teams. To illustrate in more concrete terms the nature of the above arguments and positions, management must pose questions such as the following:

1. Are our markets concentrated or are they diverse?

2. Are our markets interconnected or are they diverse and "loosely coupled"? (Pfeffer and Salancik, 1978:69)

3. Is the rate of change of key strategic issues (Technology, the disposition of critical input resources, competitor dynamics to name a few) increasing in an unpredictable manner?

4. Are key "stakeholders" (Freeman, 1984) to the organization — government, interest groups, stockholders, customers — becoming increasingly hostile or are they characterized as being benign? Is all of this happening predictably or not?

Honest answers to these questions can help management place the firm on the appropriate location on the Perceived Complexity-Turbulence dimension.

The next section will explore the second dimension by which one can assess environments: generic industry structural settings.

B. Environments Viewed from Industrial Economics: Generic Industry Structural Settings

Generic industry structural settings (Porter, 1980), can be used as analytical tools to help describe competitive conditions at the industry level of analysis. If industries are defined as a group of firms which produce products or services which are close substitutes for each other (as Porter's pioneering work does) then industries so defined can be viewed as the competitive environments of firms. Porter's work construes industries (here, competitive environments) in terms of variables which can give an indication of the overall competition that exists in the industry and which can simultaneously suggest strategic response to such industry competitive conditions.

Porter's central premise is that the amount of competition that exists in an industry can be explained by five sets of variables — called the "five forces that drive industry competition." These are the threat of entry, the threat of substitute products, the intensity of rivalry among existing competitors, the bargaining power of suppliers and the bargaining power of buyers. The total competition that exists in the focal industry is the net effect of the five competitive forces. This total amount of competition in an industry

is crucial for assessing the strategic attractiveness of the industry: higher competition in the focal industry means lower average industry profitability. In addition, the particular configuration of the five competitive forces sets in which generic structural setting the industry resides. Which generic structure an industry is housed in, in addition to causing different levels of average industry profitability, will set a range of feasible strategic responses. For example, firms in emerging industries probably cannot effect economy of scale advantages while firms in declining industries probably cannot opt for brand identification strategies.

The presentation of these industry structural settings might erroneously convey to the reader that the writer has invoked the notion of the industry life cycle. If one assumes movement of a given industry through these settings, then certainly one is skirting perilously close to one of the most debated topics in the marketing literature. Although Capon (1981) has given support to the view that at aggregate levels (as indeed an industry is an aggregate construct) the life cycle concept has validity, we do not wish to nor do we have to invoke the notion of an industry life cycle into the model. Why this is so is prompted by two arguments:

1. The life cycle may apply in the aggregate to broad product definitions (which is frightfully close to the way Porter defines industries) by accounting for their birth, growth and decline. But according to Porter, the life cycle cannot explain competitive dynamics of the population of the firms he defines as industries. On this Porter writes:

> ..."The product life cycle has attracted some legitimate criticisms: the duration of the stages varies widely from industry to industry, and it is not clear what stage of the life cycle an industry is in; industry growth does not always go through the S-shaped pattern at all; companies can affect the shape of the growth curve through product innovation and repositioning, extending it in a variety of ways; and the nature of competition associated with each stage of the life cycle is different for different industries." (1980:158-162)

2. Porter seems to be arguing then against the determinism suggested by the life cycle construct. If we were to invoke the life cycle construct as flowing through the generic structural settings, we would have to provide causal relations of industry life cycle with turbulence-complexity. In other words, does turbulence and complexity increase as one progresses through the industry life cycle? This notion was certainly in the spirit of the earlier work of Emery and Trist. However, since the work of Porter (1980) and Pfeffer and Salancik (1978), we have come to the view that it is certainly in the realm of experience and logic to say simply that any kind of degree of Turbulence-Complexity can exist in any of the industry structural settings, ceteris paribus. To illustrate examples at the extreme points in the model, we can think that both low and high complexity can exist in Emerging Industries (the industry could be fragmented which could cause high complexity or it could be low in complexity because a large firm might move into such a setting grab first mover advantages, build high market share and erect barriers to entry. For the existing players, environmental conditions could be rather unproblematic and abundant, for a time at least). At the other extreme, we can think of both high and low turbulence in Declining Industries. For example, firms may be exiting such a setting gracefully and predictably or because of high barriers to exit (Porter, 1976), existing players may stay in the industry too long only to make for more excess capacity with the attendant desire to bid down prices, wage hostile attacks, etc. The first condition can be described as non-turbulent and benign and the second as exhibiting high degrees of turbulence (if interconnectedness is high) and perhaps hostility.

So, given the arguments above, we will use each of these generic industry structural settings to suggest the likely degree of the entrenchment of the "rules of the game" that exist in the industry (task environment setting). The rules of the game are the particular repertoire of key success factors, strategic groups and strategies and tactics that have been made appropriate by the interaction of the five forces that drive competition. In general, the rules of the game are not at all entrenched in emerging industries, somewhat fixed only for diverse pockets in fragmented industries, very fixed in mature industries and are fixed but somewhat agitated in declining industries by virtue of some firms considering the exit decision. The author proposes that the degree of entrenchment of the rules of the game is one of the determinants of

the degree of actual environmental complexity and turbulence. Ceteris paribus, emerging and fragmented industries would be more complex than mature and declining industries, although declining industries may become agitated due to firms making the exit decision. Conversely, mature and declining industries would be more turbulent than emerging and fragmented industries because the level of interconnectedness would have a chance to be higher. We will never be able to completely specify these conditions however, even when we invoke the intersection of the third axis, market power position. The likely vector of the forces that drive industry competition, in any of the generic industry settings, is too situation specific to completely specify it. To observe how this axis is to be used, we need to discuss the third axis of market power position.

To sum up before we move on, complexity-turbulence (both actual and perceived) and industry structural setting will form two of the dimensions by which we will describe environments and environmental enclaves.

C. Environments Viewed From a Market Power Position Perspective

Bigler (1982, 1985) found that market power position is a construct that moderates the relationship between Environment and Strategy, both actual and perceived. Biggadike (1979) has developed this notion of market power position as it relates to entry and deterrence, and it seems to be an important variable for influencing these strategic decisions. The cumulative findings from Bigler (1982) and Biggadike (1979) suggest that market power position may be a construct, like environment, which sets certain conditions for strategic choice.

This construct represents a set of variables that are partially firm specific but which are also partially determined by industry structural dynamics.

The notion here is that high market power position is brought about by the firm's capability to affect favorable image and comparative advantage as it relates to what is required for the firm to win in its particular structural setting (Porter, 1980; Andrews, 1980; Biggadike, 1979). By this notion, market share is not the sole determinant of market power position. In fact, small firms can gain market power position over larger competitors, at least for a while. (See the HBS cases on the Chain Saw Industry and Crown Cork and Seal for examples.) A high market power position can be effected by an entrenched distinctive image, which could have been generated by reputation and/or tradition and not only by size. Figure 1 shows these relationships. A perusal of Figure 1 suggests that the construct of market power position as presented here is a "vibrant" construct that is a time bound index of market share and market distinctive image. The dynamic notion shown here is to suggest that the firm could be in a precarious position in either Cell 2 or 3. Any market power position engendered in these two cells could be easily lost if the firm does not keep vigilance over their competitive situation.

FIGURE 1

	LITTLE DISTINCTIVE IMAGE	MUCH DISTINCTIVE IMAGE
SMALL MARKET SHARE	1 NO MARKET POWER POSITION	2 POSSIBLE HIGH MARKET POWER POSITION
LARGE MARKET SHARE	3 A CONCENTRATION FORM OF MARKET POWER POSITION POSSIBLE	4 HIGH MARKET POWER POSITION

Source: Primary

While this may seem like the writer is using correlated dimensions which are not orthogonal, the writer argues that this construct can be used as the integrating mechanism between individual firm response and the determinism suggested by industry structured dynamics. In other words firm strategic response can produce market power position but the given industry structural setting may have also allowed high market power position to come into being. Any regulated or quasi-regulated industry has set the stage for some firms to gain market power position over other firms without the active commission of the high power firms (Bigler, 1982). Finally, concentration ratios (Scherer, 1980), which are essentially market share statistics, are used as indicators of certain aspects of industry structure. This would suggest the dual role that the construct of market power position can play. Market power position then perhaps represents a quasi-strategic choice/environmental context kind of construct.

Construing market power position in this manner allows Figure 2 to fall into place. The writer argues that a high market power position by any firm in a competitive arena tends to <u>dampen</u> environmental complexity and <u>increase</u> turbulence, ceteris paribus. This position is supported by the following three arguments:

1. Industrial economists have noticed the correlation between concentration ratios and oligopolistic behavior (Scherer, 1980:56-70). The writer holds that this kind of behavior tends to dampen complexity, ceteris paribus. Recall from Figure 1 that high concentration ratio environments can lead to high market power position in a competitive arena. In oligopolistic environments, networks could have built up, barriers to entry could have been erected and the rules of the game could be known with relative certainty. All of these features could result in a dampening of complexity and the increasing of turbulence.

2. Bigler (1982) and Bigler and Kedia, (1985) found that the presence of high market share banks moderated the effects among Environment, Strategy and Performance. In effect, this form of a high market power position for the banks put them in such entrenched positions

that they could be high performing no matter what their strategy repertoire looked like.

3. Bigler (1982) found a high and positive correlation between the age of a bank, its market share (or concentration ratio) and the propensity of the top management to report that they were leaders and firmly entrenched in their competitive arenas. Evidently the top managers in this sample felt that when they had high market share they also exhibited high market favorable image as well.

These three arguments point to the fact that the presence of a high market power position by any firm(s) in a competitive arena tends to dampen environmental complexity and increase turbulence, ceteris paribus.

So, the axis of market power position (which tends to dampen complexity and increase turbulence) when overlayed with generic industry structural setting could suggest the likely amount of actual environmental complexity (dynamism, diversity and abundance) and turbulence.

D. Research Questions and Hypotheses

Putting all of this together allows us to ask the following research questions:

1. Can the interaction of market power position and generic industry structural setting suggest likely amounts of actual diversity, abundance and dynamism? As stated above, high levels of these three attributes go to form complex environments (Aldrich, 1978). If certain forces have gone to provide for interconnectedness in complex environments among the key competitors and stakeholders in an industry, then what is produced is a turbulent field (Emery and Trist, 1965). So, what is proposed here is that the interaction of market power position and industry structural setting can explain a portion of the amount of abundance, dynamism, and diversity and thereby complexity and turbulence in task environments. Figure 2 depicts these relationships.

2. Can the congruence or lack and turbulence of congruence between the perception of environmental complexity and turbulence and the likely degree of actual complexity and turbulence suggest certain actual strategic responses (formulation) and ultimately, the way in which complexity is managed (implementation)?

3. Can the confluence of industry structural setting, market power position and the congruence or dissonance between actual and perceived complexity help us to understand the firm's current strategy repertoire and how it is managed?

4. How could the model be used to suggest what is entailed in the management of complexity when the firm either desires or is forced to make a cell transition (see Figure 2)?

Given the analysis above, we can also present the following hypotheses for research (see Figure 3):

H1: Cells 1 and 2 will be the most complex cells. In other words, they ought to exhibit high levels of abundance, diversity and dynamism. Cells 3 and 4 (this combination would be rare) would be partially concentrated by virtue of some firms having high market power position, and this would tend to dampen complexity.

H2: Cells 5 and 6 will be the most turbulent cells. Although this hypothesis would be difficult to operationalize, it is predicated on the argument that in mature industry settings, where no power position by any firm exists, the firms will be prone to jockey for position. Here, the firms that have survived the prior shakeout phase will view staying in the game as feasible. However, by virtue of being in a mature setting, many interconnections among firms and stakeholders will have probably developed. In this setting, actions by one firm will have consequences, the final effects of which will be difficult to discern. (See Aldrich, 1978 for his ping-pong ball analogy.)

H3: Cells 7 and 8 will be hyper-turbulent if high barriers to exit exist. Here, the risk of catastrophic loss (or gain) is high as game theory dynamics become intense (von Neumann and Morgenstern, 1953).

H4: Cells 3, 4, 9 and 10 will be the least dynamic and diverse, but will probably be abundant. High market power position firms will have moved to concentrate the dynamism and diversity away, but since this industry setting is classified as emerging and fragmented, enough abundance exists to allow for growth.

H5: Cells 1, 6 and 8 represent cells of non-congruence between perceived complexity and actual complexity and turbulence. The error in these cells represents not perceiving actual complexity when it exists. If the prescription that the firm should match internal firm strategic diversity with external complexity is valid, then this firm will risk catastrophic loss by not being properly diverse.

H6: Cells 4 and 10 represent cells of non-congruence, but the error is in the opposite direction to that in Hypothesis 5. Here, the firm is over stressed by perceiving complexity where little exists. Here, if the firm has followed the above causal prescription, it will be in a position of overkill, and will be a lower performer, in the short term.

H7: For the cells in which there is proper congruence of perceived and actual complexity and in which the firm has followed the correct prescription of diversity matching diversity, then those firms ought to

be high performing. In other words, where perceived congruence is had and where market power position is low (Bigler, 1982) firms that exhibit internal strategic complexity should be higher performers than firms with low strategic complexity. It is possible in the short term that a lack of perceptual congruence can exist, but the firm still exhibits the requisite strategic complexity. In this case, the firm would be high performing, in spite of itself. However, we would not expect this condition to last for very long or to be exhibited very often. We cannot expect that a strategic program could rest on faulty assumptions and perceptions for very long. For high market power position firms in this setting, restricting strategic diversity (but only up to a point) would be associated with high performance. The firm, by virtue of its already high market power position, should not indiscriminately expend resources to add strategic diversity. This would put the firm in a position of overkill for its environment and lead to lower performance, certainly in the short run (see Lawrence and Dyer, 1981, for a similar notion of "balance").

For low environmental complexity and turbulence cells, the following relationships should hold. Firms in which perceptual congruence is had but in which strategic diversity is restricted ought to be higher performers than firms that bring too much diversity to bear on these benign environments. This prescription holds for both high and low market power position cells.

E. Using the Model: Strategic Response to Environmental Enclaves

Before we progress to exposition, it may be useful to reflect on what the writer feels are the most revolutionary aspects of the above propositions. The reader may be perceiving that there is simply too much determinism being suggested. How can a top management team possibly use such an intricate set of frameworks and hypotheses? The author makes the following proposition: if the trend in the use and understanding of strategic management concepts and findings continues, we will have the situation where competitors, when faced with similar circumstances, will call similar strategies. By the 1990's then we could develop a rather monolithic situation where, except for outliers, most strategies in similar circumstances will look the same. How these same strategies are interpreted though will push competitive environments into a rivalrous condition or to one where coalitional maneuvering is omnipresent. The framework in Figures 2 and 3, along with the concepts presented, is a

first attempt to map out an understanding of when rivalrous or coalitional maneuvering is called for. This rather abstract exposition of environment is presented to serve as a "prior" or "first cause" construct that sets the context for strategy, structure, process and performance.

At this stage of conceptualization and research, we can begin to only describe how the model could be used. We have scant empirical findings to shed light on the exact strategic response for each of the cells in the model. In the final analysis, we will never be able to completely specify the model: there can be more than one kind of appropriate response for each of the cells. We do have some evidence from the field though that will help us highlight both proactive and reactive responses to at least the extreme cells in the model.

As stated above, perhaps the key empirical finding that has emerged from research in this area is this: Increasing dynamism (rate of change, unpredictability in the rate of change and turbulence) and diversity (the number and concentration of key environmental components) in the environment should be matched with like internal firm dynamism and diversity through strategy and structure. As mentioned, this hypothesis emanates from the work in systems theory (Bertlanffy, 1975:153) and cybernetics (Ashby, 1963) and has found empirical support from management scholars such as Duncan, 1972; Lawrence and Lorch, 1967; Leblebici and Salancik, 1981 and Bigler, 1982. For the purpose at hand, how can we use this consistent finding and the model in Figure 2 to aid the strategist in formulating business level and perhaps corporate level strategy?

Figure 4 shows how the model and the requisite variety principle could be used to aid the formulation of Business Level strategy. A quick perusal shows that we can ask of each of the functional areas of a business or SBU whether

they have the requisite complexity to respond to a complex environment (where normal strategic and tactical maneuvering is appropriate) and/or to a turbulent environment setting where more coalitional maneuvering is appropriate. An example of some of the questions for the marketing function can serve to show some of the intricacies of this formulation. First, with respect to supplying the strategist with another "lense" with which to view marketing's required activities, the strategist can ask himself whether the mix of the four P's has sufficient dynamism and diversity associated with it to effectively align itself with the amount of dynamism and diversity in the appropriate environment. For example, if the environment is extremely dynamic and diverse, does the composite mix of marketing strategy (the four P's) have sufficient turnover (planned obsolescence, new product variations or developments) to counter the environmental dynamism? Secondly, does the strategy mix have enough diversity (number of product variations, distribution options, pricing options or promotion options) to effectively match the diversity in the environment? Note that the diversity prescription here does not mean that the marketing strategy must become an aggregate strategy; that is, all things to all people. Porter (1980) suggests that firms can define their overall strategy as a niche strategy but that this would not preclude a firm from developing adequate amounts of diversity within that niche.

Secondly, with respect to supplying the strategist with a lense with which to help the marketing function better with corporate strategy, this can be said. Perhaps from the corporate point of view, what marketing strategy supplies for corporate strategy is <u>interface capability</u> with the demands of the various environments the corporate strategy interacts with. Our prescription then from the model and analysis would be as follows: to the extent that marketing strategy has provided adequate amounts of dynamism and diversity for

the "contingencies" of its particular environment, it has helped to aid its own effectiveness and supplied corporate strategy with the needed interface information and capability. For example, in highly dynamic and diverse environments a diverse and dynamic marketing strategy mix is matching the dictates of the environment and supply corporate with timely information in adequate amounts. Conversely, in low dynamic and diverse environments, effective marketing strategy would be low in diversity and dynamism. A marketing strategy that was inappropriately high in diversity and dynamism would have several undesirable attributes associated with it. First, the mix would likely be in an overkill situation; too much would be delivered to the environment when this is unneeded and unwanted. Costs associated with such extremity would eat away at the marketing strategies effectiveness and would probably overload corporate with unneeded and unwanted information. Secondly, the marketing strategy mix in this inappropriate case is poised to burn itself out. All of this capability with really no place to go is inviting untoward internal frustration.

A caveat needs to be mentioned at this stage. The above analysis was performed under simplifying assumptions. Namely, what was provided was analysis within a particular cell. Nothing was said about the dynamism or diversity between or across cells. This simplification may be justified for one main reason: most of the cells as defined are probably relatively enduring and long-lived. The industry structural setting and the current state of turbulence are probably sufficiently stable over time to allow a within cell analysis. If however, due to some catastrophic happenstance (technological revolution, shift in demand, war, etc.) the firm finds itself in another cell overnight, the strategy and structure set in place to cope with the previous cell's contingencies would or might become obsolete. Dealing with this crisis situation would be easier to handle had the firm built up slack resources

(Bourgeois, 1981). In this case, marketing strategy would have put into place some of the capability to deal with transition to and competing in the new cell in its marketing strategy for the previous or old cell. Add to this conservative stockpiling the added prescription that marketing strategy should increase its capability to forecast or be flexible with cell changes, then we have a situation where the current marketing strategy will both align with current cell contingencies and provide the capability to forecast and or deal with cell changes. If the transition is one from a less dynamic and diverse to one of more of both attributes, then the current strategy, which is required to be less dynamic and diverse, will have elements that appear to be out of tune with its requirements. This state of affairs can be shown by the following equation:

CURRENT FUNCTIONAL STRATEGY MIX IN TERMS OF DYNAMISM AND DIVERSITY	=	APPROPRIATE LEVEL OF DYNAMISM AND DIVERSITY FOR CURRENT CELL	+	STOCKPILING & OR FORECASTING CAPABILITY FOR CELL TRANSITION

To return to our example, the firm in a low dynamism and diversity environmental condition with the above total marketing strategy would be deemed out of alignment for a within cell analysis only. However, if the firm's marketing managers were risk averse and added the stockpiling and forecasting components to its strategy to aid in transition across cells, then a type of appropriate fit would be had.

So the analysis would go for the rest of the functional areas listed in Figure 3. While it is beyond the scope of this paper to expand these notions for the rest of the functional areas, the thread running through the rest of Figure 3 is application of the requisite variety principle. What is shown here is a more explicit relation between environment and strategy. These hypothesized relations and attributes await further research.

The model and the principle of requisite variety can also aid in the formulation of Corporate Level strategy. Figure 5 depicts a hypothetical example of how the model could be used for a group of SBUs. As can be seen in the Figure, complex (1...n) and turbulent (1...n) environmental settings can be analyzed in terms of the dominant environmental mission of a given SBU. For example, SBU_3 has an Internal Corporate Venturing unit that is checking a dynamic threat but also responding to an opportunity in an abundant portion of that complex task environment. Likewise, SBU_3 has certain trade association and supplier coalitions working to help check threats from the turbulent environment component. Arraying appropriate SBUs with their appropriate environmental mission such as in Figure 5 can give a picture of how the corporate portfolio is interacting with these environmental components. If this type of analysis is appropriate, much work needs to be done in specifying types of "balance" and which types of balance are associated with high performance. This depiction of the corporate portfolio is complementary to the more common portrayals (BCG, efficient portfolios, etc.). If the above arguments are valid though, it is a depiction that shows directly the relationship between environment and strategy at the corporate level. It could aid CEOs and top management teams picture the firm's relations with its relevant environments.

DISCUSSION AND CONCLUSION

This admittedly abstract presentation was one that was born of necessity. On the one hand, the writer feels that this material offers a newer view of the management of diversity. On the other hand there is little empirical and conceptual work that has been done to be able to offer a more definitive statement.

Another purpose has been then to present this material for review so that debate can be had on it and if accepted as useful, to begin to forge empirical research agendas that will lend measures of justification and validity to the concepts and hypotheses. Perhaps the main strength of this abstract analysis is that testable research hypotheses can begin to be made. Indeed, one of the main reasons for this level of analysis is to provide a means to measure the constructs of Environment, Strategy, Structure and Performance as a system. This level of analysis combines perspectives from systems theory, population ecology, industrial economics and strategic management (business policy). It remains the task of academics to operationalize both environment and strategy constructs so that hypothesized relations can be tested. These contingency relations (for example, as the environment gets more dynamic and diverse so should strategy) are crucial in then assessing which alignments lead to high performance and which lead to less success.

In terms of setting out research agendas, much can be done. Cross-sectional correlational studies within and between cells could give first look indications of the dynamics of the model. Longitudinal field research and simulation could give interesting knowledge about the dynamics of the model through time. The research possibilities are great as few attempts have been performed.

Regardless of whether there is confirmation or refutation of the above hypotheses, further direction in the conceptual and empirical development of the management of strategic diversity will be suggested. The management of diversity could take on the following attributes with respect to content and research methodology:

1. The various relationships discussed above may hold, but only over a relatively long period of time. A cross-sectional look at the model would then tend to refute the hypotheses. The issue of which longitudinal research designs would be appropriate for this subejct would then become salient.

2. The management of diversity may not conform at all to any law-like behavior. In other words, there may only be weak, rather random links to the environment. This would suggest that the successful management of diversity would lie in structuring an organization so that it is flexible and adaptive.

3. The relationships may be confirmed, even in cross-sectional research. The task would then be the conversion of this relatively abstract analysis into a more concrete operationalization. This would allow the next round of empirical testing and conceptual development. Of interest would be:

    a. How can we operationalize internal firm strategic diversity better and in a host of industry settings?

    b. How can we measure the construct of "perceptual congruence"? That is, how can we measure the congruence between perceived and actual environmental complexity?

    c. How can we think about desirable cell transitions in the model for higher performance? This begs the question of which cells are inherently more favorable and hence have better profit potential. A next question would be "Is all of this industry specific, or can we aggregate across industries?

These further research questions will provide the fuel for much thought and conceptual and empirical work before the model can be honestly confirmed or refuted.

NOTES

[1]If Pfeffer and this above interpretation are correct, then risk from an action decision making standpoint is not a simple variation concept. Variation can be predicted or accounted for and goal preferences can be adjusted so as to make the perception that risk is within normal, comfortable bounds.

REFERENCES

Aldrich, H.E., Organizations and Environments, Englewood Cliffs, New Jersey, Prentice-Hall, 1979, 384 pp.

Andrews, K.R., The Concept of Corporate Strategy, Homewood, Illinois, Irwin, 1980 rev. ed., 180 pp.

Ansoff, H.I., Strategic Management, New York, John Wiley & Sons, 1979, 236 pp.

Ansoff, H.I., Implanting Strategic Management, Englewood Cliffs, New Jersey, Prentice-Hall, 1984, 510 pp.

Ashby, W.R., An Introduction to Cybernetics, New York, John Wiley, 1963.

Bertalanffy, Ludwig von, Perspectives on General Systems Theory: Scientific-Philosophical Studies. ed. by Edgar Taschdjian, Braziller, New York, 1975, 183 pp.

Biggadike, E. Ralph, Corporate Diversification: Entry, Strategy and Performance, Harvard University Press, 1979, 220 pp.

Bigler, William R., Environment, Strategy and Performance: An Empirical Analysis in Two Service Industries, Unpublished Dissertation, Louisiana State University, 1982, 269 pp.

Bigler, W. R. and B. Kedia, "Environment, Strategy and Performance: An Empirical Analysis in Two Service Industries," in Latest Advances in Strategic Management, JAI Press, 1985.

Bourgeois, L.J., "On the Measurement of Organizational Slack," The Academy of Management Review, Vol. 6, No. 1, January 1981, 29-40.

Capon, N., "The Product Life Cycle," HBS Case Services, 9-579-072, rev. 1-81, 17pp.

"Chain Saw Industry in 1978," Harvard Business School Case Services, #9-379-176.

"Crown Cork and Seal Company, Inc.," Harvard Business School Case Services, #9-378-024.

Donaldson, G. and J. W. Lorsch, Decision Making At the Top: The Shaping of Strategic Direction, New York, Basic Books, 1983, 272pp.

Duncan, R. G., "Characteristics of Organizational Environments and Perceived Environmental Uncertainty," Administrative Science Quarterly, 1972, Vol. 17, No. 2, 313-327.

Emery, F.E. and E.L. Trist, "The Causal Texture of Organizational Environment," Human Relations, 1965, Vol. 13, 21-31.

Freeman, R. E., Strategic Management: A Stakeholder Approach, Massachusetts, Pitman Publishing Company, Inc., 1984, 276pp.

Hambrick, D.C., "Environment, Strategy and Power Within Top Management Teams," Administrative Science Quarterly, Vol. 26, No. 2, June 1981, 253-275.

Lawrence, P.R., and D. Dyer, "Toward a Theory of Organizational and Industrial Adaptation," Harvard Business School working paper 80-57, 1981.

Lawrence, R. R. and J. W. Lorsch, Organization and Environment, Homewood, IL, Irwin, 1967, 279pp.

Leblebici, H. and G. R. Salancik, "Effects of Environmental Uncertainty on Information and Decision Processes in Banks," Administrative Science Quarterly, Vol. 26, No., 4, December, 1981, 578-596.

Lenz, R.T., "Environment, Strategy, Organization Structure and Performance: Patterns in One Industry," Strategic Management Journal, Vol. 1, No. 3, July-September 1980, 209-226.

Miles, R. H., Macro Organizational Behavior, California, Goodyear Publishing Co., Inc. 1980, 542pp.

Miles, R.W. and C.C. Snow, Organizational Strategy, Structure and Process, New York, McGraw-Hill, 1978, 274 pp.

Miller, D. and P.H. Friesen, "Strategy Making in Context: Ten Empirical Archetypes," Journal of Management Studies, Vol. 14, No. 3, October 1977, 253-280.

Miller, D. and P. Friesen, "Archetypes of Strategy Formation," Management Science, Vol. 24, No. 9, May 1978, 921-932.

Miller, D. and P. Friesen, "Archetypes of Organization Transition," Administrative Science Quarterly, Vol. 25, No. 2, June 1980, 268-299.

Nisbett, R. and Lee Ross, Human Inference: Strategies and Shortcomings of Social Judgement, Prentice-Hall, 1980.

Pfeffer, J., Organization Design, Arlington Heights, IL, AHM Publishing Corp., 1978, 256pp.

Pfeffer, J., and G.R. Salancik, The External Control of Organizations: A Resource Dependence Perspective, New York, Harper and Row, 1978, 300 pp.

Porter, M., "Please Note Location of Nearest Exit: Exit Barriers and Planning," California Management Review, Winter, 1976, 21-33.

Porter, M., Competitive Strategy: Techniques for Analyzing Industries and Competitors, New York, The Free Press, 1980, 396 pp.

Scherer, F.M., Industrial Market Structure and Economic Performance, 2nd Ed., Rand McNally College Publishing Co., 1980, Chicago, 632 pp.

Terreberry, S., "The Evolution of Organization Environments," Administrative Science Quarterly, Vol. 12, 1968, 590-613.

Trist, E., "The Environment and System-Response Capability," Futures, Vol. 12, 113-127.

von Neumann, J., and O. Morganstern, Theory of Games and Economic Behavior, 3rd ed., Princeton, N.J., Princeton University Press, 1953.

Weick, K.E., The Social Psychology of Organizing, 2nd Ed., MA., Addison-Wesley Publishing Co., 1979, 294 pp.

Figure 2

A FRAMEWORK TO MANAGE DIVERSITY

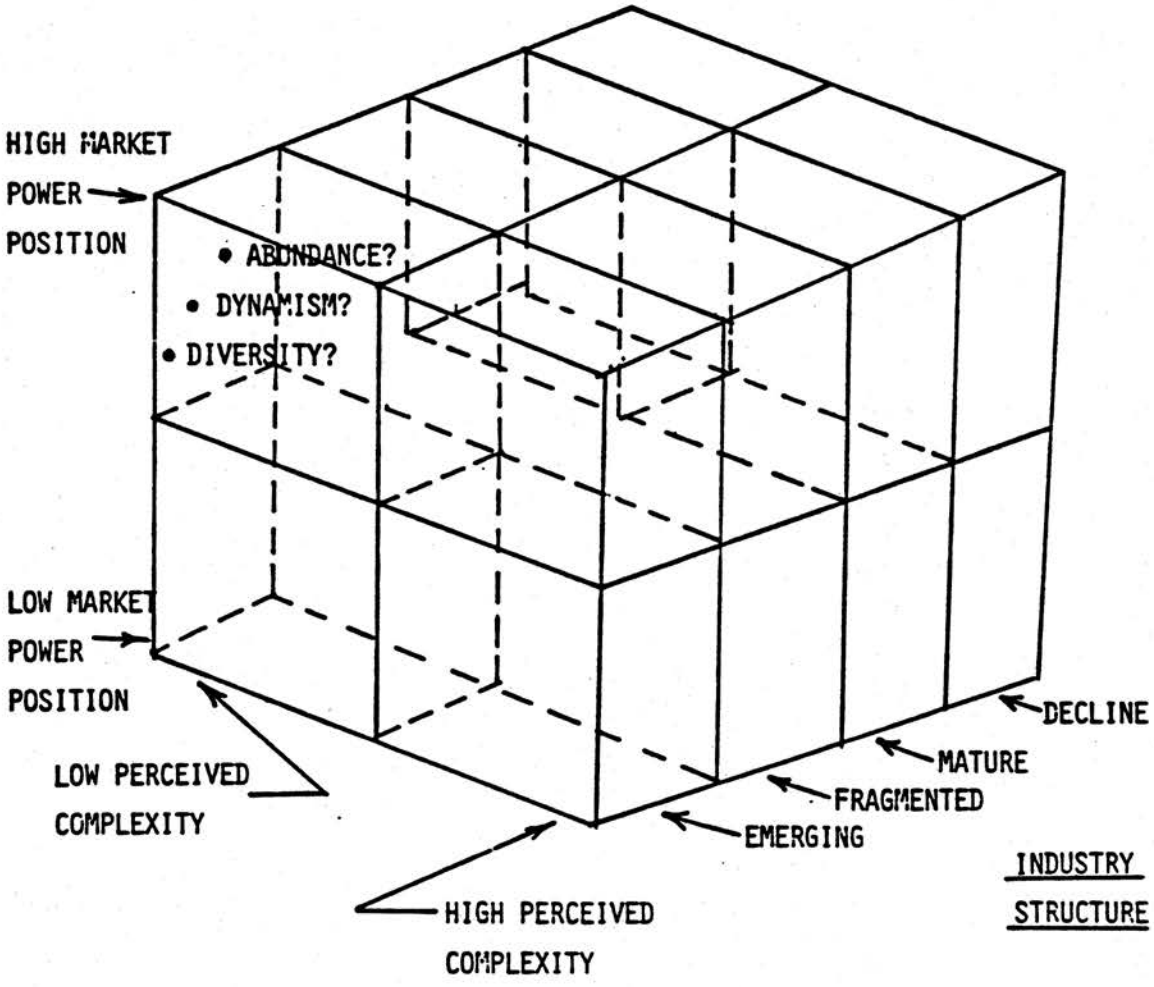


Figure 3

A FRAMEWORK TO MANAGE DIVERSITY

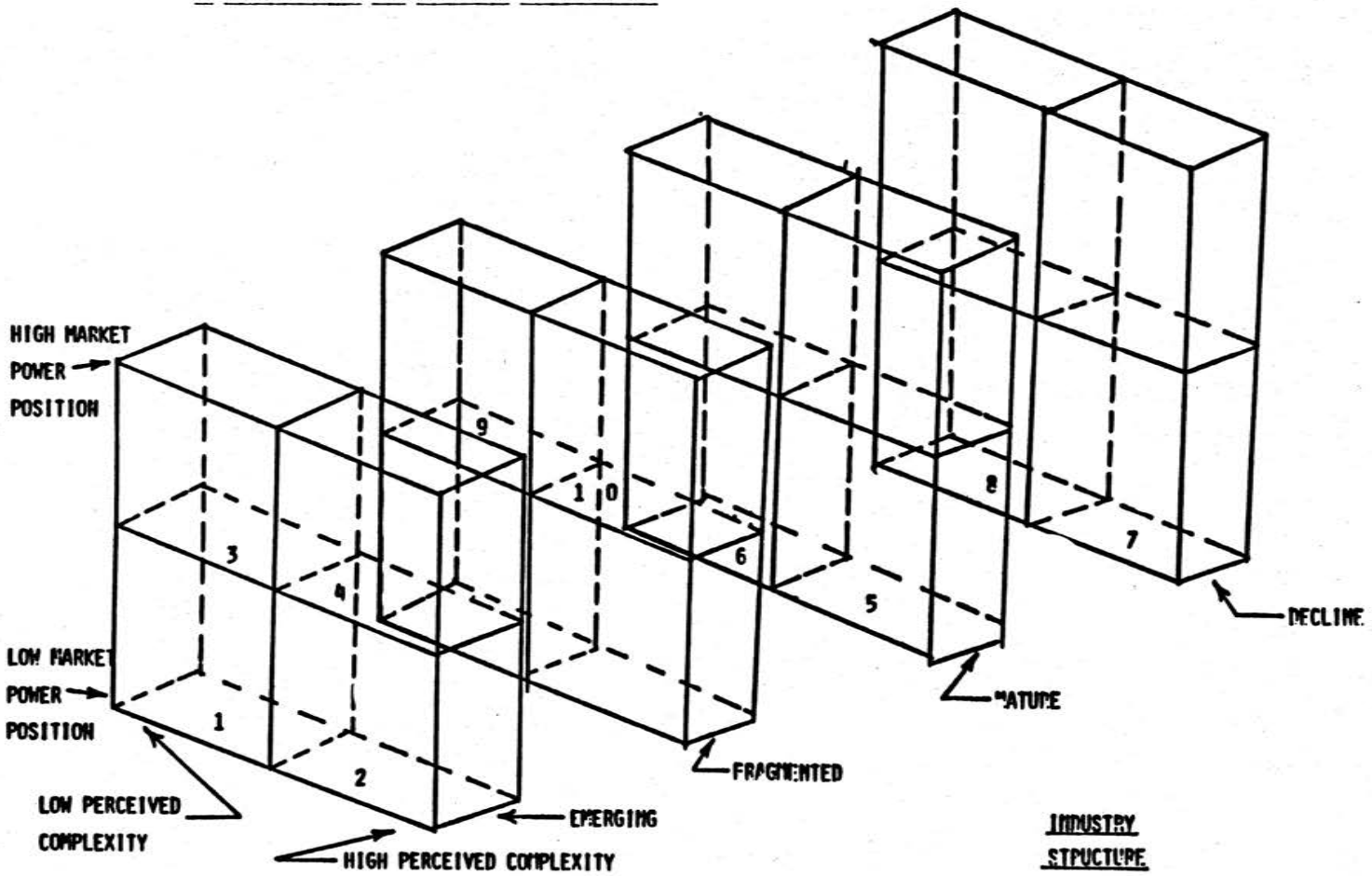


FIGURE 4

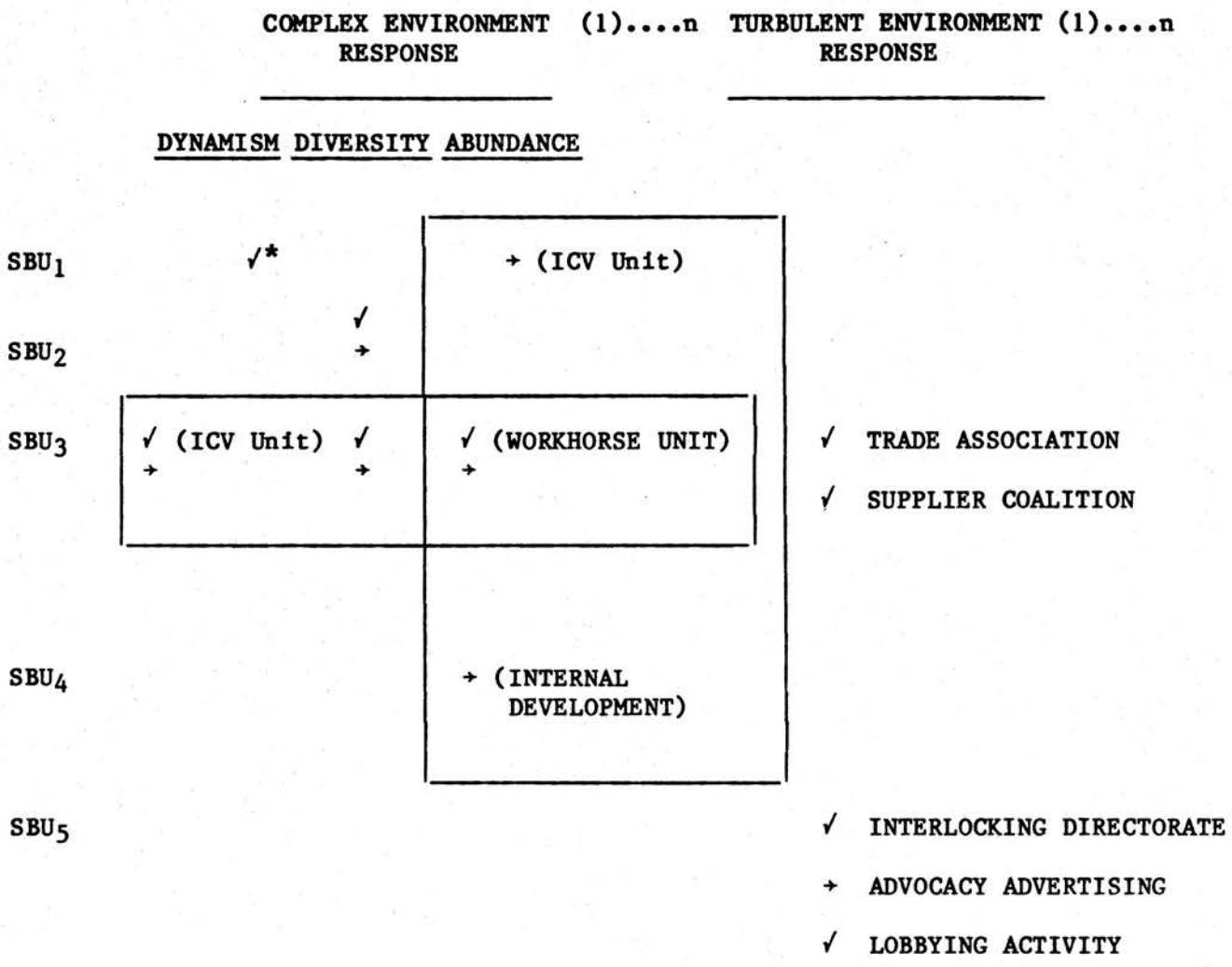
A TOOL TO AID IN BUSINESS LEVEL STRATEGY FORMULATION

	DYNAMISM, DIVERSITY, ABUNDANCE = COMPLEX ENVIRONMENT RESPONSE		INTERCONNECTEDNESS = TURBULENT ENVIRONMENT RESPONSE
SBU STRATEGY = SUMMATION OF:	COMPLEX ENVIRONMENT	+	TURBULENT ENVIRONMENT
1. MARKETING STRATEGY	ARE FOUR Ps DIVERSE ENOUGH?		INTERFACE = PUBLIC RELATIONS?
2. MANUFACTURING STRATEGY:			
° PRODUCT TECHNOLOGY	# OF AND FLEXIBILITY		CO-OPT SOURCES OF SUPPLY --
° PROCESS TECHNOLOGY	# OF AND FLEXIBILITY		JOINT VENTURE OR VERTICAL INTEGRATION?
3. FINANCE STRATEGY	# OF SOURCES OF FUNDS AND FLEXIBILITY		TIES WITH LENDING INSTITUTIONS
4. ACCTG/LEGAL STRATEGY	ARE INFORMATION FLOWS BARRIER FREE?		TAX AND LEGISLATIVE LOBBYING
5. HUMAN RESOURCES STRATEGY	IS THERE A PROPER MATCH BETWEEN THE COMPLEXITY OF THE STRATEGY AND THE PERSON ASSIGNED TO IT?		PUBLIC RELATIONS
6. TOP MANAGEMENT STRATEGY	IS THE TOP MANAGEMENT TEAM BEING PROPERLY DIVERSE IN THEIR THINKING AND ADAPTABLE?		JOINT VENTURE INTERLOCKING DIRECTORATES OTHER COALITIONAL ACTIVITY

SOURCE: PRIMARY

FIGURE 5

A TOOL TO AID IN CORPORATE LEVEL STRATEGY FORMULATION



* ✓ Means that this unit is "checking" a threat from that component of the environment.

→ Means that this unit is responding to an opportunity in that component of the environment.

SOURCE: PRIMARY

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