

AN EXAMINATION OF THE RELATIONSHIP BETWEEN FINANCIAL SLACK  
AND ORGANIZATIONAL STRATEGY: A STUDY IN TWO INDUSTRIES

by

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Management

(ABSTRACT)

A recurring debate in the Business Policy literature has centered on the nature of the relationship between strategy and structure. One school argues that the fit between context and structure determines strategy, while opponents contend that management values determine strategy which, in turn, shapes structure. Litschert and Bonham (1977) have attempted to reconcile these viewpoints with their integrative model of strategy formation. The main premise of this model is that organizational slack moderates the contingent nature of strategy formation. When slack is high, the model predicts that strategy will be based on management values and that a loose fit will occur between structure and context. When slack is low, however, the necessary tight fit between context and structure will determine strategy.

This study tested the Litschert-Bonham model by comparing the strategies used by organizations with varying levels of slack within two different industries. It was determined that an organization's absolute level of slack was significantly related to choice of strategy. However, the strategies of high-slack firms were not necessarily more diverse than were those of low-slack firms within a similar context. Moreover, low-slack firms in different contexts tended to follow the same strategy -- a finding which was opposite the model's prediction.

Two secondary objectives of the study involved the clarification of measurement issues surrounding two of the model's major components: slack and strategy. In the former case, Marino and Lange's (1983) absolute slack indicators were compared to Bourgeois' (1981) slack measures. The former absolute measures were consistently related to strategy while the latter relative measures failed to reach significance.

Finally, a multivariate procedure called cluster analysis was utilized to divide the sample firms into five strategic groups. These five empirically derived strategy types clearly related to Glueck's (1980) conceptual typology of corporate level strategy. This was the first study to offer empirical support for Glueck's widely cited typology.

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## CHAPTER I

### INTRODUCTION

There is a recurring debate in the Business Policy literature regarding the nature of the relationship between organizational structure and strategy. As in the age-old chicken and egg discussion, the key question seems to be which comes first; i.e., does structure lead to strategy or does strategy determine structure?

The first view posits that structure shapes strategy. According to this perspective, contextual factors such as size, technology and the environment determine structure which in turn, acts as a constraint on the formation of strategy. Jelinek (1977) has presented a model which depicts this sequence of events. In direct contrast to Jelinek's position, Child (1972) has described strategy formation as the result of a power struggle in which the winners, or members of the dominant coalition, are free to make strategic choices based on personal values. Here, structure is said to follow strategy in the manner described by Chandler (1965).

Although at first glance these two viewpoints may appear to be irreconcilable, Litschert and Bonham (1978) have combined them into an integrative model of strategy formation.

The key assumption of this model is that organizational slack is a moderating variable determining the contingent nature of strategy formation. Organizational slack is defined as the difference between the resources available to the organization and the total requirements of the coalition (March and Simon, 1958).

The Litschert-Bonham model suggests that when organizational slack is high, a relatively loose fit will occur between structure and contextual variables. In such a situation, dependence on the environment is low and the dominant coalition will be free to make strategic choices regarding the organization's structure. On the other hand, when organizational slack is relatively low, structure is more likely to be contingent on the interactive effects of technologies and environments. Organizational structure itself then will become a constraint which will, in turn, influence or help to determine strategy.

This dissertation has attempted to test the Litschert-Bonham (L-B) model by comparing the strategies used by organizations with varying degrees of slack within two different industries. The primary objective, therefore, was to provide an empirically based analysis of the effect of organizational slack on the contingent nature of strategy formation. In addition, there were two secondary objectives.

The first of these was to test for convergence between two different operationalizations of organizational slack; the second was to attempt to empirically validate Glueck's (1980) conceptual typology of strategic groups.

The remainder of Chapter I is divided into five sections. First, the conceptual foundations of the L-B model will be discussed. Second, the research questions examined herein will be listed. Third, some comments on the significance of the research are presented followed by a section in which important terms which are relevant to the dissertation are defined. Finally, an outline of the contents of the entire dissertation ends the chapter.

#### CONCEPTUAL FOUNDATIONS OF THE LITSCHERT-BONHAM MODEL

Earlier it was stated that the L-B model of strategy formation appears to integrate two contrasting views of the strategy-structure relationship: structure shapes strategy versus strategy shapes structure. This section will attempt to show the critical role played by the concept of organizational slack in achieving their integration.

The structural-contingency perspective, which is rooted in the organization theory literature, proposes that the appropriate organization structure can be determined by examining the specific situation in which a given organization

exists. In other words, organizational effectiveness is assumed to be a function of the fit between contextual factors and structure. Once this "fit" is achieved, the selection of strategy naturally follows. As a result of this approach, many researchers have attempted to explain variation in organizational structure by examining differences among three major contextual factors: size, technology, and environment (cf., Aiken and Hage, 1968; Blau et al., 1976; Hage and Aiken, 1969; Hall, 1962; Harvey, 1968; Huber et al., 1975; Khandwalla, 1973; Lawrence and Lorsch, 1967; Perrow, 1967; Woodward, 1965).

While the above-mentioned empirical studies support structural-contingency theory, recent, more rigorous tests have failed to support the "goodness of fit" hypothesis. Neither Child and Mansfield (1972), Hickson et al. (1969), or Mohr (1971) found support for a fit between technology and structure; nor could Pennings (1975) find evidence confirming the relationship between environment and structure.

These inconsistent findings have led some authors to question the usefulness of the structural-contingency model. Child (1972), for example, argues that many of the studies of the relationship between organization structure and situational variables have reached overly simplistic conclusions. In support of this position, he maintains that any

structural component can be moderated: e.g., size can be changed by breaking larger units into smaller ones; approaches such as job enrichment can be used to manipulate technology; and directors of large companies may possess sufficient power to change the environment.

If Child's criticism is correct, then a possible explanation for these inconsistent results may be that the appropriate moderating variable is missing from the structural contingency model. According to James et al. (1982), if a functional relation is moderated by a third (or more) variable(s), then it follows that direct causal connections of the form  $(x \rightarrow y)$  cannot be interpreted unambiguously. Indeed, failure to identify a significant moderator will result in inaccurate estimates of structural parameters and erroneous causal inferences regarding the magnitudes of causal effects (James et al., 1982).

Thus, Litschert and Bonham's real contribution may be the inclusion of the organizational slack construct as a moderator of the structural-contingency perspective. Organizational slack appears to be the appropriate moderator because it determines whether an organization will be able to absorb the inefficiencies created by a mismatch between structure and context. Given this proposition, studies on the relationship between context and structure would be expected to

find significant correlations only in those situations where slack is low. In addition, it would be expected that under conditions of low slack, structure would serve as an intervening variable between context and strategy. Therefore, when slack is low, context should dictate structure which, in turn, should lead to strategy. Low-slack firms in a given environment would thus be expected to utilize similar structures as well as similar strategies.

In contrast, as the amount of slack increases, the relationship between context and structure should decrease since organizations with high slack can better afford to absorb any inefficiencies caused by a potential mis-match between context and structure. Organization members are therefore free to choose any strategy they see fit. It follows that under conditions of high slack, organizations operating in a similar environment may choose a wide variety of different strategies.

#### RESEARCH QUESTIONS

The above model led to the development of the following three questions which served as the primary basis for this research:

Q1. Will the strategies utilized by low-slack firms be more homogeneous than the strategies utilized by high-slack firms within a given environment?



Q2. Will the content of strategies utilized by high-slack firms differ significantly from the content of strategies utilized by low-slack firms within a given environment?

Q3. Will low-slack firms in different environments utilize different strategies?

The strategic information needed to answer these questions was obtained through content analysis of the 10-K reports of 86 manufacturing firms from two separate industries: the paper industry and the computer industry. In addition, seven years of financial information was taken from the Standard and Poors Compustat Tapes in order to measure organizational slack. The sample firms then were statistically clustered into a number of strategic groups within each industry. Appropriate statistical tests were run to determine whether the level of slack was related to strategy choice, as well as to examine the differences in the strategies of low-slack firms across contexts.

#### SIGNIFICANCE OF THE STUDY

Camerer (1985) has argued that research in the policy field has failed to advance as fast as that in other areas both because of the lack of rigorous testing of theoretical models and the failure of new models to build on old ones. In his words, "(T)heories are ambiguous, untested, and fail to replace other theories with little apparent progress" (1985: 5).

In this light, the most important contribution of this research is that it tests a specific theoretical model which has been widely cited in the policy literature, but has heretofore remained untested. One reason why such a test has not been conducted before this time may be due to the ambiguous nature of one of the primary constructs associated with the model: organizational slack. Therefore, a second contribution of the present research is its inclusion of two different operationalizations of the slack construct in an attempt to compare the predictive ability of each. Since the organizational slack construct has been linked with a variety of other variables of interest to policy researchers, this aspect of the study should be informative to researchers in the policy field.

Finally, this research used a multivariate statistical procedure to identify strategic groups. This analysis should be very useful to researchers and practitioners alike. First, such a technique allows a more comprehensive representation of strategy to be achieved which is an improvement on the overly simplistic measures of strategy utilized in some past studies (Woo and Cooper, 1981). Second, as Harrigan (1985: 55) has observed, "strategic group analysis can be a useful tool which focuses managers' attentions upon salient differences in how competitors approach the marketplace".

## DEFINITIONS OF TERMS

In order to facilitate the reading of this dissertation, selective terms which are either unique to the literature or operationalized for this research are defined as follows:

Organizational Slack was defined herein as the difference between the resources available to the organization and the total requirements of the coalition (March and Simon, 1958).

Strategy was conceived of as a pattern in a stream of decisions (Mintzberg, 1978). Generally, these decisions are aimed at aligning the organization with its environment and/or managing internal interdependences (Snow and Hambrick, 1980).

Strategic Group referred to a group of firms which utilize similar strategies. According to Porter (1979) and Newman (1978) such groups can be identified and are generally recognized both by industry members and experts. Moreover, they should be considered an integral part of the structure of the industries in which they exist.

Organizational Context was operationalized in this study as the industry in which a firm operates. Companies within each industry were assumed to operate within the same broad set of environmental and technological constraints.

## OUTLINE OF THE STUDY

### Chapter I

This chapter has presented an overview of the dissertation by stating the objectives of the research, discussing the conceptual framework of the L-B model, presenting the research questions which flow from the model, describing the significance of the study, and defining key terms.

### Chapter II

Chapter II contains a review of the literature which deals with (1) conceptual and empirical research on the slack construct and (2) conceptual and empirical research on strategic groups.

### Chapter III

Chapter III is also organized into two major sections: First, a detailed consideration of the theoretical and/or research foundations for each hypothesis is presented; second, the methodology utilized in the study is described. In particular, the sample is identified, the data collection instruments and procedures are discussed, and the data analysis techniques employed are enumerated.

#### Chapter IV

Chapter IV describes the results of the statistical tests and relates these results to each of the hypotheses and research questions derived in Chapter III.

#### Chapter V

Chapter V restates the problem examined in this dissertation in light of the empirical data presented in Chapter IV. The implications of this research for the study of strategic management are discussed and directions for future study proposed.

## Chapter II

### THE LITERATURE

This chapter reviews the literature in two areas. First, the conceptual and empirical research on organizational slack is presented. Since the slack variable is a crucial component of the L-B model, the selection of an operationalization had to be made with care. Hence, each study is carefully critiqued and evaluated in terms of its implications for further research on organizational slack. Second, the literature on strategic groups is discussed. Various conceptual typologies which have appeared in the literature are described as are multivariate studies which have developed such groups empirically.

#### ORGANIZATIONAL SLACK

##### Conceptual Models of Slack

The purpose of this section is to review several conceptual models of slack in order to develop a framework with which to analyze empirical studies on the topic. Emphasis will be placed on the utilization of slack by top management (i.e., members of the dominant coalition).

The concept of organization slack has been discussed in the organization theory literature for over a quarter of a

century beginning with March and Simon's definition of the concept in 1958. However, it was Cyert and March (1963) who firmly established it as a policy factor in the organization theory literature. In their words, slack "consists of payments to members of the coalition in excess of what is required to maintain the organization" (1963: 36). Moreover, it is "typically not zero" (1963: 36).

In plain terms, organization slack can be conceptualized as a cushion of excess resources which allows firms to survive in the face of adversity. According to Cyert and March (1963), slack stabilizes organizations in two ways: 1) by absorbing excess resources, it retards upward adjustment of aspirations during good times; 2) by providing a pool of emergency resources, it permits aspirations to be maintained during bad times (Cyert and March, 1963: 38).

Based on these notions, slack is often used as an independent variable in an attempt to explain certain kinds of organization behavior (Bourgeois, 1981). Pondy (1967), for example, postulated that slack leads to reduced conflict between subunits. Mohr (1969) examined the correlation between slack resources and innovation. Thompson (1967) indicated that slack resources are used to buffer the organization's technical core from environmental uncertainty. Similarly, Galbraith (1972) described the use of slack re-

sources as a mechanism to reduce the amount of information processed by an organization. In addition, Child (1972) maintained that the presence of slack allows an organization's dominant coalition to adopt structural arrangements in keeping with its own preferences despite extra administrative costs.

Regardless of the abundance of references to slack in the literature, very few researchers have attempted to operationalize the construct for inclusion in empirical studies. As Bourgeois (1981) notes:

[T]his lack of operational definition and measurement is curious. The concept itself is a powerful one and is intuitively appealing since it conveys the notion of a cushion of excess resources available in an organization that will either solve many organizational problems or facilitate the pursuit of goals outside the realm of those dictated by optimization principles (1981: 29).

Still, the concept of slack appears to be testable and many potential operationalizations appear in the literature. Several of these proposed measures will be described below.

Cyert and March (1963), for example, identify a number of possible forms of slack: excess dividends to stockholders, lower prices to maintain income from buyers, excess wages, executive services and personal luxuries, subunits which are allowed to grow without concern for the relationship between



additional payments and revenues, public services which are provided in excess of those required, and so on.

Galbraith (1972) specifies several sources of slack which include the following: increased inventories, backlogs and time delays, reduced performance standards, relaxed budget targets, higher costs and so on. While admitting that the use of slack in this fashion is not without cost, Galbraith (1977) maintains that it can be less expensive than other alternatives in allowing rational action in the face of complexity.

Williamson (1963) theorizes that managers will utilize the margin of surplus produced by an organization in three ways: staff expenditures, discretionary investments and managerial superfluities. An increase in environmental munificence is posited to lead to a reduction in the fraction of profits reported and an increase in the fraction of profits absorbed as cost. Deterioration of the environment should bring about the reverse scenario. In other words, under adverse conditions, reported profits will equal actual profits, and discretionary investments will be replaced by required ones. The strategic implications of the availability of slack are thus readily apparent.

Bourgeois (1981) also discusses the utilization of organizational slack as a strategic tool. In moving towards a

test of this notion, he provides an operationalization of the concept that leads to the identification of "slack gainers" and "slack losers" (1981: 37). The measures he suggests are derived from secondary data and draw upon two sources of slack: those created by management and those made available by the environment. His measures and a brief rationale for each are as follows:

<u>CHANGE IN</u> <u>SLACK</u> (+ or -)	<u>INTERNAL SOURCES OF SLACK</u>
+	RETAINED EARNINGS: An increase indicates the extent to which profits are reinvested in the firm as opposed to being distributed to stockholders.
-	DIVIDEND PAYMENTS: Signify a decrease in slack due to the distribution of funds.
+	GENERAL & ADMINISTRATIVE EXPENSE: An increase shows management's investment in extra overhead.
+	WORKING CAPITAL AS PERCENT OF SALES: As working capital increases at a rate faster than sales, excess liquidity accumulates.

#### EXTERNAL SOURCES OF SLACK

-	DEBT AS PERCENT OF EQUITY: As debt increases, future interest payment obligations increase as does dependence on creditors.
+	CREDIT RATING: Changes here reflect the firm's ability to borrow and represent a larger pool of slack.
-	SHORT TERM INTEREST RATES COMPARED TO PRIME: The larger the spread between these two rates, the more expensive the cost of funding to the firm.
+	PRICE-EARNINGS RATIO: An increase in this ratio signals an increased ability to generate funds from equity sources.

Two published studies using Bourgeois's operationalization have appeared in the literature (Bourgeois and Singh, 1983; Marino and Lange, 1983). Results of these studies will be discussed in the following section.

Summary: Conceptual Models

Several common themes run through these conceptualizations of organizational slack:

1. Slack is hypothesized to decouple an organization from its environment; i.e., it reduces the level of interdependence.
2. It appears that slack can be increased or decreased at will (until adverse conditions reduce the available pool to zero).
3. Slack is absorbed throughout the organization in the form of inventories, management luxuries, excess growth, higher costs, extra staff, backlogs and so on.
4. Although absorbed slack may not be identifiable at any particular moment in time, changes in the level of slack should be observable over time (e.g., when the level of staff is reduced without comparable reductions in productivity). Furthermore, it should be possible to compare the level of slack across a number of organizations.

### Empirical Studies of Slack

The studies reviewed in this section were gleaned from a review of 20 years of the two major management journals: Administrative Science Quarterly and Academy of Management Journal. In addition, Academy of Management Proceedings through 1984 were examined. References to studies in journals from other fields (such as Accounting and Finance) were also examined. As Table 1 reveals, very few empirical studies have been conducted in this area. Moreover, those which have been conducted suffer from both reliability and validity problems among other weaknesses. The goal of this section is to critique each of these studies, and then to derive general findings from the group as a whole.

#### Schiff and Lewin, 1968

Schiff and Lewin (1968) examined the creation of slack during the budget preparation process of three Fortune 100 companies. Their investigation relied on in-depth interviews with division presidents, controllers and vice presidents in charge of planning, marketing, and production as well as with staff members in each of these departments. In addition, the researchers had access to all necessary reports and documents.

TABLE 1

## A Listing of Empirical Studies on Slack

<u>AUTHORS</u>	<u>NULL HYPOTHESES</u>	<u>CONCLUSION</u>
SCHIFF & LEWIN 1963	None (Case Study Approach)	NA
ONSI, 1975	H1) Development of the operating budget as a deterministic model will have no different impact on the creation and use of slack than budget development as a probabilistic model.	ACCEPT NULL
	H2) Slack distribution to cost slack and sales slack is not different whether sales fluctuations are small or large.	REJECT NULL ( $p < .05$ )
	H3) The differences in managers behavior toward slack institutionalization should have no impact on corporate profitability.	REJECT NULL ( $p < .05$ )
ROSNER, 1968	H1) An increase in slack will have no impact on the frequency of trial of new drugs.	REJECT NULL ( $p < .22$ , one tail)
	H2) An increase in slack will have no impact on the promptness of new drug trial.	REJECT NULL ( $p < .09$ , one tail)
DIMICK & MURRAY, 1978	H1) Slack will have no impact on the following personnel policies and programs:	
	a) selection process sophistication	REJECT NULL $P < .05$
	b) overall staffing process	REJECT NULL $P < .05$
	c) manpower planning sophistication	ACCEPT NULL
	d) range of training	REJECT NULL

TABLE 1 continued. . .

<u>AUTHORS</u>	<u>NULL HYPOTHESES</u>	<u>CONCLUSION</u>
	e) total number of training courses	P<.05 REJECT NULL
	f) education leave generosity	P<.05 ACCEPT NULL
	g) reimbursement for part-time study	ACCEPT NULL
	h) perf. appraisal sophistication	ACCEPT NULL
	i) perf. appraisal-development	REJECT NULL P<.05
	j) perf. appraisal-merit emphasis	REJECT NULL P<.05
	k) promotability as selection criteria	ACCEPT NULL
	l) policy evaluation sophistication	ACCEPT NULL
KMETZ, 1980	H1) There will be no relationship between production smoothing (ps), slack performance (sp), or slack resources (sr) and the following organizational variables:	
	a) organizational effectiveness	ACCEPT NULL
	b) information flow (ps)	REJECT NULL p<.05
	c) environmental turbulence (ps)	REJECT NULL p<.05
	d) unit interdependence (ps)	REJECT NULL p<.05
MARINO & LANGE 1982	H1) High-slack firms will exhibit the same variation in reported earnings as low-slack firms in the same industry.	REJECT NULL (p<.05, one tail)
	H2) Low-slack firms will exhibit no greater increases in inventory turnover than high-slack firms in the same industry.	REJECT NULL (p<.10, one tail)
	H3) High-slack firms will experience no more rapid growth in S,G&A expenses as a percentage of sales than low-slack firms in the same industry.	ACCEPT NULL

TABLE 1 continued. . .

<u>AUTHORS</u>	<u>NULL HYPOTHESES</u>	<u>CONCLUSION</u>
	H4) High-slack firms will experience no more rapid growth in cost of goods sold as a percentage of sales than low-slack firms in the same industry.	ACCEPT NULL
	H5) Low-slack firms will experience no more rapid growth in sales per employee than high-slack firms in the same industry.	ACCEPT NULL
BOURGEOIS & SINGH, 1983	H1) Changes in the level of slack will have no impact on the level of political behavior among the management team.	REJECT NULL $p < .05$
	H2) Changes in the level of slack will have no impact on the level of strategic discord among top management.	ACCEPT NULL
MARINO & LANGE, 1983	H1) There will be no association between the slack categories formed by absolute vs. relative measurement procedures.	ACCEPT NULL

Some of the more intriguing findings emerging from this investigation involve the overwhelming recognition and utilization of slack by management. According to one controller interviewed by the authors, slack accounted for as much as 20-25% of divisional budgeted operating expenses. Furthermore, slack was incorporated into the budgets of loss-producing divisions as well as within the budgets of their more profitable counterparts.

The most common methods of creating slack in these firms were:

MANUFACTURING COST STANDARDS: Slack arose from the discrepancy between budgeted costs and what costs could have been had various known cost improvements been introduced.

OPERATING EXPENSES: Various expenses such as special marketing programs, training programs and the hiring of new personnel were included in budgets, and yet the actual commitment of resources to these items was contingent on progress made during the year in attaining the budget. In good years, these "niceties" could be enjoyed while in bad years, they could easily be eliminated.

ACCOUNTING ADJUSTMENTS: Changes in accounting methods were also occasionally made to affect slack but the use of this technique was marginal.

According to Schiff and Lewin, these results indicate that managers build slack into their budgets by understating revenues and overstating costs. In this manner, they are able to satisfy personal aspirations through the use of



slack in good years and reconvert slack into profits in bad years (Schiff and Lewin, 1970).

Critique: Since this research relied on the case study approach, it is primarily exploratory in nature and the concepts which are developed cannot be statistically tested due to the small sample size. Some specific limitations of the case study approach follow: First, since there is only one observation per condition, there can be no conclusion validity, since the mean square for error cannot be calculated to test the significance of condition effects (Judd and Kenny, 1982). Second, the three organizations in this study were not randomly chosen and may be atypical of the population of organizations. Hence, external validity cannot be claimed.

Lastly, case studies lack control. Since many rival hypotheses could be constructed which would provide alternative explanations for Schiff and Lewin's results, internal validity is limited. For example, one explanation which cannot be discounted is the obtrusive method of data collection utilized by the researchers. As Kazdin (1982) indicates, obtrusive assessment can be reactive; that is, it can influence the performance of subjects in the situation.

In this case, Schiff and Lewin made observations and conducted interviews with subjects over a two year period. They gathered information on each step of the budget prepa-

ration process as it occurred. We cannot know to what extent subjects modified their behavior as a result of this outside presence. The fact that company records were also utilized is a positive factor, but as Bouchard (1976) notes, these too may be changed by organization members, particularly when it is known that they will be examined by outsiders.

Implications for the Study of Slack: Schiff and Lewin have provided an excellent case description of managerial creation and utilization of organizational slack. None of the problems mentioned above are fatal flaws: they are merely limitations inherent in the case study approach. All in all, their findings concur with the conceptual models of slack described earlier. Particularly supported is Williamson's (1963) model which states that managers use slack to satisfy personal aspirations in good years and reconvert slack to profits under adverse conditions. In sum, these findings provide the seeds of and motivation for further work in this area.

Onsi, 1975

Using a simulation model, Onsi (1975) also examined the emergence of slack in the budget preparation process. In his study, a monopolistic company producing one product was

chosen as a basis for analysis. The company was assumed to be a medium-sized company with a centralized planning committee.

Data were generated using the Monte Carlo method. A 2x2x2 completely crossed factorial design was utilized incorporating the following three independent variables: Budget Formation (deterministic or probabilistic); Slack Behavior (Neutral-create slack in good periods and reduce in in adverse ones; Active-create slack in good periods and attempt to maintain it); and Sales Fluctuation (Small-up to 10%; Large-up to 20%). In addition, changes in seven dependent variables were examined: average price, average quantity, average total cost per unit, percent decline in profits due to budgetary slack, percent profits forgone due to cost slack, percent slack in total costs, and percent of cost slack to profits.

Analysis of variance results showed no effect for the budget formation factors. The utilization of deterministic budgets did not lead to greater slack accumulation than did probabilistic budgets. The other two main effects, however, were significant. First, companies experiencing wide fluctuations in sales had less sales slack, while cost slack remained about the same. Second, active slack behavior led to higher rates of profitability than neutral slack behavior.

Finally, there was a significant interaction between sales stability and slack behavior.

Critique: According to Meier et al. (1969), a carefully designed simulation model provides a laboratory environment in which to make observations under controlled procedures. Because of this high level of control over each condition, the experimenter can easily determine exactly which factor leads to changes in the dependent variable. Onsi, for example, was able to run each model twice: once to examine each variable in the presence of slack and once without slack. This ability provides an advantage over field research for at least two reasons: First, internal validity is enhanced as causality can easily be determined. Second, simulation can serve as a useful tool to help discover the ways in which slack is most likely to be absorbed in real organizations.

Another strength of this method is its strong conclusion validity. Note that Onsi has used a completely crossed design which is more powerful than a nested design (Judd and Kenny, 1982). In addition, since the analysis is based on 500 observations, and the assignment rule is random, power is enhanced.

On the other hand, the disadvantages of simulation studies are not unlike those of other experimental designs.

How do we know that a model represents the actual process under study? How can we test the results to devise empirically accurate predictions? A simulation is simply a numerical representation which is not governed by any physical laws that make it similar to the system being modelled (Meier et al., 1969). Therefore, if a model is to be valid, its construction must be based on theory:

Exercising care in the early stages of formulation and construction of a simulation model is as important as any more specific procedures that can be suggested for validating a model. However, once the model is completed, validating it is a two-step process. The first step is to determine whether the model is correct in a logical and programming sense. And the second is to determine whether it represents the phenomena it is supposed to represent (Meier et al., 1969: 294).

The first step mentioned by Meier and his associates can be considered the reliability check. Onsi utilized the first 100 periods of the modelling to allow the system to reach "a reasonable level of stability" (1975: 85). This can be interpreted to mean that his "measures" were reliable.

The second step in the validation process is the establishment of construct validity. Not surprisingly, the only way to do this is to compare output from the model with known data from the real world, and to check for convergent

validity. Since this step was not present in Onsi's study, the construct validity of his slack measurement can not be inferred.

Implications for the Study of Slack: While the precise control established in simulation models is a strength of this methodology, it is also a weakness. Generalization is limited to monopolistic companies with one product. Given this constraint, Onsi's results provide limited support for the conceptual framework described earlier. In particular, the finding that companies experiencing wide fluctuations in sales tend to lose sales slack corresponds with the notion that slack will decrease under adverse conditions. However, the finding that active slack behavior leads to higher levels of profitability does not appear to corroborate the theoretical model. The maintenance of slack during adverse conditions should cause profits to fall, since theoretically, an increase in the number of constraints faced by an organization would require the diversion of funds from discretionary investments to required investments. This point obviously requires further examination - preferably in the field. It may be an artifact of the simulation method.

Rosner, 1968

In a field study drawn from his dissertation, Rosner (1968) examined the influence of economic orientation and organizational slack on innovation in 24 teaching hospitals in the Chicago area. Innovation was operationalized as the frequency and promptness with which hospitals tried new drugs. Frequency was determined by the chief pharmacist's responses to a questionnaire on drug use; while promptness was measured by audits of purchase invoices for a sample of six pre-selected drugs.

Organization slack was operationalized as the hospital occupancy rate - a pseudo-measure of profitability. Economic orientation was calculated as drug cost per in-patient day and drug inventory turnover rate. Multiple regression analysis was used to determine the relationship between these variables.

Critique: One obvious strength of this study was the careful use of controls to isolate the effects of the independent variables and improve internal validity. A relatively homogeneous sample of hospitals was used to control for differences in ownership, therapeutic emphasis and research orientation. In addition, the following factors were included in the regression equation to control for their effects: hospital size, control of medical staff activity, visibility of medical care, and medical staff innovativeness.

Of course, the use of controls in this fashion can also lead to problems. Rosner, for example, looked at the values of his standardized regression coefficients and concluded that economic orientation had a strong inverse relationship with frequency of trial and a weak positive relationship with promptness. On the other hand, occupancy rate (slack) was interpreted as having a strong influence on promptness and a weaker effect on frequency. Yet these interpretations may be somewhat misleading. According to Montgomery and Peck (1982):

In interpreting standardized regression coefficients, we must remember that they are still partial (original emphasis) coefficients (i.e.,  $b_j$  measures the effect of  $x_j$  given that other regressors  $x_i$ ,  $i \neq j$ , are in the model. Furthermore, the  $b_j$  are affected by the range of values for the regressor variables. Consequently, it may be dangerous to use the magnitude of the  $b_j$  as a measure of the relative importance of regressor  $x_j$  (Montgomery and Peck, 1982: 170).

In other words, the partial regression coefficients for organizational slack and economic orientation represent the expected change in innovation only when all the remaining regressor variables are in the model. If the control values were to change, the values for slack and economic orientation would also differ. Thus, the ability to generalize is limited.



Conclusion validity is also relatively low in this study. As Rosner (1968) points out, the F-values are barely significant and there is a high proportion of unexplained variance. This is probably due to the low sample size and the fact that the regression model is underfitted since there were "as many as six values of the dependent variable for every value of the independent variable" (Rosner, 1968: 623). Finally, since there was only one method used to measure organization slack, construct validity cannot be inferred.

Implications for the Study of Slack: The operationalization of slack applied in this study appears to be particularly weak with respect to the conceptual model of slack presented earlier. To begin with, Rosner would like to use profit as a measure of slack, but has to settle for occupancy rate. While this measure is undoubtedly related to profit, how is profit related to slack? Recall Williamson's (1963) argument that slack can be manipulated by managers to increase or decrease reported profits. It follows that by looking at reported profits alone, we cannot tell how much slack manipulation took place.

Interestingly, one of the measures chosen by Rosner to represent economic orientation was "drug inventory turnover rate." Since he is actually studying innovation at the su-

bunit level as opposed to the organization level, this may, in fact, be a better indicator of slack than occupancy rate. Indeed, inventory turnover is one of the methods of slack creation described by Galbraith (1972). Perhaps, Rosner included a measure of slack in his study despite himself.

Dimick and Murray, 1978

Dimick and Murray (1978) compared economic and contextual factors (including organizational slack) to the sophistication of personnel programs in 20 different companies from different industries. Organizational slack was operationalized as average profits controlled for size over a five year period. The authors found that staffing sophistication, the range of nonmanagerial training and the applications of performance appraisal were positively correlated with this measure of slack. Other factors, including manpower planning sophistication, educational leave and part-time study generosity, promotability, and policy evaluation sophistication were not significantly related to slack.

Critique: Like Rosner's (1968) study, this was a cross-sectional correlational design, so causality cannot be established. To further complicate the matter, the authors did not explain how this particular sample was chosen. As Judd and Kenney (1982) indicate, an unknown assignment rule

can lead to biased estimates of condition effects. Such bias is a form of systematic error affecting the validity of the results.

Data were collected through the use of questionnaires and interviews. No mention was made of reliability checks. Next, the various data were conceptually combined into a set of 12 indices summarizing different aspects of the personnel function, which were then correlated with organizational slack. However, since empirical scaling procedures were not used to compose these indices, we cannot be sure whether different groupings of data might not have led to different results. Finally, given this rather small sample size ( $N=20$ ), conclusion validity is limited.

Implications for the Study of Slack: The most important problem in this study is, once again, construct validity. While the fact that only one method of measurement was used is sufficient by itself to cause problems, the use of profits as a measure of slack is even more questionable. As Williamson (1963) has noted, reported profits rarely equal actual profits due to the presence of managerial slack absorbed as cost. On the other hand, by looking at 5-year average profits (controlled for size), Dimick and Murray may have improved upon previous profit-oriented slack measurement procedures. Although they are still actually looking

at profits, not slack, it is likely that firms which have maintained above average performance over a five year period would have greater access to slack than those which were consistently below average on profits since investors are more likely to invest in high performing firms. Hence, these researchers may have found a potential pseudo-measure of slack. Still, there was a critical problem with their use of this measure in that they compared average profits of firms from different industries. Since average profit levels vary by industry, the failure to control for industry membership may have confounded their results.

Kmetz, 1980

Kmetz (1980) attempted to provide empirical support for Galbraith's model of slack. (Recall that Galbraith (1972, 1977) postulated that slack serves to reduce the amount of information processed by an organization in order to decrease uncertainty.) To test this proposition, Kmetz distributed a 127-item questionnaire to 33 federal government managers and executives representing 27 different organizations. The questionnaire consisted of 17 groups of items (labelled for face validity) measuring managerial perceptions of organizational effectiveness, structure, context, information flow, environmental turbulence, and slack. The latter was measured as follows:

1. Slack resources: three items measuring perceived respondent inadequacies of funding and quantity or quality of personnel.
2. Slack performance: four items measuring perceived respondent capability to absorb workload increases.
3. Production smoothing: ten items measuring the use of queuing, outside contractors, priority setting, and other means of adjusting demand on the work unit.

Kmetz examined the relationship between slack and several organizational variables. The only component of slack which yielded significant results was the production smoothing dimension. This was positively related to information flow ( $r=.33$ ;  $p<.05$ , one-tailed), environmental turbulence ( $r=.32$ ;  $p<.05$ , one-tailed), and unit interdependence ( $r=.44$ ;  $p<.05$ , two-tailed). Kmetz interpreted these findings as follows: 1) The various smoothing methods utilized require information themselves for coordination; 2) Production smoothing is the primary means by which these organizations decouple themselves from the environment; and 3) Production smoothing also decreases interdependence between units.

There is a fundamental problem with Kmetz's interpretation of these last two findings: If, as Kmetz suggests, slack is used to decouple the organization from the environment or from other units, then these relationships should be

negative. In other words, as slack increases, interdependence should decrease. While Kmetz claims that this positive relationship between slack and interdependence is "consistent with Galbraith's comments" (Kmetz, 1980: 249), a look at Galbraith's work reveals that slack resources are used to "reduce the amount of interdependence between subunits" (Galbraith, 1972: 60).

Critique of Methodology: In testing this model, Kmetz utilized a perceptual measure of slack. While this appears to be a viable means of measuring the construct, he failed to report any measure of its reliability or potential validity. This is particularly damaging as it is a new scale. Furthermore, as he himself notes:

While slack may represent a functional adaptation to uncertainty, it may simultaneously be perceived as evidence of poor management, inefficiency, or other dysfunctional consequences (Kmetz, 1980: 246).

Thus, a second problem of Kmetz's scales may be reactivity. If subjects perceive slack as evidence of poor management or inefficiency, they may provide biased responses due to their desire for social approval (Alwin, 1978). Moreover, Kmetz may have added to the reactivity of the instrument by labelling each section of questions. Whereas a question on the quality of personnel may have appeared rath-

er innocuous by itself, it may take on negative connotations under the heading "SLACK RESOURCES." As Bradburn (1982: 65) comments, people can respond differently to identically worded questions that appear in different contexts.

Kmetz's sampling procedures also deserve comment. No mention is made in his article of how these particular individuals were chosen to respond to this study or whether or not the 33 subjects represent a 100% response rate. Given that the questionnaire was rather long, it is doubtful that the latter is the case, unless the respondents were acquainted with the author or, perhaps, part of a seminar. Since this information was not provided, no generalization of Kmetz's results can be made.

Lastly, Kmetz seems to be somewhat confused about the level of analysis of his investigation. He sampled 33 respondents from 27 organizations, noting that not more than two respondents from each organization answered the questionnaire. Then he included all 33 respondents in his data analysis as if he were studying 33 different organizations. Hence, six organizations are represented twice in this study probably inflating his correlations artificially.

Implications for the Study of Slack: In summary, this study had problems with the instrument, the sampling method, the analysis and with the theoretical interpretation of re-

sults. It is unfortunate that this is the case because a perceptual measure of slack could be worth investigating.

Marino and Lange, 1982

Using secondary data derived from the Compustat tapes, Marino and Lange (1982) looked at changes in earnings variation, inventory growth, and cost behavior under varying levels of slack resources. The study focused on two industries - apparel and motor vehicle parts and accessories - for the period from 1969 through 1976. Since both of these industries represent mature, competitive manufacturing environments (Marino and Lange, 1982), some measure of control was established in an attempt to enhance internal validity. Of course, the ability to generalize to other organizations is hindered as a result of this reliance on homogeneous groups.

Organizational slack was operationalized using two measures: return on total assets, and cash flow margin per sales dollar. In order to be classified as a high slack firm, a company had to have equalled or exceeded the industry median for either of these measures for seven consecutive years. Low slack firms were those below the industry median on either measure for seven consecutive years. Based on these requirements, 11 of the 48 apparel firms were classified as high slack while 9 fit into the low slack category.



In the motor vehicle parts and accessories industry, 9 organizations were classified as high slack and 11 as low slack firms.

Marino and Lange's results were mixed. First, as predicted, firms with high slack had more stable earnings than did firms with low slack. This finding held for both industries. Second, high slack firms had a lower rate of increase in inventory turnover than did low slack firms. This too, was as predicted since decreasing inventory turnover is one means of increasing slack. While these first two findings supported Marino and Lange's hypotheses, the remaining results did not.

No evidence was found of a higher rate of cost escalation among high slack firms in selling, general and administrative expense or cost of goods sold. Moreover, growth rates in sales per employee were identical for high and low slack firms in the motor vehicle parts industry while in the apparel industry, the high slack firms experienced significantly larger growth in sales per employee. This result was the opposite of that which was hypothesized. Marino and Lange explained this discrepancy by maintaining that redundant personnel is not a preferred use of slack resources among apparel firms (1982: 5).

Critique: In general, this is a well-organized study, but several criticisms apply. First, sample size is quite low. The largest category contains only 11 organizations which reduces power and conclusion validity. In addition, internal validity is limited since a cross-sectional design is utilized. Finally, only one measure of slack was utilized in this study, and it behaved as predicted about half the time. Therefore, little can be said about the construct validity of this measure; yet further use may be worthwhile as will be discussed in the next section.

Fit with Conceptual Framework: Like the Dimick and Murray (1978) study described above, this study used profitability indicators as a kind of proxy measure for slack. The assumption made by Marino and Lange is that firms which are able to maintain above average cash flows or returns on assets for seven consecutive years should have a higher level of internal resources (since they are fairly liquid) and also should have greater access to additional funding from external sources since they should be perceived as attractive investment opportunities by investors. The strengths of such an approach follow: first, the use of an extended time period appears to be a strength of this measure. Although managers can easily manipulate financial indicators to make them look good for a year or so, it would be very dif-

difficult to maintain this illusion for seven years (particularly in the presence of adverse environmental conditions) were slack resources actually not available. Second, the comparison of these ratios to industry medians is a major improvement over Dimick and Murray's comparison of firms from different industries, since different industries often have vastly different profitability norms. Therefore, although this slack measure is still only a proxy for slack, it represents a definite improvement over previous operationalizations of the construct.

Bourgeois and Singh, 1983

In this study, Bourgeois and Singh utilized a variation of Bourgeois' (1981) operationalization of slack (described earlier) to test hypotheses relating slack to certain strategic and political behaviors within top management teams. Whereas Bourgeois' (1981) paper conceived of slack as being derived from two sources, (i.e., those created by management and that offered by the environment), this paper discussed three conceptually distinct dimensions of the slack construct: available, recoverable and potential. As defined herein, available slack consists of resources that have not yet been absorbed into the organizational system. Recoverable slack consists of resources that have been ab-

sorbed as excess costs. Lastly, potential slack is described as the firm's ability to generate extra resources from the environment.

This refinement of Bourgeois' (1981) conceptualization of slack led him and his co-author to make some changes in the measures selected for its operationalization. First, the component "working capital as a percent of sales" was disaggregated into three subcomponents since it was believed to contain both available and recoverable elements of slack. Second, "general and administrative expense" was examined as a percentage of sales in order to control for increases or decreases in firm activity. Finally, two indicators were dropped, presumably due to the lack of data availability; neither "credit rating" nor "short term interest rates compared to prime" were included in the present analysis.

Bourgeois and Singh utilized these measures as follows. First, the difference in each ratio from one year to the next was calculated. (His original model called for at least a 5 year time period.) Then, the differences in each of the three categories of slack were summed. Finally, an overall slack score was calculated by summing the three sub-scores. Each of these four slack scores were then correlated with perceptions of political activity and strategic discord in a sample of 24 firms. Results showed that the individual com-

ponents of slack affected strategic behavior differentially. Recoverable slack appeared to reduce political behavior; in contrast, potential slack increased political behavior while simultaneously suppressing goal disagreement.

Critique: Although Bourgeois' original framework for the operationalization of slack appears to be theoretically sound, his actual use of these indicators is questionable. A number of questions remain unanswered in this paper. For example, why were changes in slack observed over a one year period as opposed to five or more? Is it possible to add such diverse ratios as Long Term Debt/Equity and the Price/Earnings ratio and still come up with meaningful results? In their paper, Bourgeois and Singh provide no explanation for such methodological decisions. Hence, construct validity is again a serious problem in this study.

Implications for the Study of Slack: Bourgeois' work is stronger conceptually than it is empirically. For some reason, his actual operationalization differed a good deal from his original prescriptions. However, a second study by Marino and Lange (1983) also utilizes the original Bourgeois (1981) framework with somewhat different methods and far better explanation. Before "throwing the baby out with the bathwater," this next study should be considered.

Marino and Lange, 1983

In this study, Marino and Lange compare the operationalizations of slack utilized by Dimick and Murray (1978), Bourgeois (1981), Marino and Lange (1982) as well as one unpublished dissertation by Wolf (1971). These slack measures are divided into two groups: absolute versus relative.

Absolute measures of slack are defined as those which identify firms with the most or least slack resources in comparison to other firms. Measures used by Dimick and Murray as well as Marino and Lange fall into this category. (Rosner's 1978 study would also fit here but is not included.) All of these studies employ a profitability criterion as a measure of slack. The authors' rationalization for this criterion follows:

The logic of such a criterion assumes that, in order to attract additional resources from the environment, the firm must demonstrate technical competence and efficiency in current operations. Therefore, the profitable firm not only generates internal capital but is more likely to generate additional resources from the environment.

Hence, these absolute measures of slack can be described as proxy measures. Use of such measures is based on the assumption that profitable firms can easily generate extra resources when desired.

The second category of measurement described in this article includes relative measures of slack. Such measures

seek to gauge the change in level of slack resources an organization possesses over time. The work of Bourgeois and Wolf (1971) fits here. In his unpublished doctoral dissertation, Wolf operationalized slack as change in operating profits over a four year period.

Using the same sample of apparel and motor vehicle parts firms described in their 1982 study, Marino and Lange categorized these firms as "high slack/gainers", "unclassified/constant," or "low slack/losers" using all 4 operationalizations. Pairwise comparisons of these procedures led to the construction of 3 X 3 contingency tables. The Kappa statistic (Cohen, 1960) was then utilized to determine the amount of agreement between pairs.

Results showed the two absolute measures to achieve significant agreement in classifying firms according to the level of slack. Marino and Lange admit that these strong findings were to be expected since both measures focus on profitability. The two relative measures, however, did not converge. In fact, since most of the cases in each industry fell into the extreme off-diagonal cells, it was apparent that the two measures were not tapping the same construct.

Comparison of relative to absolute measures again showed little convergence. Marino and Lange state that such results indicate that absolute and relative measures are not interchangeable.

Critique: This is an excellent study and one which has been sorely needed in researching the organizational slack construct. As the authors point out, some knowledge of the convergence of these two measurement approaches "will contribute to the process of construct validation and enhance our ability to compare empirical results from different investigations" (Marino and Lange, 1983: 84).

Actual operationalization methods utilized were spelled out in detail - in some cases surpassing explanations provided by the original author. For example, in dealing with Bourgeois' (1981) model, these authors measured change in slack over a seven year period which seems much more realistic than the one year period used by Bourgeois and Singh (1983) in terms of the length of time required for real change to occur within organizations. In addition, Marino and Lange (1983) did not attempt to add ratios which are inherently different. Rather, they looked only at the direction of change in each ratio (+ or -) and identified organizations as gainers or losers based on a simple count of expected changes in the indicators. While this does not get at the actual magnitude of the change in slack, Bourgeois, in his original (1981) article, made no claim to be able to do so.



The major problem with this study is that there is no theoretical framework within which to further test these operationalizations. Although it is shown, for example, that the Dimick and Murray (1978) measures converge with the Marino and Lange (1982) measures, there is still no evidence that the construct being measured is slack. Likewise, it is clear that the Bourgeois (1981) measure and the Marino and Lange (1982) measure are looking at different things, but what are they looking at?

The crucial missing step in this study is thus the investigation of the slack construct in relation to other constructs in terms of formal hypotheses derived from theory. If the construct behaves as it is predicted to behave, then there is additional evidence that it is measuring what it is supposed to be measuring (Churchill, 1979; Peter, 1981).

Implications for the Study of Slack: It is appropriate to have reviewed this study last in this section because it brings together many of the issues discussed earlier. Although many questions still remain as to the usefulness and meaningfulness of the measures of slack discussed herein, the initial steps have at least been taken in the development of two concrete measures of slack. An appropriate second step would be to extend the work of Marino and Lange by inserting these operationalizations into a viable theoretic-

cal framework such as that provided by the L-B model. Before this can be done, however, one more aspect of the model must be discussed. The next section of this paper, therefore, is devoted to a description of the conceptual and empirical literature on strategic taxonomies.

### CLASSIFICATIONS OF STRATEGY

A critical step in the development of any science has been said to be the availability of a widely accepted and usable classification scheme (Hempel, 1965; Haas and Drabek, 1973; McKelvey, 1975). In recent years, strategic management scholars have joined their peers in more well established paradigms in the attempt to construct classification schemes for identifying strategic typologies. The assumption underlying the generation of such typologies is that there are a limited number of identifiable strategies, each of which involves a different pattern of competitive position objectives, investment strategies, and competitive advantages (Hofer and Schendel, 1978: 160).

In general, two distinct methodologies have been used in the development of these classification schemes. The first approach can be described as a conceptual one. Here, constructs are either deductively derived from theory or, as McKelvey (1975) suggests, they are derived through the men-

tal induction method. As Galbraith and Schendel (1983) admit, important insights regarding strategic activity can be gained in this manner; yet, the validity of such typologies remains in question without empirical support.

A second approach to the development of taxonomies is to derive them empirically from data by using statistical methodologies. Generally, researchers using this approach start with a sample of firms for which data exists on a number of strategic attributes such as the degree of vertical integration, expenditures on R & D as a percentage of sales, number of new products, etc. A multivariate technique such as cluster analysis or Q-type factor analysis is then used to form groups of firms sharing similar attributes. These multivariate analytical approaches can offer researchers a chance to find a fresh set of strategic groupings based on larger samples, and free from the influence of conceptually-based taxonomies (McKelvey, 1975). Furthermore, these empirical studies can be used to test conceptual schemes in order to enhance their validity. However, only three studies have taken the extra step involved in linking strategic attributes with conceptually derived strategic groups. These studies will be discussed later in this section.

As illustrated in Table 2, different approaches to the classification of strategy can be compared according to the

level of strategy examined (corporate level versus business level) and the procedure utilized to construct the typology (conceptual versus empirical). Studies included in this table are those which take a rather comprehensive view of strategy, recognizing that a number of attributes represent an organization's strategic position at a given time (Ginsberg, 1984). Not included are studies which form strategic groupings on the basis of a single strategy variable. For example, studies on the effect of market share (e.g., Henderson, 1968; Chevalier, 1972), R & D strategy (Christensen, 1977) financial risk (Baird and Kumar, 1983) or level of diversity (Wrigley, 1970; Rumelt, 1974) are not considered herein.

The following sections will examine contributions made by both the conceptual and empirical approaches and will attempt to reconcile the two using examples of taxonomies at both the business and corporate levels of strategy.

#### Conceptual Taxonomies/Business Level Strategy

As is evident in Table 2, the vast majority of strategic typologies are aimed at identifying patterns of business level strategy. These vary widely in terms of both the number of possible strategic groups, and in terms of the attributes defining each group. Such distinctions are undoubtedly

TABLE 2

## A Matrix of Strategic Typologies

	BUSINESS LEVEL STRATEGY	CORPORATE LEVEL STRATEGY
CONCEPTUAL TAXONOMIES	Buzzell et al., 1975 Utterback et al., 1979 Miles et al., 1979 Hofer & Schendel, 1978 Vesper, 1979 Wissema et al., 1980 Porter, 1980	Glueck, 1980
EMPIRICAL TAXONOMIES	Hatten et al., 1978 Galbraith et al., 1983  Hambrick, 1983 Dess and Davis, 1984	

ly related to the objectives of the firm as perceived by each author (Galbraith and Schendel, 1983).

The typologies proposed by each of the authors in Table 2, can be found in Appendix A. In order to show how these groupings work, however, two of the more well known typologies will be discussed here. These two were chosen because of their prominence in the literature as well as for the availability of empirical data supporting their assumptions.

Miles et al. (1978) identified four strategic types of organizations in what is probably the best known typology in the business policy literature. The primary dimension underlying this typology is rate of product-market change (Hambrick, 1980). Defenders, for example, are extremely stable organizations, which tend to find a safe niche and stay there. In contrast, prospectors continually seek out new products and markets, often at the expense of profits. Analyzers tend to fall between these two extremes by attempting to locate new product and market opportunities while maintaining a firm core of traditional products and customers. Finally, reactors are inconsistent - exhibiting no clear approach to product-market change.

Using data from the PIMS project, Hambrick (1983) attempted to explore the underlying strategic attributes of the two extreme groups of this typology: prospectors and

defenders. In this study, a prospector was defined as a business whose new product sales were above 10% for a four year period. In contrast, a defender was defined as a business whose new product sales were below 1% for four consecutive years. The sample included matched pairs of defenders and prospectors in the same 4-digit SIC codes in order to control for industry differences.

Thirteen strategic attributes were hypothesized to match either the prospector or defender strategy type. Of these, six attributes were found to support the hypothesized model, two were significantly related to the wrong group and the remaining five were not significant. Hambrick (1983) described these results as providing "scattered support" for the Miles et al. (1978) model.

The second conceptual taxonomy to be discussed is that of Porter (1980). Here, three generic strategies are proposed, each of which is aimed at increasing firm profits. First, the strategy of overall cost leadership attempts to reap profits by maintaining a low cost position within an industry. Differentiation, on the other hand, involves the creation of a product or service which is perceived throughout the industry as being unique. Such a product should bring a premium price in the market place. Lastly, focus is a strategy which zeroes in on a specific buyer group, product line

segment or geographic market. This strategy actually combines the approaches described under the cost leadership and differentiation strategies above. However, in this case, these approaches are directed at a specific target.

A study by Dess and Davis (1984) provided an empirical examination of Porter's (1980) generic strategies using a sample of 22 firms from the paint industry. In this study, the authors derived a list of 21 "competitive means" which they felt might be used in implementing the three generic strategies described above. The top management teams of each sample firm were asked to rate the importance of each item to their firm's strategy using a 5-point interval scale. The data was factor analyzed in order to reveal any meaningful patterns of variables.

In Phase II of the study, a panel of 7 experts was asked to review Porter's typology and complete three copies of the 21 item questionnaire: one for each strategic type. In each case, the experts were asked to indicate which attributes were most important in implementing the generic strategy. Results of Phase I and Phase II were then compared. Strong agreement was found for the attributes underlying both the differentiation and low cost strategies; however, the attributes assigned to the focus group were rather mixed. Yet, even in this case, there was agreement on those attributes that should not be assigned to a focus strategy.



Although there are several weaknesses inherent in this study such as the small sample size, in general it is a very informative study. It is the only study which successfully depicts the link between the underlying strategic attributes and generic strategic types. Indeed, it indicates that managers really do follow coherent strategic patterns even if they do not apply the textbook names to those patterns.

#### Empirical Taxonomies/Business Level

The Hambrick (1983) and Dess and Davis (1984) studies have already been described above as attempting to link strategic attributes with a conceptually derived strategic typology. The remaining two studies in this quadrant start with no preconceived notions about the outcome of their strategic clustering procedures. They are purely concerned with deriving strategic groups or taxonomies from the data.

Briefly, Hatten et al. (1978) using secondary data, derived strategic groups within the brewing industry. Although this study was plagued by a number of methodological problems including rather severe multicollinearity, it is widely recognized in the business policy literature as being one of the first to empirically derive strategic groups. The specific strategy components analyzed can be seen in Appendix A. No attempt was made to compare these findings to any conceptual taxonomy.

The Galbraith and Schendel study (1983) was much more sophisticated. These researchers compiled a list of 26 strategic components for a sample of consumer goods firms as well as for a sample of industrial goods firms (see Appendix A) from the PIMS database. The components were then factor analyzed in order to transform the original 26 attributes into a reduced number of strategy factors. Next, cluster analysis was utilized to sort these factors into strategic groups.

Six strategy types were identified for the consumer products firms: 1) harvest; 2) builder; 3) cashout; 4) niche or specialization; 5) climber and 6) continuity. In addition, four strategy types emerged for industrial products firms: 1) low commitment; 2) growth; 3) maintenance; and 4) niche or specialization. One clear strength of this study was that the authors went on to draw comparisons between several of these strategic types and various conceptual typologies. However, some of their groups did not appear to compare to any published typology. Moreover, no one conceptual typology was supported over any other.

In summary, at the business level of strategy, a number of typologies have been developed utilizing both conceptual and empirical methodologies. With respect to the Miles et al. (1978) typology and the Porter (1980) typology, some em-

pirical support has been offered in identifying the underlying attributes for each strategic group. (This support is clearly stronger for the Porter model.) In addition, there appears to be developing a viable methodology for the empirical construction/ testing of such models as is evidenced by both the Galbraith and Schendel (1983) and the Dess and Davis (1984) papers. As shall shortly be seen, there is no such progress at the level of corporate level strategy leaving much room for additional research in this area.

#### Conceptual Taxonomies/Corporate Level Strategy

Having searched the literature for models of corporate level strategic groups, it must be reported that such models are extremely rare. About the only place where any type of taxonomy of corporate level strategy appears is in business policy and strategy textbooks. Moreover, closer examination of these textbook models, reveals most of them to be derived from a typology developed by Glueck (1980). Glueck described four generic strategies typically followed by corporations: stable growth, growth, retrenchment, and combination. These will be described in more detail in the following paragraphs.

To begin with, stable growth is described as a strategy in which few major changes in product/service line, chan-

nels, vertical integration, production capacity and the like are made over a period of time. Rather, the firm has chosen to concentrate its resources in a favorable niche in order to achieve a competitive advantage.

Growth strategies are pursued when: 1) a firm sets its level of objectives higher than any extrapolation of past objectives; 2) serves the same market or adds new ones; or 3) focuses strategic decisions on major functional performance increases. Some ways in which a growth strategy may be carried out include increasing sales in a given product/market as well as adding new products or markets through internal diversification, mergers, acquisitions, or joint ventures.

Retrenchment is pursued when: 1) the level of objectives is below its past achievement level; 2) product/service lines may be reduced; 3) strategic decisions focus on functional improvements and reduction of units with negative cash flow. Some variations of this strategy include turnaround strategy, divestment, liquidation or captive company (when a firm sells over 75% of its product to one customer).

The last of Glueck's generic strategies is the combination strategy. This is simply what he calls a situation in which a firm's main strategic decisions utilize several grand strategies at one time.

### Empirical Taxonomies/Corporate Level Strategy

The last quadrant of Table 2 is empty. No studies have been found which empirically derive corporate level strategic groups using more than one or two strategic attributes. Hence, there is a real gap in the literature here.

### CONCLUSION

This chapter has reviewed the conceptual and empirical literature on the two major variables of the L-B model: organizational slack and strategic groups. In terms of the slack variable, recent studies have been moving toward the development of at least two distinct operationalizations: Bourgeois' (1981) relative measure of slack and Marino and Lange's (1982) absolute measure of slack. Each of these operationalizations have been utilized in two published studies while none of the earlier slack indicators have been replicated. While the construct validity of both of these remains in question, the next logical step is to test their usefulness within a theoretical framework such as that provided by the L-B model.

As far as the literature on strategic groups is concerned, taxonomies have been developed by both conceptual and empirical methods. It appears that a viable way to reconcile these two approaches is to attempt to validate a

conceptual taxonomy through the development of an empirical one. This linking has been successfully demonstrated by Dess and Davis (1984) and to a lesser extent by Hambrick (1983) and Galbraith and Schendel (1983). However, all of these examples are based on business level strategy. Hence, there is room for the development of an empirical typology of corporate level strategy in an effort to validate Glueck's (1979) conceptual typology. This dissertation has attempted to fill this gap.

## Chapter III

### METHODOLOGY

The first two chapters of this dissertation have presented literature which specified the theoretical underpinnings of the Litschert-Bonham model and highlighted the current status of the measurement issues surrounding two of the model's major components: slack and strategy. The literature revealed a need for further testing of two recently developed slack categorization methods as well as for the empirical development of a typology of corporate level strategy. Therefore, the review of the literature has provided support for both the dissertation's basic goal of testing the L-B model and its secondary objectives of providing clarification on these two methodological issues.

Chapter III completes the foundation building section of this dissertation by deriving the specific hypotheses and research questions to be investigated in this study. In addition, it describes the methodology utilized to select the sample firms, operationalize the components of the model, gather the data necessary to test the hypotheses and analyze the results.

## HYPOTHESES AND RESEARCH QUESTIONS

It will be recalled that the following research questions were derived from the Litschert-Bonham model in Chapter I:

1. Will the strategies utilized by low-slack firms be more homogeneous than the strategies utilized by high-slack firms within a given environment?
2. Will the content of strategies utilized by high-slack firms differ significantly from the content of strategies utilized by low-slack firms within a given environment?
3. Will low-slack firms in different environments utilize different strategies?

These questions served as the basis for the development of the trio of conceptual hypotheses which were tested in this study. Operational hypotheses and the methodology utilized for testing each will be presented in the latter part of this chapter.

According to the L-B model, when slack is low, the appropriate strategy is determined by the fit between contextual factors and structure. On the other hand, when slack is high, the choice of strategy depends largely on the desires of the dominant coalition. It follows that low-slack firms within a given environment will tend to use strategies which are rather similar to each other while those with high slack are likely to select a wider variety of strategic alterna-



tives. Such a diversity of strategies can be expected among high slack firms since freedom from constraint, coupled with the lack of a generally accepted professional code of managerial behavior will tend to yield greater reliance on personal values (Litschert and Bonham, 1977: 217). Thus:

H1: Within a given context, a greater diversity of strategies will be observed among high slack firms than among low slack firms.

A second notion that can be derived from the L-B model is that the strategies used by high-slack firms will differ systematically from those used by low-slack firms. In other words, within a given context, there should exist a relationship between level of slack and type of strategy. The rationale for this proposition can be expressed as follows. Firms with low slack must operate as efficiently as possible as they do not have the margin of resources required to pay for the luxury of inefficiency. Their strategies should reflect this mode of efficient operation. In contrast, firms with high slack can afford more "expensive" strategic alternatives; e.g., they might be able to invest in projects with longer pay back periods, hire professionals with more skills than are currently required, engage in greater amounts of research and development than necessary, and so on. Therefore:

H2: Within a given context, there will be a relationship between level of slack and strategy.

The third hypothesis to be presented here deals only with low-slack firms. Again, recall the proposition that a fit between structure and context dictates strategy under conditions of low slack. If this assumption is correct, it follows that a change in context should result in a change in the matching strategy. For example, a highly uncertain environment coupled with an organic structure may demand one type of strategy while a more certain environment and mechanistic structure will require another. It should be possible to capture this relationship by comparing the strategies of low-slack firms in two very different contexts. Hence:

H3: Under conditions of low slack, firms in a relatively certain environment will utilize different strategies than will firms in a relatively uncertain environment.

In addition to testing the above hypotheses, two secondary issues were examined in this study. In a sense, these can be described as methodological issues in that they involved decisions relating to the operationalization of variables in the study.

The first issue pertained to the selection of an appropriate indicator of organizational slack. As described in the literature review, both absolute and relative measures of slack were tested by Marino and Lange (1983) and were shown not to converge. However, since the constructs were not embedded in any theoretical structure, it was impossible to judge the validity of either as a true measure of slack. Therefore, this study moved a step beyond the Marino and Lange (1983) study by comparing the performance of two of these measures within the framework provided by the L-B model.

Marino and Lange (1983) suggested that their own absolute measure of slack would be more appropriate than Bourgeois' (1981) relative measure of slack in terms of testing the L-B model. While it was not possible to make such a judgment on the basis of one study, it was possible to compare the strength of the relationship found between slack and strategy for these two different measures of slack. Hence, the following research question was considered:

R1: How will the statistical relationship between slack and strategy be affected by the use of a relative versus an absolute approach to the measurement of slack?

The second issue involved the empirical construction of a typology of corporate strategy. Although a number of stu-

dies have used this methodology as a way to identify patterns of strategy, few attempts have been made to link these empirically derived strategic types to conceptual typologies (See Hambrick, 1983; and Dess and Davis, 1984). In this case, the presence of such a link could be investigated by examining the extent to which the empirically derived strategic clusters unambiguously related to Glueck's (1980) conceptual typology of corporate strategy. Therefore:

R2: Will the strategic clusters which emerge in this study provide empirical support for Glueck's conceptual typology of strategy?

In summary, the first component of the present research involved fairly straightforward tests of three hypotheses derived from the Litschert-Bonham model of strategy formation. However, the secondary objectives pertained to some measurement issues which, if resolved, may have an impact on future research in the policy field. In this sense, the research must be described as exploratory. Therefore, no hypotheses were derived from these last two research questions; nor were predictions made about potential results. However, the findings should be informative to future researchers in this area.

## METHODOLOGY

### Sample

Both convenience and purposive sampling techniques were used in selecting the organizations to be examined in this research. Indeed, the first criterion for inclusion of firms into the sample was primarily convenience-based; i.e., only companies listed on Standard and Poor's 1984 Compustat Tapes were chosen. This step was taken to ensure that the 7 years of financial data required for the slack operationalizations could be attained.

As Churchill has noted, the major problem with convenience sampling techniques is that such plans provide "no assurance that the sample is representative" (1983: 345). In other words, the sampling techniques used in this research have limited the generalizability of results to other organizations or industries. To elaborate, although the Compustat Tapes contain information on over 2700 companies traded either on the New York or American stock exchanges or over-the-counter, there are no very small or privately owned businesses in the data set. Nor is there any way of determining whether the firms in this data set differ systematically from other large firms which are not included herein. Still, use of this data set did ensure that the sample included information on many of the major publicly-owned cor-

porations in the country today. Although problems of external validity certainly exist with such a sample, it is at least clear that these firms are of interest to investors and other industry analysts on the basis of factors such as stock-price movement, past or present earnings growth, as well as regional and/or economic performance ( S&P Compustat Manual, 1980: 2).

The remaining sample selection criteria can best be described as purposive or judgmental in nature. This means that the sample elements have been picked because it is expected that they can serve the research purpose (Churchill, 1983; Emory, 1980). In this study, for example, a firm must have been in operation since 1977 if it was to be included in the sample. This requirement was based on the simple fact that the slack measures used herein required seven years of financial data.

A second requirement pertained to the extent of diversification of the sample firms. It was felt that only dominant business firms should be examined in this study if strategies within each industry were to be comparable. Rumelt (1974) has defined a "dominant business" firm as one in which at least 70% of revenues come from a specific line of business. To find out which firms met this requirement, 10-K reports were screened. Finally, as mentioned in Chap-

ter I, the sample was limited to include only firms from two different industries. (The next section spells out the criteria utilized in the selection of the industries themselves.) The resulting list of 86 sample firms can be found in Appendix B.

In summary, the greatest limitation of this sampling technique lies with lack of the generalizability of results. Yet, the purpose of this research was to test a theoretical model, not to apply specific effects to real world situations. Calder et al. (1981) argue that when theory testing is the goal of research, the sample entities need only be selected to provide a rigorous test of the theory at issue. In essence, in the early stages of studying a theoretical model, it is most important to determine whether a hypothesized relationship does exist; to this end, the researcher must reduce extraneous variation in the sample, and use a design that affords the strongest possible inferences about the relationship between theoretical constructs (Calder et al., 1981: 200). In this study, the selection of 'dominant business' firms from only two industries resulted in a more homogeneous sample which increased the power of the test to detect the predicted relationship between slack and strategy.

### Measurement of Variables

Because one of the goals of the present research was to determine the status of several measurement techniques, the methods used to measure each of the variables in this study had to be carefully evaluated. Therefore, a pretest was conducted to examine the utility of each of the three measurement procedures described below. This section will present the outcomes of this pretest as they relate to decisions regarding the operationalization of each of the variables to be used in testing the hypotheses and research questions derived from the Litschert-Bonham model.

### Context

Organizational context was operationalized as the industry in which a firm operates. Companies within each industry were assumed to operate within the same broad set of environmental and technological constraints.

Context was varied in this study by examining firms within two different industries. Of prime concern in the selection of these industries was that they be as different as possible in terms of the level of uncertainty faced by the organizations within each subsample. Other considerations included number of firms in each industry (in order to achieve adequate sample size) and potential variation in slack



across firms. The two industries which were selected for study are described below.

The electronic computing equipment industry is a relatively new industry and is one which is constantly changing. New products, new product features and new technological processes appear almost daily. In addition, there are frequent new entrants into this market. Because it is relatively easy and inexpensive to purchase components and run a computer-assembly operation, many small companies have been started in little more than a garage. Unfortunately, a shakeout began in 1983. Due to the high rate of bankruptcies, most new companies are now viewed very skeptically by potential customers until they can prove they will be around for more than a couple of years. Thus, the industrial environment can be described as both high in complexity and high in rate of change - both of which have been shown to contribute to uncertainty (Duncan, 1972). In addition, since several industry giants, including I.B.M. and Wang, clearly dominate the industry, variation in slack should be found.

Although it was very difficult to find an industry environment which could be described as "certain" in today's uncertain times, the paper and pulp industry appeared to be a viable candidate. The 1983 Standard and Poor's Industrial Survey indicates that paper production closely correlates

with the trend of the overall economy, although with a lag of several months. In addition, a 1984 report by the U.S. Department of Commerce claims that this industry has traditionally been a steady profit performer; indeed, according to this report, the paper industry remains one of the few healthy U.S. "smokestack" industries.

It is important to note that the paper industry is divided into several large segments, such as pulp, printing and writing papers, newsprint, tissue and paperboard. Moreover, industry profits in each of these segments have been eroded to some extent lately by rising operating costs and compliance with strict pollution control standards which have made many older and smaller plants obsolete. As a result of these conditions, two industry trends have emerged. First, most companies have become vertically integrated - generating large portions of their fiber needs from their own timber holdings, producing the paper, and in many cases, converting the paper into a final consumer or industrial product (Standard and Poors Industry Reports, 1983). From the point of view of the present study, this fact is appealing. Since most paper companies operate in several segments, there exists a clear rationale for examining the various segments together as one industry. Second, most of the segments have become increasingly concentrated as companies

have attempted to improve efficiency through economies of scale. For example, in the newsprint segment, the 10 largest firms accounted for close to two-thirds of the total output in 1983. This trend of increasing concentration within the industry means the sample should include some large firms which are doing very well along with others which are fighting to survive; hence, variation in slack should be found.

Taken together, these facts paint very different pictures of the conditions facing paper firms versus those facing computer firms. The market for paper products is highly competitive, but the key competitors have remained the same for some time. New entrants are rare because the industry requires huge capital expenditures. Although the technology does change over time, the process of change is much slower than that of the computer industry. As new paper plants are built, obsolete ones are shut down and machines are upgraded. But it takes a long time to build paper mills, and, once built, conversions to new processes or products are not easily accomplished ( Standard and Poor's Industry Reports, 1983).

These comparisons would seem to support the assumption that both the technology and the environment of the paper industry are vastly different from those of the computer in-

dustry. However, in order to confirm this assumption, quantitative measures of market and technological volatility were calculated for each industry. These measures, first developed by Tosi, Aldag and Storey (1973) were originally found not to correlate with Lawrence and Lorsch's (1967) perceptual measures of environmental uncertainty. Duncan, Hellriegel and Slocum (1977), however, helped to explain this discrepancy with their finding that individual differences (i.e., varying tolerances for ambiguity) moderate the relationship between managerial perceptions and objective measures of volatility. Moreover, when Snyder and Glueck (1982) correlated the Tosi et al. (1973) measures with volatility ratings made by industry analysts from stock brokerage firms, a high measure of agreement was found.

The formulas used to assess market and technological volatility can be found in Appendix E. After calculating these indices for the sample firms in the computer industry and the paper industry, results were compared with Student t-tests. As predicted, the computer industry was significantly more volatile on both market ( $t_{(87)} = -3.31$ ;  $p < .001$ ) and technological volatility ( $t_{(76.8)} = -8.28$ ;  $p < .0001$ ). Results of this test can be seen in Table 3 .

TABLE 3

## Market and Technology Volatility Results

<u>Volatility Index</u>	<u>Paper Industry</u>	<u>Computer Industry</u>	<u>t</u>	<u>df</u>	<u>p</u>
Market	.244 (.182)	.402 (.236)	-3.31	87	.001
Technological	.094 (.045)	.199 (.070)	-8.28	76.8	.0001

### Organizational slack

It was originally proposed that this variable be measured in two ways in this study: first with Bourgeois' (1981) relative measure of slack and again with Marino and Lange's (1983) absolute measure. However, in the pretest, when these measures were actually utilized to categorize the 86 sample firms, some problems with the Marino and Lange measure led to the addition of a third technique which will be described at the end of this section.

As discussed in Chapter II, Bourgeois' (1981) measurement technique was designed to assess the change in the level of slack resources over time within individual firms. To this end, he developed a set of six financial indicators and explained how a positive or negative change in each would be expected to affect an organization's level of slack. Marino and Lange (1983) supplemented Bourgeois' efforts by adding a classification system which simply involved counting the expected changes to determine whether a firm should be classified as a slack gainer, loser, or constant. Thus, the following slack operationalization (hereafter referred to as BSLACK) was utilized in this study:

<u>Indicator</u>	<u>Expected Sign</u>
1. Retained earnings (1983 -1977)	+
2. Dividend payout (1983 -1977)	-
3. Sales, general and administrative	

expense/Net Sales (1983 - 1977)	+
4. Working Capital/Net Sales (1983 -1977)	+
5. Long term debt/Equity (1983 -1977)	-
6. Price/Earnings Ratio (1983 -1977)	+

Classification:

Slack gainer:      Correct signs > or = 4

Constant:        Correct signs = 3

Slack loser:      Correct signs < or = 2

Application of this slack measurement procedure involved comparing each of the 6 financial indicators at two points in time: 1983 and 1977. In each case, the 1977 figure was subtracted from the 1983 figure to determine whether an increase or decrease had occurred. The sign of each change (+ or -) was then compared to Bourgeois' expected sign and the number of agreements were calculated in order to classify firms as slack gainers, losers or constants. The specific formulas used to calculate the above ratios are presented in Appendix E. All firms fell into the three prescribed categories with no overlap.

Marino and Lange's (1983) absolute measure of slack was also described in Chapter II. This measure included two financial indicators: cash flow margin and return on total assets. The former liquidity indicator was included to assess

internal availability of slack while the latter profitability indicator assessed the potential to attract further investment from external sources. Following Marino and Lange's (1982, 1983) work, the formulas for these two indicators were taken from the Standard and Poor's Compustat Manual (1980) and are presented in Appendix E.

This measure categorized firms into three classes: high slack, low slack and unclassified. The classification procedures follow:

High Slack:

Return on total assets  $>$  or  $=$  industry median for 1977 through 1983.

or

Cash flow margin  $>$  or  $=$  industry median for 1977 through 1983.

Low Slack:

Return on total assets  $<$  industry median for 1977 through 1983.

or

Cash flow margin  $<$  industry median for 1977 through 1983.

Unclassified:

All other firms



This slack categorization procedure involved the calculation of both financial indicators for each year from 1977 through 1983. Application of this method to the sample firms led to some problems of cross-categorization. These problems were confined solely to the paper industry in which it appeared that the following six firms could be classified as possessing both high and low slack for the same 7-year period:

1. American Israeli Paper Mills
2. Grief Brothers Corporation
3. Hammermill Paper Company
4. International Paper Company
5. Scott Paper Company
6. St. Regis Paper Company

Upon closer examination, two distinct patterns of asset use emerged in this group of firms. The first two firms, American Israeli and Grief Brothers, both maintained below-average cashflows for the entire seven years, while at the same time, maintaining above-average returns on assets for all seven years. The last four firms were exactly opposite. Hence, there appears to be a trade-off involved between amount of cash held and amount of return on assets. Since cash is a component of assets, this is a logical relationship. Yet it is unclear why only these particular six firms consistently used their assets in this manner.

As a first step toward solving this categorization problem, Kenneth Marino, of the University of Kentucky, was contacted by telephone. After checking his data, Dr. Marino indicated that he had not encountered any such cross-classifications in either the apparel or the motor-vehicle industry. He then suggested that the above firms be placed in the "unclassified" category. To this author's suggestion that quartiles be used as cut-off points (as opposed to medians), he stated that such a move would be possible if it did not result in a very large middle category with only a few firms classified as having high or low slack. He went on to say that the appropriate cut-off point might vary by industry, since firms in different industries make different types of financial decisions.

Based on this discussion, it was decided to measure slack in the following 3 ways:

1. BSLACK: Bourgeois method (described above).
2. MLSLACK: Marino and Lange method (as described above but with the 6 "problem" firms added to the unclassified category).
3. QTSLACK: Marino and Lange method modified to use the industry's upper quartile for ROA or cashflow margin as the cut-off point for high slack firms and the lower quartile on the corresponding measures as the cut-off point for low slack firms.

Pretest results of the categorizations for each of these methods in both industries can be seen in Appendix B. As revealed in the appendix, many of the sample firms were classified differently by two or even all three of the slack measurement procedures. This result was expected and agrees with Marino and Lange's (1983) finding that the classifications produced by the absolute and relative slack measures did not converge when the same sample of organizations was categorized.

### Organizational Strategy

Each of the conceptual strategic typologies described in the literature review, conceived of strategy as an organization level concept. In other words, such typologies attempted to classify some organizations as following strategy "A" while others followed strategy "B". The present study attempted to empirically validate one such typology. As discussed in Chapter II, few validation studies of this type have appeared in the literature. Moreover, of the three empirical studies which have been conducted (i.e., Hambrick, 1983; Galbraith and Schendel, 1983; and Dess and Davis, 1984), all were aimed at the construction or confirmation of business level strategic typologies. Until the present study, however, there has been no attempt to empirically derive

strategic groupings based on a corporate level typology of strategy.

This research attempted to verify the strategy types described in Glueck's (1980) typology of corporate strategy. A multivariate statistical procedure called cluster analysis was used to categorize the interactions of a number of strategy variables derived from this typology. Stated simply, cluster analysis starts with a data set containing information about a sample of entities and attempts to reorganize those entities into relatively homogeneous groups or clusters (Aldenderfer and Blashfield, 1984). Although cluster analysis itself is a fairly straightforward procedure, a number of decisions must be made prior to its implementation. Specifically, decisions regarding the choice of variables, the transformation of variables, which clustering method to use and how many clusters to accept are all required. The following sections will describe the choices which were made within the present study.

Selection of Strategy Variables: As stated above, a set of strategy variables was derived from Glueck's (1980) typology of corporate strategy. Data on these indicators were gathered through content analysis of published materials concerning the sample organizations.

Content analysis has been utilized to some extent in past strategy research but the information to be content analyzed has varied widely. In the majority of instances, published case studies from such sources as Fortune Magazine, the Harvard Case Clearinghouse, and even policy textbooks have been the objects of analysis. (cf., Hofer, 1973; Miller and Friesen, 1977; or Jauch, Osborne and Glueck, 1980.) Some of the limitations of this type of analysis are potential bias within the case studies, missing information, and distortion of data.

Other studies (e.g., Schendel, Patton and Riggs, 1976; Hatton, Schendel and Cooper, 1978) have drawn information from several published data sources including corporate reports, the Wall Street Journal, Standard and Poor's, Moody's Industrial Manual, the Census of Manufactures, and so on. As a method for analyzing strategy, this approach can be beneficial since it results in large sample sizes, the ability to trace information over time, the separation of fact from opinion, and the measurement of realized, as opposed to intended, strategies (Miles and Snow, 1980; Glueck and Willis, 1979). Conversely, this method cannot be used to measure intended strategies, and may not reflect current changes in strategy which have not yet been recorded in company records.

Given that the goal of the present study was to examine the strategic posture of a sample of organizations at one point in time, it was believed that this latter method of measuring strategy was an appropriate one. The content analysis of documentary data sources should provide relatively objective data on key resource allocations, diversification moves, product line expansions and the like which can then be compared across organizations.

Although several data sources were used, the primary source for strategy data was company 10-K reports. Glueck and Willis (1979) have supported the use of 10-K data in studying the costs and benefits of strategic management, the nature of strategies, the organization of the strategic management function, and the content of effective strategies. Because these reports are required by law and there are legal sanctions for deliberate distortion, many of the problems found in other published data sources are mitigated (Glueck and Willis, 1979: 97). Other sources of data included Moody's Industrial Manual and The Journal of Corporate Development. These sources were used primarily to fill in missing data.

The decision regarding which specific strategy variables to use in the study was a complex one. Initially, an extensive list of 43 variables was derived from Glueck's (1980)

typology. Using this entire list of variables, data were gathered on 30 sample firms - 15 from each of the two industries. This pretest allowed the original list of data items to be narrowed down in the following ways:

1. Data Availability: Certain variables were only available for a small percentage of firms. These were dropped from the analysis.
2. Controllability: Since the present study regards strategy as a pattern of managerial decisions, any variables that could readily be considered "outcomes," or consequences of other strategic decisions as opposed to controllable decisions, were dropped. An example here is market share. Although high market share might be a desirable goal, other decisions must be made and the appropriate steps taken to achieve this goal. Yet economic conditions or retaliatory actions of competitors might preclude the achievement of this goal. Thus, market share would not be a controllable strategy element.
3. Statistical interpretation of clusters: A few variables which had passed each of the above hurdles were dropped only after being included in early runs of the cluster analysis procedure because they reduced the clarity and distinguishability of the clusters

formed by the computer program. (See Appendix C for further explanation).

Based on these steps, twenty-one strategy variables were selected for further use in this study. In order to ensure that the results of the clustering procedure would be as parsimonious as possible yet robust enough to capture the various dimensions of Glueck's typology, these remaining 21 variables were further segmented into two groups: eleven variables were used to make the clusters and the remaining ten were used to help validate the clusters after they were constructed. This segmentation was based on researcher judgment concerning which variables were most clearly representative of Glueck's theory as well as various trial runs of the Fastclus procedure to determine which combinations of variables produced clearly defined and meaningful clusters. A description of the twenty variables and the data source of each is provided in Appendix C. Also included in this appendix is a list of the deleted variables along with rationales for their exclusion from the study.

Choice of Clustering Methods: While a variety of clustering techniques exist, an iterative partitioning method was selected for use in this study. Specifically, the SAS Fastclus procedure which calculates Euclidean distances among the numeric variables was used herein. Fastclus operates in four steps:



1. A specified number of observations, called cluster seeds, are initially selected by the researcher.
2. Clusters are formed by assigning each observation to the nearest seed.
3. After all observations are assigned, the cluster seeds are replaced by the cluster means.
4. Steps 2 & 3 are repeated until the changes in the cluster seeds become small or zero.

This method has several advantages over other clustering procedures. First, since it is an iterative method, it can make more than one pass through the data, thereby compensating for a poor initial partition of the data if necessary (Aldenderfer and Blashfield, 1984). Second, it produces clusters that are not nested and therefore, are not part of a hierarchy. If there is no reason to believe that the clusters within the data are part of a natural hierarchy, care should be taken not to impose such a structure artificially. Finally, each observation is assigned to one and only one cluster - a fact which greatly simplifies interpretation of the results.

In order to prepare the raw data for entry into the cluster analysis procedure, the 11 strategy variables were standardized. This step was taken because the variables possessed vastly different measurement scales which had po-

tential to alter the structure of the resulting clusters. Aldenderfer and Blashfield (1984) have noted that standardization is particularly important in cluster analysis when a similarity measure such as Euclidean distance is used.

Other studies (cf., Galbraith and Schendel, 1983) have utilized a second data transformation step prior to the clustering procedure: namely, principal components analysis. This is a type of factor analysis which is based on the assumption that all of the variance in each variable can be explained by the underlying factors; traditional factor analysis, in contrast, makes no such assumption. Principal components analysis can be used to reduce the dimensionality of the data, thereby creating new, uncorrelated variables that can be used as raw data for the calculation of similarity between cases (Aldenderfer and Blashfield, 1984). The rationale behind the inclusion of this step is that the use of highly correlated variables in cluster analysis leads to an implicit weighting of such variables (i.e., if three highly correlated variables are used, the effect is the same as using only one variable that has a weight three times greater than any other variable).

Yet, as Nunnally (1978: 451) has pointed out, this rationale does not mandate the use of principal components analysis since there is no obvious mathematical necessity for

having uncorrelated variables. The potential problems caused by substantial correlations among the profile variables relate to the generalizability of results that can be obtained from the clustering procedure. These problems are mitigated if the researcher has carefully selected variables from a domain created by a specific theory. In such a case, the cluster output can be interpreted directly even if there are some substantial correlations among the variables.

Indeed, there is a great deal of controversy surrounding the transformation of the data with principal components analysis prior to cluster analysis. As Aldenderfer and Blashfield (1984: 21) state, principal components analysis:

tends to blur the relationship between clusters because it assumes that the factor scores are normally distributed. The effect is to transform the data in such a way that any modes present are merged, resulting in variables that are normally distributed.

Other authors have maintained that the use of principal components analysis may not be wise when dealing with clusters that are not widely separated. Overall and Klett (1972: 58), for example, warn that principal components analysis should "not be used where the aim is to characterize individuals within a specially selected homogeneous sample" which is certainly the case in the current study. Rohlf (1970) has noted that principal components analysis tends to

maintain the representation of widely separated clusters in a reduced space but also minimizes and thus blurs - the distances between clusters or groups that are not widely separated.

In this study, the variables to be clustered were derived from Glueck's typology of corporate strategy. Due to this fact and to the paucity of high correlations among the variables (see table 4), consideration of these trade-offs led to a decision to reject the use of principal component analysis and to perform the clustering procedure directly on the standardized variables.

Determining the Number of Clusters: In performing a cluster analysis, the next major decision to be made is the determination of the appropriate number of clusters. Unfortunately, there is no universally accepted procedure for making this decision (Everitt, 1974). However, the authors of SAS (Sarle, 1982) have developed a criterion for choosing the number of clusters based on an index called the cubic clustering criterion (CCC). This index is an approximation of the expected value of the within-cluster sum of squares (WSS). Minimizing the WSS is equivalent to maximizing  $R^2$  for predicting each variable (used to form the clusters) from the clusters.

TABLE 4  
Correlations among Strategy Variables

	SUPPLY	CUST	TERR	FOREIGN	SINGLE	BIG	JVENT	SHRINK	CHGASSET	ADV%	R&D%
SUPPLY	1.000 (.000)										
CUST	0.206 (.056)	1.000 (.000)									
TERR	-0.159 (.144)	-0.013 (.906)	1.000 (.000)								
FOREIGN	0.053 (.624)	0.085 (.436)	0.624 (.0001)	1.000 (.000)							
SINGLE	0.225 (.037)	0.000 (.999)	-0.245 (.023)	-0.222 (.040)	1.000 (.000)						
BIG	-0.144 (.186)	-0.113 (.300)	0.298 (.005)	0.308 (.004)	-0.191 (.079)	1.000 (.000)					
JVENT	-0.159 (.144)	-0.005 (.963)	0.239 (.027)	0.292 (.006)	-0.111 (.308)	0.621 (.000)	1.000 (.000)				
SHRINK	0.341 (.001)	0.121 (.267)	-0.277 (.010)	-0.029 (.792)	0.223 (.039)	-0.218 (.044)	-0.215 (.047)	1.000 (.000)			
CHGASSET	0.115 (.294)	0.242 (.026)	0.185 (.090)	0.114 (.298)	-0.000 (.999)	0.158 (.150)	0.010 (.927)	0.114 (.299)	1.000 (.000)		
ADV%	0.130 (.211)	0.208 (.054)	0.033 (.764)	0.180 (.098)	-0.040 (.715)	-0.120 (.273)	-0.091 (.404)	0.145 (.182)	0.202 (.063)	1.000 (.000)	
R&D%	0.346 (.001)	0.146 (.179)	0.349 (.001)	0.483 (.000)	0.273 (.011)	0.005 (.966)	-0.006 (.956)	0.222 (.040)	0.225 (.039)	0.317 (.003)	1.000 (.000)

According to Sarle (1982), the best way to use the CCC is to plot its value against the number of clusters ranging from two clusters up to about a tenth of the number of observations. Peaks on the plot with the CCC greater than 2 or 3 indicate good clusterings. Very distinct non-hierarchical clusters show a sharp rise before the peak, followed by a gradual decline. Peaks with the CCC between 0 and 2 indicate clusters which should be interpreted cautiously. If all values of the CCC are negative, the distribution is probably unimodal and no clusters exist in the data. On the other hand, if the CCC increases continuously as the number of clusters increases, the distribution may be grainy or the data may have been excessively rounded.

Plotting the Clusters: In order to visually inspect the clusters, the SAS manual (Sarle, 1982) suggested running a canonical discriminant analysis. This dimension reduction technique derives canonical variables that summarize between group variation. By plotting the first two canonical variables against each other, a two dimensional space is provided in which the clusters can be observed. Results of this procedure and those described above are presented in Chapter IV.

To summarize, strategy was conceived herein as an organization-level phenomenon. Therefore, each firm was classi-

fied as following a single strategy and was grouped together with other firms following similar strategies. The SAS Fastclus procedure was utilized to make these groupings. To this end, data on 11 strategic attributes were gathered. These variables were then standardized and submitted to the cluster analysis procedure which was re-run 9 times in order to generate the best possible groupings of firms. The resulting clusters were then plotted and were externally validated by looking at differences in the means of 10 external strategy variables which were specifically selected for this purpose.

#### OPERATIONAL HYPOTHESES AND DATA ANALYSIS

Thus far, this chapter has described the procedures used to operationalize each of the variables of the Litschert-Bonham model. The next section will conclude this chapter by explaining how these procedures were combined in order to test the primary hypotheses and research questions. The section is organized as follows: First, a set of operational hypotheses is derived from the conceptual ones presented at the beginning of this chapter. These hypotheses spell out the predicted relationships in specific terms. After each hypothesis, the data analysis techniques used to test it are described.

### Analysis of Hypotheses

Recall that the following hypothesis was derived at the beginning of this chapter.

H1: Within a given context, a greater diversity of strategies will be observed among high-slack firms than among low-slack firms.

In terms more suitable for statistical analysis:

O1A: Given a sample of firms selected from the paper industry, a greater diversity of strategies will be observed among high-slack firms than among low-slack firms.

O1B: Given a sample of firms selected from the computer industry, a greater diversity of strategies will be observed among high-slack firms than among low-slack firms.

The first step involved in testing these hypotheses, was to standardize the eleven strategy variables described in Appendix C. The variables were then cluster analyzed. After the clusters were formed, the sample was divided into subgroups by industry. The rest of the analysis was conducted within these industry subgroups.

To avoid confusion, it should be noted that diversity (or dispersion) as used here refers to an industry-level as opposed to an organization level phenomenon since each firm has been identified as belonging to only one strategic type (or following one overall strategy). At the industry level, diversity can be measured by counting both the number of



strategic types which occur and the frequency with which firms fall into these types.

Consider a sample of 32 hypothetical apparel firms -- 16 which have been classified as low slack firms and 16 as high slack firms. Assume that these firms have been classified as following four different strategies: S1, S2, S3 and S4. The strategy by slack cross-categorization might look as follows:

	<u>S1</u>	<u>S2</u>	<u>S3</u>	<u>S4</u>	<u>IQV</u>
Low Slack	16	0	0	0	0%
High Slack	4	4	4	4	100%

Obviously, the low slack firms are much less diverse than are the high slack firms in this example. Indeed, the low slack firms are completely homogeneous whereas, the high slack firms are completely heterogeneous. Of course, few samples would possess such extreme differences in diversity as this, so a procedure called the Index of Quantitative Variation (IQV) has been developed to measure the level of diversity between these two extremes (Mueller et al., 1977; Ott et al., 1974). The IQV is defined as the total number of observed differences expressed as a percentage of the maximum possible number of differences (Ott et al., 1974). This index ranges from 0 (perfect homogeneity) to 100% (perfect heterogeneity).

Using this index, the amount of diversity at each level of slack was compared for firms within each industry. This step was repeated for all measures of slack.

H2: Within a given context, there will be a relationship between level of slack and strategy.

In operational terms:

O2A: Given a sample of firms selected from the paper industry, there will be a significant chi-square relationship between level of slack and category of strategy.

O2B: Given a sample of firms selected from the computer industry, there will be a significant chi-square relationship between level of slack and category of strategy.

To test this hypothesis, the strategic groups formed above were considered as categories of strategy. A Chi-square Goodness of Fit test was then conducted to determine whether or not there was a relationship between category of slack and category of strategy. Separate analyses were conducted for each industry and for each measure of slack.

H3: Under conditions of low slack, firms in a relatively certain environment will utilize different strategies than will firms in a relatively uncertain environment.

Restated:

O3: Under conditions of low slack, firms in the paper industry will utilize different strategies than will firms in the computer industry.

The idea behind this hypothesis was to compare the strategic clusters which contained the majority of the low-slack firms from each industry. It was believed that this comparison would allow a test of the moderating effects of organizational slack described by the L-B model. In other words, if slack did serve to moderate the relationship between context and strategy for the firms in this sample, then the strategies used by low-slack firms in different contexts should also have differed. The proposed methodology would have used discriminant analysis to make these comparisons. Unfortunately, as will be explained in Chapter 4, this step was deleted. Instead, Student T-tests were used to compare the strategy variables used by the low slack firms in each industry.

The three conceptual hypotheses and corresponding operational hypotheses presented above were all "research hypotheses" in that they spelled out the predicted relationships in specific terms. However, even if these predictions were observed to be true, it could not be concluded that the L-B model (from which the predictions were derived) is correct; it could only be said that the model may be correct. Since the truth of a theory or model can never be established, one must proceed instead by eliminating theories. If the research hypothesis specifies that a difference ex-

ists between two groups, one proceeds by trying to eliminate the hypothesis that there is no difference. If the latter null hypothesis can be eliminated, it can be concluded that some difference, in fact, exists (Blalock, 1979: 111). The null hypotheses which were actually tested in this study can be seen in Table 5.

### Analysis of Research Questions

The following research questions were also presented at the beginning of this chapter. Methodologies used to test each are discussed below.

R1: How will the statistical relationship between slack and strategy be affected by the use of a relative versus an absolute approach to the measurement of slack?

This research question was developed to determine whether the absolute or relative slack measures would be more strongly related to organizational strategy. The rationale for including this question was based on Marino and Lange's (1983) comparison of these two measurement procedures. When these authors applied both procedures to the same sample, they found substantial disagreements in classification. Based on these results, they argued that a distinction exists "between a firm that is gaining (or losing) slack resources over time and a firm that possesses high (or low)

TABLE 5

## Null Hypotheses Tested in the Study

1A) H0: Given a sample of firms selected from the paper industry, there will be no difference in the diversity of strategies based on level of slack.

1B) H0: Given a sample of firms selected from the computer industry, there will be no difference in the diversity of strategies based on level of slack.

2A) H0: Given a sample of firms selected from the paper industry, there will be no relationship between the level of slack and category of strategy.

2B) H0: Given a sample of firms selected from the computer industry, there will be no relationship between the level of slack and category of strategy.

3) H0: Under conditions of low slack, firms in the paper industry will use the same strategies as firms in the computer industry.

slack resources relative to other firms" (Marino and Lange, 1983: 89). If a distinction does exist between these two measures such that both are capturing different aspects of the slack construct, then the two variables are likely to behave differently when placed within the theoretical context provided by the L-B model. Calculation of chi-square may not be sufficient to capture such a difference since a significant chi-square result only indicates that a relationship exists -- it says nothing about the strength of a relationship (Blalock, 1979). Hence an additional procedure was required. Guttman's Lambda is a statistical test designed to measure the "effect size" of a chi-square relationship. This test was conducted for each measure of slack and results compared.

R2: Will the strategic clusters which emerge in this study provide empirical support for Glueck's conceptual typology of strategy?

This research question was tentatively answered through the interpretation of the strategic groups formed in the cluster analysis procedure. The characteristics of the strategies embodied by the clusters were compared to Glueck's (1980) description of his conceptual strategy types. Any correspondence or lack thereof was noted.

SUMMARY

Chapter III consisted of three components: First, the specific hypotheses to be investigated in the study were derived. Next, the methodology utilized to select the sample firms and operationalize the major components of the Litsc-hert-Bonham model were presented. In conjunction with this discussion, pretest results supporting the utility of each of the measurement procedures were revealed. Finally, operational hypotheses were developed and the specific procedures used to test them were identified.

## Chapter IV

### RESULTS

This chapter presents the results of the study in three parts. First, the results of the cluster analysis procedure are described and interpreted. Second, each hypothesis is considered individually and its statistical analysis is reported. Third, findings relating to the two methodological research questions are examined.

#### DEVELOPMENT OF THE STRATEGIC CLUSTERS

Before any of the hypotheses or research questions proposed in this study could be tested, a good deal of effort had to be devoted to the construction and interpretation of meaningful strategic clusters. The steps followed in forming these clusters were identified in Chapter III. This section will present the results of those procedures beginning with an explanation of how the appropriate number of clusters was decided upon.

Recall that the first step of the cluster analysis procedure involved standardizing the eleven strategy variables. The standardized variables were then submitted to the SAS Fastclus procedure. Since this procedure requires the researcher to specify the desired number of clusters, it was



rerun 9 times generating solutions containing from 2 to 10 clusters. To determine which of these solutions was "best," a plot of the number of clusters against the cubic clustering criterion was prepared. Figure 1 shows this plot for the present data. Note that all points are above 2 on the vertical axis, indicating good clusterings. In addition, there are several peaks and dips on the plot, as opposed to a continual upward slope, which imply that the data has not been excessively rounded or recorded with too few digits. Based on this plot, the 5 cluster solution was chosen for further study. Note the sharp rise prior to the 5 cluster position and the decline following this point on the graph. These characteristics indicate the presence of a distinct non-hierarchical grouping at this level.

The five clusters were then plotted using the canonical discriminant analysis procedure described in Chapter III. Figure 2 presents this plot. The numbers on this figure represent the five strategic clusters. Note that three of the clusters are quite close together in space. This finding supports the decision to reject principal components analysis since the clusters may have become blurred beyond recognition by such a procedure.

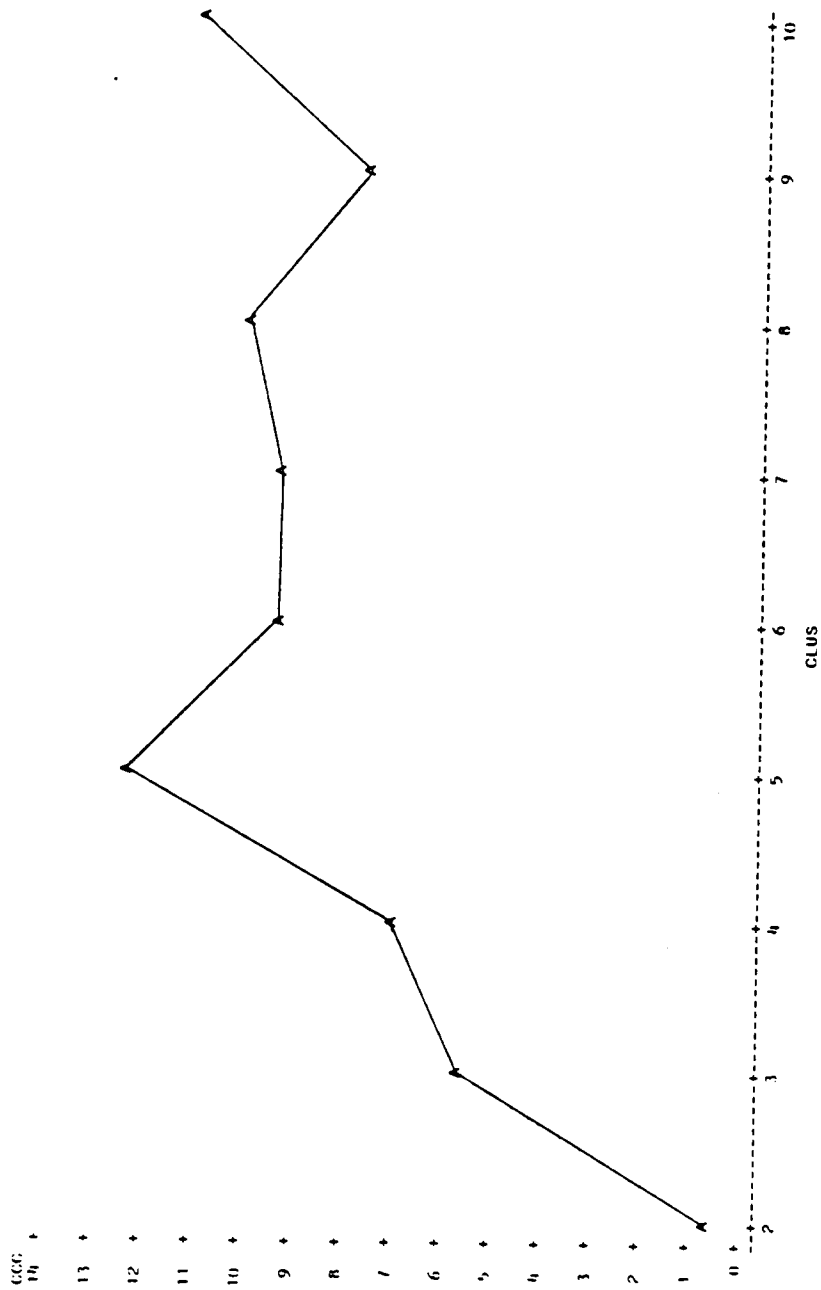
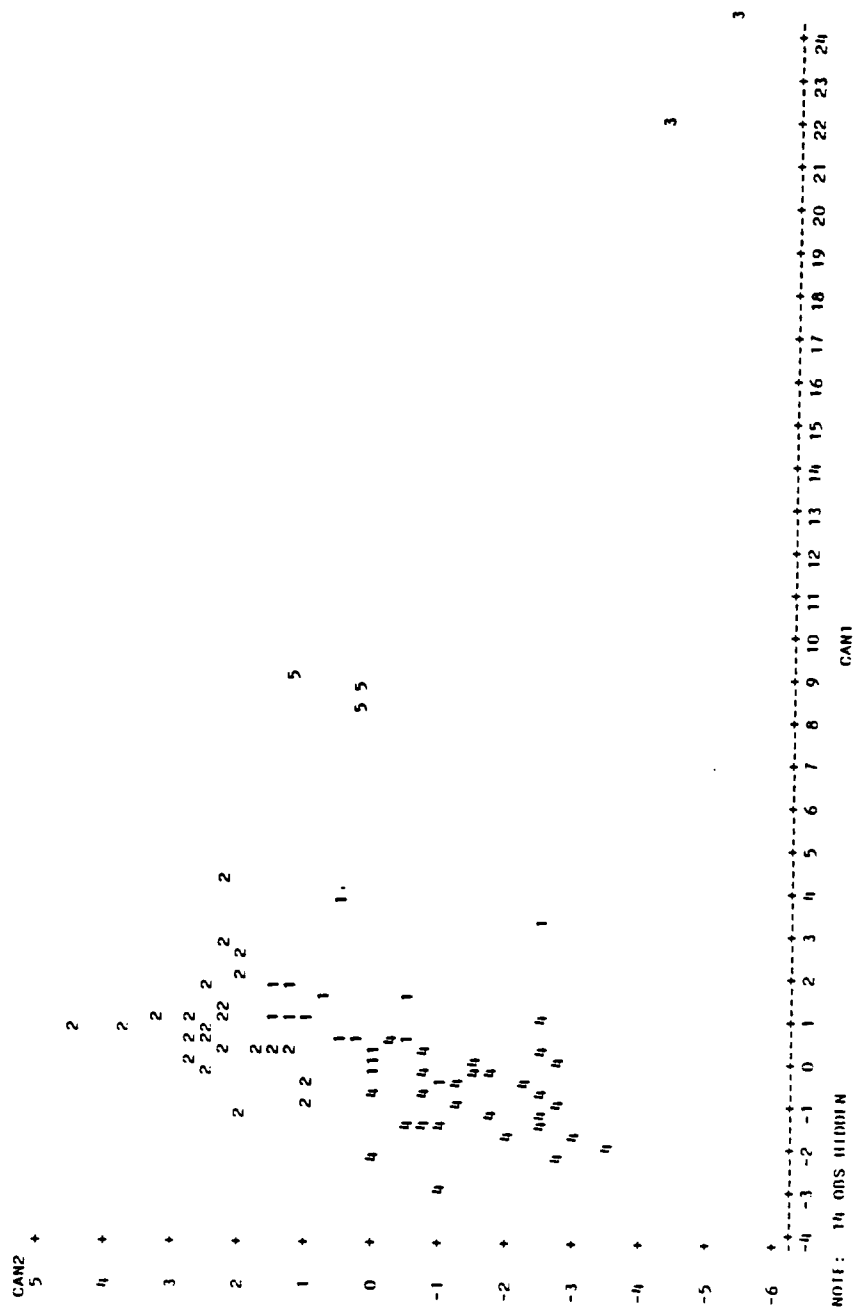


Figure 1: Plot of Number of Clusters by Cubic Clustering Criterion



### CLUSTER INTERPRETATION

In this section, the five clusters formed by the procedures described above will be examined. To this end, descriptive labels of each strategic type are provided along with a summary of the characteristics associated with each. In addition, steps taken to empirically validate these strategic clusters are described.

Since three of the variables used to form the clusters were categorical variables while the remaining eight involved interval-level data, two separate tables have been compiled to depict the differences in variable scores across clusters. First, table 6 presents results of the three nominal variables: SUPPLIERS, CUSTOMERS, and TERRITORY. As can be seen in this table, the first column on the left presents the variable names while the top row contains the descriptive labels for each of the 5 strategic groups. Within each of these groups, the percentage of firms falling into each category has been provided.

Table 7, which is organized in the same way, presents cluster means for the five derived types. Interpretation of this table should be done in two ways: First a strategic type is characterized by the cluster means or percentages read vertically within the type across all items. Second, interpretation is enhanced by comparing the scores between

TABLE 6

Percentages of Firms in Strategic Categories by Cluster

	1 Refocus (n=17)	2 Concen- tration (n=29)	3 Vertical Expand (n=2)	4 No Change (n=35)	5 Market Devel. (n=3)
SUPPLIERS					
1=Make	41.2%	0.0%	0.0%	8.6%	33.3%
2=Both	52.9%	37.9%	50.0%	34.3%	0.0%
3=Buy	5.9%	62.1%	50.0%	57.1%	66.7%
CUSTOMERS					
4=OEM's	17.6%	20.7%	0.0%	14.3%	0.0%
5=Both	70.6%	37.9%	50.0%	40.0%	0.0%
6=Endusers	11.8%	41.4%	50.0%	45.7%	100.0%
TERRITORY					
1=Regional	0.0%	0.0%	0.0%	0.0%	0.0%
2=National	0.0%	0.0%	0.0%	42.8%	0.0%
3=Exports	11.8%	3.5%	0.0%	45.7%	0.0%
4=Int'l	88.2%	96.5%	100.0%	11.4%	100.0%

the types; e.g., R&D investment: Note that Type 2 has a high mean of 9.8 percent of sales and type 1 has a low mean of 2.5% of sales on this item. To determine whether these differences were significant across clusters, a two-step analysis was performed. To begin, one-way anovas were conducted for all variables across all clusters. Results of the F-test for each variable can be found in the left-hand column of table 7. Next, whenever the anova was significant, Duncan's multiple comparison procedure was utilized to provide more detailed information about the differences among the means. Basically, multiple comparison procedures allow a researcher to determine in which clusters the differences occurred. For example, the highest mean score on a given variable may be significantly different from the lowest mean, but may not be different from any others. Or the two highest means may be equivalent to each other and higher than all others while the lowest mean may be lower than all others. In this study, results of the Duncan procedure tended to divide the means into two or three broad groups: those significantly higher than the remaining means (upper), those in the middle range, and those significantly lower than the rest (lower). These findings have been placed in parentheses beneath each cluster mean and are used as the basis for selecting the distinctive characteristics of each strategic type.

It is important to explain here that these anovas and multiple comparison procedures were run only to aid in the interpretation of the strategic clusters. Since the cluster analysis procedure formed groups on the basis of differences among these 11 variables, it is to be expected that the anovas will yield significant results. Therefore, this step is definitely not to be interpreted as a means of validating the clusters. Such a procedure would be seriously misleading.

#### THE STRATEGIC TYPOLOGY

##### Strategy Type 1: Refocus

Consisting of 13 paper companies and four computer companies, the distinguishing characteristic of this strategic type was the high level of buying and selling activity which occurred in 1983. A relatively high number of new subsidiaries and joint ventures were added, but an even higher number were sold or liquidated. No other cluster of firms showed such strong emphasis on both buying and selling. In addition, these firms were more integrated backward than any other strategy type, but seemed to place less emphasis on forward integration which seems consistent with their low investment in advertising. Most of these companies sold their products to other manufacturers although a few also

TABLE 7

Mean Values of Strategic Variables by Cluster

	1 Refocus (n=17)	2 Concen- tration (n=29)	3 Vertical Expand (n=2)	4 No Change (n=35)	5 Market Devel. (n=3)
FOREIGN (%) $F_{(4,81)}=27.99$ $p<.0001$	15.112	31.069 (upper)	18.350	2.894 (lower)	31.900 (upper)
SINGLE (%) $F_{(4,81)}=4.29$ $p<.003$	1.059	8.790	6.400	21.523	6.667
BIG $F_{(4,81)}=8.95$ $p<.0001$	1.647	.965	4.000 (upper)	.371	.667
JOINT VENTURE $F_{(4,81)}=10.43$ $p<.0001$	1.176	.379	5.500 (upper)	.057	.333
SHRINK $F_{(4,81)}=15.92$ $p<.0001$	-2.353 (lower)	-.241	-.500	-.171	.000
ADV/SALES (%) $F_{(4,81)}=13.68$ $p<.0001$	.538	1.307	.647	.925	6.099 (upper)
R&D/SALES (%) $F_{(4,81)}=9.85$ $p<.0001$	2.495 (lower)	9.843 (upper)	7.635	3.746	7.539
ASSET GROWTH (x) $F_{(4,80)}=127.63$ $p<.0001$	3.658	4.482	42.694 (upper)	2.482	22.274 (upper)



sold to endusers. Most also had foreign subsidiaries but they did not appear to rely heavily on foreign sales since such revenues were moderate. The mean R&D investment was lower than that of any other strategic type but it should be noted that the four computer companies in this group invested significantly more in R&D than did the predominant paper companies. Over all, this strategy type had exhibited relatively low growth in assets over time despite their relatively high number of new subsidiaries again suggesting that their main emphasis in 1983 was on refocusing rather than simple expansion.

#### Strategy Type 2: Concentration

This cluster represented the dominant strategy within the computer industry. Although 29 computer companies fell into this strategic type, no paper companies appeared here. While experiencing only moderate growth in assets, these firms seemed to be expanding -- but slowly. Over half of these firms had added one or more new subsidiaries in 1983, but very few had sold or liquidated any properties. The salient features of this strategy type appeared to be the heavy investment in R&D and the high emphasis on foreign sales. Although there was no clear pattern of customer types served, there was a relatively low emphasis on backward

integration. Most firms bought components from other companies and ran basic assembly operations.

### Strategy Type 3: Vertical Integration

This was a small cluster, comprised of only two computer firms, both of which produced large mainframe computers and systems. These firms had experienced great growth in recent years as evidenced by the high level of asset change. In addition, out of all clusters, the firms in this strategic group added the highest average number of new subsidiaries and joint ventures during 1983. Both firms had recently established foreign sales subsidiaries and were attempting to increase their revenues from foreign sales through this forward expansion.

### Strategy Type 4: No Change

That strategy type 4 displayed few distinguishing features, was perhaps its most distinguishing feature. Interestingly, this was also the largest cluster, with 35 total firms -- 18 from the paper industry and 17 from the computer industry. Few of these firms had foreign subsidiaries as revealed by the low mean on the TERRITORY variable. Revenues from foreign sales were also significantly lower than other groups; indeed, only five of these companies earned over 10% of re-

venues from foreign markets in 1983. This strategy type displayed a greater tendency than any other type to rely on a single customer for a large percentage of sales. Moreover, there was virtually no buying or selling of subsidiaries in 1983, indicating a rather stable posture. Investment in R&D was on the low end and change in assets was lower than any other cluster. Overall, these firms appeared to be content with their current products and markets.

#### Strategy Type 5: Market Development

Another small cluster, consisting of three computer firms, this strategy type had experienced a high growth rate as evidenced by its high mean on change in assets. This growth was apparently achieved by selling directly to endusers which is consistent with the heavy investment in advertising. Most growth appeared to be within the core product area, however, since few new subsidiaries were added in 1983 (and these were added by only one firm). Revenues from foreign markets were very high, again supporting the notion that growth was achieved primarily through the development of new markets. Investment in R&D was moderate.

### Validation of Clusters

One of the problems of the cluster analysis procedure is that it is difficult to verify whether the clusters which are generated exist naturally in the data or are imposed by the procedure itself. In order to assess the generality of the clusters then, some sort of validation procedure is required. As with most aspects of cluster analysis there is no one accepted procedure for this purpose, but the most promising tool appears to be external validation of the clusters with variables that were not used to generate the clusters. As Aldenderfer and Blashfield comment, "the power of external validation is that it directly tests the generality of a cluster solution against relevant criteria" (1984: 66). This section presents the results of the analyses of 10 variables which were selected for just this purpose.

The variable EXPAND reflects the emphasis on corporate expansion in 1983 as stated in the CEO's letter to shareholders which opens the corporate annual report. This variable actually consisted of five categories, each representing a different type of growth (see Appendix C). Using this scale, the CEO's letter was content analyzed and a determination was made as to the dominant growth method stressed in 1983. A contingency table was prepared to examine the asso-

ciation between this variable and the five strategic types. As shown in Table 8, there were clear differences in the stated emphasis on expansion which did appear to relate to the strategy profiles described above.

As can be seen in Table 8, firms in Cluster 1 (Refocus) were likely to mention just about any type of expansion. This supports the notion that the common factor here was not a particular type of growth but rather some type of growth in conjunction with other cutbacks. Next, in keeping with the concentration emphasis of their strategy, firms in Cluster 2 never mentioned concentric or conglomerate diversification. However, interestingly there was a significant emphasis on vertical integration among these firms. Similarly, both firms in cluster 3 emphasized vertical integration (hence the name of this group). The great majority of the firms in cluster 4 (no change) stressed just this fact in their annual reports clearly supporting the group profile. Finally, the three firms in cluster 5, which also appeared to be following a variation of the concentration strategy, fell into the same three expansion categories as did the firms in Cluster 2. Thus, the EXPAND variable provides strong support for the strategic types developed in the present study.

TABLE 8

Comparison of Expansion Emphasis to Strategy Type

<u>EXPAND</u>	<u>STRATEGY</u>					TOTAL
	1	2	3	4	5	
NO CHANGE	5	9	0	26	1	41
HORIZONTAL	5	9	0	6	1	21
VERTICAL	2	11	2	2	1	18
CONCENTRIC	4	0	0	1	0	5
CONGLOMERATE	1	0	0	0	0	1
TOTAL	17	29	2	35	3	55

The remaining validation variables were measured with interval level data and could thus be compared across clusters with one way anovas. Table 9 shows the means of the remaining validation variables for each of the five strategic types. (Explanations of these variables appear in Appendix B). Of these nine variables, seven were significantly different across strategy types. This section will attempt to explain how the differences in these variables correspond with the cluster profiles just provided.

First, several different "size" variables were compared across clusters in order to determine whether company size appeared to affect strategic choice. The average number of employees (EMP83) did differ across strategy types ( $F=2.56$ ;  $p<.04$ ); indeed the firms in clusters 1 (refocus) and 3 (vertical integration) far surpassed the rest on this variable. Similarly, clusters 1 and 3 also revealed the highest level of sales in 1983 ( $F=2.88$ ;  $p<.02$ ) while cluster 4 (no change) appropriately had the lowest mean on this variable. Finally, asset size (ASSET83) was again significantly different across strategy types ( $F=2.81$ ;  $p<.03$ ) but only cluster 1 appeared much different from the rest on this value. This difference may be due to the fact that cluster 1 contained mainly large paper companies which are highly capital intensive. Although the firms in cluster 3 are large in terms of

TABLE 9

Mean Values of Validation Variables by Cluster

	1 Refocus	2 Concen- tration	3 Vertical Expand	4 No Change	5 Market Devel.
EMPS83 (000) $F_{(4,79)}=2.56$ ; $p<.04$	39.097	9.109	30.127	2.106	1.052
SALES83 (000,000) $F_{(4,81)}=2.88$ ; $p<.02$	4209.1	585.4	2500.5	299.3	184.9
ASSET83 (000,000) $F_{(4,80)}=2.81$ ; $p<.03$	3912.1	548.1	415.5	277.8	178.6
EMP/SALES (%) $F_{(4,79)}=2.25$ ; $p<.07$	10.0	1.5	1.1	1.4	1.1
EMP83/EMP77 (X) $F_{(4,78)}=14.39$ ; $p<.0001$	204.00	218.00	1679.10 (upper)	145.60 (lower)	742.30 (upper)
NEW (%) $F_{(4,81)}=2.08$ ; $p<.09$	64.0	55.5	61.6	56.4	74.9
SALES/ASSET (X) $F_{(4,80)}=4.15$ ; $p<.004$	1.14	1.18 (lower)	1.01	1.61 (lower)	1.07 (upper)
CGS/SALES (%) $F_{(4,81)}=6.21$ ; $p<.0002$	68.45 (upper)	56.42	43.38 (lower)	68.27 (upper)	47.61
CGHCGS (X) $F_{(4,81)}=5.18$ ; $p<.0009$	1.05	1.14 (upper)	.82 (lower)	.96	.87 (lower)



the number of employees, the nature of the industry is probably such that less operating leverage is required. Another interesting finding here relates only to the paper industry. Clearly, the large firms in this industry have chosen a different strategy than have the smaller firms which are located in cluster 4 (no change).

When the number of employees was compared to sales (EMP/SALE) for the sample firms, there was no significant difference across clusters ( $F=2.25$ ;  $p<.07$ ). Rather it appeared that each strategy type generated about the same amount of sales from each employee. This finding was not unexpected given the identical patterns in number of employees and level of sales described above.

When the percentage increase in employees over time (EMP83/EMP77) was examined, however, significant differences were found to exist across clusters ( $F=14.39$ ;  $p<.0001$ ). Cluster 3, vertical integration, which had experienced the greatest growth in assets over time also far surpassed the remaining groups on growth in employees. Cluster 1, refocus, which had the greatest number of employees overall, but had experienced relatively low asset growth, also experienced relatively low growth in employees. Also, as expected, this variable was lowest for cluster 4 (no change).

The variable NEW was a psuedo-measure of plant age. High values on this variable indicate that little depreciation of property, plant and equipment has occurred, indicating relatively new fixed assets. The value decreases as depreciation increases. Although this variable did not reach significance ( $F=2.08$ ;  $p<.09$ ), clusters 4 and 2 appeared to have somewhat older fixed assets than did the remaining groups of firms. This finding is consistent with the "no change" orientation of cluster 4, since it corresponds with the low growth in assets that these firms have experienced over time. Cluster 2, concentration, had also experienced relatively low growth in assets.

The ratio asset turnover (ASSET/SALES) provides a rough indication of how well a firm uses its assets to generate sales. Interestingly, clusters 4 and 2, those which had experienced the lowest asset growth, appeared to use the assets they had most efficiently. Perhaps there exists a learning curve associated with the efficient use of new assets since the highest growth strategies (3 and 5) were lowest on this variable.

Cost of goods sold as a percentage of sales (CGS/SALES) also showed intriguing results. Cluster 1, the refocus strategy, had the highest mean on this variable. Although it is tempting to interpret this finding as showing support

for the notion that these firms may need to control their costs better, it may be better explained by industry membership since most of the firms in cluster 1 operate in the more mature paper industry. Yet, Cluster 4, no change, was equally high on this variable - even though half of the companies in this group were computer firms. Therefore, there may be some evidence of poor cost control here.

The change in cost of goods sold as a percentage of sales over time (CHGCCGS) was also revealing. Cluster 2, concentration, had increased this percentage the most, which may indicate potential problems in controlling manufacturing costs. Clusters 3 and 5 were again the lowest on this factor.

#### Summary of Strategic Types

Overall, the procedures described above led to the formation of five clusters which were able to be interpreted in meaningful terms. Clear differences appeared to exist in the strategic orientations of the firms in the various clusters - not only among the variables used to form the clusters, but also on 8 of the 10 external validation variables. According to Aldenderfer and Blashfield, "the value of a cluster solution that has successfully passed an external validation is far greater than a solution that has not" (1984: 66).

### ANALYSIS OF HYPOTHESIS 1

Hypothesis 1 was designed to test for differences in the diversity of strategies selected by high and low slack firms in a given context. Specifically:

H1: Within a given context, a greater diversity of strategies will be observed among high slack firms than among low slack firms.

As discussed in Chapter III, the Index of Quantitative Variation (IQV) has been developed to measure the level of diversity among categories of data (Mueller et al., 1977; Ott et al., 1974). The IQV is defined as the total number of observed differences expressed as a percentage of the maximum possible number of differences (Ott et al., 1974). This index ranges from 0 (perfect homogeneity) to 100% (perfect heterogeneity). The formula for calculating this index appears in Appendix E.

Using this index, the following operational hypotheses were examined:

O1A: Given a sample of firms selected from the paper industry, there will be a greater diversity of strategies found among high-slack firms than among low-slack firms.

O1B: Given a sample of firms selected from the computer industry, there will be a greater diversity of strategies found among high-slack firms than among low-slack firms.

Since these hypotheses only relate to high and low levels of slack, the test simply involved calculating the IQV with respect to these 2 levels. This step was repeated for each of the three different slack operationalizations (MLSLACK, QTSLACK and BSLACK). Results of this step are presented in Tables 10 and 11. As Table 10, shows, hypothesis 01A was supported across all 3 slack measures. In other words, in the paper industry, regardless of which slack measure was used, it appeared that firms with high slack were more heterogeneous in their strategic orientations than were firms with low slack. The IQV for low slack firms varied from 0% (QTSLACK and BSLACK) to 32.54% (MLSLACK). For high slack firms, the corresponding index values were 43.21%, 61.73% and 55.55% respectively. While there is no way of statistically assessing the significance of these differences, the index values in the second group were clearly larger.

Results for the computer industry, on the other hand, were not supportive of Hypothesis 01B. Referring to Table 11, it can be seen that for the MLSLACK measure, low slack firms were actually more heterogeneous (by 7.88%) than were high slack firms in their strategy selections. This finding was opposite the prediction made herein. This same trend appeared when the BSLACK measures were used but the differ-

TABLE 10

Comparison of the IQV for Low and High Slack Paper Firms

	<u>MLSLACK</u>		<u>QTSACK</u>		<u>BSLACK</u>	
	Low (n=13)	High (n=9)	Low (n=6)	High (n=9)	Low (n=3)	High (n=18)
STRATEGY 1 Refocus	2*	6	0	7	0	8
STRATEGY 4 No Change	11	3	6	2	3	10
IQV (%)	32.54	55.55	0	43.21	0	61.73

\* Cell entries in first 2 rows are frequencies of firms in strategic groups by level of slack.

TABLE 11

Comparison of the IQV for Low and High Slack Computer Firms

	<u>MLSLACK</u>		<u>QTSACK</u>		<u>BSLACK</u>	
	Low (n=22)	High (n=20)	Low (n=3)	High (n=10)	Low (n=13)	High (n=33)
STRATEGY 1 Refocus	0*	4	0	2	1	3
STRATEGY 2 Concentra.	9	13	0	6	6	19
STRATEGY 3 Vertical	0	1	0	1	0	2
STRATEGY 4 No change	12	1	3	0	5	8
STRATEGY 5 Mkt. Dev.	1	1	0	1	1	1
IQV (%)	66.63	58.75	0	72.50	78.40	74.60

\* Cell entries in first 5 rows are frequencies of firms in strategic groups by level of slack.

ences in diversity between the two groups were very small. For QTSLACK, however, the high slack companies were definitely more heterogeneous since the three low slack firms all appeared within the same strategic type. For this slack measure, only, results were supportive of Hypothesis 01B.

To summarize these findings as they relate to Hypothesis 1, it appears that no clear conclusions can be drawn regarding the relationship between strategic diversity and slack. In the paper industry, as predicted, the Index of Quantitative Variation revealed differences in the diversity of the strategies adhered to by low vs. high slack firms -- regardless of which slack measure was used. Yet as Table 10, shows, there were actually only two strategies followed by high slack paper firms just as there were two strategies followed by low slack paper firms. The I.Q.V. shows the high slack firms as more heterogeneous because they tended to be more evenly dispersed across these types. Yet, inspection of the actual distribution of firms across categories shows that high slack paper companies appear to follow a dominant strategy (Refocus) just as low slack paper companies tended to stress the No Change strategy.

Results in the computer industry were even less supportive of H1. When the QTSLACK measures were used, high slack firms were found to be more diverse in their strategic



choices. In contrast, when MLSLACK or BSLACK were examined, low slack firms appeared to be either more or at least equally diverse in their strategic orientations as high slack firms. More will be said about the possible reasons for these discrepant results and their interpretation with regard to the Litschert-Bonham model in the next chapter.

### ANALYSIS OF HYPOTHESIS 2

While the first hypothesis was designed to determine whether high slack firms would choose a wider variety of strategies than a similar group of low slack firms, the second hypothesis looked at differences in the strategies actually chosen by high versus low slack firms. In other words, it was predicted that a relationship would exist between level of slack and strategy choice. Thus:

H2: Within a given context, there will be a relationship between level of slack and strategy.

Since nominal data were used to test this hypothesis, the appropriate statistical procedure was the Chi-square Goodness of Fit test. Stated simply, this test determines whether some observed pattern of frequencies corresponds to an expected pattern. This expected pattern is based on a null hypothesis of no relationship which, in this case, assumes that firms with any level of slack would be just as

likely to choose any strategy. To the extent that the observed pattern differs significantly from this scenario, a relationship is said to exist between the variables of interest.

For the paper industry, the following operational hypothesis was tested in this manner:

O2A: Given a sample of firms selected from the paper industry, there will be a significant chi-square relationship between level of slack and category of strategy.

The contingency tables and corresponding chi-square results which relate to this hypothesis are displayed in Tables 12, 13 and 14. Note that only two strategy types appeared in the paper industry: Refocus and No Change. Results of the chi-square test between these two categories of strategy and the three levels of slack for each of the three slack operationalizations revealed that slack and strategy were significantly related when either the MLSLACK ( $\chi^2=6.71$ ;  $p<.03$ ) or QTSLACK ( $\chi^2=9.21$ ;  $p<.01$ ) measures were used; however, the BSLACK operationalization of slack was not significantly related to strategy ( $\chi^2=2.48$ ;  $p<.28$ ). Still, these results must be interpreted cautiously. Because of inadequate sample size, over 20% of the cells of the contingency tables used to conduct these  $\chi^2$  tests had expected frequencies of less than 5. Since the chi-square

test is an approximate test designed to work with large samples, this violates the rule of thumb which indicates that at least 80% of the cells should have expected counts of 5 or more (Blalock, 1979). Although some authors have stated that this value can be as low as 1 for certain situations (cf., W.G. Cochran, 1953), it was felt that a precautionary secondary analysis should be performed.

Since this study was mainly concerned with determining whether strategy differs between high and low slack firms, the entire middle category of slack was dropped. The new two by two contingency tables are displayed in Tables 15, 16, and 17. New chi-squares were calculated using a Yate's continuity correction formula (Blalock, 1979).

As can be seen in these tables, these results confirmed the pattern described for the original  $X^2$  tests. Both MLSLACK ( $X^2=4.03$ ;  $p<.05$ ) and QTSLACK ( $X^2=5.90$ ;  $p<.02$ ) were significantly related to strategy. However, the association between BSLACK and strategy ( $X^2=.204$ ;  $p<.70$ ) was not significant.

For the computer industry, the following operational hypothesis was proposed:

02B: Given a sample of firms selected from the computer industry, there will be a significant chi-square relationship between level of slack and category of strategy.

TABLE 12

Table of MSLACK by Strategy for the Paper Industry

<u>MSLACK</u>	<u>STRATEGY</u>		TOTAL
	1	4	
Low	2	11	13
Unclass.	5	4	9
High	6	3	9
TOTAL	13	18	31

$$\chi^2 = 6.710$$

$$p < .035$$

TABLE 13

Table of QTSLACK by Strategy for the Paper Industry

<u>QTSLACK</u>	<u>STRATEGY</u>		TOTAL
	1	4	
Low	0	6	6
Unclass.	6	10	16
High	7	2	9
TOTAL	13	18	31

$\chi^2 = 9.211$   
 $p < .010$

TABLE 14

Table of BSLACK by Strategy for the Paper Industry

<u>BSLACK</u>	<u>STRATEGY</u>		TOTAL
	1	4	
Losers	0	3	3
Constant	5	5	10
Gainers	8	10	18
TOTAL	13	18	31

$$\chi^2 = 2.480$$

$$p < .289$$

TABLE 15

High and Low MSLACK versus Strategy for the Paper Industry

<u>MSLACK</u>	<u>STRATEGY</u>		TOTAL
	1	4	
Low	2	11	13
High	6	3	9
TOTAL	8	14	22

$\chi^2=4.03$   
 $p < .05$

TABLE 16

High and Low QTSLACK versus Strategy for the Paper Industry

<u>QTSLACK</u>	<u>STRATEGY</u>		TOTAL
	1	4	
Low	0	6	6
High	7	2	9
TOTAL	7	8	15

$\chi^2=5.90$   
 $p < .02$



TABLE 17

High and Low BSLACK versus Strategy for the Paper Industry

<u>BSLACK</u>	<u>STRATEGY</u>		TOTAL
	1	4	
Losers	0	3	3
Gainers	8	10	18
TOTAL	8	13	21

$\chi^2 = .204$   
 $p < .70$

The sample of firms in the computer industry was divided into five strategic clusters. The original slack by strategy contingency tables are displayed in Tables 18, 19 and 20. Once again, MSLACK was significantly related to strategy ( $X^2=18.128$ ;  $p<.02$ ); the association between QTSACK and strategy approached significance ( $X^2=14.313$ ;  $p<.07$ ) and BSLACK and strategy were unrelated ( $X^2=4.763$ ;  $p<.78$ ).

Despite the increased sample size in this industry, over 20% of the cells of these contingency tables again had expected frequencies of less than five. Therefore, several of the strategy types were collapsed together in order to conduct a more robust chi-square test. To make this test comparable to the secondary test conducted in the paper industry, the unclassified or constant slack firms were again deleted from this follow-up analysis. Next, clusters 2, 3, and 5 were combined since these three strategy types exhibited the most similar profiles. As shown in Table 7, all had comparable means on the SUPPLIER variable, the CUSTOMER variable and the TERRITORY variable. In addition, these strategy types had the three highest means on FOREIGN revenues, R&D/SALES, and ASSET CHANGE. Although the firms in cluster 3 earned only 18.4% of revenues from foreign sales, while clusters 2 and 5 averaged above 30%, the firms in this group were attempting to increase this figure in 1983

through forward integration into foreign countries. In addition, the firms in cluster 2 had the highest mean investment in R&D at 9% of sales, but those in groups 3 and 5 were close behind with 7% of sales each. Finally, both clusters 3 and 5 had experienced much greater asset growth than had the organizations in cluster 2, but the firms in cluster 2 did appear to be growing as opposed to remaining stable or refocusing their resources in 1983. The three new contingency tables for these combined clusters can be seen in Tables 21, 22, and 23.

As these tables illustrate, in the computer industry, as in the paper industry, when either MLSLACK ( $X^2 = 14.245$ ;  $p < .0008$ ) or QTSLACK ( $X^2 = 13.000$ ;  $p < .001$ ) were utilized, there was a significant relationship between slack and strategy. Results for BSLACK were not significant ( $X^2 = .931$ ;  $p < .627$ ). Unfortunately, as shown in Tables 21, 22, and 23, even these collapsed contingency tables contained too few observations to meet the aforementioned rule of thumb. Yet, it is worth noting that the p-levels for MLSLACK and QTSLACK decreased dramatically despite the reduction in sample size caused by dropping the middle category of slack. This finding is particularly encouraging since the chi-square test tends to be very sensitive to sample size and any association would be expected to decrease as sample size decreases.

TABLE 18

Table of MSLACK by Strategy for the Computer Industry

<u>MSLACK</u>	<u>STRATEGY</u>					TOTAL
	1	2	3	4	5	
Low	0	9	0	12	1	22
Unclass.	0	7	1	4	1	13
High	4	13	1	1	1	20
TOTAL	4	29	2	17	3	55

$\chi^2=18.218$   
 $p<.02$

TABLE 19

Table of QTSLACK by Strategy for the Computer Industry

<u>QTSLACK</u>	<u>STRATEGY</u>					TOTAL
	1	2	3	4	5	
Low	0	0	0	3	0	3
Unclass.	2	23	1	14	2	42
High	2	6	1	0	1	10
TOTAL	4	29	2	17	3	55

$\chi^2=14.313$   
 $p<.07$

TABLE 20

Table of BSLACK by Strategy for the Computer Industry

<u>BSLACK</u>	<u>STRATEGY</u>					TOTAL
	1	2	3	4	5	
Losers	1	6	0	5	1	13
Constant	0	4	0	4	1	9
Gainers	3	19	2	8	1	33
TOTAL	4	29	2	17	3	55

$$\chi^2 = 4.763$$

$$p < .78$$

TABLE 21

High &amp; Low MSLACK by 3 Strategy Types for Computer Industry

<u>MSLACK</u>	<u>STRATEGY</u>			TOTAL
	1	2+3+5	4	
Low	0	10	12	22
High	4	15	1	20
TOTAL	4	25	13	42

$\chi^2=14.245$   
 $p < .0008$

TABLE 22

High &amp; Low QTSLACK by 3 Strategy Types for Computer Industry

<u>QTSLACK</u>	<u>STRATEGY</u>			TOTAL
	1	2+3+5	4	
Low	0	0	3	3
High	2	8	0	10
TOTAL	2	8	3	13

$\chi^2=13.000$   
 $p < .0015$



TABLE 23

High &amp; Low BSLACK by 3 Strategy types for Computer Industry

<u>BSLACK</u>	<u>STRATEGY</u>			TOTAL
	1	2+3+5	4	
Losers	1	7	5	13
Gainers	3	22	8	33
TOTAL	4	29	13	46

$$X^2 = .931$$

$$p < .627$$

This may indicate that the unclassified or constant slack firms were confounding the relationship between these absolute measures of slack and strategy.

To summarize these findings as they relate to Hypothesis 2, there appeared to be a significant relationship between level of slack and strategy type when either MLSLACK or QTSLACK measures were used. However, in no case was BSLACK significantly related to strategy. This pattern of relationships was consistent for both industries and continued to hold regardless of whether 2 or 3 levels of slack were considered. These results supported Marino and Lange's (1983) prediction that the absolute slack indicators (MLSLACK and QTSLACK) would be more appropriate than Bourgeois' relative slack indicator (BSLACK) for testing the L-B model. Although sample size was a problem in this analysis, (particularly in the computer industry), this consistency of results was extremely encouraging and lent credibility to these findings.

### ANALYSIS OF HYPOTHESIS 3

In Chapter 1, it was posited that the chief contribution of the L-B model may be its inclusion of organizational slack as a moderator of the structural-contingency perspective. The idea here is that the presence or absence of slack

changes the relationship between context and strategy. When slack is high, there should be little or no association between these variables because managers are less constrained by context and can follow their personal values. On the other hand, when little slack is available, context should dictate structure which, in turn, should lead to strategy. Low slack firms in a given environment would thus be expected to adhere to similar strategies. It follows that low slack firms in different environments should follow different strategies. Hypothesis 3 was developed to allow investigation of this idea:

H3: Under conditions of low slack, firms in a relatively certain environment will utilize different strategies than will firms in a relatively uncertain environment.

Restated:

O3: Under conditions of low slack, firms in the paper industry will utilize different strategies than will firms in the computer industry.

Analysis of this hypothesis was based on only two slack operationalizations: MSLACK and QTSACK. Since BSLACK was shown not to relate to strategy type in the last section, it would make little sense to include it here. As will be further discussed in Chapter V, the BSLACK indicator may not be an appropriate measure of slack for the present theoretic-

cal context. In order to test hypothesis 3, it was necessary to separate the dominant low-slack strategy types from the remaining sample.

Table 24 shows the number of firms falling into each of the original five strategic clusters according to level of slack (high or low) within each industry. In the paper industry, it is easy to see that the majority of the low slack firms fell into Cluster 4 (No Change). This trend was consistent for both MLSLACK and QTSLACK.

In the computer industry, under MLSLACK, it can be seen that two clusters, strategy type 2, concentration and strategy type 4, no change, both contained significant numbers of low slack firms. However, two points prohibit the labeling of cluster 2 as a low slack strategy. First, under MLSLACK, there were actually more high slack companies (13) than low slack companies (9) within this cluster. Second, when quartiles were used as cut-off points as opposed to medians (i.e., under QTSLACK), all of the "low slack" firms in cluster 2 disappeared. The three remaining low slack companies were all found in cluster 4. Therefore, it appeared that the dominant strategy followed by low slack firms in both the paper and computer industry was strategy type 4, no change.

TABLE 24

Comparison of Low-slack Strategies in Two Industries

	<u>LOW MSLACK</u>		<u>LOW QTSLACK</u>	
	Compu- ter	Paper	Compu- ter	Paper
STRATEGY 1 Refocus	0	2	0	0
STRATEGY 2 Concentration	9	0	0	0
STRATEGY 3 Vert. Integration	0	0	0	0
STRATEGY 4 No change	12	11	3	6
STRATEGY 5 Mkt. Development	1	0	0	0

This finding clearly refutes H3 which predicted that different strategies would be followed by low slack firms in different industries. However, in order to look more closely for potential differences in the application of this strategy by the two industries, an additional analysis was conducted on only the low MLSLACK firms in Cluster 4. The sample size was simply too small to conduct an equivalent analysis on the low QTSLACK firms in this cluster.

The low MLSLACK firms were divided into two groups based on industry membership. Fortunately, these groups were almost identical in size with 11 paper companies and 12 computer companies. Student T-tests were run on each of the 11 strategy variables used to make the clusters. Although it was anticipated that industry means would be similar for most of these variables, it was believed that a few significant differences might emerge.

T-test results are reported in Table 25. Of the 11 strategy variables, only 4 were significantly different between the two industries. First, it appeared that computer companies following the no change strategy tended to have a much higher dependence on a single customer than did the paper companies ( $t_{(12.8)} = -3.062$ ;  $p < .009$ ). This may reflect an attempt to find a protected niche in their more volatile environment (Kotter, 1979) and may help to explain how they

have survived using a no change strategy in an uncertain industry. Second, these computer companies invested a much higher percentage of their sales dollars into R&D than did the paper companies ( $t_{(11.3)} = -3.887$ ;  $p < .002$ ). Again, this may have been necessary for survival since technology changes so rapidly in this industry. Finally, the low-slack computer companies were more apt to have some level of foreign exports since they had higher means on the TERRITORY variable ( $t_{(21)} = -2.647$ ;  $p < .01$ ) and FOREIGN variable ( $t_{(11.1)} = -2.344$ ;  $p < .03$ ).

#### ANALYSIS OF RESEARCH QUESTIONS

Thusfar in this chapter, the results of the research corresponding to each of the three primary hypotheses has been presented. The remainder of the chapter will address the 2 methodological research questions presented in Chapter III.

R1: How will the statistical relationship between slack and strategy be affected by the use of a relative versus an absolute approach to the measurement of slack?

It will be recalled from Chapter II that relative measures of slack seek to gauge the change in level of slack resources within an organization over time. The Bourgeois (1981) measure (BSLACK) is a relative measure. In contrast, absolute measures are defined as those which identify firms

TABLE 25

T-tests on strategy variables in Cluster 4

<u>Variable</u>	<u>Paper</u>	<u>Computer</u>	<u>t-test</u>	<u>df</u>
SUPPLIERS	2.545 (.688)	2.750 (.452)	t=-.850 p<.405	21
CUSTOMERS	5.091 (.831)	5.333 (.778)	t=-.722 p<.478	21
TERR*	2.182 (.404)	2.833 (.718)	t=-2.647 p<.015	21
FOREIGN*	.100 (.300)	4.067 (5.835)	t=-2.344 p<.038	11.1
SINGLE*	7.382 (7.250)	31.542 (26.264)	t=-3.062 p<.009	12.8
BIG	.182 (.404)	.250 (.622)	t=-.308 p<.761	21
JVENT	0.000 (.000)	.083 (.289)	t=-.955 p<.350	21
SHRINK	-.273 (.467)	-.166 (.389)	t=-.594 p<.559	21
ADV/SALES	.710 (1.012)	1.531 (2.041)	t=-1.238 p<.233	16.4
R&D/SALES*	.469 (.473)	5.626 (4.545)	t=-3.887 p<.002	11.3
ASSET GROWTH	1.993 (1.277)	1.663 (1.310)	t=.611 p<.547	21

\* Achieved significance at .05 level or less



with the most or least slack resources in comparison to other firms. Marino and Lange's (1982) measures (MLSLACK and QTSLACK) fall into this category.

Referring again to the discussion of Hypothesis 2 on the preceding pages, it can easily be seen that this research question has already been answered. In both industries, both MLSLACK and QTSLACK, the absolute measures, were significantly related to strategy type. However, there were no significant relationships between BSLACK, the relative measure, and strategy.

Still, greater insight into the relationship between slack and strategy can be gained by examining the strength of this association. One measure of association which can be used with contingency tables is Guttman's Lambda (Blalock, 1979). Lambda is a proportional reduction in error (PRE) measure which allows one to determine the proportion of guessing errors which can be eliminated in predicting a firm's level on a dependent variable such as strategy, by knowing its class on a given independent variable such as slack. Lambda varies between 0 and 1. Where a strong relationship exists, there should be few prediction errors; hence, lambda should approach 1. If essentially no association exists, the number of prediction errors should be high and lambda should be close to 0.

Table 26 reports the results of this analysis. To interpret this table, begin with the first column on the left -- this is the MLSLACK by strategy association for the paper industry. The top number (22.2%) in this column means that in predicting strategy type, knowing level of slack should allow a 22% reduction in prediction errors. Moreover, in predicting MLSLACK, knowing strategy type should reduce prediction errors by 30.8%. The final number in this column is a combination of the two directional lambdas described above and can simply be considered as an overall measure of effect size, similar to  $r^2$ . Here, overall lambda equals 25.8% suggesting a moderate relationship.

Under QTSLACK for the paper industry, the most improved prediction occurred when strategy was known and slack predicted. Here a 38.5% reduction in guessing errors was observed. Knowing level of slack, however, provided little help in predicting strategy. Accordingly, the overall level of association declined to 21.4%. Finally, under BSLACK, all measures of Lambda were zero. This is to be expected when the two variables are independent of each other.

Results were similar for the computer industry. Again, the strongest associations were those between MLSLACK and strategy. Errors in predicting strategy from slack were reduced by 27.3%; for predicting slack from strategy the re-

TABLE 26

Guttman's Lambda comparisons across slack measures

	PAPER			COMPUTER		
	MLSLACK	QTSACK	BSLACK	MLSLACK	QTSACK	BSLACK
Predicting STRATEGY from slack	22.2%	6.7%	0%	27.3%	0%	0%
Predicting SLACK from strategy	30.8%	38.5%	0%	11.5%	11.5%	0%
Overall Lambda	25.8%	21.4%	0%	20.3%	7.7%	0%

duction was 11.5% and the overall association was 20.3%. In contrast, for QTSLACK, it appeared that knowing level of slack was of no help in predicting strategy. This finding did not appear consistent with the knowledge that all of the low QTSLACK firms fell into a single strategic type and should thus have been predictable. This inconsistency reveals a weakness of the Guttman Lambda measure in that it does not always take full advantage of the data. In cases such as this when all of the modal categories (i.e., those with the most observations) are in alignment, Lambda will equal 0. For the present analysis this was not a major problem since it had already been determined that BSLACK was not related to strategy.

The final research question follows:

R2: Will the strategic clusters which emerge in this study provide empirical support for Glueck's conceptual typology of strategy?

This question required the most subjective judgements about the data; yet, the clusters which were described above do appear to relate to Glueck's conceptual typology of strategy. This section will present the major similarities and dissimilarities between the empirically derived strategic types and Glueck's proposed strategy types. Excerpts from 1983 corporate annual reports were reported herein in order to add additional insights to this discussion.

Strategy Type 1: Refocus

This strategy type appeared to fit Glueck's description of the combination strategy. Glueck (1980) describes a combination strategy as one that a firm pursues when its main strategic decisions focus on the conscious use of several grand strategies (eg., stable growth, growth, retrenchment) at the same time in several strategic business units of the company. Such a strategy is most likely to be effective for larger firms which are "multiple industry firms in periods of economic transition or periods of product/service transition in the life cycle" (Glueck, 1980: 231). In correspondence with this description, the firms in this cluster were the largest in terms of the number of employees, level of sales and total assets in 1983. However, growth in employees and growth in assets were relatively low despite high levels of buying and selling activity in 1983. In total, these findings depict a strategy type which appeared consistent with Glueck's expectations.

Mead Corporation, which was a member of strategy type 1 fits this scenario. In 1983, the company dropped a number of unrelated businesses ranging from ink-jet printing to a foundry in order to refocus on the paper industry and data services (Suter, 1984: 64). Another member of this group, Datapoint, described 1983 as a year of revitalization in

which the firm strengthened its financial condition, improved its product line, divested its telecommunications divisions and redirected its corporate focus to office automation products.

The fit with Glueck's Combination Strategy profile was not quite as perfect for all firms in this cluster however. A few firms (4 out of 22) had not divested any subsidiaries in 1983 but seemed to be experiencing relatively low growth. Glueck's strategy, "Stable Growth as a Pause" may better describe the activities of these firms. Glueck describes this strategy as a temporary slowdown after a period of extensive growth during which a firm often consolidates its holdings or improves efficiency. I.B.M., for example, belonged to this strategy type yet showed no evidence of retrenching. Still, this company had experienced little change in asset size in recent years, perhaps due to antitrust pressure from the government which Glueck also describes as a common rationale for the pause strategy. According to Glueck, the stable growth as a pause strategy tends to be chosen as a stage in the combination strategy just discussed (1980: 207). If so, it makes sense that firms following both of these strategies were grouped into the same strategy type.

### Strategy Type 2: Concentration

The firms in this strategy type appeared to be following Glueck's concentration strategy which is also called "internal growth by increasing sales of the single product/service line" (Glueck, 1980: 208). Glueck describes this strategy as a successful growth strategy for firms whose products are not in the final stages of the product life cycle. This may be why this strategy appeared to dominate all others in the computer industry but was not present in the paper industry.

Glueck describes several ways in which this strategy might be carried out. After stating each of these methods, the corresponding characteristic of strategy type 2 will be presented.

a) Expand sales by increasing primary demand and encouraging new uses for the present product/service in the same area, with the same customers.

Of the 29 firms falling into this strategic type, 26 had focused their sales efforts on a single product segment. As stated in Centronics Data Computer's 1983 Corporate Report, its main focus was on achieving product acceptance of its line by major customers. Similarly, Computervision stressed building a close relationship and continuing partnership with its customers. Data General also seemed to be stressing this strategic attribute in its development of specialized services and user training at the customer's own facilities.

b)Expand sales of the product/service into additional sectors of the economy.

This aspect of Glueck's concentration strategy was seen repeatedly among the firms in this cluster. In order to set themselves apart from giant competitors (especially I.B.M.), these companies were zeroing in on various sectors of the economy. Anderson-Jacobson, for example, focused on industry, banks and government agencies. Computervision had targeted aerospace, automotive, mechanical equipment and fabricated materials firms. Cray Research designed its systems for scientific applications. Digital Computer focused on scientific, technical and education fields. MSI Data Corporation aimed at very specific segments such as retail food stores, drug stores, automotive stores and the like.

c)Expand sales of product/service into additional geographic areas.

This trend was clearly evident in this group of firms given its strong emphasis on foreign sales as seen in Table 7. In addition, most of the firms in this group either owned or were in the process of acquiring foreign subsidiaries.

d) Expand sales by introducing minor product modifications to new segments of the market.

Product enhancement was another primary concern of the firms in this strategy type. The heavy investment in R&D (see Table 7) supports this statement as do the frequent



discussions of product development which appeared in the corporate reports. To survive, these firms were forced to produce products which were either compatible with I.B.M. and which sold at a cheaper price than I.B.M., or which offered additional value to potential users. According to Amdahl's 1983 corporate report, the company was required to make frequent product changes to remain fully competitive. In addition, Cray Research described its 1983 strategy to continue enhancement of existing products while devoting substantial resources to the development of new ones.

### Strategy Type 3: Vertical Integration

As discussed above, the two companies in this cluster manufactured large scale computer systems which were targeted at selected markets. In this respect, the strategy was similar to that of Strategy Type 2 described above. Yet, the dominant expansion emphasis stressed by both of these firms in their 1983 corporate reports was vertical integration. Glueck describes vertical integration as a separate variation of his growth strategies. This strategy appears to have been effective for these two firms given the dramatic growth in assets experienced by these firms in recent years.

Strategy Type 4: No Change

According to Glueck (1980), a firm following a stable growth strategy aims only at achieving the same level of performance that has been reached in previous years, adjusted for inflation. Few major functional changes are made in product/service line, distribution channels, production capacity, vertical integration or the like. Based on the lack of activity observed in strategy type 4 (no change), the firms in this group certainly seemed to fit Glueck's conceptualization. Furthermore, the fact that this was the largest cluster lends support to his conjecture that the stable growth strategy is the strategy most frequently utilized by organizations.

Strategy Type 5: Market Development

This cluster also seemed to fit into Glueck's Concentration strategy but the main emphasis here appeared to be the development of new markets as evidenced by the high level of foreign sales and heavy investment in advertising. The rate of growth experienced by these firms, however, was much faster than the growth rate of Strategy Type 2 which may either mean that the strategy worked better for these three companies or that they were doing something else which was not apparent given the present data.

In general, these strategies did appear to support Glueck's typology. However, several of the strategy types appeared rather similar to each other. The organizations in clusters 2 and 5, for example, appeared to be following Glueck's concentration strategy; furthermore, a number of firms in cluster 2 emphasized vertical integration in their corporate reports as did the 2 firms in cluster 3. This convergence was undoubtedly due to the restrictions placed on the sample. Any companies earning less than 70% of revenues from their core business were not included herein. Therefore, firms following pure diversification strategies were probably screened out. Those remaining were by necessity those which were less diverse in their strategic emphasis. Further explanation of these findings is presented in Chapter V.

#### SUMMARY

Chapter IV has presented the results of the research conducted for this dissertation. Based upon the analyses conducted, the following general conclusions can be made. First, the diversity of strategies selected by high slack firms may or may not differ from the strategic diversity of low slack firms. Results appear to vary by industry. Perhaps factors other than slack are needed to account for dif-

ferences in strategic diversity. Second, slack was significantly related to strategy when absolute measures (i.e., MSLACK or QTSLACK) were used. Thus, firms with high levels of slack as compared to other firms in their industry chose different strategies than those with low slack. However, change in slack (BSLACK) did not appear to be related to strategy choice. Third, there were no differences in the strategies adopted by low slack firms in different industries. Based on the strategy measures employed in this study, "no change" strategies appeared to be the predominant choice of low-slack firms, regardless of industry. Finally, Glueck's strategic typology was supported by the data in this study indicating that it may prove to be of value in future investigations.

The primary purpose of this dissertation was to conduct a test of the Litschert-Bonham model of strategy formation. While a relationship between slack and strategy was shown to exist, other aspects of the model received minimal support. Chapter V will discuss some of the reasons for these findings and will attempt to explain their meaning in relationship to this model.

## Chapter V

### DISCUSSION

The purpose of this dissertation is to provide an empirically based examination of the effect of organizational slack on the contingent nature of strategy formation. Three hypotheses, derived from Litschert and Bonham's (1977) integrative model of strategy formation served as the basis for this analysis. In addition, two research questions, regarding the operationalization of organizational slack and the empirical construction of strategic typologies were considered herein. The data required to conduct this research was secured from secondary sources -- the most important of which were the Standard and Poor's Compustat Tapes and corporate 10-K reports which are filed annually with the Securities and Exchange Commission. The results of the statistical analysis on these data were presented in Chapter IV. Based upon these results it was concluded that the proposed relationship between an organization's level of slack and its selection of strategy was supported by the data; however, some of the other propositions of the L-B model received mixed support.

This chapter discusses these results in light of the Litschert-Bonham model and other relevant theory. Next, the

implications for the field of strategic management are presented and strengths and weaknesses of the research are described. Finally, potential directions for future research in this area are identified.

#### IMPORTANCE OF RESEARCH ON THE LITSCHERT-BONHAM MODEL

The key assumption of the L-B model is that organization slack moderates the contingent nature of strategy formation. In essence, the model maintains that an absence of slack resources forces the organization to adopt context-specific strategies if it is to survive, whereas the presence of slack allows greater freedom in the selection of strategy.

The importance of this model to the field of strategic management is primarily based on the proposed relationship between slack and strategy. As yet, little is known about the interactive nature of factors which lead managers to adopt particular strategies. For example, do strategy-makers attend more to environmental forces when slack is low? Do personal values play a greater role in strategy formulation when slack resources are available? Does the presence of slack resources have any effect on the type of strategy selected by top management?

The model is also important in relation to the organization theory literature. The main contribution here is the

conception of the organizational slack construct as a moderator of the structural-contingency perspective. Ever since Woodward's (1965) landmark study, organization theory researchers have attempted to explain variation in organizational structure by examining differences in context; yet, results of these studies have varied widely. The model suggests that these inconsistent findings may be due to the failure to consider differences in the level of organizational slack. Given this proposition, studies on the relationship between context and structure would be expected to find significant relationships only in those situations where slack is low. On the other hand, if high-slack firms were included in the sample, the association would be expected to decline.

Finally, by conducting this research on the L-B model, additional insights were gained on the operationalization of two constructs which frequently appear in the strategic management literature: organizational slack and strategy. As noted in Chapter II, although slack has often been used as an independent variable in the management literature, few researchers have attempted to operationalize this construct. The present study's finding that the absolute slack measures behaved as predicted within the context of a theoretical model should provide incentive for including these indicators

in future research. Similarly, the empirical validation of strategic typologies has, for some time, been an area in need of further development. Prior to this study, no attempt had been made to empirically validate Glueck's conceptual typology of strategy despite the fact that it is widely cited in the literature. Hence, an additional contribution of this research was the examination of this typology.

### EVALUATION AND DISCUSSION OF RESULTS

In order to simplify this discussion, the findings related to the two methodological research questions will be discussed first, followed by a complete discussion of the L-B model.

#### Measurement of Organizational Slack

As mentioned above, one of the secondary objectives of this study was to examine the utility of two different operationalizations of the organizational slack construct: Bourgeois' (1981) relative measure which assessed change in slack within an organization over time, and Marino and Lange's (1983) absolute measure which compared the level of slack across sample firms. It will be recalled that the Marino and Lange measure classified a firm as possessing high slack if either return on total assets or cash flow



margin was above the industry median for each of seven years, while a low slack firm was one in which either of these variables fell below the median for each of seven years. As discussed in Chapter III, a problem arose with this slack categorization method whereby six of the sample paper companies were classified as possessing both high and low slack for the same seven year period. This occurred because these six firms tended to consistently maintain one of these financial indicators above the industry median each year, apparently at the expense of the other, which was consistently below the median. One conclusion drawn by the researcher was that the Marino and Lange method did not adequately discriminate between high and low slack firms. Therefore, the method was adjusted such that quartiles were substituted for medians as cut-off points in separating high slack from low slack firms, forming a third (albeit related) slack indicator. The three measures were labeled BSLACK (Bourgeois method), MLSLACK (original Marino and Lange method) and QTSLACK (adjusted Marino and Lange method).

In discussing the findings of this research as they relate to these three slack measures, this section will first compare the relative measure (BSLACK) to the absolute measures (MLSLACK and QTSLACK). Next, the findings related to the two different forms of Marino and Lange's absolute measure will be compared to each other.

Comparison of relative and absolute measures of slack:

As reported in Chapter IV, the two absolute measures of slack (MLSLACK and QTSLACK) were significantly related to strategy type whereas the relative measure (BSLACK) was not. These findings were consistent for both the paper and the computer industry. In other words, the strategic posture of the sample firms in 1983 appeared to be related to some absolute amount of slack possessed by these firms but did not appear to be affected by the change in the amount of slack over time within firms. One potential reason for the lack of relationship between BSLACK and strategy may be that the Bourgeois measure assessed the direction of the change in slack but failed to get at the magnitude of the change. As this method is currently formulated, there is no way of detecting whether a firm has gained or lost a small percentage of its slack resources or a large proportion. For example, when this method was used, I.B.M. was classified as a "slack loser" between 1977 and 1983. However, there was no indication as to how much slack was lost; moreover, in absolute terms, even though I.B.M. may have lost some slack resources, it still possessed vast reserves in comparison to other computer firms. Thus, a second explanation for the lack of relationship between BSLACK and strategy type is that it is the actual amount of slack held, not the degree of change, which has an effect on strategy selection.

Marino and Lange (1983) argue in favor of this latter explanation by pointing out that a distinction exists between a firm that possesses high (or low) slack resources relative to other firms and one that is gaining (or losing) slack resources. Furthermore, they suggest that an absolute measure of slack would be more appropriate for testing the Litschert-Bonham model than would a relative measure since slack resources would have to accrue "to some threshold level to permit discretionary allocations" (Marino and Lange, 1983: 91). Results of this study appear to support this proposition.

In terms of the construct validity of these two types of slack indicators, the following points can be made. For the absolute measures (MLSLACK and QTSLACK), the major finding of interest is that both variables behaved the way that they were supposed to behave within the context of a theoretical model. However, construct validity cannot be established by confirming a single prediction in one study. According to Carmines and Zeller, construct validation "requires a pattern of consistent findings involving different researchers using different theoretical structures across a number of different studies" (1979: 24). Therefore, the most that can be said is that this study has presented one piece of evidence supporting the construct validation of these absolute measures of slack.

On the other hand, two interpretations can be offered concerning the failure of BSLACK to behave as predicted. First, as argued by Marino and Lange (1983), it is possible that this indicator measures a different construct all together and therefore, should not be related to strategy choice. Second, it may be that the measurement method is too rough. Perhaps the magnitude as well as the direction of the change in slack must be taken into account if the variable is to behave as predicted. One way to determine which of these alternative interpretations is correct would be to include the BLSLACK measure in other studies. For example, Marino and Lange (1983) posit that Bourgeois' relative measure of slack would be appropriate in the investigation of phenomena in which slack resource levels are monotonically related to other variables of interest. They suggest relating changes in the level of slack to changes in such organizational variables as competition and interdepartmental coordination. Moreover, Bourgeois and Singh (1983) hypothesized that change in slack would affect the amount of political behavior and strategic discord among top management. Thus, there is clear potential for assessing the utility of the Bourgeois measure in other theoretical contexts.

Comparison of MLSLACK and QTSLACK: As mentioned at the beginning of this section, when Marino and Lange's original slack measurement procedure (MLSLACK) was pretested on the sample organizations, six of the paper companies were cross-classified as possessing both high and low levels of slack. Since this measure used industry medians as cut-off points in partitioning high from low slack firms, it is easy to see how such a problem might have arisen. Indeed, even among firms which were not cross-classified, the difference between a high-slack and low-slack firm could be slight when this procedure is used. For example, consider a company which reported cash flow margins above the industry median for each of seven years while reporting below median returns on assets for six of these years. This company would be classified as high in slack. However, had the same company reported its cash flow margin as above the median for six years, and its return on assets below the median for 7 years, it would become a low slack firm. Since the difference between these two scenarios is minimal, it was felt that the use of quartiles as cut-off points might reveal more substantial differences in the slack resources possessed by high and low slack firms. The QTSLACK measure is simply a refinement of Marino and Lange's original procedure.

When Ken Marino was asked to comment on this refinement, he expressed some concerns that the measure might be too stringent -- and that few firms would fall into the high and low slack categories were such a procedure to be used. Thus, the first step in assessing the utility of this "new" measure was to examine the resulting categorization of high and low slack firms in both industries.

Application of the QTSLACK measurement procedure to the sample firms in the paper industry resulted in about half of the firms falling into the unclassified category and the remaining half being classified as either high or low in slack. This appeared to be a reasonable grouping and, in fact, both H1 and H2 were supported using this measure. In addition, when Guttman's Lambda was calculated to determine the strength of association between slack and strategy, the ability to predict slack from strategy reached its highest level (i.e., 38.5% reduction in errors) when QTSLACK was used. Thus, this form of Marino and Lange's slack measurement procedure did appear to be an appropriate measure of slack for the paper industry.

The QTSLACK measure appeared less adequate when used in the subsample of computer firms for a number of reasons. Here, Dr. Marino's concerns about the use of upper and lower quartiles as cut-off points for high and low slack firms ap-

pear to have been well-founded, since 42 of the 55 firms in this industry fell into the unclassified category when this measure was used. Although H1 and H2 were still supported, the Guttman's Lambda index, which showed the strength of the association between QTSLACK and strategy, declined drastically.

Based on these results, it appears that different cut off points may be required in distinguishing between high and low slack firms in different industries. As Marino has suggested, one reason for this difference may be that firms in different industries make different capital structure decisions. Another reason, however, has more to do with contextual factors than internal decisions. Since Marino and Lange's (1983) operationalization is actually based on a profitability criterion, one explanation may be provided by Porter's (1980) model of industry competition. This model posits that five basic competitive forces influence the long-run profit potential of every industry. These forces include the threat of new entrants, the threat of substitute products, rivalry among existing firms, the bargaining power of buyers and the bargaining power of suppliers. It can be argued that if these forces combine to produce a situation of intense competition in which industry profits are eroded away, then few firms will be able to maintain significant

levels of slack resources, particularly over a seven year time period.

When Porter's model is applied to the industries considered in the present study, the computer industry emerges as much more threatening than the paper industry in 1983. For example, as noted in Chapter III, the computer business is relatively easy to enter whereas the paper industry requires huge capital expenditures. Thus there were hundreds of new computer companies seeking market share in 1983 while the number of competitors in the paper industry remained stable. In addition, although substitute products such as plastic or foil containers may pose threats to some segments of the paper industry, it is unlikely that substitutes will ever replace standard writing paper, newsprint or even cardboard boxes. On the other hand, large numbers of potential computer buyers remain unconvinced that these machines are any more than expensive toys. Indeed, video games, calculators, and typewriters are all potential substitutes. Third, since many computer manufacturers run assembly operations only, suppliers of electronic chips and other components have significant power in this industry; in contrast, the paper firms have mitigated this threat somewhat through backward integration.



Based on this partial analysis, it appears that the intensity of competition in the computer industry was significantly greater than that of the paper industry in 1983. Indeed, industry analysts maintained that a shakeout had begun in the computer industry that year, intensifying competition even more. This may explain why the more stringent QTSLACK indicator failed to find many computer firms with extremely high or low levels of slack. Highly competitive industries such as the computer industry may not be conducive to the accrual of slack resources. For such an industry, the upper and lower thirds may be more appropriate in distinguishing between high and low slack firms.

#### Measurement of Organizational Strategy

Strong support was found in this study for Glueck's conceptual typology of strategy. Of the five strategic types which emerged from the cluster analysis, one matched Glueck's combination strategy description, one fit into his vertical integration group, two appeared to use variations of his concentration strategy, and one clearly adhered to his stable growth description.

External validation of these strategy types using additional Compustat data as well as corporate report excerpts strengthened these findings. Not only did the profiles

match Glueck's descriptions, but also some of his predictions regarding each type were observed to hold. For example, as Glueck predicted, the firms following the combination strategy were very large in relation to those in the other strategy types. His prediction that the stable growth strategy would be used most frequently by organizations was also confirmed by the finding that strategy type 4, no change, included more firms than any other cluster. Glueck also predicted that the concentration strategy would be the second most frequently used strategy, and again this prediction was confirmed since strategy type 2, concentration, contained the second highest number of firms. In addition, Glueck suggested that this strategy would be most effective for firms whose products are in the early stages of the product life cycle. In accordance with this proposition, only firms from the relatively young computer industry were included in this strategy type.

One potential question regarding these results is why several of the strategy types appeared rather similar to each other. For example, the firms in two clusters (2 and 5) appeared to be following variations of the same concentration strategy described by Glueck; moreover, the firms in cluster 2 also displayed an inclination towards increasing the extent of vertical integration as did those in cluster

3. The simplest explanation for these similarities among strategy types is that the strategies which emerged were constrained by the limitations placed on the sample. No firms which earned over 30% of revenues from a second (or more) industry were included herein. Therefore, any firms strictly adhering to Glueck's concentric or conglomerate diversification strategies were not included in the sample.

#### RESULTS OF TESTING THE LITSCHERT-BONHAM MODEL

Because the BSLACK indicator was not related to strategy type in either industry, there will be no further discussion of this variable.

#### Discussion of H1

The notion that managers of high slack firms would choose a variety of different strategies while managers of low slack firms would be constrained by the environment was indirectly tested under hypothesis 1. This hypothesis was based on the premise that the ability of the managers of high slack firms to ignore environmental demands would result in a greater dispersion of these firms among more strategic types because these managers would be free to follow personal values or preferences. In contrast, it was presumed that the managers of low slack firms would perceive environmental constraints

as imperatives which would compel them to choose from among fewer strategy alternatives because they could not afford to be inefficient. In other words, this hypothesis was designed to test whether high slack firms tend to follow strategies that are different from each other while low slack firms follow strategies that are similar to each other assuming they are subject to similar constraints.

Results of this study provided only minimal support for this hypothesis. For example, although calculation of the Index of Quantitative Variation appeared to support this hypothesis in the paper industry, examination of table 10, reveals that there were actually only two strategies followed by high slack firms just as there were for low slack firms. The I.Q.V. was higher, indicating greater diversity among high slack firms, because these firms were more evenly dispersed among the two strategy types than were the firms with low slack. Still, since only two strategy types were formed, the apparent difference in diversity between high and low slack firms was not strong. Moreover, it appeared that high slack paper companies followed a dominant strategy just as low slack paper companies did -- although the strategies differed across level of slack. The majority of the high slack paper firms in this sample tended to follow the "refocus" strategy while most low slack paper companies adhered to a "no change" approach.

Results in the computer industry were even less supportive of Hypothesis 1. In fact, when MSLACK was used, the strategy selections of high slack firms appeared to be more homogeneous than those of low slack firms - a finding which was opposite that which was predicted. When QTSACK was substituted as a measure of slack, the high slack firms were obviously more diverse in their strategy selections because the 3 low slack firms all fell into one cluster, but there still appeared to be a dominant strategy choice for high slack firms. In this case, the high slack computer companies tended to follow Glueck's concentration strategy, while the low slack computer firms followed the no change strategy.

To summarize, high slack firms may have the freedom to choose from a wider variety of strategies but few of the high slack firms in the present sample, appeared to take advantage of this opportunity. To explain these findings it is necessary to re-examine the premise upon which hypothesis 1 was based: i.e., that the ability of managers of high slack firms to ignore certain environmental constraints firms would result in a greater dispersion of these firms among more strategic types because these managers would be free to follow personal values or preferences. Implicit in this statement is the hidden assumption that managers will

possess values which differ from each other. Results of this study suggest that this assumption may be too simplistic. It is possible that the values of the managers of large corporations such as those in this sample are becoming more and more similar to each other. Although as Litschert and Bonham (1978) point out, there is still no generally accepted professional code of managerial behavior, it is likely that many managers now share similar educational and industry backgrounds. For example, an M.B.A. degree is frequently held by upper level managers in large organizations. M.B.A. programs attempt to train managers to find rational solutions to complex organizational problems. In addition, certain managerial skills are believed to generalize across industries. Therefore, managers no longer spend their entire career in a single industry but may be recruited across industries for their proven ability to turn companies around or market new products. As an example, when Atari's video-game empire crashed in 1983, its parent company, Warner Communications hired James Morgan, a supposed marketing genius from Phillip Morris, a tobacco and beverage producer, to help get the company back on its' feet. Warner's decision-makers chose Morgan because they believed that Atari was "foremost a consumer products company and that an intimate knowledge of computers and the technology

involved is secondary to management expertise" (Lardo, 1984). This increasing emphasis on managerial expertise and the right way of doing things may extend to the slack issue. Even when slack is high, managers of this new breed may share similar ideas on rational ways of utilizing the extra resources. Although more research is needed to assess the validity of this idea of shared values, it is possible that the "follow the leader" trends spotted by Rumelt (1974) and more recently by Holmes (1978) are also indicative of this phenomenon.

#### Discussion of H2

The second hypothesis was developed to test the notion that high-slack firms adopted different strategies than low-slack firms. Despite problems caused by insufficient sample size, this hypothesis was supported by the data. In both industries, there was a significant chi-square relationship between level of slack and choice of strategy. The following section will examine these results in more detail for each industry.

As previously mentioned, in the paper industry, most of the low-slack firms had adopted a "no change" strategy, while the majority of the high slack firms were engaged in a refocus strategy. At first glance it seemed curious that

firms with high slack were attempting to reposition themselves. Two explanations are offered for this finding. The first pertains to the current status of the paper industry. As mentioned in Chapter II, a trend in this industry is for firms to attempt to improve efficiency through developing economies of scale within particular segments. The firms in strategy type 1, refocus, may be representative of this trend since they appear to be cutting back in some segments while growing in others.

A second explanation is offered by Drucker (Good Growth and Bad Growth, 1979) who states that in order to grow, a firm must have a system for getting rid of its outgrown, obsolete or unproductive investments. In this view, the foundation of a growth strategy is freeing resources for new opportunities. Prasad (1983) indicates that this growth-divestment-growth cycle is likely to be particularly important to companies in mature, capital-intensive industries such as steel, autos or tires. The paper industry clearly fits this description as well. Thus, this refocus strategy does make sense for high slack firms since the ultimate result is the redeployment of assets to take advantage of more profitable opportunities in the environment.

In the computer industry, the relationship between slack and strategy was also significant. When the MLSLACK measure



was used, low-slack firms clustered into two strategy types: no change and concentration. High slack firms tended to follow either the concentration strategy or the refocus strategy. An interesting finding here is that both high and low slack computer companies appeared to be attracted to the concentration strategy. One explanation is that the computer industry is a young, growth industry. Glueck (1980) has posited that the concentration strategy would be an effective strategy in such an environment. A second explanation is that certain contextual variables within this industry are perceived as imperatives by managers regardless of level of slack. This industry is clearly dominated by a number of giants such as I.B.M., Wang, and Digital, which have a competitive advantage over smaller firms in terms of economies of scale. Therefore, to survive, smaller computer companies must find a different basis on which to compete. One such basis is reflected in the current industry trend called vertical marketing: selling computer systems tailored to the unique needs of particular industries (Uttal, 1985). According to Uttal (1985), hundreds of computer companies, both large and small, now look to vertical marketing for much of their future growth. In his words, "the allure of vertical marketing for I.B.M.'s competitors is that success depends more on specialized knowledge of customers than on economies of scale" (1985: 96).

Yet, not every company which attempts to utilize this strategy is guaranteed high profits. While there are hundreds of vertical markets, many are too small, too poor, or too hard to reach to produce a profit. Moreover, the richer ones tend to be rife with competitors. Finally, Uttal (1985) notes that many small computer manufacturers, being squeezed out of the business, have tried focusing on vertical markets with little success. "By the time they decided to go vertical, they couldn't afford to learn their target industries, write special software and set up a salesforce to sell directly to customers" (Uttal, 1985: 100). Thus, the appearance of both high and low slack firms within this strategy type is easily explained.

When the QTSLACK measure was used, however, all of the low slack firms in this strategic type moved into the unclassified category of slack. As pointed out earlier, it appeared in this study that the QTSLACK measure made a greater distinction between high and low slack firms than did MLSLACK. It is possible that those firms with the least slack did not have the minimum amount of resources necessary to adopt this strategy.

### Discussion of H3

The third hypothesis, which predicted that low slack firms in the paper industry would use different strategies than low slack firms in the computer industry received minimal support in this study. When MLSLACK was used, there appeared to be slight support for this hypothesis since the low slack paper firms clearly followed the no change strategy while the low slack computer companies followed either the no change or the concentration strategy. As discussed in the last section, this may be an indication that the concentration strategy is perceived as a means of survival in the computer industry but not in the paper industry. However, when QTSLACK was used, this difference disappeared. If this measure can be said to more clearly separate out the low slack firms, then it appears that the truly low slack companies from both industries followed the same strategy -- no change. This finding was the opposite of the predicted result.

Instead of attending more to environmental constraints when slack is low, managers may react to internal monetary constraints. This explanation concurs with the earlier discussion of hypothesis 1 in its speculation that today's managers may share common ideas on rational approaches to managing depending on the level of available resources. When

slack is low, managers may tend to cut back on all expenses in order to gain control of cash flow and stabilize the organization. This process is typically described as the first stage of a turnaround strategy (Schendel et al., 1976). Only when the organization has been stabilized will a new, more appropriate strategy be selected. Thus, the apparent "no change" emphasis found here may reflect a rational attempt to gain better control of low resources by top management.

If this explanation is correct, then the Litschert-Bonham model may be overly simplistic. As the model currently stands, it indicates that when slack is low, there will be a tight fit between context and structure which will, in turn, dictate strategy. However, changes in structure and strategy do not happen instantaneously. Once slack has deteriorated to a certain threshold level, a rational response of management may be to stabilize the organization by cutting back on expenses wherever possible while assessing the situation. This stabilization process may last for some time if the firm continues to survive because proposed changes may be viewed as excessively risky. Ultimately, the firm would have to adapt to the environment or cease to function, but in the meantime, cross-sectional studies would fail to find evidence of a tight fit between context and structure even

under conditions of low slack. This lack of fit would be especially apparent in volatile industries. Longitudinal research using within-organization designs will be required to capture this type of relationship.

A second explanation for the lack of support of H3 must also be considered. It is possible that the strategy measures used here were inadequate to capture this aspect of the L-B model. These measures were derived from a typology of corporate strategy not business strategy. Thus they may not have depicted the specific strategic activities of these firms which were aimed at competing within their respective industries. Support for this explanation is found in Table 25 which revealed that even within the no change cluster, there were significant differences between the variables R&D/SALES, TERRITORY (geographic expansion), FOREIGN (revenue from foreign sales) and SINGLE (dependence on a single customer). Interestingly, the computer companies in this cluster maintained a higher level of dependence on single customers than did the firms in any other cluster; thus, they may have been trying to reduce the volatility of their environment by locking in a certain amount of sales with a large customer.

To conclude, two explanations have been offered for the failure of the results of this study to support the third

hypothesis. First, the fact that the low slack companies from both the computer industry and the paper industry fell into the same cluster may be due to the fact that these firms have responded more to the level of slack than to the context surrounding them. This may be a temporary situation but it does make sense given the inconsistent findings of past studies which have attempted to assess the fit between context and structure. Secondly, as pointed out above, it may be that a different type of strategy measure (aimed at measuring exclusively business level strategic attributes) would be more suitable in testing this hypothesis.

#### Post Hoc Interpretation of Results

A re-examination of the results of all three hypotheses leads to the formulation of a rival hypotheses which must be considered. Since the absolute slack measures used in this study are based on a profitability criterion, they are actually only proxy measures of slack. As mentioned in Chapter II, Marino and Lange have rationalized the use of such measures with their assumption that profitable firms are more likely than non-profitable firms to be able to generate internal capital as well as to attract additional resources from the environment.

However, it can be argued that the so-called slack indicators used herein are actually performance measures. By substituting the term performance for slack, the following new interpretation can be offered. First, a re-analysis of Hypothesis I reveals that the high performing firms in both industries tended to follow a dominant strategy just as the low performing firms did. Moreover, simple inspection of the data reveals that the dominant choice of high-performing computer companies differed from the dominant strategy choice of high-performing paper companies while the choices of low performing firms in both industries tended toward the same "no change" strategy.

In other words, perhaps when performance is high, there is a match between context and strategy; hence, the high-performing firms in the uncertain computer industry environment tended to follow the concentration strategy while those in the more mature paper industry were engaged in a refocus strategy. On the other hand, the low-performing firms in both industries weren't doing much of anything. It could be that their low performance is the result of a mismatch between context and strategy. Obviously, this explanation has some merit and should be considered in future studies. It should be possible to compare these proxy slack measures with alternate performance measures in order to determine which explanation is correct.

### Strengths and Weaknesses of the Current Research

The present study should be of interest to strategy researchers for a number of reasons. First, the procedure used to measure organizational strategy was a strength of the research particularly since many past studies of strategy have employed only simple methodologies such as cross-tabulations and correlations (Woo and Cooper, 1981). While these may have been adequate for initial inquiries, they presented an overly simplistic view of strategy. Galbraith and Schendel (1983) have argued that strategy is a complex system of intertwined relationships between various management decision variables. The use of cluster analysis allows the researcher to capture this strategic network and to group businesses which make similar types of strategic decisions. Thus, a more comprehensive representation of strategy is achieved.

In forming these clusters, several other positive attributes of the research could be seen. First, the variables used to form the clusters were derived from a well-known conceptual typology of strategy. As Nunnally (1978: 451) notes, the variables included in a cluster analysis should ideally be representative of some specified domain of variables. This step helps to ensure the generality of the results. In addition, the use of external variables to validate the clusters adds further evidence of generalizability.



Another strength of the current study was its use of two different types of organizational slack measures within the context of a theoretical model. Comparison of the results of these two measures within a common model allows a preliminary judgement to be made as to the efficaciousness of using one or both of these indicators in future research. Although no claim can be made regarding the construct validity of either slack measure, it was clear from this research that the absolute measures proposed by Marino and Lange behaved as predicted while the relative measure proposed by Bourgeois did not. On the other hand, it is still not clear from the current results whether the Marino and Lange measure represents slack or simple performance; further research is required to make such an assessment.

The current study also contained a number of limitations. Probably the foremost problem encountered in this analysis was insufficient sample size. Because of this problem the strategic clusters so painstakingly formed had to be collapsed in order for more robust chi-square analyses to be conducted. On the positive side however, a significant relationship between slack and strategy was found despite this small sample size. As Blalock (1979: 301) notes, "when a sample is small, it requires a much more striking relationship in order to obtain significance." Thus, the fact that

the small sample was sufficient to generate significant results implies that the relationship between slack and strategy may be relatively strong.

Other limitations were related to the sampling techniques and data collection methods employed in the study. Since cross-sectional data were gathered, internal validity was limited. Given this data, there was no way to determine whether slack led to strategy or strategy led to slack. In addition, as mentioned earlier, the use of a convenience sample limited the study's external validity. This problem was exacerbated by the fact that only two industries were examined. On the other hand, the use of a homogeneous sample can reduce error variance and increase the power of the tests to find a relationship.

Next, the corporate level strategy measures used herein may have been too broad to accurately capture the differences in strategy between low slack firms in different industries predicted in Hypothesis 3. Perhaps a business level typology would have been more appropriate here. Finally, the formation and the interpretation of the strategic clusters required a good deal of judgment - both in choosing the best variables to include in the analysis, as well as in interpreting the clusters themselves. Yet, this in itself, is not a critical problem. A great deal of judgement is re-

quired in all research. This is where the opportunity for developing new insights and creating new knowledge lies.

#### IMPLICATIONS FOR FUTURE RESEARCH

This dissertation represents the first empirical analysis of the relationship between an organization's level of slack resources and choice of strategy. The fact that a significant relationship was found indicates that further research on the Litschert-Bonham model is warranted. The additional finding that not all predictions relating to the model were unambiguously supported leads to some potential directions for that research.

First, it was not clear from the present results whether high slack firms actually do choose a wider diversity of strategies or whether they tend to do what other firms are doing despite their lack of constraints. This particular issue is therefore in need of additional investigation. It might also be informative to introduce a new variable into the model: corporate performance. It may be that the best performing high slack firms follow similar strategies while less efficient high slack firms expend their excess resources on various more expensive strategies. Additional research should also be conducted to determine whether low slack firms in different environments actually do utilize

different business level strategies. In this study, it appeared that most low slack firms, regardless of industry, tended to use a "no change" strategy. However, this finding could either be an indication that such firms are attempting to stabilize their operations and gain control of cash flow, or it could stem from an overly broad measurement of strategy. Therefore, two types of potential studies are suggested: first, longitudinal research using within-organization designs are needed to determine whether this stable phase is a temporary reaction to the level of slack. Second, a replication of the study using a business level strategic typology would help to determine whether business-level strategies do indeed vary by industry when slack is low.

Concerning the measurement of slack, this study found that only the absolute measure proposed by Marino and Lange was related to the typology of strategy formed here. Future studies should continue to use both of these methods with different strategy measures to ensure that this finding is not an artifact of the particular method used herein.

Lastly, further research is also required on the Glueck (1980) typology of strategy. Although the present study found support for some aspects of this typology, the sample used herein was highly restricted. There is therefore an opportunity to repeat this procedure on a more heterogeneous

sample to determine if a broader spectrum of strategy types is revealed.

The results of this dissertation have provided a solid beginning for much additional research on the integrative nature of strategy formation. That a relationship between slack and strategy was found herein is only the first step of what should be an on-going research program. It is probable that additional variables such as corporate performance should be added to the Litschert-Bonham model. In addition, longitudinal research is definitely needed to examine the changing fit between context, structure and strategy. The ultimate contribution of this research may be that one piece of evidence in support of the Litschert-Bonham model has been provided. Much more research is required to confirm and build on these findings.

## BIBLIOGRAPHY

- Aiken, M. and Hage, J. Organizational interdependence and interorganizational structure. American Sociological Review, Vol. 33, December 1968, 912-930.
- Aldenderfer, M.S. and Blashfield, R.K. Cluster Analysis. Beverly Hills, CA: Sage Publications, Inc., 1984.
- Baird, I.S. and Kumar, R. The use of financial risk measures in the study of strategic groups. Academy of Management Proceedings, 1983, 37-42.
- Blalock, H.M. Social Statistics. USA: McGraw-Hill, 1979.
- Blau, P.M., Falbe, C.M., McKinley, W. and Tracy, P.K. Technology and organization in manufacturing, Administrative Science Quarterly, Vol. 21, March 1976, 20-40.
- Bouchard, T.J. Field research methods: Interviewing, questionnaires, systematic observation, unobtrusive methods, in: Dunnette, M.D. (ed.), Handbook of Industrial and Organizational Behavior, Chicago, Ill.: Rand-McNally, 1976.
- Bourgeois, L.J. On the measurement of organizational slack. Academy of Management Review, Vol. 6, 1981, 29-39.
- Bourgeois, L.J. and Singh, J.V. Organizational slack and political behavior within top management teams. Academy of Management Proceedings, 1983, 43-47.
- Bradburn, N.M. Question-wording effects in surveys, in: Hogarth, R. (ed.), New Directions for Methodology of Social and Behavioral Science: Question Framing, San Francisco: Jossey-Bass, Vol. 11, March 1982.
- Buzzell, R.D., Gale, B.T. and Sultan, R.G.M.. Market share: A key to profitability. Harvard Business Review, January/February 1975, 97-106.
- Calder, B.J., Phillips, L.W. and Tybout, A.M. Designing research for application. Journal of Consumer Research, Vol. 18, September 1981, 197-207.
- Camerer, C. Redirecting research in business policy. Strategic Management Journal. Vol. 6, 1985, 1-15.

- Carmines, J.R. and Zeller, R.A. Reliability and Validity Assessment. Beverly Hills, CA: Sage Publications, Inc., 1979.
- Campbell, D.T. and Fiske, D.W. Convergent and discriminant validation by the multitrait-multimethod matrix. Psychological Bulliten, Vol. 56, 1959, 81-105.
- Chandler, A.D. Strategy and Structure. Cambridge, MA: The MIT Press, 1962.
- Chevalier, M. The strategy spectre behind your market share. European Business, Vol. 34, 1972, 63-72.
- Child, J. Organization structure, environment and performance - the role of strategic choice. Sociology, Vol. 17, 1972, 163-177.
- Child, J. and Mansfield, R. Technology, size, and organization structure. Sociology, Vol. 6, January 1972, 1-22.
- Christiansen, K.H. Product, market, and company influences upon the profitability of business unit research and development expenditures. Unpublished doctoral dissertation, Columbia University, 1977.
- Churchill, G.A. A paradigm for developing better measures of marketing constructs. Journal of Marketing Research, Vol. 16, February 1979, 64-73.
- Churchill, G.A. Marketing Research: Methodological Foundations, 3rd. ed. NY: Dryden Press, 1983.
- Cochran, W.G. Sampling Techniques. NY: John Wiley & Sons, Inc., 1953.
- Cohen, J.A. A coefficient of agreement for nominal scales. Educational and Psychological Measurement, Vol. 20, 1960, 37-46.
- Cyert, R.M. and March, J.G. A Behavioral Theory of the Firm. Englewood Cliffs, New Jersey: Prentice-Hall, 1963.
- Dess, G.G. and Davis, P.S. Porter's (1980) generic strategies as determinants of strategic group membership and organizational performance. Academy of Management Journal, Vol. 27, No. 3, September 1984, 467-488.

- Dimick, D.E. and Murray, V.V. Correlates of substantive policy decisions in organizations: The case of human resource management. Academy of Management Journal, Vol. 21, 1978, 611-623.
- Duncan, R. Characteristics of organizational environments and perceived environmental uncertainty. Administrative Science Quarterly, Vol. 17, No. 3, 1972, 313-327.
- Duncan, R., Hellriegel, D., and Slocum, J.W. Individual characteristics as sources of perceived environmental uncertainty variability. Human Relations, Vol. 30, 1977, 161-174.
- Emory, C.W. Business Research Methods, 2nd. ed. USA: Richard D. Irwin, Inc., 1980.
- Everitt, B. Cluster Analysis. London: Heinemann Educational Books, Ltd., 1974.
- Galbraith, C. and Schendel, D. An empirical analysis of strategy types. Strategic Management Journal, Vol. 4, No. 2, April/June, 1983, 153-173.
- Galbraith, J. Organization design: An information processing view, in: Lorsch, J.W. and Lawrence, P.R. (eds.), Organization Planning: Cases and Concepts, Homewood, Ill.: Richard D. Irwin Co., 1972.
- Galbraith, J. Organization design. Reading, Mass.: Addison-Wesley, 1977.
- Ginsberg, A. Operationalizing organizational strategy: Toward an integrative framework. Academy of Management Review, Vol. 9, No. 3, 548-557.
- Glueck, W.F. Business Policy and Strategic Management, 3rd. Ed. New York: McGraw-Hill, 1980.
- Glueck, W.F. and Willis, R. Documentary sources and strategic management research. Academy of Management Review, Vol. 4, No. 1, 1979, 95-102.
- Good growth and bad growth. Wall Street Journal, April 10, 1981, 36.
- Haas, J.E. and Drabek, T.E. Complex Organizations. New York: Macmillan, 1973.



- Hage, J. and Aiken, M. Routine technology, social structure and organization goals. Administrative Science Quarterly, Vol. 14, September 1969, 366-376.
- Hall, R.H. Intraorganizational structural variation: Application of the bureaucratic model. Administrative Science Quarterly, Vol. 7, December 1962, 298-308.
- Hambrick, D.C. Operationalizing the concept of business-level strategy in research. Academy of Management Review, Vol. 5, No. 4, 1980, 567-575.
- Hambrick, D.C. Some tests of the effectiveness and functional attributes of Miles and Snow's strategic types. Academy of Management Journal, Vol. 26, No. 1, March 1983, 5-26.
- Harrigan, K.R. An application of clustering for strategic group analysis. Strategic Management Journal, Vol. 6, 1985, 55-73.
- Harvey, E. Technology and the structure of organizations. American Sociological Review, Vol. 33, April 1968, 247-259.
- Hatten, K.J., Schendel, D., and Cooper, A.C. A strategic model of the U.S. brewing industry: 1952-1971. Academy of Management Journal, Vol. 21, No. 4, 592-610.
- Hempel, C. G. Aspects of Scientific Explanation. New York: Free Press, 1965.
- Henderson, B. Perspectives on Experience. Boston: Boston Consulting Group, 1968.
- Hickson, D.J., Pugh, D.S., and Pheysey, D.C. Operations technology and organization structure, an empirical reappraisal. Administrative Science Quarterly, Vol. 14, September 1969, 378-397.
- Hofer, C.W. Some preliminary research on patterns of strategic behavior. Academy of Management Proceedings, 1973.
- Hofer, C.W. and Schendel, D. Strategy Formulation: Analytical Concepts. St. Paul: West Publishing Company, 1978.

- Holmes, S.L. Adapting corporate structure for social responsiveness. California Management Review, Vol. 21, 1978, 47-54.
- Huber, G.P., O'Connell, M.J., and Cummings, L.L. Perceived environmental uncertainty: Effects of information and structure. Academy of Management Journal, Vol. 18, December 1975, 725-740.
- James, L.R., Mulaik, S.A., and Brett, J.M. Causal Analysis: Assumptions, Models and Data. Beverly Hills, CA: Sage Publications Inc., 1982.
- Jauch, L.R., Osborn, R. N. and Glueck, W.F. Short term financial success in large business organizations: The environment-strategy connection. Strategic Management Journal, Vol. 1, 1980, 49-63.
- Jauch, L.R., Osborn, R.N. and Martin, T.N. Structured content analysis of cases: A complementary method for organizational research. Academy of Management Review, Vol. 5, No. 4, 1980, 517-525.
- Jelinek, M. Technology, organizations, and contingency. Academy of Management Review, Vol. 2, January 1977, 17-26.
- Judd, C.M. and Kenny, D.A. Research design and research validity, in: Brinburg, D. and Kidder, L. (eds.), New Directions for Methodology of Social and Behavioral Science: Forms of Validity in Research, San Francisco: Jossey-Bass, Vol. 12, June 1982.
- Kazdin, A.E. Observer effects: Reactivity of direct observation, in: Hartmann, D.P. (ed), New Directions for Methodology of Social and Behavioral Science: Using Observers to Study Behavior, San Francisco: Jossey-Bass, Vol. 14, December 1982.
- Khandwalla, P.N. Viable and effective organizational designs of firms. Academy of Management Journal, Vol. 16, No. 3, September 1973, 481-495.
- Kmetz, J.L. A preliminary test of relationships between organizational slack and theoretically related variables. Academy of Management Proceedings, 1980, 246-250.
- Lardo, L. Warner's Atari tries to end slump with new products and marketing. Wall Street Journal, May 21, 1984, 33.

- Lawrence, P.R. and Lorsch, J.W. Differentiation and integration in complex organizations. Administrative Science Quarterly, Vol. 12, 1967, 1-47.
- Litschert, R.J. and Bonham, T.W. A conceptual model of strategy formation. Academy of Management Review, April 1978, 211-219.
- March, J.B. and Simon, H.A. Organizations. New York: John Wiley and Sons, 1958.
- Marino, K. and Lange, D. Earnings variation, inventory growth and cost behavior under slack resource conditions. Academy of Management Proceedings, 1982, 1-6.
- Marino, K. and Lange, D. Measuring organizational slack: A note on the convergence and divergence of alternative operational definitions. Journal of Management, Vol. 9, No. 1, Spring/Summer 1983, 81-91.
- McKelvey, W. Guidelines for the empirical classification of organizations. Administrative Science Quarterly, Vol. 20, No. 4, December 1975, 509-525.
- Meier, R.C., Newell, W.T. and Pazer, H.L. Simulation in Business and Economics. Englewood Cliffs, N.J.: Prentice-Hall, 1969.
- Miles, R.E., Snow, C.C., Meyer, A.D., and Coleman, H.J., Jr. Organizational strategy, structure, and process. Academy of Management Review, Vol. 3, No. 3, June 1978, 546-562.
- Miller, D. and Friesen, P.H. Strategy-making in context: Ten empirical archetypes. The Journal of Management Studies, Vol. 14, 1977, 251-260.
- Mintzberg, H. Patterns in strategy formation. Management Science, Vol. 24, 1978, 934-948.
- Mohr, L.B. Determinants of innovation in organizations. American Political Science Review, Vol. 63, 1969, 111-126.
- Mohr, L.B. Organizational technology and organizational structure. Administrative Science Quarterly, Vol. 16, 1971, 444-459.
- Montgomery, D.C. and Peck, E.A. Introduction to Linear Regression Analysis. New York: John Wiley and Sons, 1982.

- Mueller, J.H., Schuessler, K.F., and Costner, H.L. Statistical Reasoning in Sociology, 3rd. ed. USA: Houghton Mifflin Company, 1977.
- Newman, H.H. Strategic groups and the structure-performance relationship. Review of Economics and Statistics, Vol. 60, No. 3, August 1978, 417-427.
- Nunnally, J.M. Psychometric Theory, 2nd. ed. USA: Mc-Graw Hill, 1978.
- Onsi, M. Simulation of the economic factors affecting organizational slack. The Accounting Review, 1975, 535-548.
- Ott, L., Mendenhall, W., and Larson, R.F. Statistics: A Tool for the Social Sciences, 2nd ed. North Scituate, MA: Duxbury Press, 1974.
- Overall, J.E. and Klett, C.J. Applied Multivariate Analysis. USA: Mc-Graw Hill, Inc., 1972.
- Pennings, J.M. The relevance of the structural-contingency model of organization effectiveness. Administrative Science Quarterly, Vol. 20, 1975, 393-410.
- Perrow, C. A framework for the comparative analysis of organizations. American Sociological Review, Vol. 32, April 1967, 194-208.
- Peter, J.P. Construct Validity: A review of basic issues and marketing practices. Journal of Marketing Research, Vol. 18, May 1981, 133-145.
- Pondy, L. Organizational conflict: Concepts and models. Administrative Science Quarterly, Vol. 12, No. 2, 1967, 296-320.
- Porter, M.E. The structure within industries and companies' performance. Review of Economics and Statistics, Vol. 61, No. 2, May 1979, 214-227.
- Porter, M.E. Competitive Strategy. New York: Free Press, 1980.
- Prasad, S.B. Policy, Strategy and Implementation: Text and Cases with a Global View. New York: Random House, 1983.
- Rohlf, F.J. Adaptive heirarchical clustering schemes. Systematic Zoology, Vol. 19, 1970, 58-82.

- Rosner, M.M. Economic determinants of organizational innovation. Administrative Science Quarterly, Vol. 12, 1968, 614-625.
- Rumelt, R. Strategy, Structure and Economic Performance. Cambridge: Harvard University Press, 1974.
- Sarle, W.S. Introduction to SAS clustering procedures. SAS User's Guide: Statistics. Cary, NC: SAS Institute, Inc., 1982.
- Schendel, D., Patton, G.R. and Riggs, J. Corporate turnaround strategies: A study of profit decline and recovery. Journal of General Management, Vol. 3, No. 3, Spring 1976, 3-11.
- Schiff, M. and Lewin, A.Y. Where traditional budgeting fails. Financial Executive, Vol. 36, 1968, 51-62.
- Schiff, M. and Lewin, A.Y. The impact of people on budgets. The Accounting Review, 1970, 259-268.
- Snow, C.C. and Hambrick, D.C. Measuring organizational strategies: Some theoretical and methodological problems. Academy of Management Review, Vol. 5, No. 4, 1980, 527-538.
- Snyder, N.H. and Glueck, W.F. Can environmental volatility be measured objectively? Academy of Management Journal, Vol. 25, No. 1, 1982, 185-192.
- Spector, P.E. Research Designs. Beverly Hills, CA: Sage Publications, 1981.
- Standard and Poor's Compustat Services, Inc. USA: Standard Statistics Co., Inc., 1980, 1984.
- Standard and Poor's Industry Surveys, Vol. 1 & 2, 1983 and 1984.
- Sullivan, J.L. and Feldman, S. Multiple Indicators: An Introduction, in: Sullivan, J.L. (ed), Quantitative Applications in the Social Sciences, Beverly Hills, CA: Sage Publications, Inc., 1979.
- Suter, D. The new breed of strategic planner. Business Week, September 17, 1984, 62-68.
- Thompson, J.D. Organizations in Action. New York: McGraw-Hill, 1967.

- Tosi, F.F., Aldag, R. and Storey, R. Administrative Science Quarterly, Vol. 18, No. 1, 1973, 27-36.
- Uttal, Bro. Pitching computers to small business. Fortune. April 1, 1985, 95-104.
- Utterback, J.M. and Abernathy, W.F. A dynamic model of process and process innovation. Omega, Vol. 3, 1975, 639-656.
- Vesper, K. Strategic mapping - a tool for corporate planners. Long Range Planning, December 1979, 75-92.
- Williamson, O.E. A model of rational managerial behavior, in: Cyert, R.M. and March, J.G. A Behavioral Theory of the Firm. Englewood Cliffs, New Jersey: Prentice-Hall, 1963.
- Williamson, O.E. The Economics of Discretionary Behavior: Managerial Objectives in a Theory of the Firm. Englewood Cliffs, New Jersey: Prentice-Hall, 1964,
- Wissema, J.G., Van Der Pol, H.W., and Messer, H.M. Strategic management archetypes. Strategic Management Journal, Vol. 1, 1980, 37-47.
- Wolf, C. An Investigation into organizational slack. Unpublished doctoral dissertation, New York University, 1971.
- Woo, C.Y.Y. and Cooper, A.C. Strategies of effective low share businesses, Strategic Management Journal, Vol. 2, 1981, 301-318.
- Woodward, J. Industrial Organization: Theory and Practice. London: Oxford University Press, 1965.
- Wrigley, L. Divisional autonomy and diversification. Unpublished doctoral dissertation, Harvard Business School, 1970.

## Appendix A

### STRATEGIC TYPOLOGIES FROM THE LITERATURE

#### CONCEPTUAL TYPOLOGIES OF STRATEGY

The following conceptual typologies were mentioned in Chapter II. Here, they are listed in chronological order by the author's last name. The entries for each typology represent the different strategy types described by each author.

##### Buzzell, et al., 1975

1. Build
2. Hold
3. Harvest

##### Utterback, et al., 1975

1. Performance maximizing
2. Sales maximizing
3. Cost minimizing

##### Hofer & Schendel, 1978

1. Share increasing
2. Growth
3. Profit
4. Market concentration  
and asset reduction
5. Turnaround
6. Liquidation

##### Vesper, 1979

1. Multiplication
2. Monopolizing
3. Specialization
4. Cooperation
5. Capitulation
6. Liquidation

Conceptual typologies (continued)Miles et al., 1979

1. Defenders
2. Prospectors
3. Analyzers
4. Reactors

Wissema, et al., 1980

1. Explosion
2. Expansion
3. Continuous growth

Porter, 1980

1. Cost Leadership
2. Differentiation
3. Focus



EMPIRICAL TYPOLOGIES OF STRATEGY

The typologies in this section were empirically developed using multivariate statistical techniques. In this section, the entries under each typology represent the variables used to form the strategic groups.

Hatten et al., 1978: Strategy Components

1. Number of plants
2. Average Capacity
3. Newness of plants
4. Length of production cycle: Inventory/Sales X 365
5. Debt as percentage of investment
6. Mergers and Acquisitions
7. Number of brands
8. Price: Annual net beer sales/Barrels sold
9. Distribution: Receivables/Sales
10. Market expenditure/Barrels sold
11. Market share: Barrels sold/Industry barrels sold
12. Size:  $1/\log$  Assets

Galbraith and Schendel, 1983: Strategy Components

## A. Strategy Posture Variables:

1. Relative price
2. Relative expenditures on sales force
3. Relative expenditures on advertising
4. Relative expenditures on sales promotion
5. Relative quality of service
6. Relative quality of product
7. Relative number of new products
8. Relative breadth of product line
9. Relative variety of customer types
10. Relative degree of forward integration
11. Relative degree of backward integration
12. Relative amount of direct costs

## B. Strategy Change Variables:

1. Change in relative price
2. Change in relative expenditures on sales force
3. Change in relative expenditures on advertising
4. Change in relative expenditures on sales promotion
5. Change in relative quality of service
6. Change in relative quality of product
7. Change in relative number of new products
8. Change in process R&D

9. Change in product R&D
10. Change in newness of facilities
11. Change in manufacturing costs
12. Change in relative amount of direct costs
13. Change in total capacity utilization
14. Growth in investment less growth of market
15. Growth in investment less 4-year mkt. growth forecast

## Hambrick, 1983: Strategy Components

1. Product R&D / Sales
2. Marketing expenses / Sales
3. Relative integration forward
4. Gross fixed assets / employee
5. Relative integration backward
6. Relative compensation rates
7. Relative direct costs
8. Process R&D / Total R&D
9. Value added / employee
10. Capacity utilization
11. Relative price
12. Relative service
13. Relative quality

## Dess and Davis, 1984: Strategy Components

1. New product development
2. Customer service
3. Operating efficiency
4. Product quality control
5. Experienced/trained personnel
6. Maintain high inventory levels
7. Competitive pricing
8. Broad range of products
9. Developing/refining existing products
10. Brand identification
11. Innovation of marketing techniques and methods
12. Control of channels of distribution
13. Procurement of raw materials
14. Minimizing use of outside financing
15. Serving special geographic markets
16. Capability to manufacture specialty products
17. Products in high price market segments
18. Advertising
19. Reputation within industry
20. Innovation in manufacturing processes

## Appendix B

### SAMPLE FIRMS CATEGORIZED BY LEVEL OF SLACK

This appendix contains a list of the sample firms from both the paper and the computer industry. These firms have been categorized according to the level of slack using all 3 measures of slack. These results are presented together to allow the reader to easily compare the combined outcomes.

The following key presents the codes used to label the slack categories.

#### KEY

##### BSLACK

1=Slack Loser  
2=Slack Constant  
3=Slack Gainer

##### MLSLACK & QTSLACK

1=Low Slack  
2=Unclassified Slack  
3=High Slack

## PAPER AND PULP INDUSTRY

<u>Company Name</u>	<u>BSLACK</u>	<u>MLSLACK</u>	<u>QTSLACK</u>
American Israeli Paper Mills	3	2	3
Badger Paper Mills Inc.	1	1	1
Boise Cascade Corp.	3	3	3
Bomarko Inc.	1	1	1
Chesapeake Corp.	3	1	2
Consolidated Papers Inc.	3	3	3
Crown Zellerbach	2	1	2
Engraph Inc.	2	1	1
Federal Paper Board Co.	2	3	2
Fort Howard Paper	3	3	3
Grief Brothers Corp.	3	2	2
Hammermill Paper Co.	3	2	2
International Paper Co.	2	2	3
James River Corp. of VA	3	2	2
Kimberly-Clark Corp	2	3	3
Majestic Penn State	2	2	2
Mead Corp.	3	2	2
Mosinee Paper Corp.	3	1	2
Pentair Inc.	3	1	2
Potlatch Corp.	3	3	2

## PAPER AND PULP INDUSTRY continued. . .

<u>Company Name</u>	<u>BSLACK</u>	<u>MLSLACK</u>	<u>QTSLACK</u>
Scott Paper Co.	3	2	3
Simkins Industries	2	1	2
Sonoco Products Co.	2	3	3
St. Regis Corp.	3	2	2
Stone Container Corp.	2	2	2
Stuart Hall Co. Inc.	3	1	1
Tranzonic Cos.	3	1	1
Union Camp Corp.	2	3	3
Wausau Paper Mills Co.	3	1	2
Westvaco Corp.	3	3	2
Whippany Paperboard	1	1	1
Williamhouse Regency	1	1	2



## COMPUTER INDUSTRY

<u>Company Name</u>	<u>BSLACK</u>	<u>MLSLACK</u>	<u>QTSLACK</u>
Adage Inc.	3	3	2
Amdahl Corp.	3	3	3
Analogic Corp.	3	3	3
Anderson Jacobson Inc.	1	1	2
Applied Magnetics Corp.	3	2	2
Burroughs Corp.	1	3	3
Centronics Data Computer	1	2	2
Cognitronics Corp.	3	1	2
Commodore Int'l. Ltd.	3	2	2
Compucorp	1	1	2
Compuscan Inc.	3	2	2
Computer & Commun. Tech.	2	1	2
Computer Automation Inc.	3	2	2
Computer Communications Inc.	2	1	2
Computer Consoles	3	2	2
Computervision Corp.	3	3	2
Control Data Corp.	3	3	3
CPT Corp.	2	3	3
Cray Research	2	3	2
Data General Corp.	3	3	3

## COMPUTER INDUSTRY continued...

<u>Company Name</u>	<u>BSLACK</u>	<u>MLSLACK</u>	<u>QTSLACK</u>
Datametrics Corp.	1	1	2
Datapoint Corp.	3	3	2
Dataproducs Corp.	3	3	2
Dataram Corp.	3	1	2
Decision Data Computer Corp.	3	2	2
Delta Data Systems Corp.	3	1	2
Digilog Inc.	3	1	2
Digital Equipment	3	1	2
General Automation	1	1	2
Genisco Technology	3	1	2
Icot Corporation	1	1	2
Information International	1	2	2
Int'l Business Machines	1	3	3
Lundy Electronics & Systems	3	1	2
Management Assistance	3	3	2
Megadata Corp.	3	1	2
Mini Computer Systems Inc.	1	1	2
Modular Computer Systems	2	2	2
MSI Data Corp.	3	3	2
Mylee Digital Sciences Inc.	1	1	1

## COMPUTER INDUSTRY continued...

<u>Company Name</u>	<u>BSLACK</u>	<u>MLSLACK</u>	<u>QTSLACK</u>
National Computer Systems	3	3	2
NCR Corp.	3	3	3
Northern Precision Labs Inc.	1	1	1
Prime Computer	3	3	2
Recognition Equipment Inc.	2	2	2
SBE Inc.	2	1	1
Scope Inc.	2	2	2
Storage Technology Corp.	3	3	2
Sykes Datatronics Inc.	3	2	2
T-Bar Inc.	3	1	2
Tandem Computers Inc.	3	2	2
Tec Inc.	2	1	2
Tesdata Systems Corp.	1	1	2
Vermont Research Inc.	3	1	2
Wang Laboratories	3	3	3

## Appendix C

### DESCRIPTION OF STRATEGY VARIABLES

#### VARIABLES USED IN FORMING CLUSTERS

The following strategy variables were utilized to form the strategic clusters:

1. SUPPLIERS:

Scaled as follows:

1 = Make most components/raw materials (over 70%)

2 = Make and buy components/raw materials

3 = Buy most components/raw materials (over 70%)

2. CUSTOMERS:

Scaled as follows:

4 = OEM's (over 70%);

5 = OEM's and End Users;

6 = End users (over 70%);

3. TERRITORY:

Scaled as follows:

1 = Regional U.S.;

2 = National U.S.;

3 = International Exports;

4 = International Subsidiaries

4. FOREIGN:

Percent revenues derived from foreign sales.

Stated as a percentage of sales (%)

## 5. SINGLE:

Largest Percentage of Sales to a single customer.

Stated as a percentage of sales (%)

## 6. BIG:

Number of new subsidiaries formed or acquired in 1983.

Stated in single units with each unit representing 1 subsidiary.

## 7. JOINT VENTURE:

Number of joint ventures formed in 1983.

Stated in single units with each unit representing 1 joint venture.

## 8. SHRINK: Number of liquidations and divestitures made in 1983.

Stated in single units with each unit representing 1 subsidiary. Also scaled negatively to imply cutting back.

## 9. ADV/SALES:

Advertising expenditures as a percentage of sales in 1983.

Stated as a percentage of sales (%)

## 10. R&amp;D/SALES:

Research & development expenditures as a percentage of sales in 1983.

Stated as a percentage of sales (%)

## 11. ASSET GROWTH:

1983 assets / 1977 assets.

Stated as the number of times assets have increased  
over 1977 amount (X)

VARIABLES USED TO VALIDATE CLUSTERS

The following variables were compared across the strategic clusters after they were formed in an attempt to show that meaningful differences existed on variables other than those used to form the clusters.

## 1. EXPAND 1983

Scaled as follows:

0 = No change

1 = Buy or develop firms in core business

2 = Expand extent of vertical integration

3 = Expand extent of concentric diversification

4 = Expand extent of conglomerate diversification

## 2. EMPS83:

Number of employees in 1983.

Stated in thousands (000)

## 3. SALES83:

Sales revenues in 1983.

Stated in millions (000,000)

## 4. ASSETS83:

Total investment in assets in 1983.

Stated in millions (000,000)

## 5. EMP/SALES:

Number of employees controlled for sales in 1983.

Stated as a percentage of sales (%)

## 6. NEW:

Net book value of plant, property and equipment divided by gross book value of property, plant and equipment.

Stated as a percentage of gross book value (%)

## 7. SALES/ASSET:

Total asset turnover for 1983 (an efficiency measure).

Stated as the number of times assets have turned over to generate sales (X)

## 8. CGS/SALES:

Cost of goods sold as a percentage of sales in 1983.

Stated as a percentage of sales (%)

## 9. CHCGS:

Change in the percentage of cost of goods sold to sales from 1977-1983.

Stated as the number of times the percentage of CGS/SALES has increased over 1977 amount (X)



VARIABLES DELETED FROM THE STUDY

As discussed in Chapter III, not all of the variables which appeared on the original data list were included in the present study. These variables have been grouped according to the reason for their deletion:

1. Lack of Data Availability: The following variables were either not available on 10-K reports or Compustat, or were present for only a small percentage of firms.

Sales Force Expenditures / Net Sales

Change in Sales Force Expenditures / Net Sales

Capacity Utilization

Change in Capacity Utilization

R&D employees / Total employees

Change in R&D employees / Total employees

Revenues from new products

Change in Revenues from new products

Seasonality

Percentage change in assets due to an increase

in forward integration

Percentage change in assets due to an increase

in backward integration

Number of existing subsidiaries developed internally

Change in number of existing subsidiaries developed  
internally

Number of existing acquisitions

Change in Number of existing acquisitions

Number of active joint ventures

Change in number of active joint ventures

2. Controllability: Any variables which were considered to be outcomes or consequences of other strategic decisions were excluded:

Market share

Change in market share

3. Statistical interpretation of clusters: Individual explanations follow.

Product-Market Segment: When inserted into the cluster analysis procedure, this variable caused the different clusters to blend together. For example, all of the paper companies fell into one big cluster.

Customization: Since most of the companies produced standardized products, this variable did not vary enough across firms to make its inclusion worthwhile.

Change in Advertising as a percentage of sales:

Change in R&D as a percentage of sales:

These variables were originally included to assess the increasing and decreasing emphasis on advertising and r&d over time. However, it turned out that a significant number of firms in both industries had not devoted any money to these functions in 1977. Therefore, the increases were in the thousands of percents and the data were meaningless.

## Appendix D

### SAMPLE FIRMS CLASSIFIED BY STRATEGIC CLUSTER

This appendix contains a listing of all sample firms by strategic cluster. In addition, the euclidean distance from each sample firm to the cluster seed is given. This measure helps show whether firm is quite typical for a particular cluster (i.e., close to the seed) or is less similar to others in the strategy type.

#### CLUSTER SUMMARY

CLUSTER	MEMBERS	RMS ST DEV	MAX DISTANCE FROM SEED
1	17	0.8682922	4.365384
2	29	0.6863439	4.184489
3	2	.	4.464098
4	35	0.7809021	4.663685
5	3	0.8586487	3.363242

## ----- CLUSTER 1: REFOCUS -----

COMPANY NAME	DISTANCE
Boise Cascade Corporation	1.24488
Chesapeake Corporation	2.64052
Consolidated Papers Inc.	2.91805
Crown Zellerbach	2.76357
Datapoint Corporation	2.95883
Int'l. Business Machines Corp.	3.85408
International Paper	2.12548
James River Corp. of Virginia	2.66928
Kimberly-Clark Corporation	2.86807
Mead Corporation	4.36538
Scott Paper Company	1.66939
Sonoco Products Company	3.39985
St. Regis Corporation	3.94130
Storage Technology Corporation	1.38424
Union Camp Corporation	1.88569
Wang Laboratories	2.69152
Westvaco Corporation	2.36064

## ----- CLUSTER 2: CONCENTRATION -----

COMPANY NAME	DISTANCE
Adage Inc.	1.99508
Amdahl Corporation	2.13127
Analogic Corporation	2.22545
Anderson Jacobson Inc.	1.99375
Applied Magnetics Corp.	2.45257
Burroughs Corporation	1.54879
Centronics Data Computer	2.21514
Computer & Commun. Technology	2.34677
Computer Automation Inc.	1.12393
Computervision Corp.	3.73044
Cray Research	2.90704
Data General Corporation	1.90865
Dataproducts Corporation	2.24962
Dataram Corporation	2.23458
Decision Data Computer Corp.	2.17077
Delta Data Systems Corp.	2.24610
Digilog Inc.	1.68982
Digital Equipment	1.15099
General Automation	2.51561
Information International	2.15167
Management Assistance	2.64258
Modular Computer Systems	1.75951
MSI Data Corporation	1.92429
NCR Corporation	2.11383
Prime Computer	1.90765
Recognition Equipment Inc.	2.14289
T-Bar Inc.	2.27670
Tesdata Systems Corporation	2.09117
Vermont Research Inc.	4.18449

## ----- CLUSTER 3: VERTICAL INTEGRATION -----

COMPANY NAME	DISTANCE
Control Data Corporation	4.46410
Tandem Computers Inc.	4.25635

## ----- CLUSTER 4: NO CHANGE -----

COMPANY NAME	DISTANCE
American Israeli Paper Mills	2.51828
Badger Paper Mills Inc.	2.09136
Bomarko Inc.	3.12559
Cognitronics Corporation	1.91847
Compuscan Inc.	1.79891
Computer Communications Inc.	1.47681
Computer Consoles	4.38598
Datametrics Corporation	4.56673
Engraph Inc.	2.63763
Federal Paper Board Co.	1.74417
Fort Howard Paper	2.33851
Genisco Technology	1.93144
Greif Bros. Corporation	2.35332
Hammermill Paper Co.	2.73825
Icot Corporation	2.63751
Lundy Electronics & Systems	1.03155
Majestic Penn State Inc.	2.04222
Megadata Corporation	2.41456
Mini Computer Systems Inc.	2.97579
Mosinee Paper Corporation	1.96701
Mylee Digital Sciences Inc.	2.60374
National Computer Systems Inc.	2.31805
Northern Precision Labs Inc.	2.11284
Pentair Inc.	2.22755
Potlatch Corp.	1.80332
SBE Inc.	4.66368
Scope Inc.	1.95227
Simkins Industries	2.73575
Stone Container Corporation	2.96101
Stuart Hall Co. Inc.	1.91929
Sykes Datatronics Inc.	3.86080
TEC Inc.	1.28939
Tranzonic Cos.	2.20152
Wausau Paper Mills Co.	1.68718
Williamhouse Regency Inc.	2.69800



## ----- CLUSTER 5: MARKET DEVELOPMENT -----

COMPANY NAME	DISTANCE
Commodore Int'l. Ltd.	3.36324
Compucorp	2.01707
CPT Corporation	1.80740

Appendix E  
MATHEMATICAL FORMULAE

VOLATILITY FORMULAE

The following formulae were used herein to assess the environmental and technological volatility of the two industries:

Market Volatility Formula

$$\frac{\sqrt{\sum_{i=1}^x \frac{(y_i - \bar{y})^2}{x}}}{\bar{y}} + \dots + \frac{\sqrt{\sum_{i=1}^x \frac{(y'_i - \bar{y}')^2}{x}}}{\bar{y}'}$$

$z$

where:

x = number of years being considered

y = sales for firm y in each of the x years

$\bar{y}$  = average of sales for firm y over x years

y' = sales for firm y' in each of the x years

$\bar{y}'$  = average of sales for firm y' over x years

z = number of firms in the industry used to  
calculate volatility measure

This formula is actually the average coefficient of variation in sales for a given industry subsample. The coefficient of variation is equal to the standard deviation divided by the mean and is useful in comparing several groups with respect to their relative homogeneity in cases where the groups have very different means.

As a measure of market volatility, this formula appears appropriate because it allows comparisons of the average fluctuations in sales from year to year for a given time period while controlling for total sales. A large amount of variation in sales from year to year would certainly relate to increased environmental uncertainty since predictions concerning raw material needs, hiring needs, manufacturing output, and the like would all become more difficult. On the other hand, use of the standard deviation by itself (without dividing by the mean sales figure) could be misleading when comparing groups with different sales levels since the standard deviation tends to increase as the mean gets larger. By controlling for average sales, it is possible to interpret increases in the index as representing higher market volatility and hence, higher environmental uncertainty.

Technological Volatility Formula

$$\frac{\sum_{i=1}^x \left( \frac{a_i + b_i}{c_i} \right)}{x} + \dots + \frac{\sum_{i=1}^x \left( \frac{a'_i + b'_i}{c'_i} \right)}{x}$$


---


$$z$$

where:

x = number of years considered

a = R&D expenditures for firm y in each of the x years

b = capital expenditures for firm y in each of the x years

c = total assets for firm y in each of the x years

a' = R&D expenditures for firm y' in each of the x years

b' = capital expenditures for firm y' in each of the x years

c' = total assets for firm y' in each of the x years

z = number of firms in the industry used to

calculate volatility indices

This formula takes the average ratio of the sum of R&D and capital expenditures to total assets over a period of years and then averages this figure across a sample of firms to obtain an industry measure. As a measure of technological volatility, this index is based on the assumption that higher average investments in R&D and capital expenditures will be required by firms in more technologically volatile

industries. In essence, rapid technological change will require equipment and machinery to be upgraded more frequently, as well as frequent product enhancements and new product development. Therefore, the higher the index, the more volatile the industry.

SLACK MEASUREMENT FORMULAE

The following financial ratios were used in classifying organizations by level of slack. These formulae were taken from the 1980 Standard and Poor's Industrial Compustat Manual. The numbers in the right hand column represent the specific data items drawn from the Compustat tapes, and also show how the items were combined (where necessary) to form the ratios in the left hand column.

Bourgeois Measures

VARIABLE NAME	COMPUSTAT ITEM / FORMULA
Retained Earnings	36 Retained Earnings
Dividend Payout	127 Cash Dividends
Selling, general & administrative expense/net sales	(12-41-13)/12
	12 = Net Sales
	41 = Cost of Goods Sold
	13 = Operating Income before Depreciation

Working Capital/  $(4 - 5)/12$   
 Net Sales

4 = Total Current Assets

5 = Total current liabilities

12 = Net Sales

Long Term Debt/  $9/(60 + 130)$   
 Equity

9 = Long Term Debt

60 = Common Equity

130 = Preferred Stock

Price Earnings Ratio  $24/58$

24 = Closing Stock Price

58 = Primary Earnings per Share

Marino and Lange Measures

VARIABLE NAME	COMPUSTAT ITEM / FORMULA
Cash Flow Margin/ Net Sales	$(123+125+126+106+124+149)/12$
	123 = Operating Expenses before Extraordinary Items & Discontinued Operations
	125 = Depreciation & Amortization
	126 = Deferred Taxes
	106 = Unremitted Earnings of Unconsolidated Subsidiaries
	124 = Extraordinary Items & Discontinued Operations
	49 = Minority Interest
	12 = Net Sales



Return on Total Assets     $(13 - 14)/(8 + 4 + 69)$

13 = Operating Income before  
Depreciation

14 = Depreciation & Amortization

8    = Plant - Net

4    = Total Current Assets

69 = Other Assets

IQV FORMULA

This section explains how the IQV or the Index of Quantitative Variation was calculated. This formula was obtained from Ott et al., 1974.

$$\text{IQV} = \frac{\text{Total number of observed differences}}{\text{Maximum number of possible differences}}$$

where:

Total number of observed differences is obtained by first multiplying each frequency by every other frequency and then summing the products.

Maximum number of possible differences for n observations on a qualitative variable with k levels is

$$n^2 (k - 1) / (2k)$$

The example shown on the next page was adapted from Ott (1974: 111-112).

Suppose that the distribution of the sex and grade point averages of candidates eligible for a university M.B.A. program appeared as follows:

<u>Sex</u>	<u>Grades</u>	<u>Frequency</u>
Female	2.5-3.0	4
Female	3.0-3.5	2
Male	2.5-3.0	7
Male	3.0-3.5	7

To calculate the total number of observed differences, first multiply each frequency by every other frequency as follows:

$$4 \times 2 = 8$$

$$4 \times 7 = 28$$

$$4 \times 7 = 28$$

$$2 \times 7 = 14$$

$$2 \times 7 = 14$$

$$7 \times 7 = 49$$

Then sum these products:

$$8+28+28+14+14+49 = 141$$

Now compute the maximum number of possible differences with the formula presented on the preceding page:

$$(20)^2 (3) / 2(4) = 150$$

Hence the index of qualitative variation is

$$IQV = 141/150 \times 100 = 94\%$$

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