Performance Parameters
as Indicators of Success and Predictors
of Failure in Strategic Management

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ABSTRACT. The purpose of this study is to articulate a logical structure of performance as represented by a model used to guide value-based management. It can be used to analyze industry leaders and to develop a comparative performance profile. As a strategic tool it can analyze competitors to identify strengths, weaknesses, opportunities, and threats in the marketplace. Those organizations pursuing diversification or acquisition strategies can use this tool to identify targets of opportunity. *[Article copies available for a fee from The Haworth Document Delivery Service: 1-800-342-9678. E-mail address: getinfo@haworthpressinc.com]*

INDICATORS OF SUCCESS AND PREDICTORS OF FAILURE

The Problem

To survive and prosper in the political, social, and economic climate of the coming millennium, organizations must achieve viability by aligning purpose, people, strategies, and structures. Without this convergence and adaptive evolution the combined factors of global competition, technological change, evolving markets, and increased capital needs may overcome the organization's ability to adapt to the environment. These scenarios can affect a decline in performance. This research has examined select performance

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indicators, and certain predictors of failure, to construct a valuation model and to propose a change strategy to turnaround performance decline.

The purpose of this study is to articulate a logical structure of performance as represented in a model (see Figure 1) that can be used to guide value-based management. It can be used to analyze industry leaders and to develop a performance profile. As a strategic tool it can analyze competitors to identify strengths, weaknesses, opportunities, and threats. If the organization is pursuing diversification or acquisition strategies, this tool can identify targets of opportunity.

Performance Validation Model (PVM). Measurement and evaluation are critical tasks in the value-based management of organizations. A model of performance trend indicators should be constructed to establish baseline valuation measurements that describe; (a) the organization, (b) the strategic group the organization competes against, and (c) the industry environment the organization operates within (by SIC codes). This model uses financial ratio indicators to establish financial baseline determinants (Altman, 1968; Tobin, 1969) that quantitate the strategic direction and economic effectiveness of an organization.

The research has examined a cross-sectional industry population (i.e., SIC codes). Sixty organizations identified in the UMI abstract database (1994-1995) representing a disparate population sample as suggested by Robbins and Pearce (1993:305) was combined with a population of seventy-two organizations identified in four previous studies (Chakravarthy, 1986; Brumagim & Klavans, 1994; Moulton & Thomas, 1993; Clapham, 1994) that have identified firms within declining industries or who have been identified as using retrenchment strategies.

PURPOSE OF THE STUDY

The development of a holistic turnaround model to correct performance decline has been objectively evaluated and empirically tested in this research. Robbins and Pearce (1992) studied cost and asset reduction strategies for thirty-eight textile mills (SIC code 22). As they suggest, "the next step in refining the model of turnaround responses is to measure the transitions in the cost, asset, and activity variables in multiple and disparate turnaround situations" (pg. 305). This research has conducted a multiple industry analysis with an expanded strategy focus on; (a) leadership changes, (b) organizational change, and (c) retrenchment strategies.

Limitations of the Study

The structure and validity of the *PVM* are grounded in previous research and empirically tested against historical data from Standard & Poor's

FIGURE 1. Strategic implications of value management.

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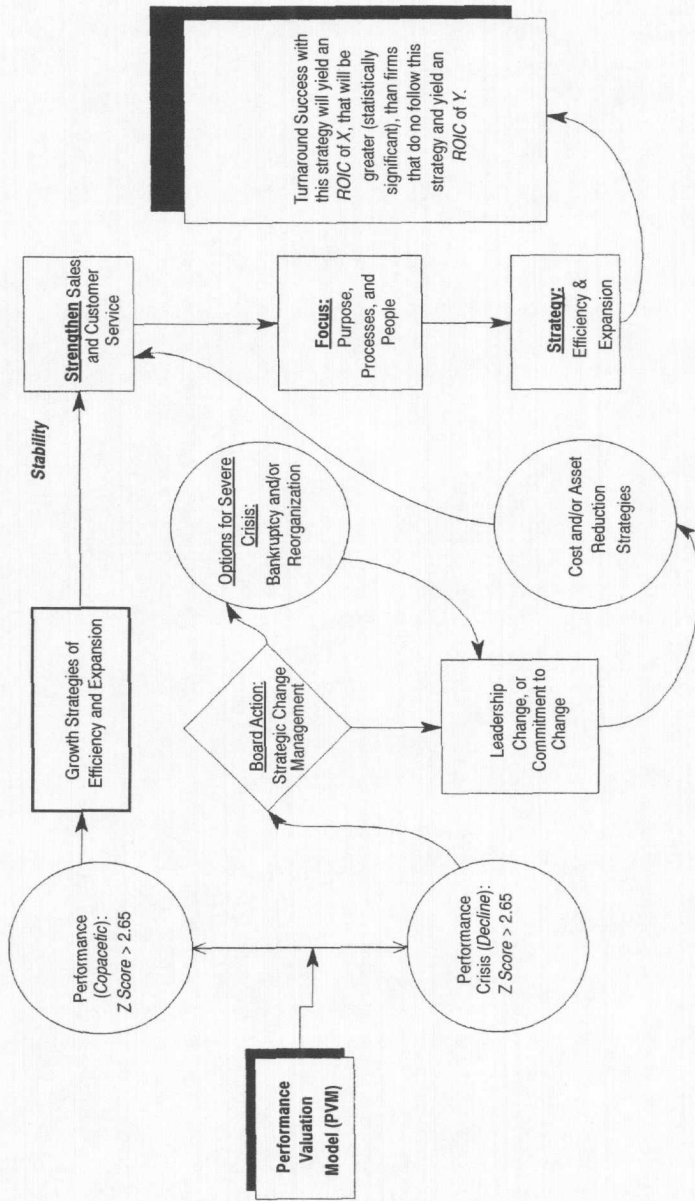
databases. Theory needs the validation of real world practice where the underlying principles, methodologies and techniques are well documented and validated so as to suggest a high degree of confidence in their utility. The development of analytical tools for diagnosis and evaluation must be complemented by a strategy to impact performance and address structural weakness.

This research has focused on the objective evidence of financial metrics and indices to identify tactics useful in correcting a decline in performance and turnaround crisis situations. Future research should explore the analysis of behavioral dynamics of managers in these situations and match it with quantitative data that illuminates the logic and reasoning behind successful and failed strategies. Information developed through tools such as the "competing values framework" of Quinn and Rohrbaugh (1983) would be insightful and valuable in future research.

The Hypotheses

Validation of performance is critical in monitoring the consequences of strategic direction and management action. The research question examines, analyzes and synthesizes statistical techniques for such measures. Hypothesis one will quantitate the indicator values that predict decline or ascent of corporate performance.

Research issue one. Organizational performance can be validated by select multivariate performance indicators that can predict success or failure. A linear equation composed of financial ratios used in a multiple discriminant function analysis can be predictive of performance.

> *Hypothesis 1:* Excellent organizations (X) will demonstrate a predictor value significantly greater than non-excellent organizations (Y).

Leadership and organizational renewal. The role of leadership is an essential element of corporate performance and the need to change leaders and organizational structure in times of crisis has been examined. This perspective views the CEO as responsible for establishing an organization's strategic direction while the board of directors is responsible to the shareholders for total stewardship. The research issue will seek to quantitate with objective research the key actions taken by organizations to address declining performance.

Research issue two. Organizations in decline will need to change leadership, strategic direction, and resource allocation, to successfully adapt to the environment as demonstrated by increasing operational performance and turnaround success. The content analysis of secondary data will indicate the organizations' response to decline.

Hypothesis 2: Organizations (X) demonstrating a performance decline who replace the CEO will be more successful at organizational renewal and turnaround than those Organizations (Y) who do not.

The literature suggests that restructuring is a common response of organizations to impending financial disaster (Gowen & Leonard, 1986; Hardy, 1987; D'Aveni, 1989). Other researchers describe restructuring and retrenchment as only a tactic of a short-term operating plan (Schendel, Patton, & Riggs, 1976; Hofer, 1980). Researchers have generally failed to operationally define restructuring as an integral tactic or to assess utility in the recovery process, although Robbins and Pearce (1992) did identify strategies and tactics that are essential to turnaround success. The logical extension of hypothesis two is to examine the relative extent to which restructuring is pursued through asset and cost reduction tactics.

Hypothesis 3A: The degree of organizational retrenchment is positively correlated to the measure of turnaround success.

Hypothesis 3B: The focus of organizational restructuring produces significantly different results.

Hypothesis 3C: The correlation between the degree of retrenchment and turnaround success is greater in severe turnaround situations.

Hypothesis 3D: The correlation between the degree of retrenchment and turnaround success is greater in retrenchers than non-retrenchers in turnaround situations.

These hypotheses lay the foundation for the development of the valuation model. They establish a theoretical perspective and general strategy for turnaround as validated by an empirical examination of historical industry data. That general strategy is presented in Figure 1. It recommends a series of actions that suggest a reversal of performance decline through the execution of this strategy.

LITERATURE REVIEW

Chaos theory from a systems perspective suggests organizations that thrive will have a fractal quality, where a fractal is a mathematical object that can have the same level of complexity at all levels of magnification. Fractals suggest the futility of searching for finer measures of discrete parts of the

system. Chaos theory would have us seek to discover the shape and motion of an organization. Therefore we must look for themes and patterns rather than isolated causes. Individuals within the system can appreciate the complex and ever-changing shape of the organization, where multiple forces work together to form and shape it (Mandelbrot, 1983; Briggs, 1992). These are reasons why total quality management (TQM) and continuous quality improvement (CQI) eventually prove effective.

This research examined organizational attributes needed for effective performance. The underlying assumptions of contingency research invoke a reductionist approach by which researchers seek to understand the behavior of a social entity by separately analyzing its constituent's parts. Organizations are treated as loosely coupled aggregates whose separate components may be adjusted or fine-tuned incrementally once weak constraints have been overcome (Meyer, Goes, & Brooks, 1993).

Configurational inquiry represents a holistic stance as does chaos theory where social systems are seen as tightly coupled amalgams entangled in bidirectional causal loops (Miller, 1987). Within the system there is a great deal of nonlinearity and the organization is faced with discontinuous change punctuated by periods of stability. A strategic approach will only work if it is embedded in an appropriate pattern of coherent organizational processes and structures. Chaos theorists call these patterns "strange attractors" by which organizational theorists call them configurations.

The predictive power of the *PVM* composite model, with respect to each of the individual dimensions of effectiveness, can be assessed by examining fit among contextual, structural, and strategic factors as relatively powerful predictors of organizational effectiveness.

The Domain of Turnaround

There is consensus in the literature as to a broad definition of turnaround as offered by Schendel, Patton and Riggs (1976:3) who define it as a "decline and recovery in performance." Bibeualt (1982) defines the concept as a substantial and sustained positive change in performance. Hofer (1980) suggests it as a situation where some firm experiences a major decline in performance followed by a marked improvement.

Strategic turnarounds involve a change in the way the firm competes by either entering new businesses or gaining market share in its present business. Such upturns are focused on long-term growth and are effected through tactics such as acquisitions, increases in marketing efforts, increases in R&D, and/or increases in new plants and equipment (Hofer & Schendel, 1978; Hofer, 1980). There are also those firms who reduce certain market share to focus on niche markets and unique capabilities.

Operating turnaround strategies are designed to improve short-term per-

formance through a focus on operational measures (e.g., actions to increase revenues, actions to decrease assets, actions to decrease costs, or some combination thereof) which are primarily based on efficiency gains. Hofer (1980) offers four types of operating strategies; (a) revenue generating, (b) cost-cutting, (c) asset reduction, and (d) some combination of these.

A second typology of principal types of turnarounds as offered by Bibeault (1982) is; (a) management process, (b) economic or business cycle, (c) competitive environment, (d) product breakthrough, and (e) government-related. It is suggested that the management process turnaround type is the most common and only "real" type of change. The reasoning here is that if management decisions are the cause of decline then management corrections would be needed to accomplish a successful organizational reorientation.

The "economic or business style" turnaround is the result of cyclical economic improvements in the industry. While the "competitive environment" turnaround type is also the result of improved environmental conditions, these improvements are not cyclical. A few companies can capitalize on "product or technology" breakthroughs. In addition, a few companies improve performance based on procurement of government contracts or a major shift in some government regulation.

Empirical Identification of Turnaround Situations

There are several methodologies for determining the phases of each stage of the turnaround process. Schendel et al. (1976), and Schendel and Patton (1976), identified turnaround firms as those that had experienced at least four years of uninterrupted decline followed by at least four years of an increase. The increase need not be continuous in net income (NI). Growth in net income was normalized by using 1951 gross national product (GNP) as the base year. Income growth as a percent of GNP growth was used in an attempt to find relative change. In their sample of fifty-four firms the average decline phase (i.e., sub-GNP growth) lasted 5.2 years with a range of four to ten years. The upturn phase (i.e., greater-than-GNP growth) averaged 7.7 years, with a range of four to sixteen years. The average rate of decline was -15% normalized income and $+15\%$ for the upturn phase.

Bibeault (1982) included eighty-one firms in his sample where each had at least three years of sustained decline in net income and an upturn phase of at least three years. Each firm had severe earnings decline or had sustained losses in income of 80% or more. The author does not specify the threshold of return necessary to determine a successful turnaround firm.

Another study of turnaround used return on investment (ROI) as the performance criterion (Hambrick & Schecter, 1983). Firms were included in the turnaround sample if ROI was below 10% for two years followed by two years where ROI was at least 20%.

Financial based performance measures are necessary for researchers to help assess the quality of a firm's adaptation. These measures include; return on equity (ROI), return on sales (ROS), earnings per share, and net income, which have been the dominant model in empirical strategy research (Venkatraman & Grant, 1986). Turnaround researchers have adopted this model with the use of net income or return on investment as the single performance criterion variable.

The use of these criterion variables presents two major problems for turnaround research. First, measures of performance rooted in financial accounting include many conceptual and practical measurement problems (Rappaport, 1986). Factors that contribute to the weakness of accounting based financial measures of performance include; (a) the scope of accounting manipulation, (b) undervaluation of assets, (c) single period historical measurements, (d) distortions due to depreciation policies, inventory valuation and treatment of certain revenue and expenditure items, (e) short-term goal orientation, and (f) neglect of post period residual value (Fisher, 1984; Hoshower & Crum, 1986; Rappaport, 1986; Reimann, 1987, 1989; Charkravarthy, 1986; Fisher & McGowan, 1983; Dearden, 1969; Kirchoff, 1977). Second, the use of these measures has increased the difficulty of establishing a benchmark in downturn and upturn phases that would identify turnaround situations.

Schendel and Patton (1976) used COMPUSTAT data to identify turnaround firms. Thirty-six turnaround and thirty-six nonturnaround firms were matched on the basis of four-digit SIC code classifications. Matching along other variables such as size (i.e., income, total assets, total unit sales, total employees, etc.), relative market share, extent of product line, technology employed, etc. was not reported by the authors. Their research indicates that turnaround firms benefit more from increased sales and the nonturnaround firms seem to benefit form efficiency actions.

Content analysis was conducted on secondary data sources (e.g., Moody's, The Wall Street Journal, etc.) (Schendel et al., 1976). In this study the researchers wanted to identify significant environmental events and management actions that contributed to downturn and upturn characteristics. Their findings suggested seven major categories of events that contribute to a firm's decline; (a) increasing costs, (b) demand declines, (c) declining revenues, (d) strikes, (e) increasing competitive pressures, (f) management problems, and (g) marketing problems.

They argue that the downturn phase was usually a combination of events coupled with the firm's inability to monitor changes. The upturn phase was characterized by eight major categories of actions; (a) organization and management change, (b) marketing program changes, (c) major plant expendi-

tures, (d) diversification of product, (e) diversification by geography, (f) efficiency increases, (g) divestiture, and (h) vertical integration.

The authors contend that while "efficiency problems predominated as causes of downturn, [the] upturn phase was brought about by proportionately more effort placed on changes in corporate strategy" (pg. 11).

RESEARCH METHODOLOGY

Whenever a relationship exists between competencies within a particular organization configuration and a set of variables, it is possible to estimate by means of multiple regression the competencies an organization may be expected to demonstrate. Developing quantitative models of a theory is a necessary step in the theory development process where the quantitative modeling process is merely a translation exercise (Blalock, 1969). In practice the ambiguous assumptions are often identified in the modeling process. Such identification forces the model builder to develop new theory to clarify these ambiguous assumptions.

The modeling process clarifies and refines the logic of the model. The quantitative model then serves as a more precise statement of the theory that can be more unambiguously falsified. When the quantitative model is not an accurate translation of the logical arguments in the theory, the model neither validly represents the theory nor adequately tests it (Venkatraman, 1989). The critical issue is to develop a model that accurately represents the logical structure.

Exploratory Research Design

This research study is exploratory in concept as it will examine methodologies and techniques for analysis, validation, and valuation of organization configuration. The researcher will test leadership change in response to performance decline, and success at turnaround, by examining performance results correlated to CEO replacement. The data search will focus on replacement of the CEO during the retrenchment phase in time-2, time-3, or time-4 (year two through year four). The criteria for the identification of change included a statement to that effect in the supporting literature. This search process used; (a) annual reports, (b) 10k reports, (c) letters to stockholders, (d) Standard and Poor's Register of Corporations, Directors, and Executives, and (e) Dun and Bradstreet's Reference Book of Corporate Management to confirm management changes.

The use of content analysis is a method of analysis and observation. This research uses a very straightforward approach by examining the data for a

2. Absolute simultaneous increases in ROIC and either ROS or ROA with a return to predownturn (time-1) levels of ROIC.

Venkatraman and Ramanujam (1986) measured these movements by trend analysis of ROI. This researcher suggests that ROIC better reflects value creation. Reduction in costs will be reflected in an increasing ROS% (where the reduction in costs of goods sold, SG&A, and depreciation, impact ROIC). The ratio of net income to total assets measures the return on total assets after interest and taxes where the ratio is stated; ROA = (net income)/(total assets). In asset retrenchment the ROA% will increase as assets, i.e., inventory and accounts receivables are reduced.

$$ROIC = (net\ income + interest)/(debt + equity)$$
or stated as,
ROIC = Return on Sales (ROS) $\times$ Capital Turnover (CT)
where; ROS = (CGS + SG&A + Depreciation), *and*
CT = (Assets + inventory + working capital).

For this research the variables used to examine each orangization are supported by previous studies (Hofer, 1980; Harrigan, 1980; Robbins & Pearce, 1993; Clapham, 1994).

1. The severity of decline (Altman Z),
2. Validate recreation of value (Market/Book value),
3. Measure downturns and upturns in performance (ROI and ROS),
4. Indicate degree of cost or asset retrenchment (ROA and ROS).
5. Overall value creation as measured by ROIC.

The points of data measurement for each organization were determined by four events; (a) the year of peak performance prior to a performance decline as measured by ROI, (b) the year of greatest value decline as measured by ROIC, (c) the year both asset and cost reductions cease as measured by the impact on ROA and ROS, and (d) the year firm achieves turnaround as reflected in a unity value, MkBk > 1, with a corresponding return to ROI at time − 1.

Framing the data with these conventions allows the classification of organizations into groups of strategic change behavior. The researcher empirically tested the impact of four key tactics.

1. Asset and cost retrenchment (ROS and ROA),
2. Cost retrenchment only (ROS),
3. Asset retrenchment only (ROA), or
4. Neither tactic used.

To validate firms that reversed a decline in performance and had a successful turnaround, Tobin's Q was used to confirm a recreation of firm value (Tobin, 1969). Q value is defined as the capital market value of the firm divided by the replacement value of its assets. In identifying those firms who have turned around, the value of Q will have been restored to unity or above (Q > = 1). It is difficult for researchers to compute this ratio, so a proxy for a will be used in this study. The ratio of market value of equity to book value of equity was found highly correlated with actual Q values (Varaiya & Kerin, 1987). Organizations included in this study have a market to book ratio greater than one (MkBk > 1) prior to the decline, exhibit a minimum steady two-year decline, and a minimum steady two years increase. Those organizations that appear to have cyclical decline and increase patterns were rejected.

To test the absolute severity of the turnaround situation, a technique used to analyze this data set included an "indicator of failure" measurement produced by the Altman Z statistical test. Previous researchers have shown a failure in their research to include an objective measure of the performance crisis (Beaver, 1966; Hofer 1980; Hambrick & Schecter, 1983). The Z value is a resultant predictor value produced by the multiple discriminant analysis using financial ratios in the form of a multivariate linear equation.

The financial ratios used in the multiple discriminant analysis to determine the Z value and the linear equation to produce that value are as follows: The Altman Z value is derived from a multiple discriminant function with five independent variables:

$$Z = .012_1 + .014X_2 + .033X_3 + .006X_4 + .0999X_5$$

where Z = discriminant score
X_1 = Working capital/total assets
X_2 = Retained earnings/total assets
X_3 = Earnings before interest and taxes/book value of total debt
X_4 = Market value of equity/book value of total debt
X_5 = Sales/total assets

The Z value identifies organizations headed for trouble (Beaver, 1966; Altman, 1968). The conceptual foundations of this analytical technique have been validated in previous research studies (Argenti, 1976; Bibeault, 1983; Chakravarthy, 1986). This technique can provide an early warning at least two to three years prior to a potential performance decline or bankruptcy. The Z value is used to identify firms that are at, near, or headed for a crisis situation. Research conducted by Chakravarthy (1986) argues that the Z factor is an excellent measure of performance with "excellent" companies displaying a significantly different Z score than "non-excellent" companies (Chakravarthy, 1986:446).

This model is reported to have a 95% accuracy rate when ratios are calculated one year before bankruptcy, 79% when ratios are calculated two years before bankruptcy (Altman, 1968). At year three to five the performance indicators can suggest a performance decline. The model has shown usefulness as an indicator of performance trends.

In his research, Altman found that firms with a Z score greater than 2.99 were in no danger of going bankrupt, a Z score of less than 1.81 suggested a bankrupt candidate, scores between 2.99 and 1.81 were considered in the "zone of indifference." Altman and McGough (1974) suggest that a Z score of 2.675 is a practical cut off point.

Retrenchment activities in turnaround according to Goodman (1982) and Slatter (1984), extend from the onset of a turnaround situation until asset and cost reductions have ceased. The average retrenchment period being three years or time-3. Organizations not demonstrating asset or cost reductions at the end of two years or time-2, were classified as non-retrenchers.

The end of the retrenchment phase leads to stability and growth. The effectiveness of recovery and growth strategies can be quantified by examining the ROS and ROA metrics at time-3, time-4, and time-5. Here it is possible to suggest an entrepreneurial, return to growth recovery strategy, reflected in a greater % growth rate of ROS relative to ROA. An efficiency, operating recovery strategy reflects a greater % growth rate of ROA relative to ROS.

PERFORMANCE VALIDATION MODEL (PVM)

Sample Data for Hypothesis One

To test hypothesis one, only firms in a single industry, computers, were chosen (Chakravarthy, 1986). The computer industry had the highest representation of "excellent" firms (seven) among the industries studied. The seven firms tested are IBM, Hewlett Packard (HP), Digital Equipment Corporation (DEC), National Cash Register (NCR), Amdahl, Wang, and Data General. This sample of seven firms was expanded to include seven other "non-excellent" firms; Burroughs, Control Data (CDC), Sperry, Honeywell, Prime Computers, Cray, and Commodore. They were chosen since they did not appear on the short list proposed by industry experts in the Peters and Waterman study. Their corporate reputations were ranked lower in the Fortune survey of January 10, 1983, listed on pages 34-44. Data available from COMPUSTAT was selected for the period of 1964 through 1980 to coincide with the Peters and Waterman study.

Testing Hypothesis One

After considering the nature of the problem and the purpose of this research regarding a performance validation measure, a multiple discriminant analysis (MDA) known as the Altman Z value was chosen as the appropriate statistical technique for this component of the model. It is used to measure the severity of the turnaround situation and was computed for each firm over a fifteen-year time-frame. This measure produces a performance value that is predictive of the financial health of the organization (Walter, 1959) and is appropriate as a comparative measure of strategic group membership.

Peters and Waterman (1982) defined organizations that were "excellent" based on their superior fit between the McKinsey 7-5 model (strategy, structure, systems, style, shared-values, staff and skill) and their environment.

> *Hypothesis 1:* Excellent organizations (X) will demonstrate a predictor value significantly greater than non-excellent organizations (Y).

The consensus group of firms met benchmarks for industry performance over a twenty-year period, 1960-1980; compound asset growth, compound equity growth, ratio of market to book value, average return on total capital, average return on equity, and average return on sales. These excellent and non-excellent companies were analyzed using data computed for the Z-values covering the period of 1964-1980, with additional data to 1994 (Table 1). These firms are revisited in the population of firms examined from 1980-1994 for testing of hypothesis three.

Organizations Z Value Scores

1. Research Question $\qquad$ $H_1\ \mu_{x_{zValue}} > \mu_{y_{zValue}}$

2. Null Hypothesis $\qquad$ $H_0\ \mu_{x_{zValue}} \leq \mu_{y_{zValue}}$

3. Alternative Hypothesis $\qquad$ $H_A\ \mu_{x_{zValue}} > \mu_{y_{zValue}}$

4. Statistical Statement:

Statistical Test: Two sample t-test for difference between means
   One-tailed test
   $\alpha = .10$

Sample 1	Sample 2
n = 7	n = 7
$\overline{X} = 7.2067$	$\overline{X} = 4.23790$

s = 4.2057   s = 4.2057
$s^2 = 17.68791$ $s^2 = 10.47428$
df = 12
t ≥ 1.480119

$$\text{critical value} = \frac{\overline{X} - \mu}{\frac{s}{\sqrt{N}}} = 1.3560$$

Reject the null hypothesis at the .10 level of significance because t of 1.480119 is > = the critical value of 1.41500. Support the alternate hypothesis that Z Values are greater for excellent firms and that excellent firms have greater financial strength than non-excellent firms.

The P value is between .10 and .05.

According to Sproull, in exploratory research an alpha (probability) value of .10 is common (1988, pg. 61).

Sample Data for Hypothesis Two

To test hypothesis two the population sample consisted of 132 companies (Table 4). From this group a sample of ninety-seven firms was selected. An analysis of data for keyword identifiers such as "top management change" or "the company's management structure was changed . . . " were used to discover CEO changes by searching the various databases and information sources. Table 2 presents a cross tabulated form of the hypothesis, using a contingency table in which the observations are summarized and examined.

It is suggested that organizations in decline will need to change leadership, strategic direction, and resource allocation, to successfully adapt to the environment as demonstrated by increasing operational performance and turnaround success. The content analysis of secondary data will indicate the organization's response to decline.

Testing Hypothesis Two

It is hypothesized that organizations experiencing decline who replace the CEO are more likely to succeed. A contingency analysis will be used to test this proposition. The criteria for the identification of change included a statement to that effect in the literature. The search process used annual reports, 10k reports, letters to stockholders, and Standard and Poor's Register of Corporations, Directors, and Executives to confirm changes.

TABLE 1. Z scores for the years 1964-1994.

	1964	1966	1970	1975	1977	1979	1980	1985	1989	1992	1994
Excellent Companies											
Amadahl					6	3.47	5.13	1.571	3.129	1.248	2.102
Data General			23.82	10.35	5.05	4.39	4.12	1.349	1.218	1.282	1.369
DEC	12.18	8.58	11.62	8.56	6.07	5.04	5.35	1.779	9.788	−8.504	0.816
HP		10.44	10.13	11.65	7.14	6.44	7.65	8.288	3.598	4.404	5.656
IBM	11.38	11.93	11.37	8.29	7.22	5.34	5.31	3.517	1.422	0.721	1.21
NCR	3.93	3.94	2.25	2.19	2.87	3.34	3.19				
Wang			14.95	2.96	3.67	5.26	5.7	1.289	1.098	1.465	12.709
Non-Excellent Companies (Y)											
Burroughs	2.08	3.65	2.93	3.67	4.17	3.97	2.52				
Commodore				1.97	2.86	4.14	8.83	1.018	1.931	2.088	
Control Data	5.04	1.94	1.74	1.59	2.06	2.6	3.04				
Cray Research				2.17	8.21	12.55	18.64	14.83	1.703	1.244	1.414
Honeywell	5.31	3.9	2.42	2.17	2.89	3.26	3.44				
Prime Computer				3.08	4.88	4.65	9.36				
Sperry	2.89	3.73	3.12	3.15	2.81	3.09	2.93				

1964-1994	Excellent	Non-Excellent
Mean	7.20675	4.237949
Median	5.85	3.12
Std. Dev	4.205749	3.236469
		p < 0.10

TABLE 2. Contingency analysis of CEO change.

	Non-Turnaround	Turnaround	Total
	ROICt-Decline=>ROICt-Turnaround		
CEO Change	6	51	57
% of category	23.08%	**71.83%**	58.76%
% of total	6.19%	52.58%	
No CEO Change	20	20	40
% of category	76.92%	**28.17%**	41.24%
% of total	20.62%	20.62%	
Total	26	71	97
	26.80%	73.20%	100.00%

Hypothesis Two: Organizations (X) demonstrating a performance decline who replace the CEO will be more successful at organizational renewal and turnaround than those Organizations (Y) who do not.

The results provide strong support for this hypothesis where the data indicates that 58.76% of organizations in decline changed the top management position of CEO where this change produced a 71.83% successful turnaround rate. In those organizations that had a performance decline and did not replace the CEO, 76.92% were unable to turnaround the decline. The combined success rate for both groups at turnaround was 73.20% to an ROIC level of pre-decline from the baseline measurement of ROIC at time-1.

Testing Hypothesis Three

To test hypothesis three, select financial ratios from the sample of 132 organizations were examined. After analyzing the data this population was reduced to ninety-seven companies. The logical progression is to examine the relative extent to which restructuring is pursued through asset and cost reduction strategies. In this manner the effectiveness of various tactical strategies and their impact on the organization can be measured.

Hypothesis 3A: The degree of organizational retrenchment is positively correlated to the measure of turnaround success.

Hypothesis 3B: The focus of organizational restructuring produces significantly different results.

Hypothesis 3C: The correlation between the degree of retrenchment and turnaround success is greater in severe turnaround situations.

Hypothesis 3D: The correlation between the degree of retrenchment and turnaround success is greater in retrenchers than non-retrenchers in turnaround situations.

These hypotheses are the essence of strategy design development by quantifying the multiple variables of measurement. They establish a theoretical perspective and support a general strategy of tactical and functional decisions for turnaround based on an objective examination of historical data over a fifteen-year timeline. That general strategy postulates a process flow of actions that the research supports. It suggests a high degree of confidence in the reversal of performance decline through the execution of these tactical axioms (see Figure 1).

Analysis and Results

Retrenchment strategies were operationalized as the net reduction in costs and/or assets between time-2 and time-3. The points of data measurement for each organization was determined by four events; (a) the year of peak performance prior to a performance decline as measured by ROIC, (b) the year of greatest value decline as measured by ROIC, (c) the year both asset and cost reductions cease as measured by the impact on ROA and ROS, and (d) the year firm achieves turnaround as reflected in a unity value, MkBk $> = 1$, with a corresponding return to ROIC at time-1.

Framing the data with these conventions allows the classification of organizations into groups of strategic change behavior. Through the analysis of organizations identified in the literature and in previous studies of turnaround and performance strategies, the researcher has empirically tested the impact of four key tactics; (a) asset and cost retrenchment, (b) cost retrenchment only, (c) asset retrenchment only, or (d) neither tactic used.

For *hypothesis 3A*, a regression analysis of cost and asset retrenchment against turnaround performance was measured using two independent variables (ROA & ROS) and one dependent variable of turnaround performance (ROIC), measured as the net changes between time-2 and time-4. The proposition for the regression procedure was that retrenchment variables will significantly predict turnaround performance. The statistical test used the least-square criterion to produce estimates that are the best linear unbiased estimates under classical assumptions (Neter & Wasserman, 1974).

The model yielded an R-square of 0.60778 that indicates a significant fit between the model and the data (Table 3). The correlation value for ROIC to ROS is .56478 while the correlation of ROIC to ROA is .77956. This indi-

TABLE 3. Analysis of variance on mean performance by degree of retrenchment.

Sample Population (n = 97)	Turnaround ROIC	Turnaround ROS	Turnaround ROA	Turnaround Z-Value	Decline ROIC	Decline ROS	Decline ROA	Decline Z-Value
Median	17.1%	4.0%	3.7%	1.807	6.4%	0.8%	0.9%	1.563
Mean	17.3%	2.8%	3.5%	2.901	4.0%	−1.1%	−0.2%	2.240
Std Deviation	24.2%	8.1%	7.5%	4.590	30.8%	11.48%	11.9%	2.455

Regression Output: (ROIC to ROS & ROA)

	Turnaround				Decline			
Constant	0.08630839				0.045441			
Std Err of Y Est	0.15383805				0.202876			
R Squared	0.60778662				0.578566			
No. of Observations	97				97			
Degrees of Freedom	95				95			
X Coefficient(s)		0.03582816	2.47609929			1.849206	0.1575402	
Std Err of Coef.		0.27563934	0.2954282			0.2796992	0.268325	
Correlations ROIC – ROS		0.56478				0.60833		
Correlation ROIC - ROA		.77956				0.75972		

Degree of Retrenchment

Number of observations in data set = 97
Levels = 4   Values = 1, 2, 3, 4
Severity index: Altman Z-value
Dependent Variables: ROIC
Independent Variables: ROA and ROS

Grouping:	ROIC Mean	Median	Std. Dev.	N
A	21.3%	18.5%	12.4%	47
B	16.3%	14.7%	7.8%	20
C	19.6%	20.2%	6.4%	4
D	2.2%	6.6%	30.3%	26

A = Cost and Asset retrenchment: [+% on ROS and ROA]
B = Cost retrenchment only: [+% on ROS]
C = Asset retrenchment only: [+% on ROA]
D = neither tactic used: Insignificant +/— % ROS and ROA

2-tailed t-test for difference between means

Alpha = .05	Reject Nul	t >= CV
Df = 96	CV = 1.6450	
P = .0006	t = 4.197320	
Retrenchers (n = 71)	ROIC = 19.7%	
Non-retrenchers (n = 26)	ROIC = 2.2%	

Accept hypothesis that the ROIC of retrenchers if >than the ROIC of non-retrenchers.

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cates a strong relationship between the dependent (ROIC) and independent (ROS & ROA) variables with turnaround performance.

Hypothesis 3B tests mean performance compared in pairwise t-tests across the levels of retrenchment where organizations that initiated both cost and asset retrenchment had a significantly higher mean level of turnaround performance (21.3%) than firms that achieved no asset or cost retrenchment (2.2%).

1. Research Question $H_1 \; \mu_{X_{ROIC\;mean}} > \mu_{Y_{ROIC\;mean}}$

2. Null Hypothesis $H_0 \; \mu_{X_{ROIC\;mean}} \leq \mu_{Y_{ROIC\;mean}}$

3. Alternative Hypothesis $H_A \; \mu_{X_{ROIC\;mean}} > \mu_{Y_{ROIC\;mean}}$

4. Statistical Statement:

Statistical Test: Two sample t-test for difference between means

One-tailed test
$\alpha = .05$

Sample 1
n = 48
$\overline{X}$ = 21.3
s = 12.4
s^2 = 153.76
df = 71
$t \geq 3.814592$

Sample 2
n = 25
$\overline{X}$ = 2.2
s = 30.3
s^2 = 918.09

$$\text{critical value} = \frac{\overline{X} - \mu}{\frac{s}{\sqrt{N}}} = 1.6450$$

Reject the null hypothesis at the .05 level of significance because t of 3.814592 is > = the critical value of 1.6450. Support the alternate hypothesis that the ROIC mean is greater for cost and asset retrenchers than for nonretrenchers.

The P value = .00006.

Hypothesis 3C examines severity of decline correlated to the tactical response. An Altman Z value index was used to dichotomize fifty-eight firms into high or low severity, based on the Z value. At time-1 of decline the average Z-value was 1.238 with a mean ROIC of −4.5%. Through the use of

costs and asset retrenchment the average z-value at turnaround was 2.345 with a mean ROIC of 18.6%. These results demonstrated a significant relationship between both cost and asset retrenchment and performance for the group of organizations with the highest severity rating. Both of these tactics are significantly associated with successful turnaround for firms in severe situations.

Hypothesis 3D. The data suggests a positive correlation between ROIC, ROA, and ROS for groups A, B, C, & D. There is a high degree of correlation in determining what relationships are predictive indicators of the various strategies for retrenchment. The retrenchers attained an average ROIC of 19.7% compared to 2.2% for the non-retrenchers, which demonstrates a significant difference in mean levels of improvement.

Table 3 examines how ROIC relates to turnaround success and what strategy it test. ROIC is a measure of costs containment (CGS + SGA + Dep.) and asset utilization (Assets + Inventory + Receivables + Working Capital) represented by a ratio that is indicative of growth in shareholder value. As indicated by the equation: ROIC = ROS × CT; where ROS (return on sales) equals the *costs variable*, and CT (capital turnover) equals the asset variable.

Discussion and Implications

It has been demonstrated in previous research that retrenchment is a necessary and indispensable process in achieving turnaround. As suggested by these previous studies further research is needed to examine the principles in a broader context of cross-sectional industry population samples (see Table 4).

This research has done that and examined the success of varying retrenchment strategies correlated to severity of decline and turnaround as representative in this study. The empirical evidence would suggest the following tactical implications of strategic management in performance decline:

1. Severe performance decline as indicated by an eroding z-value of < 2.1 will require strong costs and asset retrenchment.
2. Moderate performance decline as indicated by an eroding z-value of < 2.4 will benefit from costs control and reduction. Asset retrenchment is necessary if costs control measures are ineffective.
3. Performance growth as indicated by an increasing z-value of > 2.675 will be fueled by strategies of efficiency and expansion.

This research supports a theory of value-based management that is central to managing by the balance sheet. The critical dependent variable in this study is ROIC for it is the benchmark of value creation and a key metric for performance evaluation of corporate performance (see Figure 2).

TABLE 4. Population of organizations in study.

Organizations and Years for Data Collection

Organization	Years	Organization	Years	Organization	Years
Alco Standard	1980-1994	General Electric	1980-1994	Prime Computer	1980-1994
Allegeheny International	1980-1994	General Motors	1980-1994	Proctor & Gamble Companies	1980-1994
Allied Products	1980-1994	General Signal	1980-1994	Proteon Inc.	1980-1994
Allis-Chalmers	1980-1994	General Tire & Rubber	1980-1994	Raytheon	1980-1994
AM International Inc.	1980-1994	Gulf & Western	1980-1994	Revere Copper & Brass	1980-1994
Amadahl	1980-1994	Halliburton	1980-1994	Robintech Inc.	1980-1994
Amax	1980-1994	Harsco	1980-1994	Rockwell International	1980-1994
American Brands	1980-1994	Hartmarx	1980-1994	Rollins	1980-1994
American Express	1980-1994	Hewlett Packard	1980-1994	Salant Corporation	1980-1994
American Home Products	1980-1994	Hills Stores	1980-1994	Santa Fe Railroads	1980-1994
Apple Computer	1980-1994	Household International	1980-1994	Scott Paper Company	1980-1994
Aqualon	1980-1994	IBM	1980-1994	Seagram	1980-1994
ARMCO	1980-1994	IC Industries	1980-1994	Sears Roebuck	1980-1994
Barclays	1980-1994	Interco	1980-1994	Shoney's Inc.	1980-1994
Baxter Healthcare Corporation	1980-1994	ITT	1980-1994	Southdown	1980-1994
Benetton's	1980-1994	K-Mart	1980-1994	Sperry	1980-1994
Borg-Warner	1980-1994	Leaseway Transportation	1980-1994	Standex	1980-1994
Brunswick	1980-1994	Leisure Dynamics	1980-1994	Storage Technology Corporation	1980-1994
Burroughs	1980-1994	Lionel Corporation	1980-1994	Tambrands	1980-1994
Carson Pirie Scott & Co.	1980-1994	Litton Industries	1980-1994	Teledyne	1980-1994
Commodore	1980-1994	Lotus Development Co	1980-1994	Tenneco	1980-1994
Consolidated Food	1980-1994	LTV	1980-1994	The Limited	1980-1994

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Company	Years	Company	Years	Company	Years
Continental Airlines	1980-1994	Manville Corporation	1980-1994	Tiffany & Company	1980-1994
Continental Plastic Containers	1980-1994	Martin Marietta Corporation	1980-1994	Time Warner	1980-1994
Control Data	1980-1994	Mellon Bank	1980-1994	TransAmerica	1980-1994
Corning Glass Works	1980-1994	Minnesota Mining & M	1980-1994	Triarc Companies	1980-1994
Cray Research	1980-1994	Modern Handcraft Inc.	1980-1994	TRW	1980-1994
Curtiss-Wright	1980-1994	Morrison Knudson	1980-1994	Union Carbide	1980-1994
Data Access Systems Inc.	1980-1994	National Distl. & C	1980-1994	United Airlines	1980-1994
Data General	1980-1994	National Services Inc.	1980-1994	United Dominion	1980-1994
Dell Computer	1980-1994	NCR	1980-1994	United Technologies	1980-1994
Detroit Diesel	1980-1994	NEC Technologies	1980-1994	UNR Industries Inc.	1980-1994
Digital Equipment	1980-1994	NL Industries	1980-1994	USX	1980-1994
Dime Savings Bank	1980-1994	Northrop	1980-1994	Vulcan Materials	1980-1994
Dover	1980-1994	Northwest Airline	1980-1994	Walter (Jim)	1980-1994
Eastman Kodak	1980-1994	Norton	1980-1994	Wang	1980-1994
Easton	1980-1994	NVF	1980-1994	Warner Communications	1980-1994
Emerson Electric	1980-1994	Occidental Petroleum	1980-1994	Westinghouse	1980-1994
Federal-Mogul Corp.	1980-1994	Ogden	1980-1994	Wheeling-Pittsburgh St	1980-1994
Figgie International	1980-1994	Onyx Energy Company	1980-1994	Whirlpool	1980-1994
Fuqua Industries	1980-1994	Pfizer	1980-1994	Whittaker	1980-1994
GAF	1980-1994	Phoenix Steel Corporation	1980-1994	Wickes Cos Inc.	1980-1994
GATX	1980-1994	Poloron Products Inc.	1980-1994	Winnebago Industries	1980-1994
Gemini Industries	1980-1994	PPG	1980-1994	Zapata	1980-1994

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FIGURE 2. ROIC tree of organization X managing by ROS, versus competitor Y who manages by the balance sheet and income statement (cost and asset management).
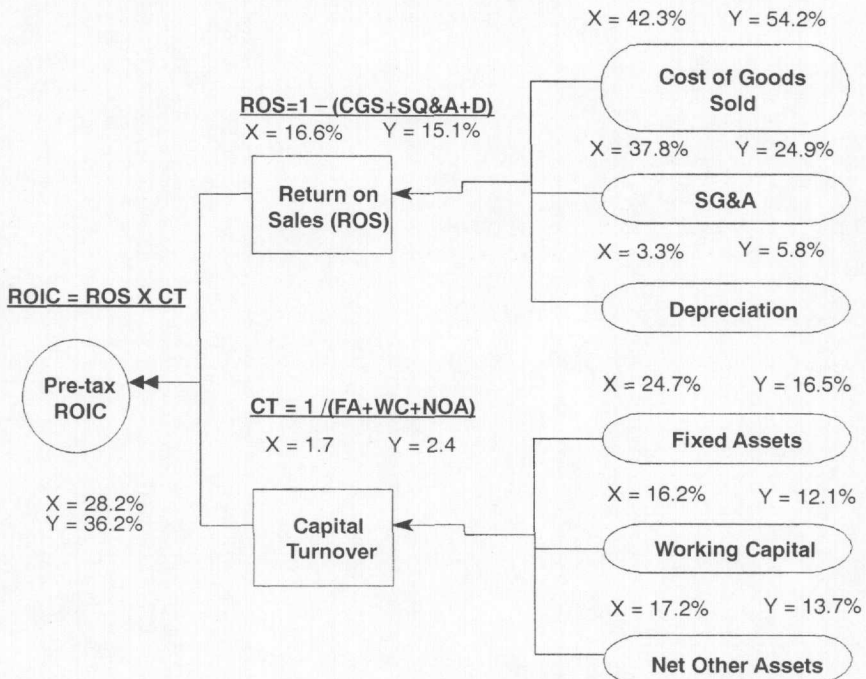
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