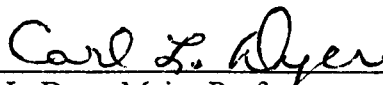


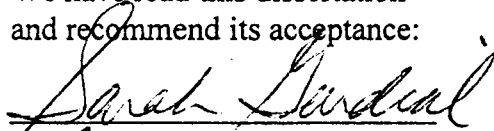
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I am submitting herewith a dissertation written by Linda M. Cushman entitled "Retailing Merger and Acquisition Activity 1973-1992: Pre-acquisition Conditions and Post-acquisition Performance". I have examined the final copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Human Ecology.

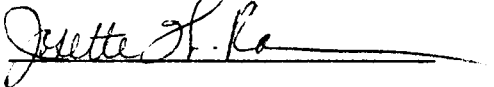


Carl L. Dyer, Major Professor

We have read this dissertation
and recommend its acceptance:







Accepted for the Council:



Associate Vice Chancellor
and Dean of the Graduate School

RETAILING MERGER AND ACQUISITION ACTIVITY 1973-1992:
PRE-ACQUISITION CONDITIONS AND POST-ACQUISITION PERFORMANCE

A Dissertation

Presented for the

Doctor of Philosophy

Degree

The University of Tennessee, Knoxville

Linda M. Cushman

August, 1995

DEDICATION

This dissertation is dedicated to my husband, Jack, and children, Chelsie and Jordan, who have offered their unconditional love and support throughout this process.

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ABSTRACT

Mergers and acquisitions (M&A) have played a fundamental role in changing the face of the retail industry over the past two decades. The FTC and others have listed five motivating factors behind M&A activity, including a desire for profitability in the form of returns, acquisition of undervalued companies, increasing sales growth, and effective utilization of resources. A study of over 450 retail firms (acquiring, targets, and non-active between 1973 and 1992) was conducted to test for pre-acquisition conditions and post-acquisition performance. A total of eleven variables internal to the individual firm, including market-to-book value, firm size, cash flow, earnings per share, price-earnings ratio, growth, liquidity, leverage, and returns (ROE, ROA, and ROS), were operationalized. A GLM procedure and subsequent Bonferroni comparisons showed that, contrary to other published results, only the size of the acquiring firms was significantly different than that of the target firms. However, non-active firms were found to differ significantly from acquiring and target firms in market-to-book value, cash flow, earnings per share, and return on equity. A discriminant analysis was used to determine the value of these variables in predicting the type of activity in which a retail firm may be likely to participate. Accuracy rates of 30.67% for acquirers, 89.19% for targets, and 71.43% for non-active firms were obtained. A post-hoc discriminant analysis indicates that the low rate of accuracy for the prediction of acquiring firms can be explained in the context of the deregulation of the banking industry. The examination of post acquisition performance of acquiring firms indicates that retail firms had significantly lower ROE and earnings, raising questions as to the efficacy of acquisition as a growth strategy.

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CHAPTER I

INTRODUCTION

Throughout the 1980's, mergers and acquisitions helped to change the face of the retail industry. By the end of the decade, many retailing icons had either succumbed to take overs or spent time warding them off. The sheer size of such giants as K mart and Sears no longer protected them from the threat of takeover ("Tumultuous times", 1989). In 1988 alone, nearly 80 retailers including Federated Department Stores and Montgomery Ward were immersed in merger mania (Harrison and Hill, 1989).

The stock-market crash early in the decade, which left many publicly held companies undervalued, and an abundance of financing opportunities, including junk bonds and foreign investments, are among the conditions credited with providing the impetus for the swell of activity (Harrison, 1983; Harrison and Hill, 1989). Though the 1990's have brought yet another change in the retail environment and different motivations, the merger and acquisition (M&A) boom has not yet gone bust.

In a time when the industry is overstored and undercapitalized the financially weak have fallen prey to larger retailers. Experts forecast a continuation of this consolidation, and many retailers, especially those with department store formats, envision these consolidations as a viable survival tactic (Davidson, 1989; Harrison, 1992; "Restructuring", 1989; Schmeltzer, 1994). Many believe that over time the industry will see fewer, larger store chains with the more than 500 chains in business today slimming down to a mere 200 or less by the end of the decade (Harrison, 1992; Schmeltzer, 1994).

Richard Nelson, Jr., a retail analyst with Duff & Phelps, believes that in the department store category not only will there be fewer and larger stores but the surviving store chains will be better (Schmeltzer, 1994). Intuitively, such a progression is quite logical, but is bigger necessarily better? The retail industry has seen nearly two decades of tremendous merger and acquisition activity and has gone through radical change, but to what end?

CHAPTER II

REVIEW OF LITERATURE

The Pressure to Ally

With the enormous volume of alliance activity that has come about in the past decade, there is little doubt that understanding the outcomes of strategic activity is important, but being able to delineate the most favorable conditions for successful outcomes may be of even greater importance. Henry Mintzberg has discussed at length the notion of "crafting" strategy. He stresses the fact that as much as the word strategy is used to describe our intended plans for the future, it also describes our realized patterns of past behavior (Mintzberg, 1987). Along the same lines, it may be helpful when retailers are considering the strategic options available to the firm to "craft" strategy. Sometimes the situation in which a firm finds itself in may drive their strategy. Recognizing such situations and "crafting" a strategy may place the firm back in the driver's seat.

Van de Ven (1976) asserts that organizations, in general, strive to maintain their autonomy and therefore, do not cooperate just for cooperation sake. He offers two reasons which may compell firms to interact: (1) an internal need for resources or (2) an external problem or opportunity. There appears to be no reason why one must assume that one of these reasons must result in the exclusion of the other. In fact, it is likely that the presence of one makes the firm aware of the presence of the other.

In more recent literature, many authors have discussed reasons for alliances which basically maintain that a firm may become aware of an external opportunity or problem which they do not have the internal resources or capabilities to take advantage of or

attend to (Starr, 1991; Contractor, 1987; Harrigan, 1985 to name only a few). Whether it be an economic condition of the time (such as recession) or a condition within the specific industry in which the firm operates (such as saturated domestic markets), a firm may see the need at a given point and time to re-evaluate or craft its corporate strategy according to some circumstances which are not within its control.

Schermerhorn (1975) and others have supported the previous conclusions in their writings on interorganizational cooperation finding that: (1) organizations are likely to consider interorganizational cooperation favorably when they need access to resources that are otherwise unavailable or when such cooperation would allow them to utilize their own firm's internal resources more efficiently, and (2) organizations may seek to cooperate when responding to a crisis or environmental pressures (Clark, 1965; Reid, 1964).

Often conditions arise within the firm that lead the powers that be (usually the CEO) to make the decision to participate in some form of alliance. The type of alliance they choose (or are forced) to enter into often depends, at least in part, on these internal conditions.

A common theme in the literature concerning the motivation to enter into alliances is the role of financial problems or opportunities. In their 1980 study, the FTC has described three specific finance related motives for entering into M&A activity: (1) the opportunity presented when a possible acquisition target's stock is undervalued, (2) to improve earnings per share, and (3) to achieve growth (e.g. sales growth or growth in market share) (Davidson, 1981).

Palepu published a study in 1986 which examined the ability of different models to accurately predict the acquisition of firms. He proposed a model which corrected former methodological flaws and utilized financial characteristics of the firm and industry as the predictive variables. These variables included average excess return on stock, return on equity, annual growth rate of net sales, the debt-equity ratio, the ratio of liquid assets to total assets, a growth-resource dummy, an industry dummy representing acquisition activity within the industry, firm size, market-to-book value ratio, and a price-earnings ratio. The findings indicated that the specified model could not predict the likelihood of takeover six months prior to the actual occurrence any better than the stock market.

This area was further explored in a study performed by Kumar, Kerin & Pereira (1991) who found that retail firms who suffered from lower market-to-book value ratios and higher earnings per share were likely to become targets of an acquisition. Conversely, as the market value of a retail firm increases and the earnings per share decreased, they found that the likelihood of that firm becoming a bidder (acquirer) in an M&A transaction increased.

Becoming a Target Firm

Gilbert W. Harrison (1992), Chairman of Financo, Inc. , reported that consolidation in the retail industry is likely to continue with many predicting that 50% to 75% of today's retailers disappearing within 10 years. Much of this disappearance will come in the form of acquisitions by retail giants.

There have been some empirical attempts to determine those conditions under which a firm may become the target of a merger or acquisition (Kumar, Kerin, and Pereira, 1991; Palepu, 1986; Dietrich and Sorensen, 1984; Stevens, 1973; Simkowitz and Monroe, 1971). The literature suggests that there are certain conditions within the firm which might signal the possibility of such activity (Kumar, Kerin and Pereira, 1991; Palepu, 1986; Gallinger, 1982). This particular situation in which a firm may find itself requires a unique place in the framework due to the fact that cooperative strategies are not often a "choice" for these firms. They find themselves in a defensive rather than offensive position at this point.

Studies have found that the size of the firm, free cash flow within the firm, the ratio of market value of equity to book value of equity, the ratio of a firm's stock price per share to its earnings per share, and the debt-to-equity ratio are just a few of the financial characteristics which may indicate that a firm is in a position to become the target of a takeover (Kumar, Kerin, & Pereira, 1991; Palepu, 1986 among others). It is still debatable how much advance notice these characteristics are likely to afford firms. Some studies indicate that these characteristics may facilitate predictions six to twelve months prior to takeover (Dietrich & Sorensen, 1984; Simkowitz & Monroe, 1971), while others (Palepu, 1986) find these characteristics provide no more forewarning than the stock market.

Flaherty (1991) espouses a computer-based multiple regression model can be an effective tool for garnering worthy candidates for acquisition. By choosing industry related "value drivers" (i.e., R&D expenditures for technology related firms) to act as

independent variables and the net present value of firms involved in past deals to act as the dependent variable, a regression model can be created which has reasonable and define predictive capability.

Becoming an Acquiring Firm

Although the 1980's could be characterized as a great time to sell a business, conditions in the 1990's have changed (Shultz, 1992). Still, even in a time of virtually non-existent acquisition financing and declining corporate earnings, Kevin W. Shultz (1992, p.15) declares the 1990's a "terrific time to buy a business--if you know where to look." He suggests obtaining an interest in the reorganization and buying a business out of bankruptcy.

This interest in the reorganization can be obtained by directly approaching the debtor and making an acquisition offer, working with a group of creditors of the firm to form a plan for reorganization, or tendering an offer to acquire the public debt (Shultz, 1992). Zell/Chilmark Partners took control of the public debt of Carter Hawley Hale then traded its claims for a substantial interest in the company, including a majority of the board seats (Shultz, 1992).

Retailing M&A Activity

The discussion that follows examines merger and acquisition as a strategic option available to retailers today, it's worth in the competitive retail marketplace and the need for scholarly research in this area. It represents an examination of the pre-acquisition or "antecedent" conditions of the firms participating in merger and acquisition activity in the retail industry, and specifically, the relationship of those conditions to the post-acquisition

success of the M&A activity. The discussion centers around the enormous wave of merger and acquisition activity in the retail industry in the 1980's and the strategic impact that this activity might have on the field in the 1990's and beyond.

Although many firms within many industries have utilized different types of alliance strategies at some point in their evolution, the 1980's in retailing saw an unparalleled acceleration of strategic alliance activity that promises to continue into the 1990's and beyond. From the international joint venture between Kroger Co. and Daiei, Inc. early on to the Federated-Allied M&A fiasco engineered by Robert Campeau later in the decade, the 1980's was a period of excess and prodigious change.

Nearly one half of all companies operating in the United States are in the retail industry (Harrison, 1983). According to Mergers and Acquisitions (1990), the U. S. retail industry ranked seventh in total number of mergers and acquisitions and a very costly fourth in terms of dollar volume. Foreign purchases of U.S. firms accounted for approximately 125 of those acquisitions, totaling 16.72 billion dollars (Sikora, 1990).

Kerin & Varaiya (1985) noted an unfortunate lack of scholarly consideration of M&A activity in the retail industry. Interestingly, their article points out that, although the industry has consistently ranked in the top ten in dollar value and numbers of transactions, not only have retailers been involved in some of the biggest M&A disasters of the decade, but case study evidence has raised questions about the profitability of retail acquisitions. What conditions have given rise to such a tremendous volume of retailing M&A activity?

Pre-acquisition Conditions

External conditions. Certainly the state of the retail industry has had a substantial impact in this area. Coming out of the late 1970's and through the early 1980's, which has been characterized as a time of variety in financing (including the well known era of the junk bond) and extremely high purchase multiples (Shultz, 1992), the industry has been characterized as "overstressed" and "undercapitalized" (Forbes, 1993; Hazel, 1993; Schmeltzer, 1994). Following a period known as the malling of America, consolidation has become the norm. From single units to entire shopping malls, many realtors recognize acquisition may be the only viable alternative for substantial growth (Hazel, 1993).

Thomas Lardner, President and CEO of L&B Group, concedes that because of the "strain in the financial markets" (Hazel, 1993 p. 33) there are some cost advantages to purchasing properties. Through a clientele that is not heavily leveraged, the L&B group has focused on the purchase of survival properties that were able to withstand the downward trends in the market.

In the later part of the 1980's, however, a depressed real-estate market and slowing construction dulled the trend toward acquisition as well. Owners held onto strong properties which they perceived to be undervalued instead of selling at a significant loss. Richard Kateley has said that investors were basically angry over events in the market which slowed lending and investment.

Hazel (1993) has focused on two recent phenomena which might aid in the bounceback of the retail/ real estate, acquisition market: real estate investment trusts

(REITs) and bullet loans. She states many REITs are formed for the purpose of growth by acquisition using the influx of capital to attract sellers. In addition, many bullet loans issued in the late 1980's, extending for a period of three to five years, are now coming due. To companies possessing such loans, liquidity is a necessary objective which often provides incentive to sell.

Bullet loans were not the only force driving the desire for liquidity among retailers. By the early 1990's, personal income levels were slowing, real disposable income falling, and unemployment was rising (Harrison, 1992). All of these conditions have a tremendous impact on consumer spending which was characteristically sluggish during these times. Other retailers, who might otherwise have been in position to acquire further holdings, were forced to reconsider due to the substantial ratios required by lending institutions (Harrison, 1992).

Internal Conditions. Historically, potential buyers of retail organizations have not always been abundant. However, willing sellers of retail establishments have often been plentiful. Some retailers (generally those valued between \$5 million and \$75 million) have aspired to become part of more sizable businesses (Harrison, 1983). Other factors, such as increased markdowns and the personal desires of family owner/operators, have also spurred the sell-offs. In fact, empirical and anecdotal evidence indicates that retailers may often be willing to become the target of an acquisition.

Kerin and Varaiya (1985) found that in a small sample of retailing acquisitions occurring between 1976 and 1983 premiums paid over the preacquisition share price

averaged nearly 70%. For many family-owned retailers and smaller retail chains, the offers were simply too good for shareholders to resist.

As stated, some smaller retailers aspire to become part of larger businesses (Harrison, 1983), but in recent years, many have found acquisition of some or all of their business assets to be a pathway out of Chapter 11 and a shelter from the takeover threats. This was probably never more evident than at the end of the 1980's when the futures of such well known businesses as Bloomingdale's, Rich's, Jordan Marsh and Burdines were riddled with uncertainty due to the financial troubles of parent company Campeau Corporation, and many other retailing icons were forced into Chapter 11 or were under threat of takeover (Sloan, 1989).

In a study of 36 matched pairs of retailers and 36 firms who had not participated in any M&A activity, Kumar, Kerin, and Pereira (1991) have identified several variables that have a significant affect on M&A activity. The variables identified included certain finance-related variables (market-to-book value, earnings-per-share, cash flow, and debt to equity) which had been determined in various bodies of literature to be associated with M&A activity.

Some of the independent variables were included on the basis of anecdotal evidence concerning market presence (firm size, market share, etc.), extent of diversification (which included number of retailing SIC codes the firm participated in), and the amount of previous acquisition activity. Sales growth and number of years in existence were not found to be significantly different between acquiring firms, target firms, and firms who did not participate in M&A activities.

Post-acquisition Performance

Experts have concluded that mergers and acquisitions can be motivated by a variety of factors. Among the most often mentioned are the desire to acquire companies that are thought to be undervalued, increasing profitability, market expansion or product expansion with little risk, increasing earnings per share and achieving rapid growth (Benston, 1980; Davidson, 1989; FTC Research Studies as reported in Davidson, 1981; Hazel, 1993; Mueller, 1980). A brief review of the extant literature which examines these motivations and others follows in the context of recent merger and acquisition activity in the retail industry.

Profitability. Though the quest for profit would appear to be the most obvious factor motivating many merger and acquisition activities, many researchers and industry experts question the ability of the M&A activity to provide profits for the acquiring firm (Davidson, 1981; Fifth, 1979; Mueller, 1980; Mueller, 1977; Salter and Weinhold, 1979). In fact, Mueller (1980) reported that the profit rates in a sample of over 200 U.S. acquiring firms dropped in the three year period after a merger and that the industry actually performed better than the merging firms on all profit measures (i.e. pretax profit-equity, posttax profit-equity).

To be sure, profit can be measured in a variety of ways, but economists generally agree that, on average, merger activity provides little benefit to the firm (in terms of profitability, etc.) or to society (in terms of price reduction, etc.). These concessions, occurring after a large wave of mergers in the 1960's, spurred a new round of

investigations by the FTC in the early 1980s. What was the impetus behind the most recent wave of merger activity?

Acquisitions of undervalued companies. The Federal Trade Commission published a study in 1980 which reported that the perceived undervaluation of a firm's common stock by the stock market results in that firm becoming an appealing candidate for acquisition. More recently, in the retailing literature, empirical studies have supported this assertion, reporting that firms who have been acquired by another firm have had significantly lower market-to-book valuation (Kerin and Varaiya, 1985; Kumar, Kerin and Pereira, 1991).

Anecdotal evidence also supports the basic premise of the "undervaluation hypothesis," purporting that the replacement value of the assets of the firm are understated in market value terms thus making it more economical to buy than to build (Hazel, 1993; Kerin and Varaiya, 1985). Even real estate investors such as Dallas-based L&B Group have cashed in on the overstored and undercapitalized state of today's retail industry (Hazel, 1993).

Kerin and Varaiya (1985, p. 14) state that the rationale underlying this theory suggests that "gains arise from the perception of the acquiring firm that the preacquisition market price per share of the acquired firm understates its 'intrinsic' worth." The authors found that in the sample of retail acquisitions investigated the market-to-book value ratio offered was as much as 3.7 times the preacquisition book value. Interestingly, using a shareholder value-based framework, the authors concluded that there is indeed reason to question whether growth by acquisition offers value creation for shareholders.

Rapid sales growth. As stated earlier, conditions have swelled over the past decade within the retail industry making acquisition a popular and often necessary strategic choice for growth. There appears to be an assumption in business that growth is good. Though often unarticulated, the cessation of growth, to many, signals the genesis of death (Davidson, 1981). Acquisition provides an immediate increase in sales and asset value often with substantially less risk than an internal venture of the same magnitude would require (Kerin and Varaiya, 1985).

Effective utilization of resources. The experts in Boucher's study consider this particular motivation among the top ten reasons that mergers occur (Davidson, 1981). With the retail industry undergoing tremendous change, the effective utilization of "physical plant and individual skills" would probably rank much higher. Acquiring retail businesses is often seen as a prime way of obtaining choice real estate or market opportunities and decreasing fixed costs on a per store basis (Schmeltzer, 1994).

The purpose of the research presented is twofold: 1) to determine whether significant differences do indeed exist in the pre-acquisition conditions of retail firms and further, to determine if such conditions are useful in the prediction of the specific role a retailer will play in future acquisition activity. 2) to examine the performance of firms within the retail industry between 1973 and 1992 in order to determine if merging firms met the objectives which experts agree are most common in motivating M&A activity.

Research Questions

1. *Certain characteristics of a retail firm, including the market-to-book value, sales, price-earnings ratio, growth, liquidity, leverage, earnings-per-share, cash flow, and returns differ significantly among those firms who subsequently acquire another firm, become the target of an acquisition, or choose not to participate in acquisition activity.*
2. *Certain characteristics of a retail firm, including the market-to-book value, sales, price-earnings ratio, growth, liquidity, leverage, earnings-per-share, cash flow, and returns are useful in predicting those firms who will become bidders in acquisition activity and those firms who will become the targets of acquisition activity.*
3. *The acquisition of retail firms has resulted in better-than-industry average performance for those retailers who participated in acquisition activity over the past two decades.*
4. *The internal conditions within an acquiring retail firm are correlated to the performance of the acquiring firm after the merger and acquisition activity has taken place.*

CHAPTER III

METHODOLOGY

Data

The sample consisted of approximately 179 retail firms who had acquired another firm, 148 retail firms who had been the target of an acquisition, and 133 retail firms who had not participated in M&A activity for at least ten years. These firms were drawn from the Compustat Industrial and Research Files and represented those firms having the available data to be included in the statistical analysis. Only M&A activity occurring between 1973 and 1992 was included in the sample.

Data from a total of 194 retail firms were collected to act as a control group for the study. These firms consisted of those registering no merger or acquisition activity for a ten year period. A year was randomly picked to act as the "non-active" year and the three years prior were averaged to parallel the pre-acquisition averages for the target and acquiring groups. Similarly, the three years after the "non-active" year were averaged to parallel the post-acquisition averages in the target and acquiring groups.

As indicated in figure 1, the retail industry was defined as those firms operating in any of eight two-digit SIC codes ranging from 52 (Building Materials) to 59 (Miscellaneous Retail). The Compustat data files compile financial and other data from firms listed on the American, New York and NASDAQ stock exchanges, all companies not listed on the exchanges who report over \$200 million in total business and various

SIC 52	SIC 53	SIC 54
5200-Building Materials, Hardware, Garden Retail 5211-Lumber & Other Building Material Retail 5271-Mobile Home Dealers	5311-Department Stores 5331-Variety Stores 5399-Miscellaneous General Merchandise Stores	5400-Food Stores 5411-Grocery Stores 5412-Convenience Stores
SIC 55	SIC 56	SIC 57
5500-Auto Dealers, Gas Stations 5531-Auto and Home Supply Stores	5600-Apparel and Accessory Stores 5621-Women's Clothing Stores 5651--Family Clothing Stores 5661-Shoe Stores	5700-Home Furniture and Equipment Stores 5712-Furniture Stores 5731-Radio, Television Electronics Stores 5734-Computers and Computer Software 5735-Record and Tape Stores
SIC 58	SIC 59	
5810-Eating and Drinking 5812-Eating Places	5900-Miscellaneous Retail 5912-Drug and Proprietary Stores 5940-Miscellaneous Shopping Goods 5944-Jewelry 5945-Hobby, Toys Games 5960-Nonstore Retailing 5961-Catalog, Mail Order 5990-Retail Stores	

Figure 1. Compustat Data Categories Included in Sample

foreign firms by request. The sample of 154 acquiring firms were generated by computer as those firms who listed a merger or acquisition during the years under investigation. The data for the variables of interest were then extracted and averaged for the three years prior to the acquisition and the three post-acquisition years. The three-year average has been used in the literature to capture stability and trends (Kumar, Kerin, and Pereira, 1991).

The data for the retail industry were gathered from the Compustat Aggregate Industry files and averaged for the three years before and after each acquisition year and matched with all appropriate sample firms in each of the eight two-digit categories. This was done to insure that the three year averages for each firm in the sample could be examined with the corresponding three year industry averages.

The independent and dependent variables were operationalized as follows:

1. **Cash Flow** - Higgins (1989) has defined cash flow as the flow remaining after all worthwhile investments have been financed. Within this definition "cash-rich" firms and "cash-poor" firms exist. These two types of firms have a "natural affinity" for each other which often results in M&A activity (Kumar et. al, 1991). The bidder firm most often has the greater cash flow (Caves, 1989). Free cash flow is defined here as a firm's operating income before depreciation less the firms expenses, dividends and taxes.
2. **Undervalued Common Stock** - Kerin and Varaiya (1985) have documented research that indicates that undervalued common stock is often motive for acquisition activity. Kumar, Kerin and Pereira (1991, p.332) found that target firms' stocks were "relatively more undervalued than bidders or non-bidder/target firms". The market-to-book value ration (M/B) is determined using the price at close value times the common shares divided by the common equity total (Palepu, 1986; Kumar et. al, 1991).

3. **Price-Earnings Ratio** - This variable is defined as the stock price per share divided by the earnings per share for the three years previous to activity. The P/E ratio has been found to be a factor in the motivation to acquire a firm. Generally a firm with a higher price to earnings ratio may seek out a firm with a lower ratio to enjoy immediate capital gains (Palepu, 1986).
4. **Liquidity** - The recent finance literature has suggested that resource poor firms with a high growth rate may be attractive as targets of an acquisition (Palepu, 1986). Liquidity is defined as the average ratio of net liquid assets of a firm to its total assets for the three years prior to the activity.
5. **Firm size** - This variable is defined as the total assets of the firm measured at the year end immediately prior to the observation year. One would expect acquiring firms, who often use acquisition as their corporate growth strategy, to be very large.
6. **Sales Growth** - as stated, acquisitions and other strategic alliances are often used as a corporate growth strategy, often in the form of sales growth. Higgins (1989) found that a firm may seek a merger partner who is cash rich when the firm's actual growth exceeds its sustainable growth. If the reverse is true, the firm may consider acquisition. This variable is operationalized as return on equity times retention ratio (sustainable growth)/ actual growth. (Kumar et. al, 1991).
7. **Leverage** - Rappaport (1987) has noted that the using debt to fund operations and debt capacity often influences M&A activities among firms. Firms who are likely to become targets of an acquisition can be expected to have a higher debt-to-equity ratio (cash-poor) than those who are likely to acquire a firm (generally, cash-rich) (Kumar et. al, 1991; Caves, 1989; Palepu, 1986).
8. **Earnings per share** - The Federal Trade Commission (1980) and others have stated that management within a firm often believe that acquisition will strengthen their firms earnings. Kumar, Kerin and Pereira (1991) supported the fact that firms likely to become targets of an acquisition had higher reported earnings per share than did acquiring firms.
9. **Return on Sales**-The ratio of net income to total sales is used in this case to represent the market performance of a firm or industry. This is only one of many performance measures found in the literature. The rate of return on sales is used as a performance measure here because it speaks to the profitability of the firm and is comparable across all firms within the

industry. Return on sales is operationalized as the total sales of a firm divided by the preferred stock plus common equity.

10. **Return on Equity** - The average return on equity is included as a market performance measure for the firms. It is expected, much the same as is the case with earnings, that those firms experiencing the greater ratio of net income to common and preferred equity would likely be targets of acquisitions. Return on equity is operationalized here as the firm's net income divided by preferred stock plus common equity.
11. **Return on Assets**- The average return on assets has been utilized in many empirical studies to indicate performance of the firm though these studies have often been criticized for failing to allow for changing conditions within the industry (Benston, 1980; Conn, 1976; Winslow, 1973; for a thorough review see Mueller, 1977). Experts often cite the need to increase "utilization of present resources" as a motive for M&A activity (Boucher study as cited in Davidson, 1981 p. 20). The return on assets variable can be operationalized as the total assets of a firm divided by the preferred stock and common equity figures for the firm.

Method

Investigation of pre-acquisition conditions. The general linear models procedure was utilized to test for possible differences in each of the internal variable between acquiring firms, target firms and non-active firms. Previous literature has shown that differences do indeed exist in samples of retail firms as well as in samples which encompass firms from a variety of industries (refer to Appendix A for examples). Cash flow, market-to-book value of stock, price-earnings ratio, liquidity, firm-size, sales growth, leverage, earnings-per-share, and return on equity have all been found to differ between groups in various extant literature. Because the literature has yet to examine the enormous amount of activity which consumed the retail industry in the late 1980's and early 1990's, this portion of the study attempted affirmation of earlier results.

Before analyzing the hypotheses proposed, the internal variables were tested for possible multicollinearity (See Table A-2 in Appendix C). These tests were negative showing no sign of multicollinearity in the internal variables under investigation.

Research question number one required a two-step procedure. First, to determine which variables were most useful in predicting whether a firm would become an acquiring firm, a target firm, or remain non-active in M&A activity, a backward stepwise discriminant analysis was conducted. This procedure was used to eliminate any variable not significant to the analysis at $p < 0.1500$.

In this portion of the analysis, the three year, pre-activity averages of all variables were input into the analysis. Due to missing data in the "non-active" data set the average sales growth variable had to be eliminated. Because the stepwise discriminant analysis procedure will drop any observation with a missing data point, allowing the sales growth variable to remain in the analysis caused a significant decrease in the number of non-active firms available for investigation. The procedure itself resulted in the removal of the price-earnings ratio and return on assets variables.

After all non-significant variables had been removed, a discriminant analysis procedure was performed utilizing only those variables found to be significant in the backward stepwise analysis. As a result, the discriminant function was created using average market-to-book value, firm size, cash flow, liquidity, earnings-per-share, return on equity, return on sales and leverage. This step created a discriminant function which, using a cross-validation procedure, was then able to predict which type of activity a firm might be likely to participate in. From this procedure, the percentage of correct

predictions was obtained and reported as evidence of the accuracy of the function. The extant literature has reported prediction accuracies of between 60 and 80 percent using a variety of statistical prediction procedures.

Investigation of post-acquisition performance. In order to determine if, as experts suggest, retail firms are motivated to participate in acquisitions by the realization that the assets of the possible target firm are undervalued by the market, the mean market-to-book value of the acquiring firms for the three years prior to the acquisition was compared to the mean market-to-book value of the target firms in the three years prior to be acquired using a t-test procedure. A significant difference in the means would indicate whether undervalued common stock could have been a possible motivation for merger and acquisition activity.

To examine whether acquiring firms in the retail industry had performed significantly better during the period under investigation, the difference between the average return-on-equity for the time-period before and after the acquisition was calculated for each retail firm in the sample. A similar calculation was made for each of the other rate of return performance variables of interest.

Experts have stated that many firms enter into merger and acquisition to experience more rapid sales growth and/or increase earnings per share. To examine the acquiring firms performance in these areas, a paired t-test procedure was used to determine if the average growth of firms before the acquisition was significantly different than the average post-acquisition growth. The average earnings per share were examined in an analogous procedure.

A sign rank procedure was then performed to determine the number of acquiring firms exhibiting a positive/negative change in return-on-equity post-acquisition and to determine if the trend exhibited was significant. Similarly, return-on-sales, return-on-assets, sales growth and earnings were examined.

To complete the analysis of post-acquisition performance, the average returns on equity, sales and assets were examined in an Analysis of Covariance procedure using the 3-year, prior/post acquisition, industry averages as the covariate. In the extant literature, Conn (1976) and Mueller (1977) have provided evidence that conclusions based on a firm's own accounting determined return-on-assets or equity are often unreliable as indicators of success. Using industry averages from corresponding years as a covariate can help to eliminate variations in performance that may actually be an outcome of industry fluctuations.

Finally, a preliminary attempt was made to examine the possibility of a relationship between the conditions that exist within an acquiring firm pre-acquisition, have any bearing on the success or failure of the acquisition. Using returns on equity, sales and assets as a measure of success, three regressions were performed in which all internal variables (excluding the returns measures) were regressed on each return measure individually.

CHAPTER IV

RESULTS

Sample Characteristics

Acquiring Firms

The sample under investigation in this research consisted of 179 retail firms that had acquired another firm during the years between and including 1973 and 1992. Though the firms included in the sample fell into twenty four different 4-digit SIC categories, the largest concentrations of firms were classified as eating establishments, drug stores, grocery stores, catalog/mail order, and apparel/accessory stores. (See Figure 4-A in Appendix C.)

Target Firms

The sample consisted of 302 retail firms that had been successfully acquired during the years between and including 1973 and 1992. Nearly 25% of all target firms in the sample fell into the 5812 SIC category for Eating Places. Because the sample was computer generated choosing any firm listing an acquisition during those years from the Compustat database, it is reasonable to believe that this is representative of the activity in the retail industry and most likely is a product of the sheer number of firms operating in that SIC category. (See Figure A-5 in Appendix C.)

Non-Active Firms

194 retail firms that were not active in merger and acquisitions during any ten year period of time between 1973-1992 were also included in the study. These firms represented a control group or "other" strategic options available to firms. Though the

firms were distributed across the SIC codes as in the target and acquiring groups, the largest portion of non-active firms fell into the category of variety stores and grocery stores. (See Figure A-6 in Appendix C.)

Two-Digit SIC Classification

Table 1 provides a visual representation of the breakdown of the sample by type of activity and two-digit SIC category. It is interesting to note that, in nearly every category, the number of firms that became the target of an acquisition surpassed the number of firms who acquired other firms. This outcome seems quite plausible due to the fact that the sample consisted solely of retail firms. Those acquisitions of retail firms which were instigated by firms who primarily participate in other industries would also be included and over the past decade, anecdotal evidence suggests that retail firms have become enticing targets of holding companies and firms who wish to become more vertically integrated.

The only exception to this finding was in the category for apparel and accessory stores where the number of acquiring firms was double that of target firms. From this, one might infer that apparel and accessory retailers are participating in acquisitions which serve to diversify their operations, either in other retail sectors or in other industries.

Number of Observations per Year

The observations within the sample were well distributed across the time-span under investigation. A slight increase in the number of observations can be seen in the mid-1980's which is consistent with reports in the literature of a rise in M&A activity at that time. A rather significant drop also occurred in the number of observations around

Table 1

Number of Firms in Total Sample Categorized by SIC Classification and Firm Type (Acquiring, Target, or Non-Active).

SIC Code	Classification	Acquiring Firms	Target Firms	Non-Active Firms
5200	Building Materials	9	19	8
5300	General Merchandise	21	30	41
5400	Food Stores	16	22	31
5500	Auto Dealers and Service Stations	5	20	13
5600	Apparel and Accessory	28	14	21
5700	Furniture and Home Furnishings	11	32	9
5800	Eating and Drinking	36	76	26
5900	Miscellaneous Retail	53	89	45
Total		179	302	194

1989-1992 which is also consistent with reports that the number of mergers and acquisitions had dropped off due to difficulty in financing the activity and in favor of other forms of alliance (see Appendix A for a review). (See Table 2.)

Analyses of Research Questions

Pre-acquisition Conditions

As discussed, the extant literature from a variety of research fields has indicated that certain variables within the firm participating in merger and acquisition activity do exist between those firms who participate as an acquiring firm and those who participate as the target of an acquisition. Because to date only one study is known to test firms within the retail industry specifically, further testing of these hypothesized differences was necessary to strengthen generalizability to the retail industry overall.

The internal variables were tested via a general linear models procedure to determine if the 3-year average prior to the acquisition differed between acquiring firms, target firms, and non-active firms. The results indicate that there are significant differences between the average market-to-book value, average firm size, average cash flow, average earnings per share and average return on equity of acquiring, target firms and non-active firms active in the time period between 1973 and 1992. (See Table 3.) Contrary to the results of some previous research, significant differences of the remaining internal variables were not identified. The study reported here encompasses a much larger sample and a greater time-span than has been previously examined which may account for inconsistencies between this and previous research.

Table 2

Number of Firms in Total Sample Categorized by Firm Type (Acquiring, Target, or Non-Active) and Year.

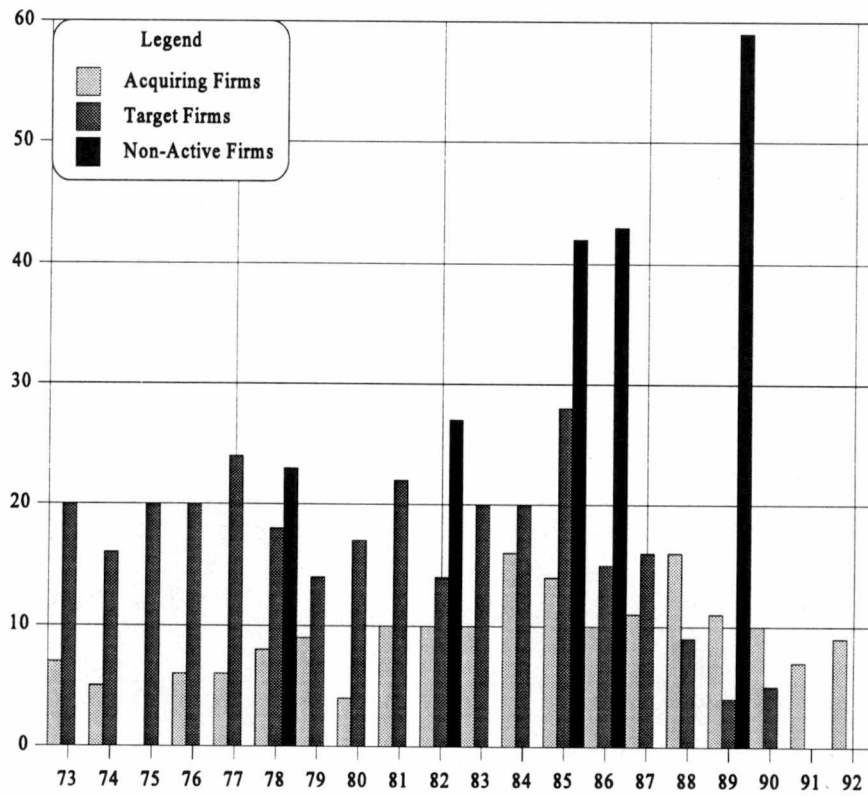


Table 3**Test for Significant Pre-Acquisition Mean Differences in Acquiring Firms, Target Firms and Non-Active Firms Between 1973 and 1992.**

(GENERAL LINEAR MODEL PROCEDURE RESULTS)

Dependent Variable	F Value	Pr>F
Average Market-to-Book Value	5.01	0.0070
Average Firm Size	15.58	0.0001
Average Price Earnings Ratio	2.04	0.1314
Average Growth	1.23	0.2685
Average Cash Flow	41.23	0.0001
Average Liquidity	1.68	0.1882
Average Earnings Per Share	12.64	0.0001
Average Return-On-Equity	37.41	0.0001
Average Return-On-Sales	0.23	0.7922
Average Return-On-Assets	0.41	0.6669

Additionally, firms were not paired in the present sample in order to enable a larger sample and to speak to the internal characteristics of acquiring or target firms without regard to which partner is subsequently chosen.

The Bonferroni multiple comparisons tests provide further explanation indicating that the market-to-book value averages of non-active firms was significantly higher than those of acquiring and target firms. However, there is no significant difference between the acquiring and target firms themselves. The same is true for the return on equity and earnings per share variables. Although the values of these variables were consistently

higher, the difference was slight, indicating that acquiring firms and target firms in this particular sample were far more similar than previous research had indicated.

The average firm size of acquiring firms was found to be larger than both the target and non-active firms. No significant difference was detected between target and non-active firms with target firms being only slightly smaller than non-active firms on average. These results would seem to support anecdotal evidence that suggests that firms participating in M&A activity as an acquiring firm, often use M&A as their main growth strategy. (See Figure 2.)

Discriminant Analysis

The test for multicollinearity indicated that no problems existed within the variables under investigation and the study proceeded. In order to determine the value of the internal conditions of a firm in subsequently predicting whether a firm will become the target of an acquisition, will participate as an acquiring firm or in no M&A activity, a multivariate discriminant analysis procedure was performed.

The backward stepwise discriminant procedure and insufficient data resulted in the removal of three variables from the original group of eleven independent variables. The variables removed included the growth variable due to insufficient data and two non-significant variables, return on assets and price-earnings ratio. (See Appendix B for computer analysis output.)

163 acquiring firms, 148 target firms and 133 non-active firms had the requisite data and thus were included in the discriminant analysis procedure. The resulting discriminant function and subsequent resubstitution procedure resulted in 50 acquiring

Average Market-to-Book Value

Acquiring Firms & Target Firms	
Acquiring Firms & Non-Active Firms	***
Target Firms & Non-Active Firms	***

Average Return on Equity

Acquiring Firms & Target Firms	
Acquiring Firms & Non-Active Firms	***
Target Firms & Non-Active Firms	***

Average Earnings Per Share

Acquiring Firms & Target Firms	
Acquiring Firms & Non-Active Firms	***
Target Firms & Non-Active Firms	***

Average Firm Size

Acquiring Firms & Target Firms	***
Acquiring Firms & Non-Active Firms	***
Target Firms & Non-Active Firms	

Figure 2. Bonferroni (Dunn) T tests for Comparison of Internal Variables Determined to be Significantly Different by General Linear Models Procedure

firms (30.67%), 132 target firms (89.17%) and 95 non-active firms (71.43%) placed in the correct classifications.

The results depicted in Table 4 indicate that the discriminant function is able to classify firms more accurately than would occur by chance with the exception of the classification of acquiring firms which fell slightly below. This particular function was able to predict with great accuracy the probability that a retail firm would become the target of an acquisition. It is important to note that, unlike some of the previous examinations of this topic, the variables used in this research are public domain and thus easily attainable for any retailer who might wish to analyze the situation of a prospective target firm or of their own firm in the marketplace. (See Appendix B for detailed resubstitution results.)

Table 4

Results of Discriminant Analysis of Pre-acquisition Means for Acquiring Firms, Target Firms, and Non-Active Frims Between 1973-1992.

From Source	Acquiring Firms	Target Firms	Non-Active Firms	Total
Acquiring Firm	50 30.67%	112 68.71%	1 0.61%	163 100.00%
Target Firm	11 7.43%	132 89.19%	5 3.38%	148 100.00%
Non-Active Firms	9 6.77%	29 21.80%	95 71.43%	133 100.00%
Total Percent	70 17.77%	273 61.49%	101 22.75%	444 100.00%

Post Hoc Investigation of Banking Deregulation

The apparent discrepancy between the low accuracy in predicting acquiring firms in this research and that of previous authors who have indicated a significantly higher predictive accuracy of these and other variables internal to the firm (mostly financial, as represented here, although some marketing and corporate related variables have been utilized in other work), called for further investigation.

The literature has indicated that the retail industry has been not only active but often turbulent over the past two decades. Because the time period under investigation in this study is larger than that included in previous research and covers this turbulent period in retail history, it becomes appropriate to consider the predictive accuracy of these variables in relation to specified time periods throughout the twenty year period.

In the early 1980's, just after President Reagan took office, the deregulation of the banking industry took place. Anecdotal evidence suggests that this was a significant event for the retail industry as well making money available (in the form of junk bonds, etc.) to retailers and private investors who may not have had the strongest potential to become an acquiring participant in M&A activity.

In order to investigate the possible impact of the deregulation, the original sample was divided into three distinct time periods. The first period (Before Deregulation) consisted of firms participating in M&A activity or remaining non-active from 1973 through 1981. The second period (During Deregulation) consisted of M&A activity from 1982 through 1987 in order to allow for the actual event and its impact. Finally, M&A

activity from 1988 through 1992 was used to represent the After Deregulation time period when the learning curve could possibly begin to impact the industry.

The multivariate discriminant analysis procedure was again utilized to determine predictive accuracy but for this post hoc investigation a separate procedure was performed for the time periods before, during and after deregulation of the banking industry. This time-dependent classification provides very useful information.

In the *before* deregulation time period, the model performs fairly well in all three areas. The accuracy of classification of acquiring firms is 56.52% which is far greater than the result from the original discriminant analysis which resulted in 30.67% accuracy for the twenty year time period. The *before* analysis has no difficulty predicting those firms who will not participate in M&A activity based on this group of internal variables.

The time period *during* deregulation brings significantly less accuracy in the ability of these variables to predict which firms will become acquiring firms in M&A activity though the target firm and non-active firm accuracies remain high. After the fall out in the banking industry (i.e. failure of savings and loans and bankruptcies of major retail players) had occurred, the accuracy of these internal variables to predict acquiring firms soars to 93.62%. Again, the accuracy of prediction of target firms and non-active firms remains high.

It appears, based on the classification and misclassification of acquiring and target firms, that in the time period *before* deregulation, many financially strong retail firms were acquiring other financially strong retail firms. The rest of the activity took the traditional form of financially strong firm acquiring a firm which was somewhat weaker

financially. Then, when deregulation occurred and the marketplace was trying to adjust, many financially weak retailers were participating as acquiring firms in M&A activity. This may have been an attempt to spur growth instigated by the easy availability of loans and positive economic growth. During this time, the internal variables associated with acquiring firms resembled those of target firms in over 58% of the observations. (See Table 5.)

In the *after* deregulation time period, firms appear to have settled back into what can be deemed from the extant literature as normal patterns of behavior. Acquiring firms are easily identified as those who are financial strong and large in size while target firms are often financially weaker and/or smaller in sales volume.

It is important to acknowledge that this time period was smaller in number of observations available for use, though a possible limitation of the study, is consistent with evidence that the number of M&A activity is slowing. Additionally, the target firms appear underrepresented in the *after* deregulation time period. It may be that the many reports of disastrous bankruptcies in the retail industry and harder economic times have combined to make retail firms less desirable. However, the results are strong indication of the possible impact of this event and merit further investigation.

Post-acquisition Performance

Examination of the market-to-book value averages of acquiring and target firms in the sample provides no overall support for the contentions in the literature that acquiring firms often enter into M&A activity to obtain a firm which they perceive to be undervalued by the market. (See Table 6.) Although some firms may indeed be taking

Table 5

Post Hoc Discriminant Analysis of Retail Firms for Time Periods Before, During, and After Deregulation of the Banking Industry.

Before Deregulation (1973-1980)

From Source	Acquiring Firms	Target Firms	Non-Active Firms	Total
Acquiring Firms	26 56.52%	20 43.48%	0 0.00%	46 100%
Target Firms	30 33.33%	60 66.67%	0 0.00%	90 100%
Non-Active Firms	1 4.76%	1 4.76%	19 90.48%	21 100%
Total Percent	57 36.31%	81 51.59%	19 12.10%	157 100%

During Deregulation (1981-1987)

From Source	Acquiring Firms	Target Firms	Non-Active Firms	Total
Acquiring Firms	26 38.81%	39 58.21%	2 2.99%	67 100%
Target Firms	8 16.00%	39 78.00%	3 6.00%	50 100%
Non-Active Firms	0 0.00%	2 2.74%	71 97.26%	73 100%
Total Percent	34 17.89%	80 42.11%	76 40.00%	190 100%

Table 5 (Continued)**After Deregulation (1988-1992)**

From Source	Acquiring Firms	Target Firms	Non-Active Firms	Total
Acquiring Firms	44 93.62%	3 6.38%	0 0.00%	47 100%
Target Firms	2 25.00%	5 62.50%	1 12.50%	8 100%
Non-Active Firms	3 7.69%	5 12.82%	31 79.49%	39 100%
Total Percent	49 52.13%	13 13.83%	32 34.04%	94 100%

Table 6

**Test for Significant Mean Differences in Pre-acquisition Market-to-Book Value
Average of Acquiring Firms and Target Firms (1973-1992).**

Dependent Variable	N	Mean	Pr> T
Market-To-Book Value Average	Acquiring =165 Target=243	Acquiring=2.17096458 Target=1.68426889	0.7810

advantage of the undervaluation of a company, it does not appear to be an overall industry trend. As stated earlier, there is a significant difference between the market-to-book value average of non-active firms and those of acquiring and target firms.

Because empirical and anecdotal indicates that the majority of M&A activity affords product and market extension or are horizontal in nature (Kerin and Varaiya, 1985; Schmelzter, 1994), it is plausible that although the sample does not represent acquiring/target firm pairs, many of the acquisitions by retailers were acquisitions of other retail firms.

The sign rank tests provided useful information about the overall performance of retailers participating in merger and acquisition activity. Of the 179 acquiring firms available for examination, significantly more of those firms (N=123) experienced lower returns-on-equity for the 3-year post acquisition period. A significant difference is also detected in the sum of the ranks indicating a significant loss in equity after merging.

Significantly more acquiring firms experienced larger returns-on-assets. The paired t-test indicates that the mean change in return-on-assets was positive and significantly different for the sample firms in the post-acquisition period. (See Appendix B) The paired t-test for return-on-sales was not significant. Although ten firms experienced a higher return on sales, the magnitude of the gain was not significantly greater than the magnitude of the losses from those firms experiencing lower returns on sales.

For the most part, the merger and acquisition activity meant better growth for the retailers in the sample. 129 (70%) of the 137 acquiring firms averaged higher growth in

the post acquisition time period under examination. Unfortunately, the acquiring firms recorded significantly lower earnings-per-share during that same period. The results indicate that of the 83 sample firms 54 firms (65%) reported negative average earnings-per-share in the 3 post-acquisition years while only 29 recorded positive earnings. The remaining firms had an average earnings difference of "0" for the prior/post time period. (See Table 7.)

The paired t-test procedure was also conducted to examine the assertion that firms enter into merger and acquisition activity to boost sales growth and increase earnings-per-share, provided mixed results. The procedure revealed that acquiring retailers did indeed experience a significant rise in sales growth averages after an acquisition. (See Table 8.) However, retailers did not experience a subsequent boost in average earnings as experts had hypothesized. In fact, acquiring retailers experienced significantly lower earnings-per-share in the three years after the acquisition took place.

Table 7

Sign Rank Test Results for Pre/Post-acquisition Returns Performance of Acquiring Firms (1973-1992).

Variable	Mean	Sign Results	Pr>= S	Pr> T
Return-On-Equity	-0.15048	(+) = 56 (-) = 98	0.0004 ^b	0.0579 ^c
Return-On-Sales	2.344248	(+) = 82 (-) = 72	0.6438	0.1154
Return-On-Assets	1.795366	(+) = 95 (-) = 59	0.0009 ^b	0.0324 ^c

a-Number of observations due to missing values

b-Significant at p<.01

c-Significant at p<.05

Table 8

Test For Significant Pre/Post-acquisition Mean Differences in Growth and Earnings for Acquiring Firms (1973-1992).

Dependent Variable	N**	Mean	Sign Results	Pr>= S 	Pr> T
Average Growth	137	41.99663	(+) = 129 (-) = 57	0.0001 ^b	0.0001 ^b
Average Earnings- Per Share	152	-0.50017	(+) = 29 (-) = 54	0.0427 ^a	0.7800

^asignificant at p<.05

^bsignificant at p<.01

**Number of observations included due to missing values

Although paired t-tests indicate that retail firms experienced significantly lower returns-on-equity and significantly higher returns-on-assets in the post-acquisition period, the analysis of covariance procedure demonstrates that trends in the industry can play a key role in those results as the extant literature has indicated.

Table 9 depicts the results of using the industry averages for the corresponding post-acquisition period as a covariate. For this sample, neither the return-on-sales or return-on assets variable showed any significant difference and the return-on-equity variable remained only marginally significant (p<.10). This would confirm, as Conn (1976) suggests, that the fluctuation of return-on-assets, return-on-sales, and/or return-on-equity can often be accounted for, at least in part, by conditions within the industry.

Although the overall regression of post-acquisition earnings per share on the pre-acquisition internal variables was not significant, the stepwise procedure results in a significant relationship between the pre-acquisition growth and cash flow of an acquiring retail firm and the post-acquisition earnings the firm is able to achieve.

Table 9

Analysis of Covariance Results For Performance Variables Using The Aggregate Industry As The Covariate (1973-1992).

Dependent Variable	N**	Pr>F
Return-On-Sales	141	0.4034
Return-On-Equity	141	0.0801 ^a
Return-On-Assets	144	0.2170

***significant at $p < .10$**

****Number of observations included in analysis due to missing values**

The results of the exploratory examination of the ability of the internal variables to predict performance results after an acquisition, though somewhat disappointing, do offer some food for thought. The best predictor variables for each performance variable differ. The average growth and cash flow are determined to be the best predictor variables for post-acquisition return-on-equity while the average leverage of a retail firm might allow the best prediction of post-acquisition return-on-sales. Neither of these afford strong prediction power based on negligible r-square values. The regression results for return-on-assets are somewhat more helpful with cash flow and leverage offering a predictive power of nearly 10%. (See Tables 10, 11, 12 & 13.)

Post Hoc Regression Analyses

A priori it was suspected that returns would differ over time and the discriminant analysis provided strong support for the assertion that the deregulation of the banking

Table 10**Regression of Post-acquisition Return on Equity Performance for Acquiring Firms
Pre-acquisition Internal Variables on (1973-1992).**

All internal variables entered:

Variable	Parameter Estimate	Standard Error	Prob> T
Intercept	-0.94300023	0.46686106	0.0455
Market-to-Book	-0.15900557	0.06608960	0.0175
Earnings-Per-Share	0.00197218	0.00451851	0.6632
Price-Earnings	-0.00118141	0.00589428	0.8415
Growth	-0.00281555	0.00130149	0.0323
Liquidity	-0.23688787	0.75653697	07547
Cash Flow	7.01482961	2.236667140	0.0036
Leverage	-0.39214973	0.33107848	0.2384
Firm Size	0.00005406	0.00005828	0.3554
Return on Equity	1.40133612	0.87997616	0.1137
Return on Sales	-0.03168482	0.04496977	0.4823
Return on Assets	0.30805271	0.25651778	0.2318

R-Square=0.1179**Prob>F=0.1120**

All internal variables left in the model are significant at the 0.1000 level.

Variable	Parameter Estimate	Standard Error	Prob> T
Intercept	-0.36148274	0.18179466	0.0487
Market-to-Book Value	-0.14400294	0.06125057	0.0201
Growth	-0.00211786	0.00102855	0.0414
Cash Flow	7.34226214	2.04766007	0.0005

R-Square=0.874**Prob>F=0.0054**

Table 11**Regression of Post-acquisition Return on Sales Performance of Acquiring Firms on Pre-acquisition Internal Variables (1973-1992).**

All internal variables entered:

Variable	Parameter Estimate	Standard Error	Prob> T
Intercept	19.21021238	8.15753261	0.0200
Market-to-Book	0.6543516	1.15479344	0.5718
Earnings-Per-Share	-0.04528720	0.07895267	0.5672
Price-Earnings	-0.00446856	0.10299160	0.9655
Growth	0.03084428	0.02274120	0.1773
Liquidity	5.07171326	13.21908281	0.7019
Cash Flow	-77.85596241	41.35320104	0.0620
Leverage	5.33221879	5.78498352	0.3584
Firm Size	-0.00052075	0.00101840	0.6100
Return on Equity	-12.85555510	15.37595425	0.4046
Return on Sales	1.50473271	0.78576342	0.0577
Return on Assets	-5.56642548	4.48042591	0.2163

R-Square=0.0683**Prob>F=0.5751**

All internal variables left in model are significant at the 0.1000 level:

Variable	Parameter Estimate	Standard Error	Prob> T
Intercept	9.93377126	3.34948633	0.0036
Cash Flow	-54.91622125	28.28968970	0.0543
Return on Sales	1.0747513	0.58919455	0.0703
Return on Assets	-1.37741218	0.78953972	0.0833

R-Square=0.0435**Prob>F=0.1043**

Table 12

Regression of Post-acquisition Return on Assets Performance of Acquiring Firms on Pre-acquisition Internal Variables on (1973-1992).

All internal variables entered:

Variable	Parameter Estimate	Standard Error	Prob> T
Intercept	11.19546682	4.59552070	0.0162
Market-to-Book	0.90303453	0.65054930	0.1675
Earnings-per-Share	-0.02179946	0.04447774	0.6249
Price-Earnings	-0.00791652	0.05802000	0.8917
Growth	0.02644751	0.01281119	0.0410
Liquidity	3.46743608	7.44692931	0.6423
Cash Flow	-66.44707491	23.29619758	0.0051
Leverage	0.48424800	3.25895253	0.8821
Firm Size	-0.00001491	0.00057371	0.9793
Return on Equity	-6.10266360	8.66199615	0.4824
Return on Sales	0.01039079	0.44265738	0.9813
Return on Assets	-0.46662365	2.52403405	0.8536

R-Square=0.0964

Prob>F=0.2545

All internal variables entered are significant at 0.1000 level:

Variable	Parameter Estimate	Standard Error	Prob> T
Intercept	9.64765917	1.74900663	0.0001
Cash Flow	-55.52243542	17.16061092	0.0015
Growth	0.01706660	0.00922979	0.0666

R-Square=0.0719

Prob>F=0.0056

Table 13

Regression of Post-acquisition Earnings Per Share Performance of Acquiring Firms on Pre-acquisition Internal Variables on (1973-1992).

Variable	Parameter Estimate	Standard Error	Prob> T
Intercept	12.94547328	5.31059768	0.0162
Market-to-Book	0.53009164	0.74917628	0.4805
Earnings-per-Share	-0.00245257	0.05116399	0.9618
Price-Earnings	-0.00578037	0.06674697	0.9311
Growth	0.02209436	0.01477217	0.1372
Liquidity	-5.41585857	8.59455756	0.5297
Cash Flow	-71.78196968	27.10357555	0.0091
Leverage	2.26146057	3.75048107	0.5476
Firm Size	-0.00054619	0.00066037	0.4097
Return on Equity	-8.37161365	10.01351982	0.4047
Return on Sales	-0.30112185	0.50928662	0.5554
Return on Assets	-1.35115075	2.906763	0.6428

R-Square=0.0935

Prob>F=0.2930

All internal variables entered are significant at the 0.1000 level:

Variable	Parameter Estimate	Standard Error	Prob> T
Intercept	8.49114511	2.02675052	0.0001
Cash Flow	-63.57791972	19.78983433	0.0016
Growth	0.01948812	0.01060302	0.0682

R-Square=0.0719

Prob>F=0.0060

industry may result in varying results over time. For these reasons, individual regressions were performed to regress the performance variables on the independent variables during the three time periods (before, during and after deregulation). (See Computer Results in Appendix B.)

The result of the regressions for return on equity yielded non-significant results for the before and after time periods but were significant for the time period specified as during deregulation. The pre-acquisition market-to-book value, cash flow, return on equity, and growth average effects were significant.

The regressions for return on assets proved only to be significant in the time period prior to deregulation. The degree of explanatory power provided by the variables was relatively high, however, with an R-square of .8184. Similarly the regression equation for return on sales was significant only in the time period before deregulation with a R-square of .5755. These results appear fairly inconclusive and merit further investigation.

The regressions for earnings per share proved most interesting. The equation for the before deregulation time period was significant with a R-square of 0.5972 and significant negative effect found in the pre-aquisition return on sales variable. During deregulation, the same set of independent variables yielded a non-significant regression model with a significant (negative) effect for the cash flow variable and a negligible R-square (0.1691). The period after deregulation again yielded a positive overall effect with a R-square of 0.6500 and significant positive effects found in the return on assets and market-to-book value variables.

Significant negative effects were also found for the return on equity. This last tends to indicate that, in times of relative market stability, these variables or some combination thereof may provide relatively high explanatory power of post-aquisition earnings. The further investigation of this contention is necessary due to the importance of such information to retail firms who have a responsibility to their shareholders to consider earning potential in business decisions.

As stated, though these results are disappointing they are helpful nonetheless. One would not expect the financial conditions within a firm prior to an acquisition to be highly correlated with the performance after the merger due to the fact that each of these variables is affected greatly by the acquisition itself. They do account for a small portion of the performance outcome, and when examined in conjunction with other factors known to influence performance may begin to allow highly accurate prediction of post-acquisition performance.

Post Hoc Tests for Mean Differences

Finally, because the previous post hoc analyses had indicated that indeed some time-related differences did exist and that these differences may, in fact, be linked to some stimuli external to the retail firms participating in M&A activity, a post hoc test for mean differences between acquiring, target and non-active firms was conducted for the time periods before, during and after deregulation of the banking industry. It appears that the deregulation, and possibly other factors external to the firm, may have instigated changes in the types of retailers who might participate and in which capacity they were able to participate. (See Computer Results in Appendix B.)

The post hoc tests for mean differences show that in the years before deregulation both target and bidder firms were significantly undervalued in the market as compared to non-active firms and acquiring firms were significantly larger than target firms. These results are consistent with the overall results from the 20 year period. However, in the decade before deregulation, non-active firms had a significantly higher ratio of long-term debt to equity and were significantly less liquid on average. Overall, non-active firms were able to provide significantly higher earnings per share than either targets or acquiring firms.

During deregulation, the internal differences began to shift. Non-active firms became significantly more liquid than acquiring and target firms a dramatic turn around from the results of the previous time period. The non-active firms continued to provide significantly stronger earnings and returns on equity to their constituents.

After the industry had a chance to adjust for deregulation and in the wake of many bankruptcies and heavy M&A activity, acquiring firms continued to be significantly larger on average than target and non-active firms but were providing returns and earnings than both non-active and target firms.

CHAPTER V

DISCUSSION AND CONCLUSION

The SIC code system of categorizing retailers encompasses a wide variety of types of retail firms from automobile dealers to mail order apparel retailers and the research presented here covers a very turbulent era in the history of the retail industry. These limitations should be duly noted when generalizing the results of this study because findings may vary by SIC category. Further analysis by type of retailer could provide some significant information and merits further investigation.

The analysis is meant to provide an overview of industry activity and has made no attempt to match pairs of retailers who actually participated in M&A activity together. The matching of pairs may indeed highlight some differences not detected here, but the intent of the study is to provide practitioners and academicians general findings regarding the various roles of M&A activity without regard to the partner chosen.

The exploration has provided an attempt to examine the predictive power of financial conditions within firms from pre-acquisition to the post-acquisition performance of the firm. Though the findings offer support for a slight connection between pre-acquisition financial conditions and the recorded post-merger performance of the firm, the majority of the explanation for post-acquisition performance logically appears to lie in other variables such as the negotiation and management of the acquisition.

The relationship between post-acquisition performance and pre-acquisition conditions investigated here in conjunction with the outcome of the discriminant analysis presented raises some very important questions for the retail industry. The pre-

acquisition conditions investigated were mostly financial in nature and were initially found to be of little use for the prediction of which retailers would participate in M&A activity as an acquiring firm overall. A large percentage of these firms were misclassified as target firms indicating that in general acquiring firms may resemble target firms (financially) too closely for such variables to differentiate well.

The post hoc examination of firms before, during and after the deregulation of the banking industry provides interesting insight and affirmation that these financial variables can be used to accurately predict acquiring firms, target firms, and non-active firms. These findings raise questions as to the impact of availability of capital and public perception of economic conditions in retailing M&A activity. It appears that easy availability of financing can cause many firms to enter into acquisitions when they are not as financially strong as they need to be. Significantly, the question of whether a relationship exists between the financially weak acquiring firms of the early 1980's and the subsequent onslaught of bankruptcies that occurred later in the decade.

This same group of retail firms were subsequently found to be less than highly successful in their M&A endeavors. These findings may explain the highly leveraged condition of the industry in the late 1980's. Many retailers, finding themselves in a weakening market, may have chosen to go into debt or take a well-financed partner to acquire other firms in an attempt to strengthen their position. Since the more recent mergers and acquisitions have not been included in studies to date, this would tend to explain the disparities with earlier findings which found similar financial variables to be significantly different among acquiring and target firms.

Evidence has also been reported which calls into question the motives behind the enormous amount of merger and acquisition activity in the retail field. The apparent lack of post-acquisition prosperity over the past two decades demands further exploration. Perhaps a psychological measure of the benefits and performance of M&A activity from the perception of retailers is necessary. What does the retailer perceive to be the benefits of acquisition and do they see the M&A activity of their firm as successful?

The examination of these issues in the retail field is imperative. Experts see the numbers of retail chains alone as decreasing by over 50% before the end of the decade. Is this necessary? Are there better growth alternatives available to retail firms? Finally, and perhaps most importantly, is there knowledge which can afford retail firms a more proactive position in their own future? The results presented indicate that there most definitely are internal variables that will help in assessing the position of the firm and the opportunities available to the firm.

Have retailers reaped great benefits from the M&A frenzy of the past two decades? The analysis presented here has provided a first look at the performance of acquiring retail firms in the 1970's and 1980's and indicates that, at best, the results are mixed. Though many retailers do indeed experience more rapid sales growth after an acquisition, the evidence presented here provides very little support for the fact that increased sales growth translates into better performance. The firms in the sample experienced lower earnings and returns on equity overall and experienced no significant change (neither positive nor negative) in average return on sales. Though this last does

not directly speak to the effective utilization of resources, it certainly indicates that there is not indication that the additional resources are stimulating returns for the retailer.

Although Mead (1969) had asserted that the desire to increase earnings-per-share may have been the driving force behind much of the M&A activity of 1960's, Kerin and Varaiya (1985) cite recent research which shows a negative relationship between earnings and the market-to-book value ratio. This research supports the experts assertions that many retailers might be taking advantage of the fact that target firms are often undervalued, but in contrast with experts claims, lends support to the possibility that earnings may in fact decline after acquisition as investors become aware of the "fictitious earnings growth" (Kerin and Varaiya, 1985 p. 15) which may accompany the acquisition.

The results presented add a new perspective to the merger and acquisition activity in the retail industry and provide evidence that bigger may not necessarily mean better. Certainly, doubt is raised as to the efficacy of M&A as a strategic growth option for retailers dependent upon the desired outcomes and external conditions in the environment in which the firm is operating. Perhaps retailers and their investors could benefit greatly from the exploration of other forms of alliance to spur growth, such as joint ventures or cooperative agreements which may provide the growth many in the retail industry seek but with lower costs, lower commitments and potentially greater returns.

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APPENDIX A

APPENDIX A: REVIEW OF THE LITERATURE

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APPENDIX A

Review Of The Literature

Strategic Alliances

Forms of "cooperative strategies" or "strategic alliances" among firms can range from mergers and acquisitions (M&A) to informal working agreements where knowledge or resources are pooled (Starr, 1991; Harrigan, 1985). The various cooperative strategy forms can be classified on a continuum of ownership equity and control as Harrigan (1985) has done, where mergers and acquisitions represent full equity ownership and control and such forms as cross-licensing agreements represent non-equity arrangements with only contractual control.

In a similar theoretical classification system, Lorange and Roos (1992) have defined strategic alliances on a continuous scale of vertical integration from free market transactions ("none") to total internalization ("large"). Using this classification system, mergers and acquisitions represent a higher degree of vertical integration and other types of alliances, such as informal cooperative ventures, a lower degree.

Still others have classified the various forms of alliance as a hierarchy of interdependence that firms may opt to progress through as the relationship strengthens (i.e. Contractor and Lorange, 1988). These authors suggest that firms may wish to start in a form of alliance that requires less commitment and, thus, is easier to reverse. The firms would then "upgrade" to a more highly committed form of alliance, such as joint ownership or merger, as the trust and confidence in the relationship matures.

A number of other taxonomies which could be used to characterize strategic alliances were proposed by Root (1987) and reprinted in Lorange and Roos (1992).

These included:

- *nationality and the degree of interfirm cooperation
- *each company's contribution from the value chain
- *geographical scope and mission (in a value chain sense)
- *fiduciary risk and environmental risk exposure
- *relative bargaining power and ownership

The taxonomies represented in the extant literature include a variety of factors upon which to classify or characterize strategic alliance types. Although the characteristics with which firms can be classified differ, in most cases the alliance types included and the proximity of one to another remain constant. (Refer to Figure 1)

Traditionally, analysis of cooperative ventures has been based on a win-lose mentality pitting participating firms as adversaries (Lorange and Roos, 1992). More recently, however, highly regarded experts in the industry and in academe have affirmed the possibility of strategic alliances that result in a win-win mentality (i.e. Hamel, Doz and Prahalad, 1989; Lorange and Roos, 1992; Ohmae, 1989).

Hamel, Doz and Prahalad (1989, p. 133) are quick to caution that although strategic alliances can "strengthen both companies against outsiders" they may, at the same time, "weaken one partner vis-a-vis the other". It appears that, although a strong case can be made in favor of utilizing cooperative strategies, there is much to learn about

the factors and decisions which can ensure the successful use of such strategies. They advocate adherence to the following principles (p.134):

Collaboration is competition in a different form

*Harmony is not the most important measure of success

*Cooperation has limits

*Learning from partners is paramount

The decision to use (or not to use) "cooperative strategies" is often a significant corporate strategy decision that ranks in importance with market entry/exit decisions and diversification decisions (Harrigan, 1985). Much of the literature has focused on the outcomes of the alliance such as the impact the activity had on share-holder wealth or profitability to the firm. More recently, scholarly work has begun in the area of partner or target choice (Kumar, Kerin & Pereira, 1991; Palepu, 1986; Harrigan, 1985; Gallinger, 1982).

It is clear that an era of cooperation among firms has begun. What are the motives behind such cooperation and is it profitable? Kenneth M. Davidson (1989) has said the only consistent profits in merger and acquisition activity have been procured by the intermediaries participating in the activity not necessarily the firms themselves. Could there be other non-monetary benefits to be gained through cooperation? It now becomes the task of both practitioners and scholars to examine the phenomena and all of its facets. The following research presents a conceptual framework which begins to delineate the process and practice of choosing and utilizing alliance as a strategy.

Conceptual Framework

With the enormous volume of alliance activity that has come about in the past decade, there is little doubt that understanding the outcomes of strategic activity is important, but being able to delineate the most favorable conditions for successful outcomes may be of even greater importance. Henry Mintzberg has discussed at length the notion of "crafting" strategy. He stresses the fact that as much as the word strategy is used to describe our intended plans for the future, it also describes our realized patterns of past behavior (Mintzberg, 1987). Along the same lines, it is helpful when considering strategic options to "craft" strategy. Sometimes the situation a firm finds itself in may drive their strategy. Recognizing such situations and "crafting" a strategy may place the firm back in the driver's seat.

The literature has begun to explore past alliance activities but has analyzed these relationships with respect to the outcomes achieved (or not achieved) by the participants after the fact (Agrawal, Jaffe and Mandelker, 1992; Chatterjee and Lubatkin, 1990; Healy, Palepu and Ruback, 1992; Schweiger and Walsh, 1990; Shelton, 1988 to name only a few). With so many firms entering into all types of strategic alliance activities, a framework which is not merely descriptive but begins to provide some normative guidelines as well would be exceedingly beneficial. (Refer to Figure 7)

Van de Ven (1976) asserts that organizations, in general, strive to maintain their autonomy and therefore, do not cooperate just for cooperation sake. He offers two reasons which may compell firms to interact: (1) an internal need for resources or (2) an external problem or opportunity. There appears to be no reason why one must assume

that one of these reasons must result in the exclusion of the other. In fact, it is likely that the presence of one makes the firm aware of the presence of the other.

In more recent literature, many authors have discussed reasons for alliances which basically maintain that a firm may become aware of an external opportunity or problem which they do not have the internal resources or capabilities to take advantage of or attend to (Starr, 1991; Contractor, 1987; Harrigan, 1985 to name only a few). Whether it be an economic condition of the time (such as recession) or a condition within the specific industry in which the firm operates (such as saturated domestic markets), a firm may see the need at a given point and time to re-evaluate or "craft" its corporate strategy according to some circumstances which are not within the its control.

Schermerhorn (and others have supported the previous conclusions in their writings on interorganizational cooperation finding that: (1) organizations are likely to consider interorganizational cooperation favorably when they need access to resources that are otherwise unavailable or when such cooperation would allow them to utilize their own firm's internal resources more efficiently, and (2) organizations may seek to cooperate when responding to a crisis or environmental pressures (Clark, 1965; Reid, 1964).

External Conditions

Harrigan (1985) has studied in great depth the use of joint ventures in various industries and found that industries which are capital intensive, lower in product differentiability, and have less market standardization tend to favor the use of joint ventures as a cooperative strategy. On the otherhand, cross-licensing and other

cooperative strategies were more favorable in industries where technological change was fast-paced or where a global orientation exists.

Michael Gort (1969), who proposed the theory of economic disturbances, asserts that such events as technological change or increased business opportunities and stock prices can often lead to increased merger and acquisition activity. The theory espouses that the management of some firms may value the profit and growth potential of another firm believing that the acquisition will offer a better rate of return than direct investment in their own firm.

Benston (1980) building on the theory of economic disturbances listed increased government regulation, rising foreign competition and decreasing tariffs additional disturbances which may potentially arouse suspicion of the future prospects of some firms. Some may believe that these suspicions serve to undervalue the firm and thus consider acquisition an intelligent investment.

Competitive forces can also play a large part in a company's decision to form an alliance. Foreign competitors have been forming cooperative teams for years and many U. S. firms are now forced to cooperate to survive (Business Week, 1983). "'If the Japanese play by one set of rules and we play by another, we are not going to win,' says Gordon R. Brown, president of Peripheral Products Co., a subsidiary of Control Data Corp." (Business Week, 1983 p. 72)

The pressure to ally tends to be extremely pronounced in those industries driven by rapidly changing technologies. R&D is constantly striving to move the technological innovations down the pipeline more swiftly, and the lifespan of the product grows ever

shorter. Add to this the skyrocketing costs of R&D and one of the motivations for the formation of strategic alliances becomes imminently clear.

Another interesting external motive behind some strategic alliances is the lack of prime real estate or facilities available. This problem is often an impetus in retailing M&A activity (Rufrano, 1990). In such cases, a retailer may choose to acquire an existing firm to utilize the real estate for their own purposes. Harrison (1983, p. 45) claims that the horizontal acquisition of retail businesses "for their basic lease and other asset values" accounted for over 50% retail M&A activity in 1981 and 1982.

One must not disregard the considerable impact that shareholders in a company can have on the decision to ally. Benston (1980, p. 26) writes that, in the case of merger activity, "Shareholders benefit if the pooling or sale and investment give rise to greater value than would have been achieved if some other alternative had been followed." These benefits may come in the form of economies of scale (Benston, 1980; Harrigan, 1985) or diversification which can reduce the risk of negative cash flow (Benston, 1980). The viability of shareholder wealth as a motivation for alliance activity, particularly merger activity, has been scrutinized in the literature. Some feel that a comprehensive and accurate way of measuring the benefits and costs of mergers to the shareholders is as yet undetermined (Mueller, 1977; Stern, 1988).

Government policies have and will continue to motivate and/or discourage entrance into various forms of alliance activity. U. S. antitrust laws have greatly impacted the merger and acquisition activities of past decades and have played a smaller but significant role in the formation of other forms of alliances. Harrigan (1985) asserts

that antitrust law considers merger and acquisition activity and joint venture activity indistinguishable where policy is concerned. As a result of her comprehensive study of over 800 joint ventures, Harrigan contends that joint ventures often inherently less likely to violate antitrust laws especially when the activities are closely related to R&D.

Because many governments support local firms with a variety of policies, strategic alliances can become an important part of a firm's international business strategy as well. Although, for example, the Japanese have reduced requirements for local ownership, many U.S. firms have continued to take partners in the form of joint ventures in order to effectively infiltrate unfamiliar distribution channels (Harrigan, 1985) and crack otherwise hard to penetrate markets (Mergers & Acquisitions, 1985).

Internal Conditions

Often conditions arise within the firm that lead the "powers that be" (usually the CEO) to make the decision to participate in some form of alliance. The type of alliance they choose (or are forced) to enter into often depends, at least in part, on these internal conditions.

A common theme in the literature concerning the motivation to enter into alliances is the role of financial problems or opportunities. In their 1980 study, the FTC has described three specific finance related motives for entering into M&A activity: (1) the opportunity presented when an possible acquisition target's stock is undervalued, (2) to improve earnings per share, and (3) to achieve growth (e.g. sales growth or growth in market share)(Davidson, 1981).

Palepu published a study in 1986 which examined the ability of different models to accurately predict the acquisition of firms. He proposed a model which corrected former methodological flaws and utilized financial characteristics of the firm and industry as variables. These variables included average excess return on stock, return on equity, annual growth rate of net sales, the debt-equity ratio, the ratio of liquid assets to total assets, a growth-resource dummy, an industry dummy representing acquisition activity within the industry, firm size, market-to-book value ratio, and a price-earnings ratio. The findings indicated that the specified model could not predict the likelihood of takeover six months prior to the actual occurrence any better than the stock market.

This area was further explored in a study performed by Kumar, Kerin & Pereira (1991) who found that retail firms who suffered from lower market-to-book value ratios and higher earnings per share were likely to become targets of an acquisition. Conversely, as the market value of a retail firm increases and the earnings per share decreased, they found that the likelihood of that firm becoming a bidder (acquirer) in an M&A transaction increased.

Nearly all of the literature regarding financial characteristics of firms participating in strategic alliances has discussed those firms participating in mergers and acquisitions. To date, there appear to be no empirical investigations of financial characteristics of firms who participate in other forms of strategic alliance most likely due to the fact that most studies have examined the impact of the alliance on the firms involved.

Much of the literature emphasizes that another important aspect of strategic alliance activity is the reduction of risks and costs (Hamel, Doz & Prahalad, 1989;

Ohmae, 1989; Contractor, 1987; Harrigan, 1985; Business Week, 1983). The risk reduction is often most pronounced with those forms of alliance which do not entail the purchase of full equity ownership such as the joint venture.

Joint venture activity disperses the risk (and costs) among the parties which can be useful in the age of skyrocketing R&D costs and shortened product life cycles (Contractor, 1987; Ohmae, 1989). The alliance of Apple Computer Inc. and Toshiba Corporation created to develop computer equipment is a fitting example (Mergers and Acquisitions, 1991). Such activities can also lessen the risks and costs related to the firm's diversification efforts as in the case of General Motors and Toyota (Contractor, 1987).

Harrigan (1985) is quick to point out, however, that cooperative strategies and in particular joint ventures "should not be seen as a way to hide weaknesses" ... but..."can be a way of creating internal strengths". Such strategies can provide small firms with more capital (as is the case when joint venturing or cross licensing), they can provide access to resources and technologies that are otherwise unavailable, and many of the strategies provide companies with opportunities to learn (Harrigan, 1985, Ohmae, 1989 and many more).

Becoming a Target

Gilbert W. Harrison (1992), Chairman of Financo, Inc. , reported that consolidation in the retail industry is likely to continue with many predicting that 50% to 75% of today's retailers disappearing within 10 years. Much of this disappearance will come in the form of acquisitions by retail giants.

There have been some empirical attempts to determine those conditions under which a firm may become the target of a merger or acquisition (Kumar, Kerin, and Pereira, 1991; Palepu, 1986; Dietrich and Sorensen, 1984; Stevens, 1973; Simkowitz and Monroe, 1971). The literature suggests that there are certain conditions within the firm which might signal the possibility of such activity (Kumar, Kerin and Pereira, 1991; Palepu, 1986; Gallinger, 1982). This particular situation in which a firm may find itself requires a unique place in the framework due to the fact that cooperative strategies are not often a "choice" for these firms. They find themselves in a defensive rather than offensive position at this point.

Studies have found that the size of the firm, free cash flow within the firm, the ratio of market value of equity to book value of equity, the ratio of a firm's stock price per share to its earnings per share, and the debt-to-equity ratio are just a few of the financial characteristics which may indicate that a firm is in a position to become the target of a takeover (Kumar, Kerin, & Pereira, 1991; Palepu, 1986 among others). It is still debatable how much advance notice these characteristics are likely to afford firms. Some studies indicate six to twelve months prior to takeover (Dietrich & Sorensen, 1984; Simkowitz & Monroe, 1971) while others (Palepu, 1986) find these characteristics provide no more forewarning than the stock market.

Flaherty (1991) espouses a computer-based multiple regression model can be an effective tool for garnering worthy candidates for acquisition. By choosing industry related "value drivers" (i.e. R&D expenditures for technology related firms) to act as independent variables and the net present value of firms involved in past deals to act as

the dependent variable, a regression model can be created which has reasonable and prompt predictive capability.

Chapter 11/Reorganization

Some of the financial conditions which have been found to indicate that a particular firm is a desirable target for acquisition could also be indicative of an impending decision to file Chapter 11 bankruptcy and subsequent reorganization. In some cases, a firm is able to file bankruptcy and management is then able to reorganize and win the backing of the creditors, as in the example of Revco D.S. Inc an Ohio-based drugstore chain, or simply sell off some assets to better their financial position and emerge from Chapter 11. But in the 1990's, Chapter 11 cannot be thought of as a "safe-haven" from acquisition.

Although the 1980's could be characterized as a great time to sell a business, conditions in the 1990's have changed (Shultz, 1992). Still, even in a time of virtually non-existent acquisition financing and declining corporate earnings, Kevin W. Shultz (1992, p.15) declares the 1990's a "terrific time to buy a business--if you know where to look". He suggests obtaining an interest in the reorganization and buying a business out of bankruptcy.

This interest in the reorganization can be obtained by directly approaching the debtor and making an acquisition offer, working with a group of creditors of the firm to form a plan for reorganization, or tendering an offer to acquire the public debt (Shultz, 1992). Zell/Chilmark Partners took control of the public debt of Carter Hawley Hale then

traded its claims for a substantial interest in the company including a majority of the board seats (Shultz, 1992).

Cooperative Strategy Decisions

Managers must consider many factors when choosing a cooperative strategy . A realistic assessment of the cooperating partners' flexibility regarding diversity in management control, strategic missions and time constraints, and management of the venture can aid in making an effective strategic choice (Harrigan, 1985).

The literature generally agrees on the strategic alliance alternatives available to firms, though some would not include acquisitions as a form of cooperative strategy due to the fact that relatively little cooperation exists when one firm takes complete control of another. Nonetheless, mergers and acquisitions are most assuredly a type of alliance, though sometimes hostile, used to fulfill corporate strategies and thus must be included and examined for a robust treatment alternatives.

Mergers and acquisitions. Until the 1980's, the twentieth century had seen three major M&A waves. The first, at the turn of the century, is notable because it created industry-wide trusts, holding companies and monopolies. The second, peaking in the 1920's, ushering in a more oligopolistic structure in many industries. And the third, in the 1960's, brought immense conglomerate growth.(Davidson, 1989)

In the 1980's, a wave of M&A activity overtook U. S. businesses resulting in over 31,000 transactions that totalled over \$1.3 trillion (Sikora, 1990). Unlike the previous surges, this latest wave did not go 'bust' with the stock market crash of October 1987 (Davidson, 1989). The notable outcome of this last and greatest M&A wave was the

creation of a M&A industry made up of facilitators or intermediaries (Davidson, 1989).

There appears to be questions regarding the profitability of this type of activity for the companies involved (Harrigan, 1985; Davidson, 1989; Sikora, 1991 to name only a few), but there is no doubt that profit has been abundant for the bankers, consultants and other intermediaries who participated.

It is easy to see why a firm might prefer the fully owned venture to any form of partially owned or contractually agreed upon cooperative venture. Harrigan (1985) suggests that possibly the management within the firm enjoys dealing with large or complex projects or that cooperation may endanger the competitive edge by revealing the firm's secrets. These tendencies within a firm, or within the firm's management, lead to a strategy of either buying the skills and/or assets they desire (M&A) or developing them in-house (internal venturing).

In the case of internal ventures, companies prefer to fully control the venture but realize that the corporate culture of their firms does not provide a favorable environment for innovative ideas (Harrigan, 1985). A separate business unit is often created internally to handle the venture. The drawback with this strategy is that entrepreneurial employees who supply these innovative ideas could have chosen to start their own business and firms often must give them a share of the equity to deter this (Harrigan, 1985). When this happens, a joint venture has been entered into between the parent firm and the SBU created where the parents could arrange either a participative role or a more "hands-off" approach.

The transaction status of M&A activity, on the otherhand, is characterized within the literature by two business combinations (Kerin & Varaiya, 1985; Scharf, 1971). The first is acquisitions, where the buyer absorbs both the assets and liabilities of the seller and, in so doing, the seller no longer exists as a seperate entity (Kerin & Varaiya, 1985). The second combination is consolidation where a new entity is formed from the combination of two firms but a buyer or seller cannot be distinguished (Kerin & Varaiya, 1985).

The FTC has further identified three types of M&A activity based on the relationship of participant firms to one another. A *horizontal* M&A transaction occurs between two firms who distribute closely related products in the same geographic area. A *vertical* M&A transaction best describes the situation where one firm acquires or consolidates with a current supplier or a firm who might become a supplier. *Conglomerate* transactions are those which change the scope of the acquiring or consolidating firms by either extending the product or the market or diversifying the firm into entirely new business areas (Kerin & Varaiya, 1985).

This category is included as a cooperative strategy choice although, admittedly, some firms do not choose to cooperate with other firms to attain objectives (as in the case of hostile takeovers). Many authors feel that M&A activity can and does often encompass a cooperative agreement utilized to meet the strategic objectives of two firms and must be included in any robust treatment of strategy options (Starr, 1991; Contractor & Lorange, 1988; Harrigan, 1985). Certainly on the part of the acquiring or 'bidder' firm, acquisition is a strategic choice.

Once the choice to utilize a strategic alliance has been made, it becomes important to consider why firms choose to participate in M&A transactions as opposed to one of the other alliance options. As was previously stated, it is clear that firms making this strategic choice generally prefer wholly owned ventures (Starr, 1991; Harrigan, 1985), but what are the additional motives that drive the choice of M&A as a strategy? To begin to answer these questions, one must turn to the extant literature.

Willard Carlton and associates prepared an econometric study which provided a different view of merger activity. The study assessed financial and marketing characteristics in an attempt to delineate which would be indicative of firms that were targets of an acquisition. The researchers hypothesized that firms might be inclined to seek "financial fit" in the partners they choose for their M&A activities. This financial fit might come, for example, in the form of choosing an underleveraged partner (Davidson, 1981). The findings indicated that, instead of differences, the merging firms actually had similar characteristics (Davidson, 1981). Specifically, firms tended to be similar with respect to "degree of market concentration, advertising intensity and commitment to research and development" (Davidson, 1981).

Wayne I. Boucher completed a study (see Davidson, 1981 for a review) of prominent players in merger activity to try to determine why firms choose to merge. He found that the choice is generally made by the CEO and that the interests of the actual persons involved were not adequately reflected in any rational model of how merger decisions are made. Twelve motives for merger were brought out by the study:

1. To take advantage of the fact that a company is undervalued
2. To achieve rapid growth
3. To satisfy surplus market demand
4. Avoid risks of internal start-ups
5. Increase earnings per share
6. Reduce product/service dependence
7. Gain market share
8. Offset cyclical fluctuations
9. Enhance management power and prestige
10. Maximize utilization of facilities and skills
11. Acquire exceptional personnel
12. Open new markets

Nearly all of the participants in the Boucher study agreed that evaluating the "fit" of a potential target or merger partner is paramount. Perceived "fit" could encompass a variety of compatibilities from production techniques to management styles (Davidson, 1981). This advice from the "experts" participating in the study appear to be consistent with those of the Carlton study in professing the importance of "fit" between M&A partners.

Joint ventures. In a study involving firms participating in joint venture activities, Harrigan (1988) found that ventures were more successful when they are related or horizontally related to their parent firms. In contrast to the findings of Boucher and Carlton, however, she found that firms participating in a venture should concern themselves less with the traits of their partner and more with the traits of the industry and the competitive need the venture is meant to fill (Harrigan, 1987).

Harrigan (1987) and Lorange and Roos (1992) among others define joint ventures as that type of partnership wherein two firms share ownership of a venture leading to a moderate amount of integration and interdependence as well as reduced risk. Although

the outcomes of this type of activity can often mirror those of merger and acquisition activity, defining joint venture activity in this way begins to delineate some of the differences in motivating factors.

Harrigan (1987) has divided the motivations for forming joint ventures into three categories consisting of internal uses (i.e. cost and risk sharing, obtaining intelligence), competitive uses (i.e. "first-mover" advantages, rapid customer access) and strategic uses (i.e. diversification, exploitation of synergies). Though the motivations are similar to those merger and acquisition motivations listed above, the literature suggests that certain conditions, both external and internal to the firms, lead to the decision to enter into a joint venture rather than proceed as an independent entity (i.e. acquisition, internal venture).

Many have proclaimed the merits of the joint venture for entrance into the international arena (Harrigan, 1985; Kohn, 1990; Morris & Hergert, 1987; Ohmae, 1989) which include entrance into otherwise closed markets, procurement of knowledge and/or talent, infusion of capital and more. In the late 1980's, Harrigan (1985) and Taylor (1989) and others declared the joint venture an appropriate tool for use within the domestic industries of many firms. The authors contend that widespread voluntary use of joint ventures within a firm's domestic market can tend to significantly change industry structures leading to consistent profit levels. Equally, many have also cautioned about the pitfalls of such a collaborative undertaking, such as the surrender of core competences (Hamel, Doz & Prahalad, 1989) and loss of absolute control (Kohn, 1990).

Formal & informal cooperative ventures. The forms of alliance included in this category include minority investments, which represent partial ownership or shared

equity, and other non-equity forms of alliance including research and development partnerships, cross-licensing agreements and joint bidding activities.

Minority investments are those arrangements wherein investors share in the equity of an ongoing firm typically through cash or capital investment. This type of activity may be entered into to sustain a primary supplier or obtain access to entrepreneurial talents that may resign if an acquisition ensued.

In recent years federal antitrust policies have relaxed in regards to R&D partnerships in part due to the challenge presented by other developed countries to the technological leadership of U.S. firms. Before 1984, antitrust policies had contended that joint research activities would impede competitive vigor and innovation (Harrigan, 1985).

Kenneth Krosin (1971) maintains it may become necessary for provisions to be made that allow access to patents for non-members through licensing agreements to facilitate future R&D partnerships. Conversely, Harrigan (1985, p. 24) argues that such provisions "may instead retard the use of R&D partnerships, given the preferences of many managers for control over their operations and over the technologies that give them competitive advantages".

Cross-licensing arrangements aid in the acquisition of process knowledge. Generally two firms, participating independently in the development of the same or similar products or processes, agree to exchange licenses to gain knowledge. Cross-distribution arrangements, in a similar vein, give license to participating firms to market the products of the partner firm(s) in a specified geographic region. As discussed earlier,

these types of alliances gain various forms and degrees of access to competitor firms but the level of risk and commitment required by the partners is considerably less than would be commanded by an acquisition or internal venture.

Factors for success. After examining the internal and external conditions affecting the firm and choosing the appropriate strategic alternative, it becomes necessary to determine what factors are involved in assuring the successful implementation of the chosen strategy. The literature suggests that the basic issues which must be settled do not vary with the of alliance strategy adopted, however, the specific considerations within each basic issue may vary according to the alliance chosen and the conditions at the time of attempted implementation.

Choosing a partner (or "target" in the case of acquisition) is one of the earliest of decisions to be made. Although in many instances, a firm may have recognized an opportunity (external condition) which drove the decision to enter into an alliance, it can be argued that the firm must still analyze the potential of partnering.

The strategic reasoning behind the decision to ally plays a key role in partner choice. Is the alliance meant to strengthen a core competence (a long-term strategic mission) or to produce a key technology (a short-term, finite strategic mission)? J. Michael Geringer (1988) suggests that joint venturing requires partner compatability, both task-related and organizational. Note that the term compatability not similarity is commonly used in strategic alliance discussions because in most situations partnering firms need not have similar strategic objectives but merely objectives that are compatible so as not to impede fruition

In the case of minority investments and internal venturing, issues concerning the level of intervention of "parent" firms and the management of the relationship between firms (i.e. non-cash assets partner firms may contribute to the alliance) must be resolved for a more successful relationship (Harrigan, 1985). This appears to be true for all forms of cooperative strategy, even acquisitions which the literature suggests often require a successful "transitional" period to aid in longterm success (Gall, 1991; Slowinski, 1992).

Measuring success. Because each strategic alliance has unique characteristics, there has been a great deal of discussion concerning how to evaluate the effectiveness of these alliances. Should success be measured in terms of financial outcomes, survival, contract renegotiation, or other measures (i.e. Killing, 1983; Lorange & Roos, 1992; Tomlinson, 1970)?

Anderson (1990) developed a "input-output continuum" which places indicators of output performance, such as financial measures like profitability, as indicative of "short-term orientation" and input measures, such as harmony and morale, as indicative of "long-term orientation". Practitioners often use a combination of these "short-term orientation" measures such as profitability, return-on-equity, and/or growth of total assets to rank performance (Lorange & Roos, 1992).

Because the purposes of strategic alliances formations are widely varied and often unique, it is difficult to find a flawless measure of success which works in every case (Lorange & Roos, 1992). If, for example, the purpose of the alliance is product development, the termination of the alliance may indicate success, because a viable

product has been developed. Clearly, termination of the alliance does not always indicate success.

Empirical attempts to assess the success of merger and acquisition activity from the shareholder perspective can be placed into two categories (Benston, 1980). The "accounting data" studies have been criticized due to the fact that the data used often do not capture the economic values involved and that they fail to consider conditions that may affect the firm which are unrelated to the activity (Benston, 1980; Stern, 1988). Conversely, though the "stock market data" studies have been found to be potentially valid indicators of shareholder value because markets are efficient and thus neither negatively or positively biased, many of the studies are criticized for lack of consideration of external factors which may also impact the companies' price per share (Benston, 1980).

It is difficult to measure the success of alliances in which the firms have agreed to share equity or simply cooperate by contract with no shared equity with objective performance measures. The exception, however, is in determining the impact of joint ventures where joint venture is defined as that venture where two parents cooperate to form a separate business entity. There is much anecdotal evidence to attest to the benefits of participating in joint ventures (Business Week, 1984; Hamel, Doz, & Prahalad, 1989) but the empirical evidence is unfortunately lacking.

In a 1991 study, Geringer and Hebert empirically tested the reliability and comparability of certain objective and subjective measures of alliance performance. They found a positive correlation between objective and subjective measures of performance. According to Lorange and Roos (1992), the findings of the Geringer and Hebert study

imply that, in the absence of a subjective assessment of alliance performance, objective assessments can be employed as "surrogates". The latter becomes an important finding since obtaining and analyzing subjective assessments of alliance success can prove difficult.

Retailing M&A Activity

The discussion that follows examines merger and acquisition as a strategic option available to retailers today, its worth in the competitive retail marketplace and the need for scholarly research in this area. The general framework is followed to examine preacquisition or "antecedent" conditions of the firms participating in merger and acquisition activity in the retail industry and specifically, the relationship of those conditions, if any, to the success of the M&A activity. The discussion centers around the enormous wave of merger and acquisition activity in the retail industry in the 1980's and the strategic impact that this activity might have on the field in the 1990's and beyond.

Although many firms within many industries have utilized different types of alliance strategies at some point in their evolution, the 1980's in retailing saw an unparalleled acceleration of strategic alliance activity that promises to continue into the 1990's and beyond. From the international joint venture between Kroger Co. and Daiei, Inc. early on to the Federated-Allied M&A fiasco engineered by Robert Campeau later in the decade, the 1980's was a period of excess and prodigious change.

Nearly one half of all companies operating in the United States are in the retail industry (Harrison, 1983). According to Mergers and Acquisitions (1990), the U. S. retail industry ranked seventh in total number of mergers and acquisitions and a very costly

fourth in terms of dollar volume. Foreign purchases of U.S. firms accounted for approximately 125 of those acquisitions totaling 16.72 billion dollars (Sikora, 1990).

Kerin & Varaiya (1985) noted an unfortunate lack of scholarly consideration of M&A activity in the retail industry. Interestingly, their article points out that, although the industry has consistently ranked in the top ten in dollar value and numbers of transactions, not only have retailers been involved in some of the biggest M&A disasters of the decade but case study evidence has raised questions about the profitability of retail acquisitions. What conditions have given rise to such a tremendous volume of retailing M&A activity?

External conditions. Certainly the state of the retail industry has had a substantial impact in this area. Coming out of the late 1970's and through the early 1980's, which have been characterized as a time of variety in financing (including the well known era of the junk bond) and extremely high purchase multiples (Shultz, 1992), the industry has been characterized as "overstressed" and "undercapitalized" (Forbes, 1993; Hazel, 1993; Schmeltzer, 1994). Following a period known as "the malling of America", consolidation has become the norm. From single units to entire shopping malls, many realtors recognize acquisition may be the only viable alternative for substantial growth (Hazel, 1993).

Thomas Lardner, president and ceo of L&B Group, concedes that because of the "strain in the financial markets" (Hazel, 1993 p. 33) there are some cost advantages to purchasing properties. Through a clientele that is not heavily leveraged, the L&B group

has focused on the purchase of survival properties that were able to withstand the downward trends in the market.

In the later part of the 1980's, however, a depressed real-estate market and slowing construction dulled the trend toward acquisition as well. Owners held onto strong properties which they perceived to be undervalued instead of selling at a significant loss. Richard Kateley has said that investors were basically angry over events in the market which slowed lending and investment.

Hazel (1993) has focused on two recent phenomena which might aid in the bounceback of the retail/ real estate, acquisition market: real estate investment trusts (REITs) and bullet loans. She states many REITs are formed for the purpose of growth by acquisition using the influx of capital to attract sellers. In addition, many bullet loans issued in the late 1980's extending for a period of three to five years are now coming due. To companies possessing such loans, liquidity is a necessary objective which often provides incentive to sell.

Bullet loans were not the only force driving the desire for liquidity among retailers. By the early 1990's, personal income levels were slowing, real disposable income falling, and unemployment was rising (Harrison, 1992). All of these conditions have a tremendous impact on consumer spending which was characteristically sluggish during these times. Other retailers, who might otherwise have been in position to acquire further holdings, were forced to reconsider due to the substantial ratios required by lending institutions (Harrison, 1992).

Internal Conditions. Historically, potential buyers of retail organizations have not always been abundant. However, willing sellers of retail establishments have often been plentiful. Some retailers (generally those valued between \$5 million and \$75 million) have aspired to become part of more sizable businesses (Harrison, 1983). Other factors, such as increased markdowns and the personal desires of family owner/operators, have also spurred the sell-offs. In fact, empirical and anecdotal evidence indicates that retailers may often be willing to become the target of an acquisition.

Kerin and Varaiya (1985) found that in a small sample of retailing acquisitions occurring between 1976 and 1983 premiums paid over the preacquisition share price averaged nearly 70%. For many family-owned retailers and smaller retail chains, the offers were simply too good for shareholders to resist.

As stated, some smaller retailers aspire to become part of larger businesses (Harrison, 1983), but in recent years, many have found acquisition of some or all of their business assets to be a pathway out of Chapter 11 and a shelter from the takeover threats. This was probably never more evident than at the end of the 1980's when the futures of such well known businesses as Bloomingdale's, Rich's, Jordan Marsh and Burdines were riddled with uncertainty due to the financial troubles of parent company Campeau Corporation and many other retailing icons were forced into Chapter 11 or under threat of takeover (Sloan, 1989).

In a study of 36 matched pairs of retailers and 36 firms who had not participated in any M&A activity, Kumar, Kerin, and Pereira (1991) have identified several variables that have a significant affect on M&A activity. The variables identified included certain

finance-related variables (market-to-book value, earnings-per-share, cash flow, and debt to equity) which had been determined in various bodies of literature to be associated with M&A activity.

Additionally, hypotheses were developed based on anecdotal evidence concerning market presence (firm size, market share, etc.), extent of diversification (which included number of retailing SIC codes the firm participated in), and the amount of previous acquisition activity. Sales growth and number of years in existence were not found to be significantly different between acquiring firms, target firms, and firms who did not participate in M&A activities.

Measuring Success . There has been much discussion in the literature regarding the assessment of the financial implications of acquisition activity (Fruhan, 1979; Mueller, 1980; Reid, 1968). Many assume that firms participate in acquisition activity to increase shareholder value or wealth (i.e. Fruhan, 1979). Others question this assumption arguing that the desire for growth is the catalyst behind acquisition activity (i.e. Mueller, 1980).

Kumar, Kerin, and Pereira (1991) found some support in the retail industry for Mueller (1980) and Reid's (1968) argument that the management of many firms simply wish to grow and use acquisition as the vehicle for that growth. Using the extent of a firm's diversification and the number of previous acquisitions in which that firm had participated as indications of a corporate growth strategy, they found that acquiring firms differ significantly from target firms and firms who did not participate in M&A activity.

Additionally, in contrast to the arguments of Fruhan (1979) and others, Kerin and Varaiya (1985) have examined the effect of merger and acquisition activity on shareholder wealth in the retail industry and determined that the activity may in fact be destroying shareholder value and this destruction may be compounded by an increase in the rate of growth. The authors suggest that as many as 70 percent of the acquisitions among general merchandise and specialty retailers are "unlikely to create value for the acquiring firm's shareholders..." (Kerin and Varaiya, 1985 p. 27). Higgins and Kerin (1983) have documented similar findings.

In light of such empirical results, what goals do retailers hope to achieve by acquiring other firms? Though no research specific to the retailing industry exists to date, the FTC (1980) found six reasons listed as major factors behind a firm choosing to acquire another firm. These include:

- *the opportunity to acquire a firm whose stock is undervalued
- *to increase the acquirers earnings per share
- *to grow sales and assets or market share quickly
- *to reduce dependence by adding new products/services
- *to offset business fluctuations
- *to heighten owner or management prestige

The goals relating to undervalued stock and earnings per share can each be seen as potential ways for increasing shareholder value for the acquiring firm. As discussed, the literature has raised serious concerns regarding the use of acquisition as a vehicle for increasing shareholder wealth.

Although the ability of retailing acquisitions to provide shareholder wealth is in question, many agree that in the past decade, due to industry conditions, it is cheaper to buy than to build (i.e. Hazel, 1993; Kerin and Varaiya, 1985). Some credit the large numbers of foreign acquisitions of domestic retailers to the "undervaluation" theory.

Kerin and Varaiya (1985) have determined that product and market extensions (conglomerate mergers) did indeed appear to play a large role in acquisition activity among retailers in the early 1980's. It would also appear that the desire to decrease seasonal or cyclical business fluctuations could correspond to the number of incidence of conglomerate mergers cited by Kerin and Varaiya (1985) as well. This correlation is especially evident in cases where the merger represents the purchase of a firm in another SIC classification. The retail industry consists of widely varying product types from lumber to clothing to restaurants whose seasonal fluctuations vary as greatly as the product types.

The FTC (1980) has cited the quick attainment of sales and asset growth as a major factor in the decision to acquire. In retailing, as well as other industries, many judge performance of the firm in terms of return-on-sales or return-on-equity (i.e. Lorange and Roos, 1992). Has the merger and acquisition activity retailers participated in had a positive impact on these performance variables? Further, the literature provides a first look at what the authors termed "antecedent conditions, or preacquisition variables, associated with M&A activity in retailing" (Kumar, Kerin, and Pereira, 1991 p. 322), the relationship of these conditions, if any, to the financial performance of the M&A activity has yet to be determined.

Conclusions and Implications

Utilizing the proposed framework and examining the financial variables and performance variables as outlined here makes an important contribution to retailing thought and practice. To date, empirical studies of this type have determined that certain factors make it possible to predict fairly accurately whether a firm will become an acquiring firm or the target of an acquisition. The results of this type of empirical investigation will examine potential relationships between those preacquisition conditions within a firm and the ultimate success or failure of the M&A activity.

The framework and empirical analysis of the relationships proposed will afford retailers a more robust understanding of what factors play a role in successfully using merger and acquisition as a growth strategy. The results will also assist retailers in better evaluation of the position the firm holds in the volatile, competitive environment they face today and in more proactive crafting of the firm's corporate strategy. Is the firm in danger of becoming a target? Is this a position the firm wants to be in and, if not, how can we protect ourselves or better the firm's position? Or, conversely, is the firm in a position to use acquisition to achieve growth? How should the firm evaluate possible candidates for acquisition and what impact might such activities have on the financial performance of the firm?

The review presented here and the relationships delineated in the proposed framework give rise to the following research questions:

Research Questions

1. *Certain characteristics of a retail firm, including the market-to-book value, sales, price-earnings ratio, growth, liquidity, leverage, earnings-per-share, cash flow, and returns differ significantly among those firms who subsequently acquire another firm, become the target of an acquisition, or choose not to participate in acquisition activity.*
2. *Certain characteristics of a retail firm, including the market-to-book value, sales, price-earnings ratio, growth, liquidity, leverage, earnings-per-share, cash flow, and returns are useful in predicting those firms who will become bidders in acquisition activity and those firms who will become the targets of acquisition activity.*
3. *The acquisition of retail firms has resulted in better-than-industry average performance for those retailers who participated in acquisition activity over the past two decades.*
4. *The internal conditions within an acquiring retail firm are correlated to the performance of the acquiring firm after the merger and acquisition activity has taken place.*

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APPENDIX B

APPENDIX B: COMPUTER OUTPUT FOR ANALYSIS

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APPENDIX B

Computer Output For Analytical Procedures

General Linear Models Procedure

Class Level Information

Class	Levels	Values
SOURCE	3	1 2 3

Number of observations in data set = 675

Group	Obs	Dependent Variables
1	549	PMBAVG
2	549	PFSAVG
3	542	PPEAVG
4	344	PGRWTHAV
5	544	PCFAVG
6	544	PLIQDAVG
7	541	PEPSAVG
8	451	PROEAVG
9	546	PROSAVG
10	547	PROAAVG

NOTE: Variables in each group are consistent with respect to the presence or absence of missing values.

General Linear Models Procedure

Dependent Variable: PMBAVG

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	39358748.007	19679374.004	5.01	0.0070
Error	546	2143830154.382	3926428.854		
Corrected Total	548	2183188902.390			

R-Square	C.V.	Root MSE	PMBAVG Mean
0.018028	1244.015	1981.5219	159.28439

Source	DF	Type I SS	Mean Square	F Value	Pr > F
SOURCE	2	39358748.007	19679374.004	5.01	0.0070

Source	DF	Type III SS	Mean Square	F Value	Pr > F
SOURCE	2	39358748.007	19679374.004	5.01	0.0070

Dependent Variable: PFSAVG

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	39443924.267	19721962.134	15.58	0.0001
Error	546	691009080.427	1265584.396		
Corrected Total	548	730453004.694			

R-Square	C.V.	Root MSE	PFSAVG Mean
0.053999	349.1754	1124.9820	322.18245

Source	DF	Type I SS	Mean Square	F Value	Pr > F
SOURCE	2	39443924.267	19721962.134	15.58	0.0001

Source	DF	Type III SS	Mean Square	F Value	Pr > F
SOURCE	2	39443924.267	19721962.134	15.58	0.0001

Dependent Variable: PPEAVG

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	284498.90744	142249.45372	2.04	0.1314
Error	539	37637755.08373	69828.85915		
Corrected Total	541	37922253.99117			

R-Square	C.V.	Root MSE	PPEAVG Mean
0.007502	1126.605	264.25151	23.455559

Source	DF	Type I SS	Mean Square	F Value	Pr > F
SOURCE	2	284498.90744	142249.45372	2.04	0.1314

Source	DF	Type III SS	Mean Square	F Value	Pr > F
SOURCE	2	284498.90744	142249.45372	2.04	0.1314

Dependent Variable: PGRWTHAV

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	1	718627.87297	718627.87297	1.23	0.2685
Error	342	200093081.2962	585067.48917		
Corrected Total	343	200811709.1692			

R-Square	C.V.	Root MSE	PGRWTHAV Mean
0.003579	-927.9830	764.89704	-82.425761

Source	DF	Type I SS	Mean Square	F Value	Pr > F
SOURCE	1	718627.87297	718627.87297	1.23	0.2685

Source	DF	Type III SS	Mean Square	F Value	Pr > F
SOURCE	1	718627.87297	718627.87297	1.23	0.2685

Dependent Variable: PCFAVG

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	167791.36360	83895.68180	41.23	0.0001
Error	541	1100884.07553	2034.90587		
Corrected Total	543	1268675.43913			

R-Square	C.V.	Root MSE	PCFAVG Mean
0.132257	-442.2170	45.109931	-10.200858

Source	DF	Type I SS	Mean Square	F Value	Pr > F
SOURCE	2	167791.36360	83895.68180	41.23	0.0001

Source	DF	Type III SS	Mean Square	F Value	Pr > F
SOURCE	2	167791.36360	83895.68180	41.23	0.0001

Dependent Variable: PLIQDAVG

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	14058328.122	7029164.061	1.68	0.1882
Error	541	2270093345.689	4196105.999		
Corrected Total	543	2284151673.811			

R-Square	C.V.	Root MSE	PLIQDAVG Mean
0.006155	2198.648	2048.4399	93.168147

Source	DF	Type I SS	Mean Square	F Value	Pr > F
SOURCE	2	14058328.122	7029164.061	1.68	0.1882

Source	DF	Type III SS	Mean Square	F Value	Pr > F
SOURCE	2	14058328.122	7029164.061	1.68	0.1882

Dependent Variable: PEPSAVG

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	3542415.4605	1771207.7303	12.64	0.0001
Error	538	75359594.4222	140073.5956		
Corrected Total	540	78902009.8827			

R-Square	C.V.	Root MSE	PEPSAVG Mean
0.044896	723.5228	374.26407	51.728029

Source	DF	Type I SS	Mean Square	F Value	Pr > F
SOURCE	2	3542415.4605	1771207.7303	12.64	0.0001

Source	DF	Type III SS	Mean Square	F Value	Pr > F
SOURCE	2	3542415.4605	1771207.7303	12.64	0.0001

Dependent Variable: PROEAVG

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	2623.0805230	1311.5402615	37.41	0.0001
Error	448	15705.9885885	35.0580102		
Corrected Total	450	18329.0691114			

R-Square	C.V.	Root MSE	PROEAVG Mean
0.143110	341.0809	5.9209805	1.7359460

Source	DF	Type I SS	Mean Square	F Value	Pr > F
SOURCE	2	2623.0805230	1311.5402615	37.41	0.0001

Source	DF	Type III SS	Mean Square	F Value	Pr > F
SOURCE	2	2623.0805230	1311.5402615	37.41	0.0001

Dependent Variable: PROSAVG

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	4218.0166599	2109.0083299	0.23	0.7922
Error	543	4913562.308909	9048.9176960		
Corrected Total	545	4917780.325569			

R-Square	C.V.	Root MSE	PROSAVG Mean
0.000858	4997.982	95.125799	1.9032840

Source	DF	Type I SS	Mean Square	F Value	Pr > F
SOURCE	2	4218.0166599	2109.0083299	0.23	0.7922

Source	DF	Type III SS	Mean Square	F Value	Pr > F
SOURCE	2	4218.0166599	2109.0083299	0.23	0.7922

Dependent Variable: PROAAVG

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	525.02146827	262.51073414	0.41	0.6669
Error	544	352302.0782111	647.61411436		
Corrected Total	546	352827.0996794			

R-Square	C.V.	Root MSE	PROAAVG Mean
0.001488	715.8108	25.448263	3.5551661

Source	DF	Type I SS	Mean Square	F Value	Pr > F
SOURCE	2	525.02146827	262.51073414	0.41	0.6669

Source	DF	Type III SS	Mean Square	F Value	Pr > F
SOURCE	2	525.02146827	262.51073414	0.41	0.6669

Multiple Comparisons Tests of Significant General Linear Models Variables

General Linear Models Procedure

Class Level Information

Class	Levels	Values
SOURCE	3	1 2 3

Number of observations in data set = 675

Group	Obs	Dependent Variables
1	549	PMB AVG
2	451	PROE AVG
3	541	PEPS AVG
4	549	PFS AVG

NOTE: Variables in each group are consistent with respect to the presence or absence of missing values.

Dependent Variable: PMBAVG

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	39358748.007	19679374.004	5.01	0.0070
Error	546	2143830154.382	3926428.854		
Corrected Total	548	2183188902.390			

R-Square	C.V.	Root MSE	PMB AVG Mean
0.018028	1244.015	1981.5219	159.28439

Source	DF	Type I SS	Mean Square	F Value	Pr > F
SOURCE	2	39358748.007	19679374.004	5.01	0.0070

Source	DF	Type III SS	Mean Square	F Value	Pr > F
SOURCE	2	39358748.007	19679374.004	5.01	0.0070

T tests (LSD) for variable: PMBAVG

NOTE: This test controls the type I comparisonwise error rate not the experimentwise error rate.

Alpha= 0.05 Confidence= 0.95 df= 546 MSE= 3926429
Critical Value of T= 1.96432

Comparisons significant at the 0.05 level are indicated by '***'.

SOURCE Comparison	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit
3 - 1	166.2	612.6	1059.0 ***
3 - 2	201.0	613.1	1025.1 ***
1 - 3	-1059.0	-612.6	-166.2 ***
1 - 2	-392.2	0.5	393.1
2 - 3	-1025.1	-613.1	-201.0 ***
2 - 1	-393.1	-0.5	392.2

Bonferroni (Dunn) T tests for variable: PMBAVG

NOTE: This test controls the type I experimentwise error rate but generally has a higher type II error rate than Tukey's for all pairwise comparisons.

Alpha= 0.05 Confidence= 0.95 df= 546 MSE= 3926429
Critical Value of T= 2.40138

Comparisons significant at the 0.05 level are indicated by '***'.

SOURCE Comparison	Simultaneous Lower Confidence Limit	Difference Between Means	Simultaneous Upper Confidence Limit
3 - 1	66.9	612.6	1158.3 ***
3 - 2	109.3	613.1	1116.8 ***
1 - 3	-1158.3	-612.6	-66.9 ***
1 - 2	-479.5	0.5	480.5
2 - 3	-1116.8	-613.1	-109.3 ***
2 - 1	-480.5	-0.5	479.5

Dependent Variable: PROEAVG

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	2623.0805230	1311.5402615	37.41	0.0001
Error	448	15705.9885885	35.0580102		
Corrected Total	450	18329.0691114			

R-Square	C.V.	Root MSE	PROEAVG Mean
0.143110	341.0809	5.9209805	1.7359460

Source	DF	Type I SS	Mean Square	F Value	Pr > F
SOURCE	2	2623.0805230	1311.5402615	37.41	0.0001

Source	DF	Type III SS	Mean Square	F Value	Pr > F
SOURCE	2	2623.0805230	1311.5402615	37.41	0.0001

T tests (LSD) for variable: PROEAVG

NOTE: This test controls the type I comparisonwise error rate not the experimentwise error rate.

Alpha= 0.05 Confidence= 0.95 df= 448 MSE= 35.05801
Critical Value of T= 1.96527

Comparisons significant at the 0.05 level are indicated by '***'.

SOURCE Comparison	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit
3 - 1	3.8243	5.1651	6.5060 ***
3 - 2	3.8913	5.2632	6.6351 ***
1 - 3	-6.5060	-5.1651	-3.8243 ***
1 - 2	-1.2231	0.0981	1.4193
2 - 3	-6.6351	-5.2632	-3.8913 ***
2 - 1	-1.4193	-0.0981	1.2231

Bonferroni (Dunn) T tests for variable: PROEAVG

NOTE: This test controls the type I experimentwise error rate but generally has a higher type II error rate than Tukey's for all pairwise comparisons.

Alpha= 0.05 Confidence= 0.95 df= 448 MSE= 35.05801
Critical Value of T= 2.40300

Comparisons significant at the 0.05 level are indicated by '***'.

SOURCE Comparison	Simultaneous Lower Confidence Limit	Simultaneous Difference Between Means	Upper Confidence Limit
3 - 1	3.5256	5.1651	6.8046 ***
3 - 2	3.5858	5.2632	6.9407 ***
1 - 3	-6.8046	-5.1651	-3.5256 ***
1 - 2	-1.5174	0.0981	1.7136
2 - 3	-6.9407	-5.2632	-3.5858 ***
2 - 1	-1.7136	-0.0981	1.5174

Dependent Variable: PEPSAVG

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	3542415.4605	1771207.7303	12.64	0.0001
Error	538	75359594.4222	140073.5956		
Corrected Total	540	78902009.8827			

R-Square C.V. Root MSE PEPSAVG Mean
0.044896 723.5228 374.26407 51.728029

Source	DF	Type I SS	Mean Square	F Value	Pr > F
SOURCE	2	3542415.4605	1771207.7303	12.64	0.0001

Source	DF	Type III SS	Mean Square	F Value	Pr > F
SOURCE	2	3542415.4605	1771207.7303	12.64	0.0001

T tests (LSD) for variable: PEPSAVG

NOTE: This test controls the type I comparisonwise error rate not the experimentwise error rate.

Alpha= 0.05 Confidence= 0.95 df= 538 MSE= 140073.6
Critical Value of T= 1.96438

Comparisons significant at the 0.05 level are indicated by '***'.

SOURCE Comparison	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit
3 - 1	98.14	182.19	266.24 ***
3 - 2	105.33	183.03	260.74 ***
1 - 3	-266.24	-182.19	-98.14 ***
1 - 2	-74.30	0.84	75.98
2 - 3	-260.74	-183.03	-105.33 ***
2 - 1	-75.98	-0.84	74.30

Bonferroni (Dunn) T tests for variable: PEPSAVG

NOTE: This test controls the type I experimentwise error rate but generally has a higher type II error rate than Tukey's for all pairwise comparisons.

Alpha= 0.05 Confidence= 0.95 df= 538 MSE= 140073.6
Critical Value of T= 2.40149

Comparisons significant at the 0.05 level are indicated by '***'.

SOURCE Comparison	Simultaneous Lower Confidence Limit	Difference Between Means	Simultaneous Upper Confidence Limit
3 - 1	79.44	182.19	284.94 ***
3 - 2	88.04	183.03	278.03 ***
1 - 3	-284.94	-182.19	-79.44 ***
1 - 2	-91.02	0.84	92.70
2 - 3	-278.03	-183.03	-88.04 ***
2 - 1	-92.70	-0.84	91.02

Dependent Variable: PFSAVG

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	39443924.267	19721962.134	15.58	0.0001
Error	546	691009080.427	1265584.396		
Corrected Total	548	730453004.694			

R-Square	C.V.	Root MSE	PFSAVG Mean
0.053999	349.1754	1124.9820	322.18245

Source	DF	Type I SS	Mean Square	F Value	Pr > F
SOURCE	2	39443924.267	19721962.134	15.58	0.0001

Source	DF	Type III SS	Mean Square	F Value	Pr > F
SOURCE	2	39443924.267	19721962.134	15.58	0.0001

T tests (LSD) for variable: PFSAVG

NOTE: This test controls the type I comparisonwise error rate not the experimentwise error rate.

Alpha= 0.05 Confidence= 0.95 df= 546 MSE= 1265584
Critical Value of T= 1.96432

Comparisons significant at the 0.05 level are indicated by '***'.

SOURCE Comparison	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit
1 - 3	317.6	571.0	824.4 ***
1 - 2	369.1	592.1	815.0 ***
3 - 1	-824.4	-571.0	-317.6 ***
3 - 2	-212.9	21.1	255.0
2 - 1	-815.0	-592.1	-369.1 ***
2 - 3	-255.0	-21.1	212.9

Bonferroni (Dunn) T tests for variable: PFSAVG

NOTE: This test controls the type I experimentwise error rate but generally has a higher type II error rate than Tukey's for all pairwise comparisons.

Alpha= 0.05 Confidence= 0.95 df= 546 MSE= 1265584
Critical Value of T= 2.40138

Comparisons significant at the 0.05 level are indicated by '***'.

SOURCE Comparison	Simultaneous Lower Confidence Limit	Difference Between Means	Simultaneous Upper Confidence Limit
1 - 3	261.2	571.0	880.8 ***
1 - 2	319.5	592.1	864.6 ***
3 - 1	-880.8	-571.0	-261.2 ***
3 - 2	-264.	921.1	307.1
2 - 1	-864.6	-592.1	-319.5 ***
2 - 3	-307.1	-21.1	264.9

Post Hoc General Linear Models Procedure and Multiple Comparisons Before Deregulation (1973-1981).

Class Levels Values

SOURCE 3 1 2 3

Number of observations in data set = 249

Group Obs Dependent Variables

1	203	PMBAVG
2	204	PFSAVG PLEVAVG PLIQDAVG PPEAVG PROAAVG PROSAVG
3	203	PCFAVG
4	202	PEPSAVG
5	158	PROEAVG

NOTE: Variables in each group are consistent with respect to the presence or absence of missing values.

Dependent Variable: PMBAVG

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	211872.57362	105936.28681	8.50	0.0003
Error	200	2494076.72650	12470.38363		
Corrected Total	202	2705949.30012			

R-Square	C.V.	Root MSE	PMBAVG Mean
0.078299	1057.462	111.67087	10.560268

Source	DF	Type I SS	Mean Square	F Value	Pr > F
SOURCE	2	211872.57362	105936.28681	8.50	0.0003

Source	DF	Type III SS	Mean Square	F Value	Pr > F
SOURCE	2	211872.57362	105936.28681	8.50	0.0003

T tests (LSD) for variable: PMBAVG

NOTE: This test controls the type I comparisonwise error rate not the experimentwise error rate.

Alpha= 0.05 Confidence= 0.95 df= 200 MSE= 12470.38
Critical Value of T= 1.97190

Comparisons significant at the 0.05 level are indicated by '***'.

SOURCE Comparison	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit	
3 - 1	45.85	103.85	161.84	***
3 - 2	55.11	106.74	158.37	***
1 - 3	-161.84	-103.85	-45.85	***
1 - 2	-34.66	2.90	40.45	
2 - 3	-158.37	-106.74	-55.11	***
2 - 1	-40.45	-2.90	34.66	

Bonferroni (Dunn) T tests for variable: PMBAVG

NOTE: This test controls the type I experimentwise error rate but generally has a higher type II error rate than Tukey's for all pairwise comparisons.

Alpha= 0.05 Confidence= 0.95 df= 200 MSE= 12470.38
Critical Value of T= 2.41428

Comparisons significant at the 0.05 level are indicated by '***'.

SOURCE Comparison	Simultaneous Lower Confidence Limit	Difference Between Means	Simultaneous Upper Confidence Limit	
3 - 1	32.84	103.85	174.85	***
3 - 2	43.53	106.74	169.95	***
1 - 3	-174.85	-103.85	-32.84	***
1 - 2	-43.09	2.90	48.88	
2 - 3	-169.95	-106.74	-43.53	***
2 - 1	-48.88	-2.90	43.09	

Dependent Variable: PFSAVG

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	3485731.3777	1742865.6889	3.12	0.0463
Error	201	112254901.9722	558482.0994		
Corrected Total	203	115740633.3499			

R-Square	C.V.	Root MSE	PFSAVG Mean
0.030117	454.4680	747.31660	164.43769

Source	DF	Type I SS	Mean Square	F Value	Pr > F
SOURCE	2	3485731.3777	1742865.6889	3.12	0.0463

Source	DF	Type III SS	Mean Square	F Value	Pr > F
SOURCE	2	3485731.3777	1742865.6889	3.12	0.0463

T tests (LSD) for variable: PFSAVG

NOTE: This test controls the type I comparisonwise error rate not the experimentwise error rate.

Alpha= 0.05 Confidence= 0.95 df= 201 MSE= 558482.1
Critical Value of T= 1.97184

Comparisons significant at the 0.05 level are indicated by '***'.

SOURCE Comparison	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit
1 - 2	49.45	300.79	552.13 ***
1 - 3	-18.83	363.15	745.13
2 - 1	-552.13	-300.79	-49.45 ***
2 - 3	-276.27	62.36	400.99
3 - 1	-745.13	-363.15	18.83
3 - 2	-400.99	-62.36	276.27

Bonferroni (Dunn) T tests for variable: PFSAVG

NOTE: This test controls the type I experimentwise error rate but generally has a higher type II error rate than Tukey's for all pairwise comparisons.

Alpha= 0.05 Confidence= 0.95 df= 201 MSE= 558482.1
Critical Value of T= 2.41418

Comparisons significant at the 0.05 level are indicated by '***'.

SOURCE Comparison	Simultaneous Lower Confidence Limit	Difference Between Means	Simultaneous Upper Confidence Limit
1 - 2	-6.94	300.79	608.51
1 - 3	-104.52	363.15	830.82
2 - 1	-608.51	-300.79	6.94
2 - 3	-352.23	62.36	476.95
3 - 1	-830.82	-363.15	104.52
3 - 2	-476.95	-62.36	352.23

Dependent Variable: PLEVAVG

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	1731.6482702	865.8241351	13.71	0.0001
Error	201	12698.1890908	63.1750701		
Corrected Total	203	14429.8373609			

R-Square 0.120005 C.V. 726.3825 Root MSE 7.9482747 PLEVAVG Mean 1.0942271

Source	DF	Type I SS	Mean Square	F Value	Pr > F
SOURCE	2	1731.6482702	865.8241351	13.71	0.0001
Source	DF	Type III SS	Mean Square	F Value	Pr > F
SOURCE	2	1731.6482702	865.8241351	13.71	0.0001

T tests (LSD) for variable: PLEVAVG

NOTE: This test controls the type I comparisonwise error rate not the experimentwise error rate.

Alpha= 0.05 Confidence= 0.95 df= 201 MSE= 63.17507
Critical Value of T= 1.97184

Comparisons significant at the 0.05 level are indicated by '***'.

SOURCE Comparison	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit	
3 - 1	4.7472	8.8099	12.8725	***
3 - 2	5.9244	9.5259	13.1275	***
1 - 3	-12.8725	-8.8099	-4.7472	***
1 - 2	-1.9572	0.7160	3.3892	
2 - 3	-13.1275	-9.5259	-5.9244	***
2 - 1	-3.3892	-0.7160	1.9572	

Bonferroni (Dunn) T tests for variable: PLEVAVG

NOTE: This test controls the type I experimentwise error rate but generally has a higher type II error rate than Tukey's for all pairwise comparisons.

Alpha= 0.05 Confidence= 0.95 df= 201 MSE= 63.17507
Critical Value of T= 2.41418

Comparisons significant at the 0.05 level are indicated by '***'.

Simultaneous SOURCE Comparison	Simultaneous Lower Confidence Limit	Difference Between Means	Upper Confidence Limit	
3 - 1	3.8359	8.8099	13.7839	***
3 - 2	5.1164	9.5259	13.9354	***
1 - 3	-13.7839	-8.8099	-3.8359	***
1 - 2	-2.5568	0.7160	3.9889	
2 - 3	-13.9354	-9.5259	-5.1164	***
2 - 1	-3.9889	-0.7160	2.5568	

Dependent Variable: PLIQDAVG

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	20.20882796	10.10441398	9.96	0.0001
Error	201	204.00225046	1.01493657		
Corrected Total	203	224.21107842			

R-Square	C.V.	Root MSE	PLIQDAVG Mean
0.090133	-421.3444	1.0074406	-0.2391014

Source	DF	Type I SS	Mean Square	F Value	Pr > F
SOURCE	2	20.20882796	10.10441398	9.96	0.0001

Source	DF	Type III SS	Mean Square	F Value	Pr > F
SOURCE	2	20.20882796	10.10441398	9.96	0.0001

T tests (LSD) for variable: PLIQDAVG

NOTE: This test controls the type I comparisonwise error rate not the experimentwise error rate.

Alpha= 0.05 Confidence= 0.95 df= 201 MSE= 1.014937
Critical Value of T= 1.97184

Comparisons significant at the 0.05 level are indicated by '***'.

SOURCE Comparison	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit
1 - 2	-0.2726	0.0662	0.4051
1 - 3	0.5455	1.0604	1.5753 ***
2 - 1	-0.4051	-0.0662	0.2726
2 - 3	0.5377	0.9942	1.4507 ***
3 - 1	-1.5753	-1.0604	-0.5455 ***
3 - 2	-1.4507	-0.9942	-0.5377 ***

Bonferroni (Dunn) T tests for variable: PLIQDAVG

NOTE: This test controls the type I experimentwise error rate but generally has a higher type II error rate than Tukey's for all pairwise comparisons.

Alpha= 0.05 Confidence= 0.95 df= 201 MSE= 1.014937
Critical Value of T= 2.41418

Comparisons significant at the 0.05 level are indicated by '***'.

SOURCE Comparison	Simultaneous Lower Confidence Limit	Difference Between Means	Simultaneous Upper Confidence Limit
1 - 2	-0.3486	0.0662	0.4811
1 - 3	0.4300	1.0604	1.6909 ***
2 - 1	-0.4811	-0.0662	0.3486
2 - 3	0.4353	0.9942	1.5531 ***
3 - 1	-1.6909	-1.0604	-0.4300 ***
3 - 2	-1.5531	-0.9942	-0.4353 ***

Dependent Variable: PPEAVG

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	591.15538711	295.57769355	0.04	0.9581
Error	201	1387477.156919	6902.87142746		
Corrected Total	203	1388068.312306			

R-Square C.V. Root MSE PPEAVG Mean
0.000426 2005.744 83.083521 4.1422785

Source	DF	Type I SS	Mean Square	F Value	Pr > F
SOURCE	2	591.15538711	295.57769355	0.04	0.9581
Source	DF	Type III SS	Mean Square	F Value	Pr > F
SOURCE	2	591.15538711	295.57769355	0.04	0.9581

Dependent Variable: PROAAVG

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	209.37441771	104.68720886	0.18	0.8382
Error	201	119137.4984664	592.72387297		
Corrected Total	203	119346.8728841			

R-Square	C.V.	Root MSE	PROAAVG Mean
0.001754	2663.671	24.345921	0.9139988

Source	DF	Type I SS	Mean Square	F Value	Pr > F
SOURCE	2	209.37441771	104.68720886	0.18	0.8382

Source	DF	Type III SS	Mean Square	F Value	Pr > F
SOURCE	2	209.37441771	104.68720886	0.18	0.8382

Dependent Variable: PROSAVG

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	9227.9133109	4613.9566554	0.19	0.8233
Error	201	4764384.166933	23703.4038156		
Corrected Total	203	4773612.080244			

R-Square	C.V.	Root MSE	PROSAVG Mean
0.001933	-3061.857	153.95910	-5.0282920

Source	DF	Type I SS	Mean Square	F Value	Pr > F
SOURCE	2	9227.9133109	4613.9566554	0.19	0.8233

Source	DF	Type III SS	Mean Square	F Value	Pr > F
SOURCE	2	9227.9133109	4613.9566554	0.19	0.8233

Dependent Variable: PCFAVG

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	21.88436482	10.94218241	15.46	0.0001
Error	200	141.51472353	0.70757362		
Corrected Total	202	163.39908835			

R-Square	C.V.	Root MSE	PCFAVG Mean
0.133932	-884.7755	0.8411740	-0.0950720

Source	DF	Type I SS	Mean Square	F Value	Pr > F
SOURCE	2	21.88436482	10.94218241	15.46	0.0001

Source	DF	Type III SS	Mean Square	F Value	Pr > F
SOURCE	2	21.88436482	10.94218241	15.46	0.0001

T tests (LSD) for variable: PCFAVG

NOTE: This test controls the type I comparisonwise error rate not the experimentwise error rate.

Alpha= 0.05 Confidence= 0.95 df= 200 MSE= 0.707574
Critical Value of T= 1.97190

Comparisons significant at the 0.05 level are indicated by '***'.

SOURCE Comparison	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit
1 - 2	-0.1933	0.0899	0.3731
1 - 3	0.6866	1.1166	1.5465 ***
2 - 1	-0.3731	-0.0899	0.1933
2 - 3	0.6453	1.0267	1.4081 ***
3 - 1	-1.5465	-1.1166	-0.6866 ***
3 - 2	-1.4081	-1.0267	-0.6453 ***

Bonferroni (Dunn) T tests for variable: PCFAVG

NOTE: This test controls the type I experimentwise error rate but generally has a higher type II error rate than Tukey's for all pairwise comparisons.

Alpha= 0.05 Confidence= 0.95 df= 200 MSE= 0.707574
Critical Value of T= 2.41428

Comparisons significant at the 0.05 level are indicated by '***'.

SOURCE Comparison	Simultaneous Lower Confidence Limit	Difference Between Means	Simultaneous Upper Confidence Limit
1 - 2	-0.2568	0.0899	0.4366
1 - 3	0.5901	1.1166	1.6430 ***
2 - 1	-0.4366	-0.0899	0.2568
2 - 3	0.5598	1.0267	1.4936 ***
3 - 1	-1.6430	-1.1166	-0.5901 ***
3 - 2	-1.4936	-1.0267	-0.5598 ***

Dependent Variable: PEPSAVG

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	19303.635158	9651.817579	13.94	0.0001
Error	199	137751.719722	692.219697		
Corrected Total	201	157055.354880			

R-Square 0.122910 C.V. 435.8629 Root MSE 26.310068 PEPSAVG Mean 6.0363172

Source	DF	Type I SS	Mean Square	F Value	Pr > F
SOURCE	2	19303.635158	9651.817579	13.94	0.0001

Source	DF	Type III SS	Mean Square	F Value	Pr > F
SOURCE	2	19303.635158	9651.817579	13.94	0.0001

T tests (LSD) for variable: PEPSAVG

NOTE: This test controls the type I comparisonwise error rate not the experimentwise error rate.

Alpha= 0.05 Confidence= 0.95 df= 199 MSE= 692.2197
Critical Value of T= 1.97196

Comparisons significant at the 0.05 level are indicated by '***'.

SOURCE Comparison	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit
3 - 2	18.346	30.281	42.216 ***
3 - 1	20.020	33.468	46.917 ***
2 - 3	-42.216	-30.281	-18.346 ***
2 - 1	-5.679	3.187	12.053
1 - 3	-46.917	-33.468	-20.020 ***
1 - 2	-12.053	-3.187	5.679

Bonferroni (Dunn) T tests for variable: PEPSAVG

NOTE: This test controls the type I experimentwise error rate but generally has a higher type II error rate than Tukey's for all pairwise comparisons.

Alpha= 0.05 Confidence= 0.95 df= 199 MSE= 692.2197
Critical Value of T= 2.41439

Comparisons significant at the 0.05 level are indicated by '***'.

SOURCE Comparison	Simultaneous Lower Confidence Limit	Difference Between Means	Simultaneous Upper Confidence Limit
3 - 2	15.668	30.281	44.894 ***
3 - 1	17.002	33.468	49.935 ***
2 - 3	-44.894	-30.281	-15.668 ***
2 - 1	-7.668	3.187	14.042
1 - 3	-49.935	-33.468	-17.002 ***
1 - 2	-14.042	-3.187	7.668

Dependent Variable: PROEAVG

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	1.78640108	0.89320054	0.37	0.6933
Error	155	377.00789588	2.43230901		
Corrected Total	157	378.79429696			

R-Square	C.V.	Root MSE	PROEAVG Mean
0.004716	4557.461	1.5595862	0.0342205

Source	DF	Type I SS	Mean Square	F Value	Pr > F
SOURCE	2	1.78640108	0.89320054	0.37	0.6933

Source	DF	Type III SS	Mean Square	F Value	Pr > F
SOURCE	2	1.78640108	0.89320054	0.37	0.6933

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Class Level Information

Class	Levels	Values
SOURCE	3	1 2 3

Number of observations in data set = 296

Group Obs Dependent Variables

1	238	PMB AVG PFS AVG PCF AVG
2	237	PLEV AVG PROA AVG PROS AVG
3	233	PLIQD AVG
4	232	PEPS AVG
5	234	PPE AVG
6	195	PROE AVG

NOTE: Variables in each group are consistent with respect to the presence or absence of missing values.

Dependent Variable: PMB AVG

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	60346296.452	30173148.226	3.37	0.0360
Error	235	2103786890.063	8952284.639		
Corrected Total	237	2164133186.516			

R-Square	C.V.	Root MSE	PMB AVG Mean
0.027885	848.5463	2992.0369	352.60737

Source	DF	Type I SS	Mean Square	F Value	Pr > F
SOURCE	2	60346296.452	30173148.226	3.37	0.0360

Source	DF	Type III SS	Mean Square	F Value	Pr > F
SOURCE	2	60346296.452	30173148.226	3.37	0.0360

T tests (LSD) for variable: PMBAVG

NOTE: This test controls the type I comparisonwise error rate not the experimentwise error rate.

Alpha= 0.05 Confidence= 0.95 df= 235 MSE= 8952285
Critical Value of T= 1.97011

Comparisons significant at the 0.05 level are indicated by '***'.

SOURCE Comparison	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit
3 - 2	164.3	1074.7	1985.2 ***
3 - 1	101.3	1078.5	2055.6 ***
2 - 3	-1985.2	-1074.7	-164.3 ***
2 - 1	-935.0	3.7	942.5
1 - 3	-2055.6	-1078.5	-101.3 ***
1 - 2	-942.5	-3.7	935.0

Bonferroni (Dunn) T tests for variable: PMBAVG

NOTE: This test controls the type I experimentwise error rate but generally has a higher type II error rate than Tukey's for all pairwise comparisons.

Alpha= 0.05 Confidence= 0.95 df= 235 MSE= 8952285
Critical Value of T= 2.41124

Comparisons significant at the 0.05 level are indicated by '***'.

SOURCE Comparison	Simultaneous Lower Confidence Limit	Difference Between Means	Simultaneous Upper Confidence Limit
3 - 2	-39.6	1074.7	2189.1
3 - 1	-117.5	1078.5	2274.4
2 - 3	-2189.1	-1074.7	39.6
2 - 1	-1145.2	3.7	1152.7
1 - 3	-2274.4	-1078.5	117.5
1 - 2	-1152.7	-3.7	1145.2

Dependent Variable: PFSAVG

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	5225814.9547	2612907.4773	10.11	0.0001
Error	235	60723959.0837	258399.8259		
Corrected Total	237	65949774.0384			

R-Square	C.V.	Root MSE	PFSAVG Mean
0.079239	214.1245	508.33043	237.39944

Source	DF	Type I SS	Mean Square	F Value	Pr > F
SOURCE	2	5225814.9547	2612907.4773	10.11	0.0001

Source	DF	Type III SS	Mean Square	F Value	Pr > F
SOURCE	2	5225814.9547	2612907.4773	10.11	0.0001

T tests (LSD) for variable: PFSAVG

NOTE: This test controls the type I comparisonwise error rate not the experimentwise error rate.

Alpha= 0.05 Confidence= 0.95 df= 235 MSE= 258399.8
Critical Value of T= 1.97011

Comparisons significant at the 0.05 level are indicated by '***'.

SOURCE Comparison	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit	
1 - 2	100.68	260.17	419.66	***
1 - 3	204.22	370.23	536.24	***
2 - 1	-419.66	-260.17	-100.68	***
2 - 3	-44.62	110.06	264.74	
3 - 1	-536.24	-370.23	-204.22	***
3 - 2	-264.74	-110.06	44.62	

Bonferroni (Dunn) T tests for variable: PFSAVG

NOTE: This test controls the type I experimentwise error rate but generally has a higher type II error rate than Tukey's for all pairwise comparisons.

Alpha= 0.05 Confidence= 0.95 df= 235 MSE= 258399.8
Critical Value of T= 2.41124

Comparisons significant at the 0.05 level are indicated by '***'.

SOURCE Comparison	Simultaneous Lower Confidence Limit	Difference Between Means	Simultaneous Upper Confidence Limit
1 - 2	64.97	260.17	455.37 ***
1 - 3	167.04	370.23	573.42 ***
2 - 1	-455.37	-260.17	-64.97 ***
2 - 3	-79.25	110.06	299.38
3 - 1	-573.42	-370.23	-167.04 ***
3 - 2	-299.38	-110.06	79.25

Dependent Variable: PCFAVG

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	156855.49590	78427.74795	40.50	0.0001
Error	235	455126.85810	1936.71003		
Corrected Total	237	611982.35400			

R-Square 0.256307 C.V. -248.6775 Root MSE 44.008068 PCFAVG Mean -17.696842

Source	DF	Type I SS	Mean Square	F Value	Pr > F
SOURCE	2	156855.49590	78427.74795	40.50	0.0001
Source	DF	Type III SS	Mean Square	F Value	Pr > F
SOURCE	2	156855.49590	78427.74795	40.50	0.0001

T tests (LSD) for variable: PCFAVG

NOTE: This test controls the type I comparisonwise error rate not the experimentwise error rate.

Alpha= 0.05 Confidence= 0.95 df= 235 MSE= 1936.71
Critical Value of T= 1.97011

Comparisons significant at the 0.05 level are indicated by '***'.

SOURCE Comparison	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit
1 - 2	-13.780	0.027	13.835
1 - 3	40.519	54.891	69.264 ***
2 - 1	-13.835	-0.027	13.780
2 - 3	41.473	54.864	68.255 ***
3 - 1	-69.264	-54.891	-40.519 ***
3 - 2	-68.255	-54.864	-41.473 ***

Bonferroni (Dunn) T tests for variable: PCFAVG

NOTE: This test controls the type I experimentwise error rate but generally has a higher type II error rate than Tukey's for all pairwise comparisons.

Alpha= 0.05 Confidence= 0.95 df= 235 MSE= 1936.71
Critical Value of T= 2.41124

Comparisons significant at the 0.05 level are indicated by '***'.

SOURCE Comparison	Simultaneous Lower Confidence Limit	Difference Between Means	Simultaneous Upper Confidence Limit
1 - 2	-16.872	0.027	16.926
1 - 3	37.301	54.891	72.482 ***
2 - 1	-16.926	-0.027	16.872
2 - 3	38.474	54.864	71.254 ***
3 - 1	-72.482	-54.891	-37.301 ***
3 - 2	-71.254	-54.864	-38.474 ***

Dependent Variable: PLEVAVG

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	435.02316976	217.51158488	0.47	0.6263
Error	234	108539.6042279	463.84446251		
Corrected Total	236	108974.6273977			

R-Square	C.V.	Root MSE	PLEVAVG Mean
0.003992	811.1001	21.537049	2.6552885

Source	DF	Type I SS	Mean Square	F Value	Pr > F
SOURCE	2	435.02316976	217.51158488	0.47	0.6263

Source	DF	Type III SS	Mean Square	F Value	Pr > F
SOURCE	2	435.02316976	217.51158488	0.47	0.6263

Dependent Variable: PROAAVG

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	1368.4852409	684.2426205	0.78	0.4590
Error	234	204915.1062013	875.7055821		
Corrected Total	236	206283.5914422			

R-Square	C.V.	Root MSE	PROAAVG Mean
0.006634	636.3976	29.592323	4.6499738

Source	DF	Type I SS	Mean Square	F Value	Pr > F
SOURCE	2	1368.4852409	684.2426205	0.78	0.4590

Source	DF	Type III SS	Mean Square	F Value	Pr > F
SOURCE	2	1368.4852409	684.2426205	0.78	0.4590

Dependent Variable: PROSAVG

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	1246.2235459	623.1117730	1.41	0.2458
Error	234	103299.3336970	441.4501440		
Corrected Total	236	104545.5572429			

R-Square	C.V.	Root MSE	PROSAVG Mean
0.011920	296.3734	21.010715	7.0892709

Source	DF	Type I SS	Mean Square	F Value	Pr > F
SOURCE	2	1246.2235459	623.1117730	1.41	0.2458

Source	DF	Type III SS	Mean Square	F Value	Pr > F
SOURCE	2	1246.2235459	623.1117730	1.41	0.2458

Dependent Variable: PLIQDAVG

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	2953.3154839	1476.6577420	8.98	0.0002
Error	230	37833.6848052	164.4942818		
Corrected Total	232	40787.0002891			

R-Square	C.V.	Root MSE	PLIQDAVG Mean
0.072408	547.5652	12.825532	2.3422839

Source	DF	Type I SS	Mean Square	F Value	Pr > F
SOURCE	2	2953.3154839	1476.6577420	8.98	0.0002

Source	DF	Type III SS	Mean Square	F Value	Pr > F
SOURCE	2	2953.3154839	1476.6577420	8.98	0.0002

T tests (LSD) for variable: PLIQDAVG

NOTE: This test controls the type I comparisonwise error rate not the experimentwise error rate.

Alpha= 0.05 Confidence= 0.95 df= 230 MSE= 164.4943
Critical Value of T= 1.97033

Comparisons significant at the 0.05 level are indicated by '***'.

SOURCE Comparison	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit
3 - 2	3.696	7.657	11.618 ***
3 - 1	3.442	7.701	11.960 ***
2 - 3	-11.618	-7.657	-3.696 ***
2 - 1	-3.997	0.044	4.086
1 - 3	-11.960	-7.701	-3.442 ***
1 - 2	-4.086	-0.044	3.997

Bonferroni (Dunn) T tests for variable: PLIQDAVG

NOTE: This test controls the type I experimentwise error rate but generally has a higher type II error rate than Tukey's for all pairwise comparisons.

Alpha= 0.05 Confidence= 0.95 df= 230 MSE= 164.4943
Critical Value of T= 2.41162

Comparisons significant at the 0.05 level are indicated by '***'.

SOURCE Comparison	Simultaneous Lower Confidence Limit	Difference Between Means	Simultaneous Upper Confidence Limit
3 - 2	2.809	7.657	12.505 ***
3 - 1	2.488	7.701	12.914 ***
2 - 3	-12.505	-7.657	-2.809 ***
2 - 1	-4.902	0.044	4.991
1 - 3	-12.914	-7.701	-2.488 ***
1 - 2	-4.991	-0.044	4.902

Dependent Variable: PEPSAVG

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	17634.866199	8817.433099	6.55	0.0017
Error	229	308229.285214	1345.979411		
Corrected Total	231	325864.151413			

R-Square	C.V.	Root MSE	PEPSAVG Mean
0.054117	392.9255	36.687592	9.3370343

Source	DF	Type I SS	Mean Square	F Value	Pr > F
SOURCE	2	17634.866199	8817.433099	6.55	0.0017

Source	DF	Type III SS	Mean Square	F Value	Pr > F
SOURCE	2	17634.866199	8817.433099	6.55	0.0017

T tests (LSD) for variable: PEPSAVG

NOTE: This test controls the type I comparisonwise error rate not the experimentwise error rate.

Alpha= 0.05 Confidence= 0.95 df= 229 MSE= 1345.979
Critical Value of T= 1.97038

Comparisons significant at the 0.05 level are indicated by '***'.

SOURCE Comparison	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit
3 - 1	2.767	14.738	26.709 ***
3 - 2	8.887	20.148	31.408 ***
1 - 3	-26.709	-14.738	-2.767 ***
1 - 2	-6.400	5.410	17.220
2 - 3	-31.408	-20.148	-8.887 ***
2 - 1	-17.220	-5.410	6.400

Bonferroni (Dunn) T tests for variable: PEPSAVG

NOTE: This test controls the type I experimentwise error rate but generally has a higher type II error rate than Tukey's for all pairwise comparisons.

Alpha= 0.05 Confidence= 0.95 df= 229 MSE= 1345.979
Critical Value of T= 2.41170

Comparisons significant at the 0.05 level are indicated by '***'.

SOURCE Comparison	Simultaneous Lower Confidence Limit	Difference Between Means	Simultaneous Upper Confidence Limit
3 - 1	0.085	14.738	29.391 ***
3 - 2	6.365	20.148	33.930 ***
1 - 3	-29.391	-14.738	-0.085 ***
1 - 2	-9.045	5.410	19.865
2 - 3	-33.930	-20.148	-6.365 ***
2 - 1	-19.865	-5.410	9.045

Dependent Variable: PPEAVG

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	479405.26645	239702.63323	1.55	0.2139
Error	231	35665753.95495	154397.20327		
Corrected Total	233	36145159.22140			

R-Square 0.013263 C.V. 817.0362 Root MSE 392.93410 PPEAVG Mean 48.092620

Source	DF	Type I SS	Mean Square	F Value	Pr > F
SOURCE	2	479405.26645	239702.63323	1.55	0.2139

Source	DF	Type III SS	Mean Square	F Value	Pr > F
SOURCE	2	479405.26645	239702.63323	1.55	0.2139

Dependent Variable: PROEAVG

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	3359.6123061	1679.8061531	26.34	0.0001
Error	192	12245.1015164	63.7765704		
Corrected Total	194	15604.7138225			

R-Square	C.V.	Root MSE	PROEAVG Mean
0.215295	228.2297	7.9860234	3.4991165

Source	DF	Type I SS	Mean Square	F Value	Pr > F
SOURCE	2	3359.6123061	1679.8061531	26.34	0.0001

Source	DF	Type III SS	Mean Square	F Value	Pr > F
SOURCE	2	3359.6123061	1679.8061531	26.34	0.0001

T tests (LSD) for variable: PROEAVG

NOTE: This test controls the type I comparisonwise error rate not the experimentwise error rate.

Alpha= 0.05 Confidence= 0.95 df= 192 MSE= 63.77657
Critical Value of T= 1.97240

Comparisons significant at the 0.05 level are indicated by '***'.

SOURCE Comparison	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit
3 - 1	5.859	8.481	11.102 ***
3 - 2	5.645	8.506	11.367 ***
1 - 3	-11.102	-8.481	-5.859 ***
1 - 2	-2.909	0.025	2.960
2 - 3	-11.367	-8.506	-5.645 ***
2 - 1	-2.960	-0.025	2.909

Bonferroni (Dunn) T tests for variable: PROEAVG

NOTE: This test controls the type I experimentwise error rate but generally has a higher type II error rate than Tukey's for all pairwise comparisons.

Alpha= 0.05 Confidence= 0.95 df= 192 MSE= 63.77657
Critical Value of T= 2.41514

Comparisons significant at the 0.05 level are indicated by '***'.

SOURCE Comparison	Simultaneous Lower Confidence Limit	Difference Between Means	Simultaneous Upper Confidence Limit
3 - 1	5.271	8.481	11.690 ***
3 - 2	5.003	8.506	12.009 ***
1 - 3	-11.690	-8.481	-5.271 ***
1 - 2	-3.568	0.025	3.618
2 - 3	-12.009	-8.506	-5.003 ***
2 - 1	-3.618	-0.025	3.568

Post Hoc General Linear Models Procedure and Multiple Comparisons After Deregulation (1988-1992).

Class Level Information

Class	Levels	Values
SOURCE	3	1 2 3

Number of observations in data set = 130

Group Obs Dependent Variables

1	108	PMBAVG
2	107	PFSAVG PLIQDAVG
3	103	PCFAVG
4	106	PLEVAVG PROAAVG
5	107	PEPSAVG
6	104	PPEAVG
7	98	PROEAVG
8	105	PROSAVG

NOTE: Variables in each group are consistent with respect to the presence or absence of missing values.

Dependent Variable: PMBAVG

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	18716.275913	9358.137956	1.56	0.2143
Error	105	628662.123655	5987.258321		
Corrected Total	107	647378.399568			

R-Square	C.V.	Root MSE	PMBAVG Mean
0.028911	604.3186	77.377376	12.804070

Source	DF	Type I SS	Mean Square	F Value	Pr > F
SOURCE	2	18716.275913	9358.137956	1.56	0.2143

Source	DF	Type III SS	Mean Square	F Value	Pr > F
SOURCE	2	18716.275913	9358.137956	1.56	0.2143

Dependent Variable: PFSAVG

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	34160629.276	17080314.638	3.68	0.0285
Error	104	482194504.080	4636485.616		
Corrected Total	106	516355133.356			

R-Square	C.V.	Root MSE	PFSAVG Mean
0.066157	265.3380	2153.2500	811.51221

Source	DF	Type I SS	Mean Square	F Value	Pr > F
SOURCE	2	34160629.276	17080314.638	3.68	0.0285

Source	DF	Type III SS	Mean Square	F Value	Pr > F
SOURCE	2	34160629.276	17080314.638	3.68	0.0285

T tests (LSD) for variable: PFSAVG

NOTE: This test controls the type I comparisonwise error rate not the experimentwise error rate.

Alpha= 0.05 Confidence= 0.95 df= 104 MSE= 4636486
Critical Value of T= 1.98304

Comparisons significant at the 0.05 level are indicated by '***'.

SOURCE Comparison	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit
1 - 3	159.8	1053.5	1947.3 ***
1 - 2	51.1	1308.1	2565.2 ***
3 - 1	-1947.3	-1053.5	-159.8 ***
3 - 2	-1029.8	254.6	1539.0
2 - 1	-2565.2	-1308.1	-51.1 ***
2 - 3	-1539.0	-254.6	1029.8

Bonferroni (Dunn) T tests for variable: PFSAVG

NOTE: This test controls the type I experimentwise error rate but generally has a higher type II error rate than Tukey's for all pairwise comparisons.

Alpha= 0.05 Confidence= 0.95 df= 104 MSE= 4636486
Critical Value of T= 2.43332

Comparisons significant at the 0.05 level are indicated by '***'.

SOURCE Comparison	Simultaneous Lower Confidence Limit	Difference Between Means	Simultaneous Upper Confidence Limit
1 - 3	-43.1	1053.5	2150.2
1 - 2	-234.3	1308.1	2850.6
3 - 1	-2150.2	-1053.5	43.1
3 - 2	-1321.4	254.6	1830.6
2 - 1	-2850.6	-1308.1	234.3
2 - 3	-1830.6	-254.6	1321.4

Dependent Variable: PLIQDAVG

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	36445765.779	18222882.889	0.85	0.4302
Error	104	2228846585.347	21431217.167		
Corrected Total	106	2265292351.126			

R-Square 0.016089 C.V. 987.0072 Root MSE 4629.3863 PLIQDAVG Mean 469.03268

Source	DF	Type I SS	Mean Square	F Value	Pr > F
SOURCE	2	36445765.779	18222882.889	0.85	0.4302
Source	DF	Type III SS	Mean Square	F Value	Pr > F
SOURCE	2	36445765.779	18222882.889	0.85	0.4302

Dependent Variable: PCFAVG

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	27881.765172	13940.882586	2.35	0.1009
Error	100	593848.629650	5938.486297		
Corrected Total	102	621730.394822			

R-Square	C.V.	Root MSE	PCFAVG Mean
0.044845	-602.1720	77.061575	-12.797271

Source	DF	Type I SS	Mean Square	F Value	Pr > F
SOURCE	2	27881.765172	13940.882586	2.35	0.1009

Source	DF	Type III SS	Mean Square	F Value	Pr > F
SOURCE	2	27881.765172	13940.882586	2.35	0.1009

Dependent Variable: PLEVAVG

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	167.85496763	83.92748382	2.04	0.1356
Error	103	4243.46493789	41.19868872		
Corrected Total	105	4411.31990552			

R-Square	C.V.	Root MSE	PLEVAVG Mean
0.038051	453.7643	6.4186205	1.4145275

Source	DF	Type I SS	Mean Square	F Value	Pr > F
SOURCE	2	167.85496763	83.92748382	2.04	0.1356

Source	DF	Type III SS	Mean Square	F Value	Pr > F
SOURCE	2	167.85496763	83.92748382	2.04	0.1356

Dependent Variable: PROAAVG

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	1700.4193383	850.2096691	3.80	0.0256
Error	103	23053.0104596	223.8156355		
Corrected Total	105	24753.4297979			

R-Square	C.V.	Root MSE	PROAAVG Mean
0.068694	241.6743	14.960469	6.1903425

Source	DF	Type I SS	Mean Square	F Value	Pr > F
SOURCE	2	1700.4193383	850.2096691	3.80	0.0256

Source	DF	Type III SS	Mean Square	F Value	Pr > F
SOURCE	2	1700.4193383	850.2096691	3.80	0.0256

T tests (LSD) for variable: PROAAVG

NOTE: This test controls the type I comparisonwise error rate not the experimentwise error rate.

Alpha= 0.05 Confidence= 0.95 df= 103 MSE= 223.8156
Critical Value of T= 1.98326

Comparisons significant at the 0.05 level are indicated by '***'.

SOURCE Comparison	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit
3 - 2	-1.437	7.516	16.470
3 - 1	2.156	8.407	14.659 ***
2 - 3	-16.470	-7.516	1.437
2 - 1	-7.844	0.891	9.626
1 - 3	-14.659	-8.407	-2.156 ***
1 - 2	-9.626	-0.891	7.844

Bonferroni (Dunn) T tests for variable: PROA AVG

NOTE: This test controls the type I experimentwise error rate but generally has a higher type II error rate than Tukey's for all pairwise comparisons.

Alpha= 0.05 Confidence= 0.95 df= 103 MSE= 223.8156
Critical Value of T= 2.43371

Comparisons significant at the 0.05 level are indicated by '***'.

SOURCE Comparison	Simultaneous Lower Confidence Limit	Difference Between Means	Simultaneous Upper Confidence Limit
3 - 2	-3.470	7.516	18.503
3 - 1	0.736	8.407	16.079 ***
2 - 3	-18.503	-7.516	3.470
2 - 1	-9.828	0.891	11.610
1 - 3	-16.079	-8.407	-0.736 ***
1 - 2	-11.610	-0.891	9.828

Dependent Variable: PEPSAVG

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	8270228.3416	4135114.1708	6.52	0.0021
Error	104	65913482.2186	633783.4829		
Corrected Total	106	74183710.5602			

R-Square 0.111483 C.V. 346.2827 Root MSE 796.10520 PEPSAVG Mean 229.90034

Source	DF	Type I SS	Mean Square	F Value	Pr > F
SOURCE	2	8270228.3416	4135114.1708	6.52	0.0021

Source	DF	Type III SS	Mean Square	F Value	Pr > F
SOURCE	2	8270228.3416	4135114.1708	6.52	0.0021

T tests (LSD) for variable: PEPSAVG

NOTE: This test controls the type I comparisonwise error rate not the experimentwise error rate.

Alpha= 0.05 Confidence= 0.95 df= 104 MSE= 633783.5
Critical Value of T= 1.98304

Comparisons significant at the 0.05 level are indicated by '***'.

SOURCE Comparison	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit
3 - 2	93.6	567.0	1040.4 ***
3 - 1	237.2	567.1	897.0 ***
2 - 3	-1040.4	-567.0	-93.6 ***
2 - 1	-465.7	0.1	466.0
1 - 3	-897.0	-567.1	-237.2 ***
1 - 2	-466.0	-0.1	465.7

Bonferroni (Dunn) T tests for variable: PEPSAVG

NOTE: This test controls the type I experimentwise error rate but generally has a higher type II error rate than Tukey's for all pairwise comparisons.

Alpha= 0.05 Confidence= 0.95 df= 104 MSE= 633783.5
Critical Value of T= 2.43332

Comparisons significant at the 0.05 level are indicated by '***'.

SOURCE Comparison	Simultaneous Lower Confidence Limit	Difference Between Means	Simultaneous Upper Confidence Limit
3 - 2	-13.9	567.0	1147.9
3 - 1	162.3	567.1	971.9 ***
2 - 3	-1147.9	-567.0	13.9
2 - 1	-571.5	0.1	571.7
1 - 3	-971.9	-567.1	-162.3 ***
1 - 2	-571.7	-0.1	571.5

Dependent Variable: PPEAVG

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	4442.9706218	2221.4853109	1.67	0.1936
Error	101	134425.5117844	1330.9456612		
Corrected Total	103	138868.4824062			

R-Square	C.V.	Root MSE	PPEAVG Mean
0.031994	617.7218	36.482128	5.9059151

Source	DF	Type I SS	Mean Square	F Value	Pr > F
SOURCE	2	4442.9706218	2221.4853109	1.67	0.1936

Source	DF	Type III SS	Mean Square	F Value	Pr > F
SOURCE	2	4442.9706218	2221.4853109	1.67	0.1936

Dependent Variable: PROEAVG

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	64.64715257	32.32357628	2.65	0.0760
Error	95	1159.84146120	12.20885749		
Corrected Total	97	1224.48861377			

R-Square	C.V.	Root MSE	PROEAVG Mean
0.052795	359.7752	3.4941176	0.9711946

Source	DF	Type I SS	Mean Square	F Value	Pr > F
SOURCE	2	64.64715257	32.32357628	2.65	0.0760

Source	DF	Type III SS	Mean Square	F Value	Pr > F
SOURCE	2	64.64715257	32.32357628	2.65	0.0760

Dependent Variable: PROSAVG

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	900.61641677	450.30820839	2.07	0.1318
Error	102	22220.72777378	217.85027229		
Corrected Total	104	23121.34419055			

R-Square	C.V.	Root MSE	PROSAVG Mean
0.038952	402.7401	14.759752	3.6648326

Source	DF	Type I SS	Mean Square	F Value	Pr > F
SOURCE	2	900.61641677	450.30820839	2.07	0.1318

Source	DF	Type III SS	Mean Square	F Value	Pr > F
SOURCE	2	900.61641677	450.30820839	2.07	0.1318

Stepwise Discriminant Analysis

444 Observations 10 Variable(s) in the Analysis
3 Class Levels 0 Variable(s) will be included

The Method for Selecting Variables will be: BACKWARD

Significance Level to Stay = 0.1500

Class Level Information

SOURCE	Frequency	Weight	Proportion
1	163	163.0000	0.367117
2	148	148.0000	0.335601
3	133	133.0000	0.301587

Backward Elimination: Step 0

All variables have been entered

Multivariate Statistics

Wilks' Lambda = 0.56347237 $F(20, 858) = 14.251$ Prob > F = 0.0001

Pillai's Trace = 0.453619 $F(20, 860) = 12.614$ Prob > F = 0.0001

Average Squared Canonical Correlation = 0.22680935

Backward Elimination: Step 1

Statistics for Removal, DF = 2, 432

Variable	Partial R**2	F	Prob > F
PMB AVG	0.0508	11.482	0.0001
PFS AVG	0.0555	12.596	0.0001
PPE AVG	0.0041	0.877	0.4167
PCF AVG	0.1063	25.526	0.0001
PLIQD AVG	0.0335	7.434	0.0007
PEP AVG	0.0994	23.672	0.0001
PROE AVG	0.0109	2.361	0.0955
PROS AVG	0.1080	25.980	0.0001
PROA AVG	0.0030	0.636	0.5297
PLEV AVG	0.0520	11.766	0.0001

The following variable(s) have been removed:
PROAAVG

Multivariate Statistics

Wilks' Lambda = 0.56514419 F(18, 860) = 15.777 Prob > F = 0.0001
Pillai's Trace = 0.451186 F(18, 862) = 13.951 Prob > F = 0.0001

Average Squared Canonical Correlation = 0.22559320

Backward Elimination: Step 2

Statistics for Removal, DF = 2, 433

Variable	Partial R**2	F	Prob > F
PMBAVG	0.0520	11.789	0.0001
PFSAVG	0.0554	12.610	0.0001
PPEAVG	0.0040	0.858	0.4247
PCFAVG	0.1085	26.170	0.0001
PLIQDAVG	0.0329	7.306	0.0008
PEPSAVG	0.1159	28.176	0.0001
PROEAVG	0.0105	2.286	0.1029
PROSAVG	0.1188	28.985	0.0001
PLEVAVG	0.0755	17.546	0.0001

Backward Elimination: Step 2

The following variable(s) have been removed:
PPEAVG PROAAVG

Multivariate Statistics

Wilks' Lambda = 0.56739985 F(16, 862) = 17.647 Prob > F = 0.0001
Pillai's Trace = 0.448834 F(16, 864) = 15.625 Prob > F = 0.0001

Average Squared Canonical Correlation = 0.22441715

Backward Elimination: Step 3

Statistics for Removal, DF = 2, 434

Variable	Partial R**2	F	Prob > F
PMB AVG	0.0529	12.038	0.0001
PFS AVG	0.0554	12.636	0.0001
PCF AVG	0.1086	26.268	0.0001
PLIQD AVG	0.0328	7.310	0.0008
PEP AVG	0.1152	28.048	0.0001
PROE AVG	0.0111	2.421	0.0900
PROS AVG	0.1193	29.183	0.0001
PLEV AVG	0.0750	17.477	0.0001

No variables can be removed

No further steps are possible

Backward Elimination: Summary

Step	Variable Removed	Number In	Partial F R**2 Stat	Prob > Wilks' F Lambda	Prob < Lambda
0		10	.	0.56347237	0.0001
1	PROA AVG	9	0.0030 0.636	0.5297 0.56514419	0.0001
2	PPE AVG	8	0.0040 0.858	0.4247 0.56739985	0.0001

Backward Elimination: Summary

Step	Variable Removed	Number In	Average Squared Canonical Correlation	Prob > ASCC
0		10	0.22680935	0.0001
1	PROA AVG	9	0.22559320	0.0001
2	PPE AVG	8	0.22441715	0.0001

Discriminant Analysis Using Variables Identified in Stepwise Procedure

444 Observations	443 DF Total
8 Variables	441 DF Within Classes
3 Classes	2 DF Between Classes

Class Level Information

SOURCE	Frequency	Weight	Prior Proportion	Probability
1	163	163.0000	0.367117	0.333333
2	148	148.0000	0.333333	0.333333
3	133	133.0000	0.299550	0.333333

Discriminant Analysis Pooled Covariance Matrix Information

Covariance Matrix Rank	Natural Log of the Determinant of the Covariance Matrix
7	49.2778745

Discriminant Analysis Pairwise Generalized Squared Distances Between Groups

$$D_{(ilj)} = \frac{1}{2} (X_i - X_j)' \text{COV}^{-1} (X_i - X_j)$$

Generalized Squared Distance to SOURCE

From SOURCE	1	2	3
1	0	0.22758	2.19295
2	0.22758	0	2.33753
3	2.19295	2.33753	0

Discriminant Analysis Linear Discriminant Function

$$\text{Constant} = -\frac{1}{2} X' \text{COV}^{-1} X \quad \text{Coefficient Vector} = \text{COV}^{-1} X$$

	SOURCE		
	1	2	3
CONSTANT	-0.36146	-0.30223	-0.78397
PCFAVG	-0.00278	-0.00162	-0.02643
PROEAVG	-0.03316	-0.03713	0.08986
PROSAVG	0.04103	0.05171	-0.01377
PFSAVG	0.0004615	0.0000948	0.0001721
PMBAVG	9.17236E-6	0.0000236	-0.0002192
PLIQDAVG	-0.0000600	-0.0000470	-0.0002408
PROSAVG	0.04103	0.05171	-0.01377
PLEVAVG	-0.05849	-0.08198	0.07488

Resubstitution Summary using Linear Discriminant Function

Generalized Squared Distance Function:

$$D_j(X) = \frac{1}{2} (X - X_j)' \text{COV}_j^{-1} (X - X_j)$$

Posterior Probability of Membership in each SOURCE:

$$\Pr(j|X) = \frac{\exp(-.5 D_j(X))}{\sum_k \exp(-.5 D_k(X))}$$

Number of Observations and Percent Classified into SOURCE:

From SOURCE	1	2	3	Total
1	50 30.67	112 68.71	1 0.61	163 100.00
2	11 7.43	132 89.19	5 3.38	148 100.00
3	9 6.77	29 21.80	95 71.43	133 100.00
Total	70	273	101	444
Percent	15.77	61.49	22.75	100.00
Priors	0.3333	0.3333	0.3333	

Error Count Estimates for SOURCE:

	1	2	3	Total
Rate	0.6933	0.1081	0.2857	0.3624
Priors	0.3333	0.3333	0.3333	

Classification Results using Linear Discriminant Function

Generalized Squared Distance Function:

$$D_j(X) = \frac{1}{2} (X - \bar{X}_j)' \text{COV}_j^{-1} (X - \bar{X}_j)$$

Posterior Probability of Membership in each SOURCE:

$$\Pr(j|X) = \frac{\exp(-.5 D_j(X))}{\sum_k \exp(-.5 D_k(X))}$$

Posterior Probability of Membership in SOURCE:

Obs	From SOURCE	Classified into SOURCE		1	2	3
1	1	2 *	0.4133	0.4708	0.1159	
2	1	1	0.5170	0.4385	0.0446	
3	1	1	0.6966	0.2612	0.0421	
5	1	2 *	0.3817	0.4206	0.1976	
6	1	2 *	0.3816	0.4189	0.1995	
7	1	1	0.4287	0.2790	0.2923	
9	1	2 *	0.3852	0.4264	0.1885	
10	1	2 *	0.3894	0.4213	0.1893	
11	1	2 *	0.4145	0.4482	0.1373	
12	1	2 *	0.3945	0.4529	0.1525	
13	1	2 *	0.3957	0.4484	0.1559	
14	1	2 *	0.3710	0.3957	0.2333	
15	1	2 *	0.3836	0.4038	0.2127	
16	1	2 *	0.3853	0.4046	0.2101	
17	1	2 *	0.3874	0.4308	0.1818	
18	1	2 *	0.3883	0.4290	0.1827	
19	1	2 *	0.3969	0.5039	0.0992	
20	1	2 *	0.4133	0.4500	0.1367	
21	1	2 *	0.3886	0.4546	0.1568	
22	1	2 *	0.3889	0.4364	0.1747	
24	1	2 *	0.3692	0.3908	0.2399	
25	1	2 *	0.3693	0.3909	0.2398	
26	1	2 *	0.3856	0.4239	0.1904	

27	1	2 *	0.3869	0.4399	0.1732
28	1	2 *	0.3847	0.4122	0.2031
29	1	2 *	0.3855	0.3981	0.2164
30	1	3 *	0.0061	0.0022	0.9917
31	1	1	0.4223	0.4070	0.1707
32	1	1	0.4215	0.4129	0.1656
33	1	1	0.4265	0.4211	0.1524
34	1	1	0.4303	0.4230	0.1467
35	1	2 *	0.3923	0.4538	0.1539
36	1	2 *	0.3864	0.4339	0.1797
37	1	2 *	0.3900	0.4335	0.1765
38	1	2 *	0.3970	0.5001	0.1030
39	1	2 *	0.4099	0.4800	0.1101
40	1	2 *	0.4209	0.4697	0.1094
42	1	2 *	0.4041	0.4507	0.1451
43	1	2 *	0.4146	0.4777	0.1077
44	1	1	0.4189	0.4037	0.1774
45	1	2 *	0.4051	0.4181	0.1768
46	1	1	0.4993	0.4377	0.0630
47	1	1	0.5175	0.4115	0.0710
48	1	1	0.5693	0.3590	0.0718
49	1	2 *	0.3815	0.5812	0.0372
51	1	2 *	0.4075	0.4626	0.1299
52	1	1	0.4736	0.3318	0.1946
53	1	1	0.6076	0.2397	0.1527
54	1	2 *	0.3960	0.4991	0.1049
55	1	2 *	0.3967	0.4737	0.1296
56	1	2 *	0.4275	0.5198	0.0528
57	1	2 *	0.3973	0.5244	0.0783
58	1	2 *	0.3981	0.5170	0.0849
59	1	2 *	0.3953	0.4501	0.1545
60	1	2 *	0.3974	0.4474	0.1552
61	1	2 *	0.4000	0.4416	0.1584
62	1	2 *	0.4036	0.4147	0.1817
63	1	2 *	0.4098	0.4178	0.1724
64	1	2 *	0.3924	0.4321	0.1755
65	1	2 *	0.3943	0.4312	0.1745
66	1	2 *	0.4006	0.4250	0.1744
67	1	2 *	0.3926	0.4628	0.1446
68	1	2 *	0.3931	0.4655	0.1414
69	1	2 *	0.3938	0.4668	0.1394
70	1	2 *	0.3935	0.4573	0.1492
71	1	2 *	0.3933	0.4464	0.1604

72	1	2 *	0.3948	0.4183	0.1868
74	1	1	0.9675	0.0183	0.0142
75	1	1	0.9755	0.0136	0.0110
76	1	1	0.9883	0.0061	0.0056
77	1	1	0.5987	0.3568	0.0444
78	1	2 *	0.3998	0.4374	0.1628
79	1	1	0.4131	0.4093	0.1776
80	1	2 *	0.3915	0.4610	0.1475
81	1	2 *	0.3980	0.4438	0.1581
82	1	2 *	0.4244	0.4302	0.1455
83	1	1	0.5052	0.3536	0.1412
84	1	1	0.5593	0.3037	0.1370
85	1	1	0.4429	0.3605	0.1965
86	1	1	0.4520	0.3582	0.1898
87	1	1	0.4874	0.3504	0.1622
88	1	1	0.5920	0.2701	0.1379
89	1	1	0.6358	0.2392	0.1250
91	1	1	0.4418	0.3520	0.2062
92	1	2 *	0.4132	0.4277	0.1591
93	1	1	0.4542	0.4013	0.1445
94	1	1	0.5600	0.3132	0.1268
95	1	1	0.6139	0.2696	0.1165
96	1	2 *	0.3948	0.4514	0.1538
97	1	2 *	0.3963	0.4481	0.1556
98	1	2 *	0.4128	0.4687	0.1186
100	1	2 *	0.3941	0.4643	0.1416
101	1	2 *	0.3901	0.4561	0.1538
102	1	2 *	0.3498	0.3563	0.2939
103	1	2 *	0.3936	0.5408	0.0656
104	1	2 *	0.4111	0.4539	0.1351
106	1	2 *	0.3797	0.4165	0.2038
107	1	2 *	0.3889	0.4523	0.1587
108	1	1	0.4439	0.3931	0.1631
109	1	2 *	0.3856	0.4113	0.2031
110	1	2 *	0.4036	0.4302	0.1662
111	1	2 *	0.4090	0.4256	0.1654
112	1	1	0.4460	0.3961	0.1579
113	1	2 *	0.4051	0.4953	0.0996
114	1	2 *	0.3953	0.4782	0.1265
115	1	2 *	0.3996	0.4870	0.1134
116	1	2 *	0.4009	0.4823	0.1168
117	1	2 *	0.4028	0.4738	0.1234
118	1	2 *	0.4139	0.4758	0.1103

119	1	1	0.4062	0.3986	0.1952
120	1	2 *	0.3915	0.4280	0.1805
121	1	2 *	0.3949	0.4483	0.1569
122	1	1	0.4040	0.4032	0.1929
124	1	2 *	0.3881	0.4351	0.1767
125	1	2 *	0.4112	0.4376	0.1512
126	1	2 *	0.4155	0.4347	0.1498
127	1	2 *	0.4206	0.4311	0.1483
128	1	2 *	0.4263	0.4282	0.1455
129	1	1	0.4327	0.4222	0.1451
130	1	1	0.4420	0.4140	0.1440
131	1	1	0.4528	0.4050	0.1421
132	1	1	0.4655	0.4017	0.1327
134	1	2 *	0.4014	0.4560	0.1427
135	1	2 *	0.4027	0.4584	0.1389
136	1	2 *	0.4068	0.4705	0.1227
137	1	2 *	0.4141	0.4676	0.1182
139	1	1	0.9526	0.0231	0.0243
140	1	2 *	0.3996	0.4724	0.1280
141	1	2 *	0.4244	0.4413	0.1343
142	1	1	0.4512	0.4057	0.1431
144	1	2 *	0.3929	0.4307	0.1764
145	1	2 *	0.3990	0.4372	0.1638
146	1	2 *	0.4011	0.4313	0.1676
147	1	2 *	0.4035	0.4252	0.1713
149	1	2 *	0.3882	0.4116	0.2001
150	1	2 *	0.3929	0.4078	0.1993
151	1	2 *	0.3947	0.4050	0.2002
153	1	2 *	0.3715	0.3965	0.2320
154	1	1	0.4710	0.4073	0.1218
155	1	1	0.5263	0.3801	0.0936
156	1	2 *	0.3826	0.4165	0.2010
157	1	2 *	0.3833	0.4259	0.1908
158	1	2 *	0.4009	0.4792	0.1199
159	1	2 *	0.4047	0.4242	0.1711
160	1	2 *	0.3838	0.4316	0.1846
161	1	2 *	0.3854	0.4363	0.1784
162	1	2 *	0.3838	0.4116	0.2046
164	1	1	0.5354	0.4270	0.0376
165	1	2 *	0.4048	0.4688	0.1264
166	1	2 *	0.4304	0.4411	0.1285
167	1	1	0.6554	0.2521	0.0926
168	1	2 *	0.3816	0.4271	0.1913

169	1	2 *	0.3819	0.4136	0.2045
170	1	2 *	0.3841	0.4085	0.2074
171	1	2 *	0.3933	0.4118	0.1949
172	1	1	0.4218	0.3865	0.1917
173	1	1	0.4319	0.3792	0.1889
174	1	1	0.4407	0.3734	0.1858
175	1	1	0.4447	0.3708	0.1845
176	1	1	0.4438	0.3708	0.1854
177	1	1	0.4427	0.3699	0.1874
178	1	1	0.4447	0.3659	0.1893
179	1	2 *	0.4325	0.4818	0.0857
182	2	2	0.3815	0.4263	0.1922
186	2	2	0.3697	0.3942	0.2361
191	2	2	0.3953	0.4624	0.1424
192	2	2	0.3962	0.4631	0.1406
195	2	2	0.3578	0.3797	0.2625
196	2	3 *	0.0117	0.0051	0.9832
199	2	2	0.3867	0.4444	0.1689
200	2	2	0.3865	0.4450	0.1686
205	2	2	0.3887	0.4500	0.1613
207	2	2	0.3979	0.5024	0.0997
209	2	2	0.3867	0.4409	0.1724
210	2	2	0.3938	0.4718	0.1343
211	2	2	0.3840	0.4311	0.1849
220	2	2	0.3660	0.6072	0.0267
221	2	2	0.3884	0.4385	0.1731
224	2	2	0.3764	0.3979	0.2258
225	2	2	0.3785	0.3983	0.2232
229	2	2	0.3894	0.4540	0.1566
230	2	3 *	0.2483	0.2138	0.5379
232	2	2	0.3714	0.3974	0.2313
233	2	2	0.3744	0.4053	0.2203
234	2	2	0.3758	0.3995	0.2247
236	2	2	0.3746	0.4081	0.2173
239	2	2	0.3951	0.4632	0.1417
240	2	2	0.3990	0.4372	0.1638
241	2	2	0.4011	0.4313	0.1676
242	2	2	0.4035	0.4252	0.1713
244	2	2	0.3792	0.4172	0.2035
245	2	2	0.3786	0.4129	0.2085
246	2	2	0.3819	0.4194	0.1987
255	2	2	0.4068	0.4498	0.1434
258	2	2	0.3947	0.4961	0.1092

261	2	2	0.3652	0.3839	0.2509
262	2	2	0.3655	0.3852	0.2493
265	2	2	0.3906	0.3923	0.2171
266	2	2	0.4005	0.4300	0.1695
267	2	2	0.4016	0.4201	0.1783
270	2	2	0.3913	0.4645	0.1441
271	2	1 *	0.5609	0.2932	0.1459
272	2	2	0.3953	0.4947	0.1100
276	2	2	0.3916	0.4481	0.1603
277	2	2	0.3960	0.4484	0.1556
281	2	2	0.3671	0.3901	0.2428
286	2	2	0.4007	0.4389	0.1604
289	2	2	0.3305	0.6615	0.0080
290	2	2	0.3145	0.6813	0.0042
291	2	2	0.1433	0.8567	0.0000
292	2	2	0.3161	0.6802	0.0036
293	2	2	0.4028	0.5160	0.0813
295	2	2	0.3707	0.3949	0.2344
296	2	2	0.3958	0.4868	0.1174
297	2	2	0.3864	0.4370	0.1766
298	2	2	0.3892	0.4422	0.1686
300	2	1 *	0.3938	0.3706	0.2356
301	2	1 *	0.4105	0.3738	0.2157
303	2	1 *	0.4523	0.4225	0.1252
304	2	1 *	0.4570	0.4174	0.1256
305	2	2	0.3940	0.4184	0.1876
311	2	2	0.3785	0.4032	0.2183
314	2	2	0.3906	0.5619	0.0475
315	2	2	0.3934	0.4494	0.1572
316	2	2	0.3728	0.3938	0.2334
318	2	2	0.3709	0.3862	0.2429
320	2	2	0.3806	0.4276	0.1918
321	2	2	0.3804	0.4260	0.1937
322	2	2	0.3815	0.4282	0.1903
326	2	2	0.3940	0.4879	0.1181
327	2	2	0.3912	0.4614	0.1473
331	2	2	0.3893	0.4483	0.1625
332	2	2	0.3922	0.4642	0.1436
334	2	2	0.3955	0.4480	0.1565
335	2	2	0.4056	0.4502	0.1442
336	2	2	0.3760	0.4096	0.2144
339	2	2	0.3803	0.4193	0.2004
340	2	2	0.3663	0.3826	0.2511

341	2	2	0.3720	0.3971	0.2309
343	2	2	0.3923	0.4652	0.1425
345	2	2	0.3842	0.4268	0.1889
346	2	2	0.3980	0.4328	0.1692
347	2	2	0.3924	0.4785	0.1290
348	2	2	0.3949	0.4941	0.1110
351	2	2	0.3929	0.5252	0.0820
353	2	2	0.4415	0.4990	0.0595
354	2	2	0.4484	0.4932	0.0584
356	2	3 *	0.2899	0.2587	0.4514
357	2	2	0.3888	0.4421	0.1692
359	2	3 *	0.3034	0.2768	0.4198
361	2	2	0.3903	0.4599	0.1498
363	2	2	0.3953	0.4943	0.1104
364	2	1 *	0.4120	0.4014	0.1866
365	2	1 *	0.4220	0.3957	0.1823
366	2	2	0.3055	0.6904	0.0041
371	2	2	0.3946	0.4843	0.1211
372	2	2	0.3960	0.5026	0.1015
373	2	2	0.3956	0.5232	0.0812
374	2	2	0.3942	0.5368	0.0690
375	2	2	0.3920	0.5485	0.0596
376	2	2	0.3900	0.5575	0.0525
377	2	2	0.3849	0.5747	0.0404
378	2	2	0.3816	0.5846	0.0338
380	2	2	0.4065	0.4255	0.1680
382	2	2	0.4000	0.4870	0.1130
383	2	2	0.4052	0.4641	0.1307
384	2	2	0.3694	0.3881	0.2425
388	2	2	0.3979	0.5324	0.0697
395	2	2	0.3540	0.3824	0.2636
396	2	2	0.3868	0.4072	0.2060
398	2	2	0.3953	0.4626	0.1421
399	2	2	0.4017	0.4536	0.1447
400	2	2	0.4001	0.4170	0.1829
403	2	2	0.3965	0.4552	0.1483
404	2	2	0.3991	0.4536	0.1473
405	2	2	0.4247	0.4330	0.1423
406	2	2	0.4277	0.4295	0.1428
407	2	2	0.4041	0.4997	0.0962
410	2	2	0.4086	0.4258	0.1657
411	2	2	0.4131	0.4221	0.1648
418	2	2	0.3917	0.4653	0.1430

419	2	2	0.3918	0.4552	0.1530
420	2	2	0.3968	0.4601	0.1431
422	2	2	0.3727	0.3881	0.2393
423	2	1 *	0.5284	0.3164	0.1551
424	2	1 *	0.6106	0.2564	0.1330
425	2	1 *	0.6803	0.1952	0.1245
428	2	2	0.3952	0.4752	0.1296
429	2	2	0.3952	0.4595	0.1453
433	2	2	0.4133	0.5011	0.0856
434	2	2	0.4180	0.4809	0.1011
436	2	2	0.3918	0.6026	0.0056
439	2	2	0.3743	0.3977	0.2280
440	2	2	0.3744	0.3990	0.2266
441	2	2	0.3941	0.4698	0.1361
442	2	2	0.3993	0.4552	0.1455
446	2	2	0.3809	0.4226	0.1965
447	2	2	0.3877	0.4228	0.1895
448	2	2	0.3484	0.3500	0.3015
449	2	3 *	0.2961	0.2779	0.4260
450	2	2	0.3768	0.4062	0.2170
453	2	2	0.3862	0.4342	0.1796
454	2	2	0.3942	0.4636	0.1422
460	2	2	0.3891	0.4375	0.1734
461	2	2	0.3794	0.4192	0.2015
465	2	2	0.3728	0.3951	0.2321
469	2	2	0.3850	0.4337	0.1813
470	2	2	0.3858	0.4356	0.1785
478	2	2	0.3934	0.4819	0.1246
480	2	2	0.3951	0.4145	0.1904
481	2	1 *	0.4892	0.3348	0.1760
482	3	3	0.1470	0.1071	0.7459
483	3	3	0.3057	0.2890	0.4053
484	3	3	0.2460	0.2106	0.5434
485	3	3	0.2882	0.2540	0.4577
486	3	3	0.2907	0.2661	0.4433
487	3	3	0.0517	0.0307	0.9175
488	3	3	0.3027	0.2929	0.4044
489	3	3	0.3101	0.2918	0.3982
490	3	3	0.2472	0.2129	0.5399
491	3	3	0.1712	0.1290	0.6998
492	3	1 *	0.3355	0.3312	0.3333
493	3	3	0.1654	0.1261	0.7085
494	3	3	0.2777	0.2502	0.4721

496	3	3	0.3162	0.2965	0.3873
497	3	3	0.3273	0.3216	0.3511
498	3	3	0.2875	0.2605	0.4520
499	3	3	0.1602	0.1008	0.7390
500	3	3	0.1810	0.1360	0.6831
501	3	3	0.2610	0.2291	0.5099
503	3	3	0.1092	0.0731	0.8177
504	3	3	0.3074	0.2843	0.4083
505	3	3	0.0003	0.0002	0.9995
506	3	3	0.2977	0.3058	0.3964
508	3	3	0.0295	0.0275	0.9430
509	3	3	0.1340	0.1208	0.7452
510	3	3	0.0604	0.0570	0.8826
511	3	3	0.0059	0.0050	0.9892
512	3	3	0.2202	0.2205	0.5593
513	3	3	0.0725	0.0682	0.8592
514	3	3	0.0000	0.0000	0.9999
515	3	3	0.0001	0.0001	0.9999
516	3	3	0.0823	0.0771	0.8406
517	3	3	0.0008	0.0005	0.9987
518	3	3	0.1197	0.1167	0.7636
519	3	3	0.1492	0.1442	0.7066
520	3	3	0.1050	0.0991	0.7959
522	3	3	0.2133	0.2172	0.5695
523	3	3	0.0018	0.0014	0.9968
525	3	3	0.0468	0.0507	0.9025
526	3	3	0.0000	0.0000	1.0000
527	3	3	0.1281	0.1238	0.7482
529	3	3	0.1492	0.1437	0.7071
530	3	3	0.0062	0.0052	0.9886
531	3	3	0.0433	0.0393	0.9174
532	3	3	0.2537	0.2507	0.4956
534	3	3	0.2771	0.2866	0.4363
537	3	3	0.3124	0.3378	0.3499
538	3	3	0.0657	0.0688	0.8655
539	3	3	0.2141	0.2426	0.5433
540	3	3	0.1024	0.1144	0.7832
541	3	2 *	0.3364	0.3592	0.3044
542	3	3	0.3021	0.3238	0.3742
543	3	3	0.0610	0.0609	0.8781
544	3	3	0.2725	0.2851	0.4423
546	3	2 *	0.3320	0.3441	0.3239
550	3	3	0.2511	0.2666	0.4822

552	3	2 *	0.3467	0.3719	0.2815
555	3	3	0.0360	0.0344	0.9296
556	3	3	0.2540	0.2522	0.4937
557	3	3	0.1355	0.1511	0.7133
558	3	2 *	0.3331	0.3457	0.3212
559	3	3	0.3069	0.3248	0.3684
562	3	2 *	0.3857	0.4823	0.1320
563	3	3	0.0038	0.0022	0.9940
566	3	3	0.1394	0.1429	0.7177
568	3	3	0.1308	0.1375	0.7317
570	3	3	0.3218	0.3140	0.3642
572	3	3	0.2517	0.2490	0.4993
573	3	3	0.2917	0.2904	0.4179
574	3	2 *	0.3772	0.3774	0.2453
576	3	2 *	0.3539	0.3757	0.2703
579	3	2 *	0.3536	0.3778	0.2686
580	3	2 *	0.3318	0.3480	0.3202
581	3	3	0.2943	0.3120	0.3937
582	3	2 *	0.3565	0.4209	0.2226
583	3	2 *	0.3673	0.3949	0.2378
584	3	2 *	0.3639	0.3883	0.2478
585	3	3	0.0775	0.0748	0.8477
586	3	2 *	0.3737	0.3947	0.2316
589	3	2 *	0.3409	0.3516	0.3075
593	3	2 *	0.3281	0.3462	0.3257
595	3	2 *	0.3620	0.3893	0.2487
598	3	3	0.2981	0.3027	0.3993
599	3	2 *	0.3643	0.3736	0.2621
600	3	2 *	0.3461	0.3682	0.2857
601	3	2 *	0.3707	0.3881	0.2412
602	3	2 *	0.3664	0.3880	0.2456
605	3	2 *	0.3770	0.4436	0.1794
606	3	3	0.0452	0.0265	0.9283
609	3	2 *	0.3535	0.3635	0.2830
611	3	3	0.3120	0.3390	0.3490
613	3	1 *	0.3854	0.3821	0.2325
615	3	1 *	0.3554	0.3554	0.2892
616	3	2 *	0.3786	0.3894	0.2320
617	3	1 *	0.4285	0.2420	0.3295
619	3	2 *	0.4199	0.4611	0.1189
621	3	3	0.3247	0.3215	0.3538
622	3	3	0.2749	0.2668	0.4583
626	3	2 *	0.3265	0.3375	0.3360

627	3	3	0.2608	0.2593	0.4799
629	3	1 *	0.3404	0.3361	0.3235
631	3	2 *	0.3410	0.3606	0.2984
632	3	3	0.2405	0.2247	0.5348
633	3	3	0.0102	0.0095	0.9804
634	3	3	0.2576	0.2538	0.4886
635	3	3	0.2645	0.2589	0.4766
636	3	1 *	0.3605	0.2814	0.3581
640	3	3	0.1855	0.1784	0.6361
642	3	2 *	0.4164	0.5620	0.0216
643	3	3	0.2059	0.2023	0.5918
645	3	3	0.2872	0.2743	0.4385
646	3	3	0.2726	0.2755	0.4519
647	3	3	0.1362	0.1306	0.7332
650	3	3	0.2953	0.3019	0.4028
651	3	3	0.3366	0.2893	0.3741
652	3	3	0.3327	0.2730	0.3943
653	3	3	0.2639	0.2604	0.4757
654	3	3	0.3321	0.3301	0.3379
656	3	3	0.3130	0.3049	0.3821
657	3	3	0.1963	0.1927	0.6110
658	3	3	0.2198	0.2109	0.5694
659	3	3	0.3402	0.2995	0.3602
660	3	1 *	0.8947	0.1041	0.0012
661	3	3	0.2952	0.2985	0.4063
664	3	2 *	0.3826	0.4087	0.2088
665	3	3	0.3247	0.2175	0.4578
666	3	3	0.1451	0.1404	0.7144
667	3	3	0.3001	0.2979	0.4020
668	3	2 *	0.3457	0.3487	0.3056
669	3	1 *	0.3633	0.2971	0.3396
670	3	3	0.0071	0.0058	0.9872
674	3	1 *	0.3856	0.2792	0.3352
675	3	3	0.3391	0.3076	0.3533

*** Misclassified observation**

Classification Summary using Linear Discriminant Function

Generalized Squared Distance Function:

$$D_j(X) = \frac{1}{2} (X - X_j)' \text{COV}_j^{-1} (X - X_j)$$

Posterior Probability of Membership in each SOURCE:

$$\Pr(j|X) = \frac{\exp(-.5 D_j(X))}{\sum_k \exp(-.5 D_k(X))}$$

Number of Observations and Percent Classified into SOURCE:

From SOURCE	1	2	3	Total
1	50 30.67	112 68.71	1 0.61	163 100.00
2	11 7.43	132 89.19	5 3.38	148 100.00
3	9 6.77	29 21.80	95 71.43	133 100.00
Total	70	273	101	444
Percent	15.77	61.49	22.75	100.00
Priors	0.3333	0.3333	0.3333	

Error Count Estimates for SOURCE:

	1	2	3	Total
Rate	0.6933	0.1081	0.2857	0.3624
Priors	0.3333	0.3333	0.3333	

Post Hoc Discriminant Analysis Results for Time Period Before Deregulation of the Banking Industry.

157 Observations	156 DF Total
10 Variables	154 DF Within Classes
3 Classes	2 DF Between Classes

Class Level Information

SOURCE	Frequency	Weight	Proportion	Prior Probability
1	46	46.0000	0.292994	0.333333
2	90	90.0000	0.573248	0.333333
3	21	21.0000	0.133758	0.333333

Discriminant Analysis Pooled Covariance Matrix Information

Covariance Matrix Rank	Natural Log of the Determinant of the Covariance Matrix
10	44.5302612

Discriminant Analysis Pairwise Generalized Squared Distances Between Groups

$$D^2(i|j) = \frac{(X_i - X_j)' COV^{-1} (X_i - X_j)}{2}$$

Generalized Squared Distance to SOURCE

From SOURCE	1	2	3
1	0	0.17844	30.42441
2	0.17844	0	30.02108
3	30.42441	30.02108	0

Discriminant Analysis Linear Discriminant Function

$$\text{Constant} = -.5 \sum_j \bar{X}_j' \text{COV}_j^{-1} \bar{X}_j \quad \text{Coefficient Vector} = \text{COV}_j^{-1} \bar{X}_j$$

	SOURCE		
	1	2	3
CONSTANT	-1.05529	-1.12752	-12.69789
PMB AVG	-0.0000106	-0.0004784	0.00693
PPE AVG	-0.0006035	0.0003723	-0.00205
PEP AVG	0.00221	0.00852	-0.00957
PLE AVG	-0.21522	-0.21660	2.42382
PLIQ AVG	-0.54024	-0.40071	0.58158
PCF AVG	0.78230	0.57305	-3.74578
PFS AVG	0.0006611	0.0002828	0.0000203
PROE AVG	0.28643	0.24641	-0.17624
PROA AVG	0.41329	0.47714	-1.04841
PROS AVG	0.11814	0.11724	0.03605

Classification Summary for Calibration Data: Before Deregulation

Resubstitution Summary using Linear Discriminant Function

Generalized Squared Distance Function:

$$D_j(X) = \sum_j \bar{(X-X_j)}' \text{COV}_j^{-1} \bar{(X-X_j)}$$

Posterior Probability of Membership in each SOURCE:

$$\Pr(j|X) = \frac{\exp(-.5 D_j(X))}{\sum_k \exp(-.5 D_k(X))}$$

Number of Observations and Percent Classified into SOURCE:

From SOURCE	1	2	3	Total
1	26 56.52	20 43.48	0 0.00	46 100.00
2	30 33.33	60 66.67	0 0.00	90 100.00
3	1 4.76	1 4.76	19 90.48	21 100.00
Total	57	81	19	157
Percent	36.31	51.59	12.10	100.00
Priors	0.3333	0.3333	0.3333	

Error Count Estimates for SOURCE:

	1	2	3	Total
Rate	0.4348	0.3333	0.0952	0.2878
Priors	0.3333	0.3333	0.3333	

Post Hoc Discriminant Analysis for Time Period During Deregulation of the Banking Industry.

190 Observations	189 DF Total
10 Variables	187 DF Within Classes
3 Classes	2 DF Between Classes

Class Level Information

Prior SOURCE	Frequency	Weight	Proportion	Probability
1	67	67.0000	0.352632	0.333333
2	50	50.0000	0.263158	0.333333
3	73	73.0000	0.384211	0.333333

Discriminant Analysis Pooled Covariance Matrix Information

Covariance Matrix Rank	Natural Log of the Determinant of the Covariance Matrix
10	68.9435587

Discriminant Analysis Pairwise Generalized Squared Distances Between Groups

$$D(i|j) = \frac{1}{2} (X_i - X_j)' COV^{-1} (X_i - X_j)$$

Generalized Squared Distance to SOURCE

From SOURCE	1	2	3
1	0	0.29303	7.42604
2	0.29303	0	7.62468
3	7.42604	7.62468	0

Discriminant Analysis Linear Discriminant Function

$$\text{Constant} = -\frac{1}{2} \sum_j \bar{X}_j' \text{COV}_j \bar{X}_j \quad \text{Coefficient Vector} = \text{COV}_j \bar{X}_j$$

	SOURCE		
	1	2	3
CONSTANT	-2.27609	-2.27306	-1.55108
PMBAVG	-0.0000844	0.0000338	-0.0005653
PPEAVG	0.0008655	0.0008655	0.0008183
PEPSAVG	0.00880	-0.00283	0.03153
PLEVAVG	-3.08140	-3.16407	0.11823
PLIQDAVG	-0.00493	-0.00828	-0.05946
PCFAVG	0.02129	0.01912	-0.03765
PFSAVG	0.00106	0.0003644	-0.0000600
PROEAVG	0.28789	0.27881	0.12472
PROAAVG	2.88418	2.92169	-0.18426
PROSAVG	-0.21433	-0.17532	0.05377

Classification Summary for Calibration Data: During Deregulation

Resubstitution Summary using Linear Discriminant Function

Generalized Squared Distance Function:

$$D_j(X) = \frac{1}{2} (\bar{X} - \bar{X}_j)' \text{COV}_j (\bar{X} - \bar{X}_j)$$

Posterior Probability of Membership in each SOURCE:

$$\Pr(j|X) = \frac{\exp(-\frac{1}{2} D_j(X))}{\sum_k \exp(-\frac{1}{2} D_k(X))}$$

Number of Observations and Percent Classified into SOURCE:

From SOURCE	1	2	3	Total
1	26 38.81	39 58.21	2 2.99	67 100.00
2	8 16.00	39 78.00	3 6.00	50 100.00
3	0 0.00	2 2.74	71 97.26	73 100.00
Total	34	80	76	190
Percent	17.89	42.11	40.00	100.00
Priors	0.3333	0.3333	0.3333	

Error Count Estimates for SOURCE:

	1	2	3	Total
Rate	0.6119	0.2200	0.0274	0.2864
Priors	0.3333	0.3333	0.3333	

Post Hoc Discriminant Analysis for Time Period After Deregulation of the Banking Industry.

94 Observations	93 DF Total
10 Variables	91 DF Within Classes
3 Classes	2 DF Between Classes

Class Level Information

SOURCE	Frequency	Weight	Proportion	Prior Probability
1	47	47.0000	0.500000	0.333333
2	8	8.0000	0.085106	0.333333
3	39	39.0000	0.414894	0.333333

Discriminant Analysis Pooled Covariance Matrix Information

Covariance Matrix Rank	Natural Log of the Determinant of the Covariance Matrix
10	76.6072792

Discriminant Analysis Pairwise Generalized Squared Distances Between Groups

$$D^2(i|j) = \frac{1}{2} (X_i - X_j)' COV^{-1} (X_i - X_j)$$

Generalized Squared Distance to SOURCE

From SOURCE	1	2	3
1	0	4.32557	7.97653
2	4.32557	0	6.44769
3	7.97653	6.44769	0

Discriminant Analysis Linear Discriminant Function

$$\text{Constant} = -\frac{1}{2} \sum_j \bar{X}_j' \text{COV}_j \bar{X}_j \quad \text{Coefficient Vector} = \text{COV}_j \bar{X}_j$$

	SOURCE		
	1	2	3
CONSTANT	-0.83010	-0.78705	-3.61822
PMBAVG	0.0003169	-0.00463	-0.02027
PPEAVG	0.01578	-0.01320	0.0001139
PEPSAVG	-0.0000875	0.0005373	0.00363
PLEVAVG	-0.12128	0.07760	-0.08085
PLIQDAVG	0.0001538	0.0004289	0.0005830
PCFAVG	-0.00297	0.0001148	-0.03988
PFSAVG	0.0002819	0.0000103	-0.0000272
PROEAVG	0.26911	0.60694	1.69139
PROAAVG	-0.04070	-0.06123	0.06278
PROSAVG	0.21924	-0.06221	0.03347

Classification Summary for Calibration Data: After Deregulation

Resubstitution Summary using Linear Discriminant Function

Generalized Squared Distance Function:

$$D_j(X) = \frac{1}{2} (X - \bar{X}_j)' \text{COV}_j (X - \bar{X}_j)$$

Posterior Probability of Membership in each SOURCE:

$$\Pr(j|X) = \frac{\exp(-\frac{1}{2} D_j(X))}{\sum_k \exp(-\frac{1}{2} D_k(X))}$$

Number of Observations and Percent Classified into SOURCE:

From SOURCE	1	2	3	Total
1	44 93.62	3 6.38	0 0.00	47 100.00
2	2 25.00	5 62.50	1 12.50	8 100.00
3	3 7.69	5 12.82	31 79.49	39 100.00
Total	49	13	32	94
Percent	52.13	13.83	34.04	100.00
Priors	0.3333	0.3333	0.3333	

Error Count Estimates for SOURCE:

	1	2	3	Total
Rate	0.0638	0.3750	0.2051	0.2147
Priors	0.3333	0.3333	0.3333	

Regression of Post-acquisition Return on Equity Performance for Acquiring Firms on Internal Variables (1973-1992).

Step 0 All Variables Entered R-square = 0.11790357 C(p) = 12.00000000

	DF	Sum of Squares	Mean Square	F	Prob>F
Regression	11	17.68263937	1.60751267	1.58	0.1120
Error	130	132.29279614	1.01763689		
Total	141	149.97543551			

Variable	Parameter Estimate	Standard Error	Type II Sum of Squares	F	Prob>F
INTERCEP	-0.94300023	0.46686106	4.15184509	4.08	0.0455
PMB AVG	-0.15900557	0.06608960	5.89048779	5.79	0.0175
PFS AVG	0.00005406	0.00005828	0.87551477	0.86	0.3554
PCF AVG	7.01482961	2.36667140	8.94028104	8.79	0.0036
PPE AVG	-0.00118141	0.00589428	0.04088215	0.04	0.8415
PEP AVG	0.00197218	0.00451851	0.19386206	0.19	0.6632
PLIQD AVG	-0.23688787	0.75653697	0.09977419	0.10	0.7547
PLEV AVG	-0.39214973	0.33107848	1.42769277	1.40	0.2384
PGRWTH AV	-0.00281555	0.00130149	4.76249489	4.68	0.0323
PROE AVG	1.40133612	0.87997616	2.58068895	2.54	0.1137
PROS AVG	-0.03168482	0.04496977	0.50518906	0.50	0.4823
PROA AVG	0.30805271	0.25641778	1.46874584	1.44	0.2318

Bounds on condition number: 90.75926, 2067.794

Step 1 Variable PPE AVG Removed R-square = 0.11763098
C(p) = 10.04017361

	DF	Sum of Squares	Mean Square	F	Prob>F
Regression	10	17.64175723	1.76417572	1.75	0.0769
Error	131	132.33367828	1.01018075		
Total	141	149.97543551			

Variable	Parameter Estimate	Standard Error	Type II Sum of Squares	F	Prob>F
INTERCEP	-0.95120830	0.46335465	4.25719267	4.21	0.0421
PMB AVG	-0.16291331	0.06291667	6.77299394	6.70	0.0107
PFS AVG	0.00005355	0.00005801	0.86069323	0.85	0.3577
PCF AVG	7.06259003	2.34600309	9.15524403	9.06	0.0031
PEP AVG	0.00191129	0.00449174	0.18290290	0.18	0.6712
PLIQD AVG	-0.25283454	0.74958060	0.11493048	0.11	0.7364
PLEV AVG	-0.39271472	0.32985140	1.43191350	1.42	0.2360
PGRWTH AV	-0.00272711	0.00121993	5.04822070	5.00	0.0271
PROE AVG	1.38887910	0.87455704	2.54771998	2.52	0.1147
PROS AVG	-0.03178208	0.04480211	0.50835453	0.50	0.4793
PROA AVG	0.30881188	0.25544880	1.47631609	1.46	0.2289

Bounds on condition number: 90.73946, 1858.765

Step 2 Variable PLIQD AVG Removed R-square = 0.11686465
C(p) = 8.15311220

	DF	Sum of Squares	Mean Square	F	Prob>F
Regression	9	17.52682674	1.94742519	1.94	0.0514
Error	132	132.44860876	1.00339855		
Total	141	149.97543551			

Variable	Parameter Estimate	Standard Error	Type II Sum of Squares	F	Prob>F
INTERCEP	-0.96618193	0.45967230	4.43296829	4.42	0.0375
PMB AVG	-0.16095718	0.06243817	6.66797412	6.65	0.0110
PFS AVG	0.00005636	0.00005722	0.97365681	0.97	0.3264
PCF AVG	7.18584718	2.30957636	9.71325461	9.68	0.0023
PEP AVG	0.00195438	0.00447483	0.19139842	0.19	0.6630
PLEV AVG	-0.40230200	0.32751946	1.51392242	1.51	0.2215
PGRWTH AV	-0.00254060	0.00108375	5.51422476	5.50	0.0206
PROE AVG	1.37410951	0.87052310	2.50008954	2.49	0.1168
PROS AVG	-0.02560949	0.04075676	0.39616473	0.39	0.5309
PROA AVG	0.30996681	0.25456696	1.48764659	1.48	0.2255

Bounds on condition number: 90.72315, 1635.87

Step 3 Variable PEPSAVG Removed R-square = 0.11558845
C(p) = 6.34119345

	DF	Sum of Squares	Mean Square	F	Prob>F
Regression	8	17.33542833	2.16692854	2.17	0.0334
Error	133	132.64000718	0.99729329		
Total	141	149.97543551			

Variable	Parameter Estimate	Standard Error	Type II Sum of Squares	F	Prob>F
INTERCEP	-0.95529635	0.45759756	4.34642034	4.36	0.0387
PMB AVG	-0.16119249	0.06224560	6.68798283	6.71	0.0107
PFSAVG	0.00005631	0.00005704	0.97169576	0.97	0.3254
PCFAVG	7.07141520	2.28767486	9.52899219	9.55	0.0024
PLEVAVG	-0.39602536	0.32620704	1.46988116	1.47	0.2269
PGRWTHAV	-0.00252550	0.00107990	5.45444055	5.47	0.0208
PROEAVG	1.37555899	0.86786436	2.50540319	2.51	0.1153
PROSAVG	-0.02070097	0.03905721	0.28015728	0.28	0.5970
PROAAVG	0.30004135	0.25277799	1.40509791	1.41	0.2374

Bounds on condition number: 90.00013, 1435.53

Step 4 Variable PROSAVG Removed R-square = 0.11372043
C(p) = 4.61649526

	DF	Sum of Squares	Mean Square	F	Prob>F
Regression	7	17.05527105	2.43646729	2.46	0.0211
Error	134	132.92016446	0.99194153		
Total	141	149.97543551			

Variable	Parameter Estimate	Standard Error	Type II Sum of Squares	F	Prob>F
INTERCEP	-0.90496161	0.44643173	4.07601973	4.11	0.0446
PMB AVG	-0.15761893	0.06171311	6.47065063	6.52	0.0118
PFSAVG	0.00005314	0.00005658	0.87511120	0.88	0.3493
PCFAVG	6.85665912	2.24545680	9.24914915	9.32	0.0027
PLEVAVG	-0.31869645	0.29097716	1.18993358	1.20	0.2754
PGRWTHAV	-0.00252721	0.00107700	5.46186731	5.51	0.0204
PROEAVG	1.33703539	0.86249182	2.38375657	2.40	0.1235
PROAAVG	0.22296310	0.20620031	1.15977415	1.17	0.2815

Bounds on condition number: 62.29888, 911.2128

 Step 5 Variable PFSAVG Removed R-square = 0.10788540
 C(p) = 3.47643972

	DF	Sum of Squares	Mean Square	F	Prob>F
Regression	6	16.18015985	2.69669331	2.72	0.0158
Error	135	133.79527566	0.99107612		
Total	141	149.97543551			

Variable	Parameter Estimate	Standard Error	Type II Sum of Squares	F	Prob>F
INTERCEP	-0.88625225	0.44579254	3.91702304	3.95	0.0488
PMB AVG	-0.15390685	0.06155956	6.19486523	6.25	0.0136
PCF AVG	6.65761020	2.23445889	8.79830469	8.88	0.0034
PLEV AVG	-0.33451621	0.29036256	1.31540690	1.33	0.2513
PGRWTHAV	-0.00241931	0.00107039	5.06303879	5.11	0.0254
PROE AVG	1.39891755	0.85959659	2.62483426	2.65	0.1060
PROA AVG	0.23356489	0.20580132	1.27651470	1.29	0.2584

Bounds on condition number: 62.09015, 772.2608

 Step 6 Variable PROA AVG Removed R-square = 0.09937391
 C(p) = 2.73083085

	DF	Sum of Squares	Mean Square	F	Prob>F
Regression	5	14.90364515	2.98072903	3.00	0.0133
Error	136	135.07179036	0.99317493		
Total	141	149.97543551			

Variable	Parameter Estimate	Standard Error	Type II Sum of Squares	F	Prob>F
INTERCEP	-0.43010447	0.19304191	4.93026710	4.96	0.0275
PMB AVG	-0.14717214	0.06133772	5.71770451	5.76	0.0178
PCF AVG	6.37467629	2.22285780	8.16805505	8.22	0.0048
PLEV AVG	-0.00827152	0.04096573	0.04049071	0.04	0.8403
PGRWTHAV	-0.00210673	0.00103544	4.11145546	4.14	0.0438
PROE AVG	1.03355659	0.79787973	1.66655407	1.68	0.1974

Bounds on condition number: 1.938353, 37.24683

 Step 7 Variable PLEVAVG Removed R-square = 0.09910393
 C(p) = 0.77061981

	DF	Sum of Squares	Mean Square	F	Prob>F
Regression	4	14.86315444	3.71578861	3.77	0.0061
Error	137	135.11228107	0.98622103		
Total	141	149.97543551			

Variable	Parameter Estimate	Standard Error	Type II Sum of Squares	F	Prob>F
INTERCEP	-0.43647381	0.18977920	5.21667066	5.29	0.0230
PMBAVG	-0.14712273	0.06112212	5.71395662	5.79	0.0174
PCFAVG	6.49128478	2.13899726	9.08270325	9.21	0.0029
PGRWTHAV	-0.00212947	0.00102568	4.25097105	4.31	0.0397
PROEAVG	0.96703667	0.72413993	1.75879474	1.78	0.1840

Bounds on condition number: 1.807514, 23.302

 Step 8 Variable PROEAVG Removed R-square = 0.08737671
 C(p) = 0.49893248

	DF	Sum of Squares	Mean Square	F	Prob>F
Regression	3	13.10435970	4.36811990	4.40	0.0054
Error	138	136.87107580	0.99181939		
Total	141	149.97543551			

Variable	Parameter Estimate	Standard Error	Type II Sum of Squares	F	Prob>F
INTERCEP	-0.36148274	0.18179466	3.92143917	3.95	0.0487
PMBAVG	-0.14400294	0.06125057	5.48220196	5.53	0.0201
PCFAVG	7.34226214	2.04766007	12.75195129	12.86	0.0005
PGRWTHAV	-0.00211786	0.00102855	4.20507321	4.24	0.0414

Bounds on condition number: 1.647094, 13.4489

 All variables left in the model are significant at the 0.1000 level.

Regression of Post-acquisition Return on Assets Performance for Acquiring Firms on Internal Variables (1973-1992).

Step 0 All Variables Entered R-square = 0.09638630 C(p) = 12.00000000

	DF	Sum of Squares	Mean Square	F	Prob>F
Regression	11	1367.29695234	124.29972294	1.26	0.2545
Error	130	12818.29767103	98.60228978		
Total	141	14185.59462337			

Variable	Parameter Estimate	Standard Error	Type II Sum of Squares	F	Prob>F
INTERCEP	11.19546682	4.59552070	585.19682491	5.93	0.0162
PMBAVG	0.90303453	0.65054930	189.99198534	1.93	0.1675
PFSAVG	-0.00001491	0.00057371	0.06658762	0.00	0.9793
PCFAVG	-66.44707491	23.29619758	802.17413257	8.14	0.0051
PPEAVG	-0.00791652	0.05802000	1.83569283	0.02	0.8917
PEPSAVG	-0.02179946	0.04447774	23.68606749	0.24	0.6249
PLIQDAVG	3.46743608	7.44692931	21.37713328	0.22	0.6423
PLEVAVG	0.48424800	3.25895253	2.17704100	0.02	0.8821
PGRWTHAV	0.02644751	0.01281119	420.22114798	4.26	0.0410
PROEAVG	-6.10266360	8.66199615	48.94292139	0.50	0.4824
PROSAVG	0.01039079	0.44265738	0.05433116	0.00	0.9813
PROAAVG	-0.46662365	2.52403405	3.37000135	0.03	0.8536

Bounds on condition number: 90.75926, 2067.794

Step 1 Variable PROSAVG Removed R-square = 0.09638247 C(p) = 10.00055101

	DF	Sum of Squares	Mean Square	F	Prob>F
Regression	10	1367.24262118	136.72426212	1.40	0.1883
Error	131	12818.35200219	97.85001528		
Total	141	14185.59462337			

Variable	Parameter Estimate	Standard Error	Type II Sum of Squares	F	Prob>F
INTERCEP	11.17866276	4.52207135	597.95126190	6.11	0.0147
PMB AVG	0.90108747	0.64277362	192.29974562	1.97	0.1633
PFS AVG	-0.00001448	0.00057122	0.06283259	0.00	0.9798
PCF AVG	-66.38277692	23.04618269	811.84613751	8.30	0.0046
PPE AVG	-0.00790182	0.05779488	1.82909654	0.02	0.8915
PEP AVG	-0.02155025	0.04302699	24.54614998	0.25	0.6173
PLIQD AVG	3.39623597	6.77521986	24.58724265	0.25	0.6170
PLEV AVG	0.45621505	3.02066845	2.23199898	0.02	0.8802
PGRWTHAV	0.02639487	0.01256517	431.78033683	4.41	0.0376
PROE AVG	-6.08398141	8.59238928	49.05787871	0.50	0.4802
PROA AVG	-0.43582784	2.14804895	4.02812082	0.04	0.8395

Bounds on condition number: 68.06028, 1474.008

Step 2 Variable PFS AVG Removed R-square = 0.09637804 C(p) = 8.00118825

	DF	Sum of Squares	Mean Square	F	Prob>F
Regression	9	1367.17978860	151.90886540	1.56	0.1324
Error	132	12818.41483478	97.10920329		
Total	141	14185.59462337			

Variable	Parameter Estimate	Standard Error	Type II Sum of Squares	F	Prob>F
INTERCEP	11.17068493	4.49398987	600.00630920	6.18	0.0142
PMB AVG	0.90042138	0.63980015	192.33720850	1.98	0.1617
PCF AVG	-66.31134882	22.78640425	822.40268438	8.47	0.0042
PPE AVG	-0.00796641	0.05751967	1.86274204	0.02	0.8901
PEP AVG	-0.02154848	0.04286375	24.54219445	0.25	0.6160
PLIQD AVG	3.42644020	6.64425313	25.82583457	0.27	0.6069
PLEV AVG	0.45656830	3.00918010	2.23550446	0.02	0.8796
PGRWTHAV	0.02638334	0.01250931	431.96942842	4.45	0.0368
PROE AVG	-6.09994771	8.53675653	49.58231778	0.51	0.4761
PROA AVG	-0.43581573	2.13990213	4.02789723	0.04	0.8389

Bounds on condition number: 68.05883, 1316.123

Step 3 Variable PPEAVG Removed R-square = 0.09624673 C(p) = 6.02007971

	DF	Sum of Squares	Mean Square	F	Prob>F
Regression	8	1365.31704656	170.66463082	1.77	0.0883
Error	133	12820.27757681	96.39306449		
Total	141	14185.59462337			

Variable	Parameter Estimate	Standard Error	Type II Sum of Squares	F	Prob>F
INTERCEP	11.11436784	4.45902277	598.87466336	6.21	0.0139
PMB AVG	0.87397965	0.60839556	198.91904305	2.06	0.1532
PCF AVG	-65.97552790	22.57333121	823.41775534	8.54	0.0041
PEP SAVG	-0.02197525	0.04259492	25.65653946	0.27	0.6068
PLIQD AVG	3.33045058	6.58359592	24.66751723	0.26	0.6138
PLEV AVG	0.45460852	2.99803072	2.21640326	0.02	0.8797
PGRWTHAV	0.02698148	0.01169680	512.91184429	5.32	0.0226
PROE AVG	-6.18913962	8.48098556	51.33501566	0.53	0.4668
PROA AVG	-0.43263085	2.13187399	3.96970002	0.04	0.8395

Bounds on condition number: 68.05732, 1153.227

Step 4 Variable PLEV AVG Removed R-square = 0.09609048 C(p) = 4.04255793

	DF	Sum of Squares	Mean Square	F	Prob>F
Regression	7	1363.10064330	194.72866333	2.03	0.0551
Error	134	12822.49398007	95.69025358		
Total	141	14185.59462337			

Variable	Parameter Estimate	Standard Error	Type II Sum of Squares	F	Prob>F
INTERCEP	10.52020850	2.12049962	2355.26620549	24.61	0.0001
PMB AVG	0.86664212	0.60425322	196.83818367	2.06	0.1538
PCF AVG	-65.55753152	22.32256082	825.32473410	8.62	0.0039
PEP SAVG	-0.02227403	0.04239392	26.41545503	0.28	0.6002
PLIQD AVG	3.61263014	6.29205814	31.54490716	0.33	0.5668
PGRWTHAV	0.02683487	0.01161421	510.84328540	5.34	0.0224
PROE AVG	-5.66439568	7.71456754	51.58835741	0.54	0.4641
PROA AVG	-0.11231880	0.28660027	14.69668656	0.15	0.6958

Bounds on condition number: 2.028877, 74.18673

Step 5 Variable PROAAVG Removed R-square = 0.09505445 C(p) = 2.19160808

	DF	Sum of Squares	Mean Square	F	Prob>F
Regression	6	1348.40395673	224.73399279	2.36	0.0334
Error	135	12837.19066664	95.09030123		
Total	141	14185.59462337			

Variable	Parameter Estimate	Standard Error	Type II Sum of Squares	F	Prob>F
INTERCEP	10.19820305	1.94870448	2604.30331614	27.39	0.0001
PMB AVG	0.86640768	0.60235569	196.73189585	2.07	0.1526
PCF AVG	-63.06355153	21.32905032	831.28517555	8.74	0.0037
PEPS AVG	-0.02184204	0.04224652	25.41794886	0.27	0.6060
PLIQ DAVG	3.87171395	6.23758523	36.63614468	0.39	0.5358
PGRWTHAV	0.02648429	0.01154335	500.55230243	5.26	0.0233
PROE AVG	-6.77990446	7.14773894	85.55512032	0.90	0.3446

Bounds on condition number: 1.887316, 54.05731

Step 6 Variable PEPS AVG Removed R-square = 0.09326264 C(p) = 0.44939062

	DF	Sum of Squares	Mean Square	F	Prob>F
Regression	5	1322.98600787	264.59720157	2.80	0.0194
Error	136	12862.60861550	94.57800453		
Total	141	14185.59462337			

Variable	Parameter Estimate	Standard Error	Type II Sum of Squares	F	Prob>F
INTERCEP	10.06929706	1.92747529	2581.13557502	27.29	0.0001
PMB AVG	0.87905240	0.60023553	202.85058998	2.14	0.1454
PCF AVG	-62.00853193	21.17394265	811.12834931	8.58	0.0040
PLIQ DAVG	4.39855548	6.13718763	48.58156412	0.51	0.4748
PGRWTHAV	0.02666285	0.01150706	507.77931221	5.37	0.0220
PROE AVG	-6.78448951	7.12845332	85.67100829	0.91	0.3429

Bounds on condition number: 1.885627, 39.51695

Step 7 Variable PLIQDAVG Removed R-square = 0.08983793 C(p) = -1.05790719

	DF	Sum of Squares	Mean Square	F	Prob>F
Regression	4	1274.40444375	318.60111094	3.38	0.0113
Error	137	12911.19017962	94.24226408		
Total	141	14185.59462337			

Variable	Parameter Estimate	Standard Error	Type II Sum of Squares	F	Prob>F
INTERCEP	9.70298107	1.85517264	2578.02673133	27.36	0.0001
PMB AVG	0.84691408	0.59749484	189.34598187	2.01	0.1586
PCF AVG	-64.22527675	20.90961109	889.13103487	9.43	0.0026
PGRWTHAV	0.02263886	0.01002650	480.45851056	5.10	0.0255
PROE AVG	-6.26407519	7.07877681	73.79776284	0.78	0.3778

Bounds on condition number: 1.807514, 23.302

Step 8 Variable PROE AVG Removed R-square = 0.08463563 C(p) = -2.30946855

	DF	Sum of Squares	Mean Square	F	Prob>F
Regression	3	1200.60668091	400.20222697	4.25	0.0066
Error	138	12984.98794246	94.09411553		
Total	141	14185.59462337			

Variable	Parameter Estimate	Standard Error	Type II Sum of Squares	F	Prob>F
INTERCEP	9.21721906	1.77070436	2549.58896187	27.10	0.0001
PMB AVG	0.82670534	0.59658878	180.68154306	1.92	0.1681
PCF AVG	-69.73756638	19.94448358	1150.40417369	12.23	0.0006
PGRWTHAV	0.02256370	0.01001826	477.30783585	5.07	0.0259

Bounds on condition number: 1.647094, 13.4489

Step 9 Variable PMB AVG Removed R-square = 0.07189865 C(p) = -2.47704110

	DF	Sum of Squares	Mean Square	F	Prob>F
Regression	2	1019.92513785	509.96256892	5.38	0.0056
Error	139	13165.66948552	94.71704666		
Total	141	14185.59462337			

Variable	Parameter Estimate	Standard Error	Type II Sum of Squares	F	Prob>F
INTERCEP	9.64765917	1.74900663	2881.96790140	30.43	0.0001
PCFAVG	-55.52243542	17.16061092	991.51587866	10.47	0.0015
PGRWTHAV	0.01706660	0.00922979	323.84606375	3.42	0.0666

Bounds on condition number: 1.211359, 4.845434

All variables left in the model are significant at the 0.1000 level.

Regression of Post-acquisition Return on Sales Performance for Acquiring Firms on Internal Variables (1973-1992).

Backward Elimination Procedure for Dependent Variable FROSAVG

Step 0 All Variables Entered R-square = 0.06828451 C(p) = 12.00000000

	DF	Sum of Squares	Mean Square	F	Prob>F
Regression	11	2960.17541231	269.10685566	0.87	0.5751
Error	130	40390.43553376	310.69565795		
Total	141	43350.61094607			

Variable	Parameter Estimate	Standard Error	Type II Sum of Squares	F	Prob>F
INTERCEP	19.21021238	8.15753261	1722.98651896	5.55	0.0200
PMB AVG	0.65453516	1.15479344	99.81424720	0.32	0.5718
PFS AVG	-0.00052075	0.00101840	81.23646728	0.26	0.6100
PCF AVG	-77.85596241	41.35320104	1101.28740780	3.54	0.0620
PPE AVG	-0.00446856	0.10299160	0.58488009	0.00	0.9655
PEP AVG	-0.04528720	0.07895267	102.22388061	0.33	0.5672
PLIQD AVG	5.07171326	13.21908281	45.73428783	0.15	0.7019
PLEV AVG	5.33221879	5.78498352	263.96530837	0.85	0.3584
PGRWTHAV	0.03084428	0.02274120	571.55459265	1.84	0.1773
PROE AVG	-12.85555510	15.37595425	217.18643447	0.70	0.4046
PROS AVG	1.50473271	0.78576342	1139.38447552	3.67	0.0577
PROA AVG	-5.56642548	4.48042591	479.56710132	1.54	0.2163

Bounds on condition number: 90.75926, 2067.794

Step 1 Variable PPEAVG Removed R-square = 0.06827102 C(p) = 10.00188249

	DF	Sum of Squares	Mean Square	F	Prob>F
Regression	10	2959.59053222	295.95905322	0.96	0.4815
Error	131	40391.02041385	308.32840011		
Total	141	43350.61094607			

Variable	Parameter Estimate	Standard Error	Type II Sum of Squares	F	Prob>F
INTERCEP	19.17916622	8.09507252	1730.73863082	5.61	0.0193
PMBAVG	0.63975458	1.09919054	104.44661723	0.34	0.5616
PFSAVG	-0.00052268	0.00101355	81.99718661	0.27	0.6069
PCFAVG	-77.67531376	40.98602488	1107.40878146	3.59	0.0603
PEPSAVG	-0.04551750	0.07847336	103.73514210	0.34	0.5629
PLIQDAVG	5.01139671	13.09560477	45.15231032	0.15	0.7026
PLEVAVG	5.33008175	5.76269397	263.77288854	0.86	0.3567
PGRWTHAV	0.03117879	0.02131280	659.85881091	2.14	0.1459
PROEAVG	-12.90267243	15.27901517	219.87818743	0.71	0.3999
PROSAVG	1.50436483	0.78271867	1138.96004398	3.69	0.0568
PROAAVG	-5.56355400	4.46283765	479.17700561	1.55	0.2148

Bounds on condition number: 90.73946, 1858.765

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Step 2 Variable PLIQDAVG Removed R-square = 0.06722946 C(p) = 8.14720898

	DF	Sum of Squares	Mean Square	F	Prob>F
Regression	9	2914.43822190	323.82646910	1.06	0.3988
Error	132	40436.17272417	306.33464185		
Total	141	43350.61094607			

Variable	Parameter Estimate	Standard Error	Type II Sum of Squares	F	Prob>F
INTERCEP	19.47595639	8.03174028	1801.25162745	5.88	0.0167
PMBAVG	0.60098244	1.09096659	92.96014001	0.30	0.5827
PFSAVG	-0.00057845	0.00099976	102.55083639	0.33	0.5639
PCFAVG	-80.11837575	40.35465568	1207.46094329	3.94	0.0492
PEPSAVG	-0.04637165	0.07818758	107.75205286	0.35	0.5541
PLEVAVG	5.52010973	5.72266647	285.03268404	0.93	0.3365
PGRWTHAV	0.02748197	0.01893617	645.21976037	2.11	0.1491
PROEAVG	-12.60992635	15.21043444	210.54162688	0.69	0.4086
PROSAVG	1.38201880	0.71213284	1153.72416311	3.77	0.0544
PROAAVG	-5.58644566	4.44798549	483.21515441	1.58	0.2114

Bounds on condition number: 90.72315, 1635.87

Step 3 Variable PMBAVG Removed R-square = 0.06508508 C(p) = 6.44640898

	DF	Sum of Squares	Mean Square	F	Prob>F
Regression	8	2821.47808189	352.68476024	1.16	0.3298
Error	133	40529.13286418	304.73032229		
Total	141	43350.61094607			

Variable	Parameter Estimate	Standard Error	Type II Sum of Squares	F	Prob>F
INTERCEP	19.27945493	8.00277663	1768.57622798	5.80	0.0174
PFSAVG	-0.00053735	0.00099436	88.99068965	0.29	0.5898
PCFAVG	-69.54984446	35.40944376	1175.62763935	3.86	0.0516
PEPSAVG	-0.04674331	0.07797967	109.49436110	0.36	0.5499
PLEVAVG	5.11131056	5.65946812	248.55870254	0.82	0.3681
PGRWTHAV	0.02327293	0.01728080	552.70077249	1.81	0.1804
PROEAVG	-11.99819695	15.13006827	191.63104560	0.63	0.4292
PROSAVG	1.34210853	0.70658038	1099.43054146	3.61	0.0597
PROAAVG	-5.25260593	4.39495416	435.26787071	1.43	0.2342

Bounds on condition number: 89.03906, 1412.382

Step 4 Variable PFSAVG Removed R-square = 0.06303227 C(p) = 4.73283296

	DF	Sum of Squares	Mean Square	F	Prob>F
Regression	7	2732.48739224	390.35534175	1.29	0.2610
Error	134	40618.12355383	303.12032503		
Total	141	43350.61094607			

Variable	Parameter Estimate	Standard Error	Type II Sum of Squares	F	Prob>F
INTERCEP	19.01097031	7.96621189	1726.31449547	5.70	0.0184
PCFAVG	-67.91445817	35.18656620	1129.23872923	3.73	0.0557
PEPSAVG	-0.04661981	0.07777307	108.91748897	0.36	0.5499
PLEVAVG	5.15534165	5.64391284	252.91195891	0.83	0.3627
PGRWTHAV	0.02249847	0.01717572	520.10512539	1.72	0.1925
PROEAVG	-12.59331625	15.05002133	212.23697478	0.70	0.4042
PROSAVG	1.30605567	0.70156302	1050.52176149	3.47	0.0648
PROAAVG	-5.23896146	4.38325641	433.02374586	1.43	0.2341

Bounds on condition number: 89.03612, 1228.042

Step 5 Variable PEPSAVG Removed R-square = 0.06051979 C(p) = 3.08339303

	DF	Sum of Squares	Mean Square	F	Prob>F
Regression	6	2623.56990327	437.26165054	1.45	0.2004
Error	135	40727.04104280	301.68178550		
Total	141	43350.61094607			

Variable	Parameter Estimate	Standard Error	Type II Sum of Squares	F	Prob>F
INTERCEP	18.75031874	7.93543845	1684.31976379	5.58	0.0196
PCFAVG	-65.09115349	34.78707175	1056.22703510	3.50	0.0635
PLEVAVG	5.00164497	5.62469119	238.54891433	0.79	0.3755
PGRWTHAV	0.02210155	0.01712218	502.66282017	1.67	0.1990
PROEAVG	-12.62025168	15.01419996	213.14773900	0.71	0.4021
PROSAVG	1.18870228	0.67209330	943.70477296	3.13	0.0792
PROAAVG	-4.99910559	4.35458454	397.59439769	1.32	0.2530

Bounds on condition number: 88.29414, 1038.493

Step 6 Variable PROEAVG Removed R-square = 0.05560296 C(p) = 1.76942688

	DF	Sum of Squares	Mean Square	F	Prob>F
Regression	5	2410.42216426	482.08443285	1.60	0.1638
Error	136	40940.18878181	301.03079987		
Total	141	43350.61094607			

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Variable	Parameter Estimate	Standard Error	Type II Sum of Squares	F	Prob>F
INTERCEP	15.92289527	7.17947305	1480.70952622	4.92	0.0282
PCFAVG	-75.59302596	32.43094627	1635.51733579	5.43	0.0212
PLEVAVG	3.04714916	5.11603169	106.79032474	0.35	0.5524
PGRWTHAV	0.02162710	0.01709440	481.83664275	1.60	0.2080
PROSAVG	1.14112758	0.66898290	875.88945270	2.91	0.0903
PROAAVG	-3.71420812	4.07306004	250.32359121	0.83	0.3634

Bounds on condition number: 77.41377, 736.1661

Step 7 Variable PLEVAVG Removed R-square = 0.05313955 C(p) = 0.11314048

	DF	Sum of Squares	Mean Square	F	Prob>F
Regression	4	2303.63183952	575.90795988	1.92	0.1102
Error	137	41046.97910655	299.61298618		
Total	141	43350.61094607			

Variable	Parameter Estimate	Standard Error	Type II Sum of Squares	F	Prob>F
INTERCEP	12.34241924	3.91593704	2976.38988202	9.93	0.0020
PCFAVG	-70.17600738	31.05614686	1529.82868834	5.11	0.0254
PGRWTHAV	0.01986498	0.01679674	419.07033097	1.40	0.2390
PROSAVG	0.96185593	0.59603891	780.24583592	2.60	0.1089
PROAAVG	-1.33445998	0.78923769	856.55668295	2.86	0.0931

Bounds on condition number: 2.943184, 33.5442

Step 8 Variable PGRWTHAV Removed R-square = 0.04347255 C(p) = -0.53804655

	DF	Sum of Squares	Mean Square	F	Prob>F
Regression	3	1884.56150855	628.18716952	2.09	0.1043
Error	138	41466.04943752	300.47861911		
Total	141	43350.61094607			

Variable	Parameter Estimate	Standard Error	Type II Sum of Squares	F	Prob>F
INTERCEP	9.93377126	3.34948633	2642.92881043	8.80	0.0036
PCFAVG	-54.91622125	28.28968970	1132.29215721	3.77	0.0543
PROSAVG	1.07475130	0.58919455	999.79760008	3.33	0.0703
PROAAVG	-1.37741218	0.78953972	914.52049879	3.04	0.0833

Bounds on condition number: 2.914217, 20.45888

All variables left in the model are significant at the 0.1000 level.

Summary of Backward Elimination Procedure for Dependent Variable FROSAVG

Step	Variable Removed	Number In	Partial R**2	Model R**2	C(p)	F	Prob>F
1	PPEAVG	10	0.0000	0.0683	10.0019	0.0019	0.9655
2	PLIQDAVG	9	0.0010	0.0672	8.1472	0.1464	0.7026
3	PMBAVG	8	0.0021	0.0651	6.4464	0.3035	0.5827
4	PFSAVG	7	0.0021	0.0630	4.7328	0.2920	0.5898
5	PEPSAVG	6	0.0025	0.0605	3.0834	0.3593	0.5499
6	PROEAVG	5	0.0049	0.0556	1.7694	0.7065	0.4021
7	PLEVAVG	4	0.0025	0.0531	0.1131	0.3547	0.5524
8	PGRWTHAV	3	0.0097	0.0435	-0.5380	1.3987	0.2390

Regression of Post-acquisition Earnings Per Share Performance for Acquiring Firms on Pre-acquisition Internal Variables (1973-1992).

Step 0 All Variables Entered R-square = 0.09353556 C(p) = 12.00000000

	DF	Sum of Squares	Mean Square	F	Prob>F
Regression	11	1720.90441724	156.44585611	1.20	0.2930
Error	128	16677.49335675	130.29291685		
Total	139	18398.39777398			

Variable	Parameter Estimate	Standard Error	Type II Sum of Squares	F	Prob>F
INTERCEP	12.94547328	5.31059768	774.22977431	5.94	0.0162
PMB AVG	0.53009164	0.74917628	65.23109845	0.50	0.4805
PFS AVG	-0.00054619	0.00066037	89.13121026	0.68	0.4097
PCF AVG	-71.78196968	27.10357555	913.89936103	7.01	0.0091
PPE AVG	-0.00578037	0.06674697	0.97716589	0.01	0.9311
PEPS AVG	-0.00245257	0.05116399	0.29938789	0.00	0.9618
PLEV AVG	2.26146057	3.75048107	47.37234577	0.36	0.5476
PLIQD AVG	-5.41585857	8.59455756	51.73785126	0.40	0.5297
PROE AVG	-8.37161365	10.01351982	91.06796616	0.70	0.4047
PROS AVG	-0.30112185	0.50928662	45.54920641	0.35	0.5554
PROA AVG	-1.35115075	2.90676369	28.15198162	0.22	0.6428
PGRWTH AV	0.02209436	0.01477217	291.47102689	2.24	0.1372

Bounds on condition number: 91.03669, 2073.246

Step 1 Variable PEPS AVG Removed R-square = 0.09351929 C(p) = 10.00229781

	DF	Sum of Squares	Mean Square	F	Prob>F
Regression	10	1720.60502935	172.06050294	1.33	0.2208
Error	129	16677.79274463	129.28521507		
Total	139	18398.39777398			

Variable	Parameter Estimate	Standard Error	Type II Sum of Squares	F	Prob>F
INTERCEP	12.93193929	5.28253996	774.80175436	5.99	0.0157
PMB AVG	0.53118997	0.74592444	65.56301471	0.51	0.4777
PFS AVG	-0.00054584	0.00065777	89.02799929	0.69	0.4082
PCF AVG	-71.63694373	26.82982997	921.69476291	7.13	0.0086
PPE AVG	-0.00599211	0.06634259	1.05468807	0.01	0.9282
PLEV AVG	2.25306094	3.73186975	47.12396048	0.36	0.5471
PLIQD AVG	-5.40078626	8.55552606	51.51923493	0.40	0.5290
PROE AVG	-8.37327005	9.97466236	91.10509185	0.70	0.4028
PROS AVG	-0.30696439	0.49257093	50.20966399	0.39	0.5343
PROA AVG	-1.33863657	2.88379966	27.85762335	0.22	0.6433
PGRWTHAV	0.02206758	0.01470440	291.18136524	2.25	0.1359

Bounds on condition number: 90.30236, 1861.311

Step 2 Variable PPE AVG Removed R-square = 0.09346196 C(p) = 8.01039255

	DF	Sum of Squares	Mean Square	F	Prob>F
Regression	9	1719.55034128	191.06114903	1.49	0.1584
Error	130	16678.84743270	128.29882641		
Total	139	18398.39777398			

Variable	Parameter Estimate	Standard Error	Type II Sum of Squares	F	Prob>F
INTERCEP	12.88661526	5.23855228	776.38626581	6.05	0.0152
PMB AVG	0.51133484	0.71007186	66.53173541	0.52	0.4727
PFS AVG	-0.00054829	0.00065470	89.98188566	0.70	0.4039
PCF AVG	-71.36120872	26.55369994	926.61001952	7.22	0.0081
PLEV AVG	2.24851454	3.71726805	46.94251223	0.37	0.5463
PLIQD AVG	-5.48112050	8.47664500	53.64304138	0.42	0.5190
PROE AVG	-8.44056047	9.90878302	93.09462736	0.73	0.3959
PROS AVG	-0.30826181	0.49047959	50.67809126	0.40	0.5308
PROA AVG	-1.33259557	2.87200478	27.62161677	0.22	0.6434
PGRWTHAV	0.02251046	0.01380977	340.89356062	2.66	0.1055

Bounds on condition number: 90.25379, 1655.984

Step 3 Variable PROAAVG Removed R-square = 0.09196066 C(p) = 6.22238886

	DF	Sum of Squares	Mean Square	F	Prob>F
Regression	8	1691.92872451	211.49109056	1.66	0.1145
Error	131	16706.46904948	127.53029809		
Total	139	18398.39777398			

Variable	Parameter Estimate	Standard Error	Type II Sum of Squares	F	Prob>F
INTERCEP	10.85828240	2.87800200	1815.32109893	14.23	0.0002
PMB AVG	0.46609063	0.70123500	56.34131168	0.44	0.5074
PFS AVG	-0.00054227	0.00065261	88.05267735	0.69	0.4075
PCF AVG	-68.98777687	25.97819638	899.37266566	7.05	0.0089
PLEV AVG	0.56012039	0.75737069	69.75239969	0.55	0.4609
PLIQD AVG	-5.44474795	8.45085732	52.93798370	0.42	0.5205
PROE AVG	-6.84935342	9.26853602	69.64504815	0.55	0.4612
PROS AVG	-0.42571602	0.41884930	131.74610023	1.03	0.3113
PGRWTHAV	0.02136230	0.01354551	317.18950268	2.49	0.1172

Bounds on condition number: 3.407642, 134.6352

Step 4 Variable PLIQD AVG Removed R-square = 0.08908334 C(p) = 4.62868864

	DF	Sum of Squares	Mean Square	F	Prob>F
Regression	7	1638.99074081	234.14153440	1.84	0.0840
Error	132	16759.40703318	126.96520480		
Total	139	18398.39777398			

Variable	Parameter Estimate	Standard Error	Type II Sum of Squares	F	Prob>F
INTERCEP	10.57454161	2.83779899	1762.96852161	13.89	0.0003
PMB AVG	0.51046803	0.69629620	68.23917442	0.54	0.4648
PFS AVG	-0.00048203	0.00064444	71.03337772	0.56	0.4558
PCF AVG	-66.50230083	25.63318416	854.58043294	6.73	0.0105
PLEV AVG	0.38230093	0.70372764	37.47021823	0.30	0.5879
PROE AVG	-7.17168680	9.23449612	76.57745719	0.60	0.4388
PROS AVG	-0.28942068	0.36069951	81.74340909	0.64	0.4238
PGRWTHAV	0.02542432	0.01196221	573.53603036	4.52	0.0354

Bounds on condition number: 2.846069, 89.81084

Step 5 Variable PLEVAVG Removed R-square = 0.08704674 C(p) = 2.91627310

	DF	Sum of Squares	Mean Square	F	Prob>F
Regression	6	1601.52052258	266.92008710	2.11	0.0558
Error	133	16796.87725141	126.29231016		
Total	139	18398.39777398			

Variable	Parameter Estimate	Standard Error	Type II Sum of Squares	F	Prob>F
INTERCEP	10.00752705	2.63188104	1825.98810142	14.46	0.0002
PMB AVG	0.52023508	0.69421708	70.92275302	0.56	0.4549
PFS AVG	-0.00051961	0.00063902	83.50352577	0.66	0.4176
PCF AVG	-69.84475139	24.81779586	1000.27184148	7.92	0.0056
PROE AVG	-5.21453363	8.48018584	47.75260996	0.38	0.5397
PROS AVG	-0.14228876	0.23759482	45.29436405	0.36	0.5503
PGRWTHAV	0.02518646	0.01192247	563.60966767	4.46	0.0365

Bounds on condition number: 1.885175, 49.18171

Step 6 Variable PROS AVG Removed R-square = 0.08458487 C(p) = 1.26390799

	DF	Sum of Squares	Mean Square	F	Prob>F
Regression	5	1556.22615853	311.24523171	2.48	0.0352
Error	134	16842.17161546	125.68784788		
Total	139	18398.39777398			

Variable	Parameter Estimate	Standard Error	Type II Sum of Squares	F	Prob>F
INTERCEP	9.15201409	2.20514857	2164.96529139	17.22	0.0001
PMB AVG	0.52969611	0.69237440	73.56391698	0.59	0.4456
PFS AVG	-0.00054060	0.00063652	90.66015614	0.72	0.3972
PCF AVG	-67.61205934	24.47738460	958.98451471	7.63	0.0065
PROE AVG	-6.36252384	8.24089520	74.92096330	0.60	0.4414
PGRWTHAV	0.02386530	0.01168852	523.97194513	4.17	0.0431

Bounds on condition number: 1.842633, 34.6359

Step 7 Variable PMBAVG Removed R-square = 0.08058649
C(p) = -0.17148789

	DF	Sum of Squares	Mean Square	F	Prob>F
Regression	4	1482.66224155	370.66556039	2.96	0.0222
Error	135	16915.73553243	125.30174468		
Total	139	18398.39777398			

Variable	Parameter Estimate	Standard Error	Type II Sum of Squares	F	Prob>F
INTERCEP	9.38196951	2.18120897	2318.19839425	18.50	0.0001
PFS AVG	-0.00050640	0.00063398	79.94485785	0.64	0.4258
PCF AVG	-58.60506765	21.42707950	937.34938602	7.48	0.0071
PROE AVG	-6.16156079	8.22404659	70.33434845	0.56	0.4550
PGRWTHAV	0.02028133	0.01069220	450.83317099	3.60	0.0600

Bounds on condition number: 1.416351, 19.41065

Step 8 Variable PROE AVG Removed R-square = 0.07676364 C(p) = -1.63167076

	DF	Sum of Squares	Mean Square	F	Prob>F
Regression	3	1412.32789310	470.77596437	3.77	0.0123
Error	136	16986.06988088	124.89757265		
Total	139	18398.39777398			

Variable	Parameter Estimate	Standard Error	Type II Sum of Squares	F	Prob>F
INTERCEP	8.94209565	2.09731601	2270.41305519	18.18	0.0001
PFS AVG	-0.00053590	0.00063173	89.87754484	0.72	0.3978
PCF AVG	-64.59695876	19.84650571	1323.15290549	10.59	0.0014
PGRWTHAV	0.02043873	0.01067288	458.03489857	3.67	0.0576

Bounds on condition number: 1.228108, 10.37583

Step 9 Variable PFS AVG Removed R-square = 0.07187856 C(p) = -2.94185932

	DF	Sum of Squares	Mean Square	F	Prob>F
Regression	2	1322.45034826	661.22517413	5.30	0.0060
Error	137	17075.94742573	124.64195201		
Total	139	18398.39777398			

Variable	Parameter Estimate	Standard Error	Type II Sum of Squares	F	Prob>F
INTERCEP	8.49114511	2.02675052	2187.74237681	17.55	0.0001
PCFAVG	-63.57791972	19.78983433	1286.44893550	10.32	0.0016
PGRWTHAV	0.01948812	0.01060302	421.06104694	3.38	0.0682

Bounds on condition number: 1.214569, 4.858275

All variables left in the model are significant at the 0.1000 level.

Summary of Backward Elimination Procedure for Dependent Variable FEPSAVG

Step	Variable Removed	Number In	Partial R**2	Model R**2	C(p)	F	Prob>F
1	PEPSAVG	10	0.0000	0.0935	10.0023	0.0023	0.9618
2	PPEAVG	9	0.0001	0.0935	8.0104	0.0082	0.9282
3	PROAAVG	8	0.0015	0.0920	6.2224	0.2153	0.6434
4	PLIQDAVG	7	0.0029	0.0891	4.6287	0.4151	0.5205
5	PLEVAVG	6	0.0020	0.0870	2.9163	0.2951	0.5879
6	PROSAVG	5	0.0025	0.0846	1.2639	0.3586	0.5503
7	PMBAVG	4	0.0040	0.0806	-0.1715	0.5853	0.4456
8	PROEAVG	3	0.0038	0.0768	-1.6317	0.5613	0.4550
9	PFSAVG	2	0.0049	0.0719	-2.9419	0.7196	0.3978

Post Hoc Regression of Post-acquisition Return On Equity for Acquiring Firms on Pre-acquisition Internal Variables Before Deregulation (1973-1981).

Dependent Variable: FROEAVG

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	11	1.21891	0.11081	1.587	0.1816
Error	19	1.32669	0.06983		
C Total	30	2.54560			

Root MSE	0.26425	R-square	0.4788
Dep Mean	0.12000	Adj R-sq	0.1771
C.V.	220.19662		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob > T
INTERCEP	1	-0.072493	0.59666021	-0.121	0.9046
PMBAVG	1	-0.039747	0.04643005	-0.856	0.4026
PCFAVG	1	5.257288	2.84226153	1.850	0.0800
PFS AVG	1	-0.000007204	0.00049767	-0.014	0.9886
PLEVAVG	1	0.870181	0.65724250	1.324	0.2012
PLIQDAVG	1	-0.526279	0.44558053	-1.181	0.2521
PROAAVG	1	-0.357215	0.32670212	-1.093	0.2879
PROSAVG	1	0.042530	0.02406850	1.767	0.0933
PROEAVG	1	-1.042471	0.80181320	-1.300	0.2091
PGRWTHAV	1	-0.002980	0.00412808	-0.722	0.4792
PEPSAVG	1	0.017723	0.08838739	0.201	0.8432
PPEAVG	1	-0.002321	0.00221852	-1.046	0.3086

Post Hoc Regression of Post-acquisition Return On Assets for Acquiring Firms on Pre-acquisition Internal Variables Before Deregulation (1973-1981).

Dependent Variable: FROAAVG

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	11	38.31720	3.48338	7.784	0.0001
Error	19	8.50217	0.44748		
C Total	30	46.81937			

Root MSE	0.66894	R-square	0.8184
Dep Mean	3.03463	Adj R-sq	0.7133
C.V.	22.04358		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob > T
INTERCEP	1	1.373032	1.51045492	0.909	0.3747
PMB AVG	1	-0.107052	0.11753842	-0.911	0.3738
PCF AVG	1	-20.076071	7.19523072	-2.790	0.0117
PFS AVG	1	0.001036	0.00125986	0.822	0.4213
PLEV AVG	1	-0.686413	1.66381995	-0.413	0.6846
PLIQD AVG	1	-0.755645	1.12799427	-0.670	0.5110
PROA AVG	1	1.073849	0.82705166	1.298	0.2097
PROS AVG	1	-0.022554	0.06092980	-0.370	0.7153
PROE AVG	1	4.342470	2.02980300	2.139	0.0456
PGRWTH AV	1	-0.014650	0.01045030	-1.402	0.1771
PEPS AVG	1	0.089925	0.22375410	0.402	0.6922
PPE AVG	1	-0.000697	0.00561623	-0.124	0.9025

Post Hoc Regression of Post-acquisition Return On Sales for Acquiring Firms on Pre-acquisition Internal Variables Before Deregulation (1973-1981).

Dependent Variable: FROSAVG

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	11	167.61964	15.23815	2.342	0.0498
Error	19	123.61618	6.50611		
C Total	30	291.23583			
Root MSE		2.55071	R-square	0.5755	
Dep Mean		6.55325	Adj R-sq	0.3298	
C.V.		38.92279			

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob > T
INTERCEP	1	0.266568	5.75944410	0.046	0.9636
PMB AVG	1	-0.284584	0.44818018	-0.635	0.5330
PCF AVG	1	-35.332704	27.43579344	-1.288	0.2133
PFS AVG	1	0.004824	0.00480392	1.004	0.3279
PLEV AVG	1	-7.491679	6.34423303	-1.181	0.2522
PLIQD AVG	1	-3.391966	4.30110150	-0.789	0.4401
PROA AVG	1	2.776431	3.15359152	0.880	0.3896
PROS AVG	1	0.641872	0.23232855	2.763	0.0124
PROE AVG	1	11.721084	7.73974568	1.514	0.1464
PGRWTH AV	1	-0.014836	0.03984753	-0.372	0.7138
PEPS AVG	1	-0.469303	0.85318616	-0.550	0.5887
PPE AVG	1	0.019052	0.02141496	0.890	0.3848

Post Hoc Regression of Post-acquisition Earnings Per Share for Acquiring Firms on Pre-acquisition Internal Variables Before Deregulation (1973-1981).

Dependent Variable: FEPSAVG

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	11	92.93509	8.44864	2.560	0.0348
Error	19	62.69284	3.29962		
C Total	30	155.62793			

Root MSE	1.81649	R-square	0.5972
Dep Mean	0.61838	Adj R-sq	0.3639
C.V.	293.75099		

Parameter Estimates

Parameter Variable	Standard DF	T for H0: Estimate	Error	Parameter=0	Prob > T
INTERCEP	1	-0.853187	4.10158650	-0.208	0.8374
PMB AVG	1	0.328965	0.31917139	1.031	0.3156
PCF AVG	1	-18.463653	19.53839258	-0.945	0.3565
PFS AVG	1	0.001007	0.00342111	0.294	0.7716
PLEV AVG	1	-8.187685	4.51804377	-1.812	0.0858
PLIQD AVG	1	4.100322	3.06302823	1.339	0.1965
PROA AVG	1	3.937529	2.24582931	1.753	0.0957
PROS AVG	1	-0.347034	0.16545271	-2.097	0.0496
PROE AVG	1	0.397387	5.51185771	0.072	0.9433
PGRWTH AV	1	0.022611	0.02837741	0.797	0.4354
PEPS AVG	1	-0.914015	0.60759629	-1.504	0.1489
PPE AVG	1	0.018645	0.01525066	1.223	0.2364

Post Hoc Regression of Post-acquisition Return on Equity for Acquiring Firms on Pre-acquisition Internal Variables During Deregulation (1982-1987).

Dependent Variable: FROEAVG

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	11	45.32947	4.12086	2.725	0.0061
Error	63	95.27858	1.51236		
C Total	74	140.60805			

Root MSE	1.22978	R-square	0.3224
Dep Mean	-0.07285	Adj R-sq	0.2041
C.V.	-1688.02738		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob > T
INTERCEP	1	-1.850548	0.94900879	-1.950	0.0556
PMB AVG	1	-0.358647	0.11776262	-3.046	0.0034
PCF AVG	1	15.934410	4.27301766	3.729	0.0004
PFS AVG	1	0.000422	0.00024603	1.715	0.0912
PLEV AVG	1	0.775583	1.08296180	0.716	0.4765
PLIQD AVG	1	-1.014929	1.51499159	-0.670	0.5054
PROA AVG	1	-0.143254	0.67242927	-0.213	0.8320
PROS AVG	1	-0.067962	0.08711822	-0.780	0.4382
PROE AVG	1	5.068872	1.77619243	2.854	0.0058
PGRWTH AV	1	-0.005743	0.00233729	-2.457	0.0168
PEPS AVG	1	0.003930	0.00587769	0.669	0.5062
PPE AVG	1	0.014073	0.01540767	0.913	0.3645

Post Hoc Regression of Post-acquisition Return on Assets for Acquiring Firms on Pre-acquisition Internal Variables During Deregulation (1982-1987).

Dependent Variable: FROAAVG

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	11	1677.49474	152.49952	1.097	0.3784
Error	63	8756.79118	138.99669		
C Total	74	10434.28592			

Root MSE	11.78969	R-square	0.1608
Dep Mean	5.56756	Adj R-sq	0.0142
C.V.	211.75661		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob > T
INTERCEP	1	19.864920	9.09798261	2.183	0.0327
PMB AVG	1	0.393559	1.12896982	0.349	0.7286
PCF AVG	1	-69.867382	40.96467886	-1.706	0.0930
PFS AVG	1	0.002448	0.00235862	1.038	0.3032
PLEV AVG	1	9.551601	10.38216690	0.920	0.3611
PLIQD AVG	1	-1.575611	14.52396151	-0.108	0.9140
PROA AVG	1	-5.446511	6.44646270	-0.845	0.4014
PROS AVG	1	0.549194	0.83518724	0.658	0.5132
PROE AVG	1	-31.917663	17.02804856	-1.874	0.0655
PGRWTH AV	1	0.025349	0.02240720	1.131	0.2622
PEPS AVG	1	-0.064599	0.05634843	-1.146	0.2560
PPE AVG	1	-0.013136	0.14771063	-0.089	0.9294

Post Hoc Regression of Post-acquisition Return on Sales for Acquiring Firms on Pre-acquisition Internal Variables During Deregulation (1982-1987).

Dependent Variable: FROSAVG

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	11	5707.42561	518.85687	1.019	0.4407
Error	63	32080.65181	509.21670		
C Total	74	37788.07743			

Root MSE	22.56583	R-square	0.1510
Dep Mean	9.90582	Adj R-sq	0.0028
C.V.	227.80386		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob > T
INTERCEP	1	38.676948	17.41382587	2.221	0.0300
PMBAVG	1	0.252815	2.16088388	0.117	0.9072
PCFAVG	1	-106.525094	78.40768830	-1.359	0.1791
PFSAVG	1	0.001578	0.00451446	0.350	0.7278
PLEVAVG	1	26.997714	19.87179514	1.359	0.1791
PLIQDAVG	1	-1.817946	27.79932075	-0.065	0.9481
PROAAVG	1	-19.062908	12.33873307	-1.545	0.1274
PROSAVG	1	3.284372	1.59857475	2.055	0.0441
PROEAVG	1	-48.833374	32.59222241	-1.498	0.1390
PGRWTHAV	1	0.036424	0.04288808	0.849	0.3989
PEPSAVG	1	-0.130958	0.10785267	-1.214	0.2292
PPEAVG	1	-0.009761	0.28272280	-0.035	0.9726

Regression of Post-acquisition Earnings Per Share for Acquiring Firms on Pre-acquisition Internal Variables During Deregulation (1982-1987).

Dependent Variable: FEPSAVG

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	11	752.68965	68.42633	1.147	0.3419
Error	62	3697.89701	59.64350		
C Total	73	4450.58666			

Root MSE	7.72292	R-square	0.1691
Dep Mean	2.99990	Adj R-sq	0.0217
C.V.	257.43884		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob > T
INTERCEP	1	8.705761	5.96723361	1.459	0.1496
PMBAVG	1	0.037814	0.74141398	0.051	0.9595
PCFAVG	1	-74.233783	26.83465001	-2.766	0.0075
PFSAVG	1	-0.001320	0.00154620	-0.854	0.3967
PLEVAVG	1	-1.527101	6.83106160	-0.224	0.8238
PLIQDAVG	1	-9.966541	9.63439793	-1.034	0.3049
PROAAVG	1	0.191094	4.23129051	0.045	0.9641
PROSAVG	1	-0.056395	0.54710393	-0.103	0.9182
PROEAVG	1	4.542703	1.15452737	0.407	0.6852
PGRWTHAV	1	0.016058	0.01476320	1.088	0.2809
PEPSAVG	1	-0.027356	0.03694914	-0.740	0.4619
PPEAVG	1	0.028146	0.09676513	0.291	0.7721

Post Hoc Regression of Post-acquisition Return on Equity for Acquiring Firms on Pre-acquisition Internal Variables After Deregulation (1988-1992).

Dependent Variable: FROEAVG

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	11	1.47265	0.13388	0.721	0.7077
Error	24	4.45349	0.18556		
C Total	35	5.92614			

Root MSE	0.43077	R-square	0.2485
Dep Mean	0.03805	Adj R-sq	-0.0959
C.V.	1132.02368		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob > T
INTERCEP	1	-0.062842	0.50705429	-0.124	0.9024
PMBAVG	1	-0.114201	0.08676523	-1.316	0.2005
PCFAVG	1	4.491324	2.09237602	2.147	0.0421
PFSAVG	1	0.000024469	0.00003039	0.805	0.4286
PLEVAVG	1	0.164566	0.38828358	0.424	0.6755
PLIQDAVG	1	0.911216	0.67579602	1.348	0.1901
PROAAVG	1	-0.170639	0.30503479	-0.559	0.5811
PROSAVG	1	0.052257	0.04442012	1.176	0.2510
PROEAVG	1	-0.182489	1.27791365	-0.143	0.8876
PGRWTHAV	1	-0.001605	0.00176364	-0.910	0.3719
PEPSAVG	1	0.026040	0.02254938	1.155	0.2595
PPEAVG	1	0.002389	0.00701632	0.341	0.7364

Post Hoc Regression of Post-acquisition Return on Assets for Acquiring Firms on Pre-acquisition Internal Variables After Deregulation (1988-1992).

Dependent Variable: FROAAVG

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	11	1455.77341	132.34304	1.526	0.1862
Error	24	2081.00824	86.70868		
C Total	35	3536.78165			

Root MSE	9.31175	R-square	0.4116
Dep Mean	3.82473	Adj R-sq	0.1419
C.V.	243.46179		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob > T
INTERCEP	1	9.164957	10.96077237	0.836	0.4113
PMB AVG	1	3.659284	1.87556625	1.951	0.0628
PCF AVG	1	-81.410601	45.22998340	-1.800	0.0845
PFS AVG	1	-0.000096842	0.00065689	-0.147	0.8840
PLEV AVG	1	-3.816780	8.39335749	-0.455	0.6534
PLIQD AVG	1	-10.074549	14.60838903	-0.690	0.4970
PROA AVG	1	5.251810	6.59380444	0.796	0.4336
PROS AVG	1	-2.288805	0.96021036	-2.384	0.0254
PROE AVG	1	-23.197899	27.62410406	-0.840	0.4093
PGRWTH AV	1	0.039843	0.03812374	1.045	0.3064
PEPS AVG	1	0.096170	0.48744005	0.197	0.8453
PPE AVG	1	-0.128160	0.15166871	-0.845	0.4065

Post Hoc Regression of Post-acquisition Return on Sales for Acquiring Firms on Pre-acquisition Internal Variables After Deregulation (1988-1992).

Dependent Variable: FROSAVG

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	11	1912.75632	173.88694	1.629	0.1534
Error	24	2562.16276	106.75678		
C Total	35	4474.91908			

Root MSE	10.33232	R-square	0.4274
Dep Mean	4.40199	Adj R-sq	0.1650
C.V.	234.71938		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob > T
INTERCEP	1	13.863095	12.16207328	1.140	0.2656
PMBAVG	1	2.986345	2.08112836	1.435	0.1642
PCFAVG	1	-24.208354	50.18719066	-0.482	0.6339
PFS AVG	1	0.000185	0.00072888	0.254	0.8019
PLEV AVG	1	0.011357	9.31326967	0.001	0.9990
PLIQDAVG	1	-8.356216	16.20946882	-0.516	0.6109
PROAAVG	1	3.169548	7.31648556	0.433	0.6687
PROSAVG	1	-2.681256	1.06544944	-2.517	0.0189
PROE AVG	1	-47.545982	30.65170653	-1.551	0.1339
PGRWTHAV	1	0.005420	0.04230211	0.128	0.8991
PEPS AVG	1	0.875789	0.54086349	1.619	0.1185
PPE AVG	1	-0.188301	0.16829160	-1.119	0.2743

Post Hoc Regression of Post-acquisition Earnings Per Share for Acquiring Firms on Pre-acquisition Internal Variables After Deregulation (1988-1992).

Dependent Variable: FEPSAVG

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	11	8850.36329	804.57848	3.883	0.0029
Error	23	4765.85181	207.21095		
C Total	34	13616.21510			

Root MSE	14.39482	R-square	0.6500
Dep Mean	3.70500	Adj R-sq	0.4826
C.V.	388.52428		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob > T
INTERCEP	1	-22.096820	19.73824797	-1.119	0.2745
PMBAVG	1	8.878049	2.98313217	2.976	0.0068
PCFAVG	1	140.374960	82.56187841	1.700	0.1026
PFSAVG	1	0.001058	0.00107480	0.984	0.3351
PLEVAVG	1	-23.340535	14.04214835	-1.662	0.1100
PLIQDAVG	1	15.742155	22.66889707	0.694	0.4944
PROAAVG	1	23.796387	11.30794708	2.104	0.0465
PROSAVG	1	-1.471168	1.50768502	-0.976	0.3393
PROEAVG	1	-292.284942	54.65058506	-5.348	0.0001
PGRWTHAV	1	0.008488	0.05925026	0.143	0.8873
PEPSAVG	1	1.328684	0.75395986	1.762	0.0913
PPEAVG	1	-0.194656	0.24684936	-0.789	0.4384

Ttest Results for Mean Differences of Market-to-Book Value Average for Acquiring Firms and Target Firms (1973-1992).

Variable: PMBAVG

SOURCE	N	Mean	Std Dev	Std Error	Minimum	Maximum
1	165	2.17096458	3.54765064	0.27618423	-16.1986861	38.4935570
2	243	1.68426889	26.92299803	1.72711113	-142.2758750	248.2691357

Variances	T	DF	Prob> T
Unequal	0.2783	254.3	0.7810
Equal	0.2308	406.0	0.8176

For H0: Variances are equal, F' = 57.59 DF = (242,164) Prob>F' = 0.0000

**Acquiring Firms: Paired Ttest Results for Pre/Post Acquisition
Performance Variables (1973-1992).**

EQUITY:

Moments

N	154	Sum Wgts	154
Mean	-0.15048	Sum	-23.1743
Std Dev	0.977284	Variance	0.955083
Skewness	-9.84353	Kurtosis	110.1032
USS	149.615	CSS	146.1277
CV	-649.434	Std Mean	0.078752
T:Mean=0	-1.91085	Pr> T	0.0579
Num ^= 0	154	Num > 0	56
M(Sign)	-21	Pr>= M	0.0009
Sgn Rank	-1933.5	Pr>= S	0.0004

Quantiles(Def=5)

100% Max	1.046711	99%	0.854233
75% Q3	0.028697	95%	0.213224
50% Med	-0.02374	90%	0.112227
25% Q1	-0.08569	10%	-0.25756
0% Min	-11.2408	5%	-0.58981
	1% -2.35562		

Range	12.28749
Q3-Q1	0.114391
Mode	-11.2408

Extremes

Lowest	Obs	Highest	Obs
-11.2408(	87)	0.474177(	86)
-2.35562(	42)	0.579292(	76)
-2.11861(	52)	0.587396(	47)
-1.99798(	98)	0.854233(	92)
-1.52722(	91)	1.046711(	77)

Acquiring Firms: Paired Ttest Results for Pre/Post Acquisition Performance Variables (1973-1992).

SALES:

Moments

N	154	Sum Wgts	154
Mean	2.344248	Sum	361.0142
Std Dev	18.37401	Variance	337.6043
Skewness	5.68672	Kurtosis	49.26647
USS	52499.76	CSS	51653.45
CV	783.7912	Std Mean	1.48062
T:Mean=0	1.583288	Pr> T	0.1154
Num ^= 0	154	Num > 0	82
M(Sign)	5	Pr>= M	0.4684
Sgn Rank	257.5	Pr>= S	0.6438

Quantiles(Def=5)

100% Max	170.7698	99%	79.33001
75% Q3	0.927011	95%	18.32498
50% Med	0.053646	90%	7.42903
25% Q1	-0.96954	10%	-3.5375
0% Min	-50.5898	5%	-9.16038
	1% -47.2954		

Range	221.3596
Q3-Q1	1.89655
Mode	-50.5898

Extremes

Lowest	Obs	Highest	Obs
-50.5898(	3)	39.49374(	77)
-47.2954(	33)	41.23173(	53)
-30.1388(	17)	67.09385(	52)
-10.8207(	92)	79.33001(	46)
-10.1397(	90)	170.7698(	98)

Acquiring Firms: Paired Ttest Results for Pre/Post Acquisition Performance Variables (1973-1992).

ASSETS:

Moments

N	154	Sum Wgts	154
Mean	1.795366	Sum	276.4864
Std Dev	10.31731	Variance	106.447
Skewness	3.715628	Kurtosis	26.77943
USS	16782.78	CSS	16286.39
CV	574.6634	Std Mean	0.831393
T:Mean=0	2.159468	Pr> T	0.0324
Num ^= 0	154	Num > 0	95
M(Sign)	18	Pr>= M	0.0046
Sgn Rank	1818.5	Pr>= S	0.0009

Quantiles(Def=5)

100% Max	78.49822	99%	49.87249
75% Q3	0.912327	95%	14.52636
50% Med	0.137373	90%	4.874243
25% Q1	-0.18147	10%	-1.41909
0% Min	-43.1345	5%	-4.32411
	1% -15.7345		

Range	121.6327
Q3-Q1	1.093797
Mode	-43.1345

Extremes

Lowest	Obs	Highest	Obs
-43.1345(	33)	32.111(	53)
-15.7345(	3)	33.98376(	77)
-11.8177(	17)	44.73935(	42)
-5.99363(	90)	49.87249(	52)
-5.63412(	67)	78.49822(	98)

Acquiring Firms: Paired Ttest Results for Pre/Post Acquisition Performance Variables (1973-1992).

GROWTH:

Moments			
N	137	Sum Wgts	137
Mean	41.99663	Sum	5753.538
Std Dev	103.5339	Variance	10719.27
Skewness	7.710652	Kurtosis	67.16373
USS	1699449	CSS	1457820
CV	246.5291	Std Mean	8.845497
T:Mean=0	4.747797	Pr> T	0.0001
Num ^= 0	137	Num > 0	129
M(Sign)	60.5	Pr>= M	0.0001
Sgn Rank	4371.5	Pr>= S	0.0001

Quantiles(Def=5)

100% Max	1027.022	99%	614.1197
75% Q3	40.55988	95%	96.69162
50% Med	25.97101	90%	59.59959
25% Q1	13.33909	10%	6.350665
0% Min	-83.4622	5%	-1.48867
		1%	-36.2966

Range	1110.484
Q3-Q1	27.22079
Mode	-83.4622

Extremes

Lowest	Obs	Highest	Obs
-83.4622(	79)	153.5758(	7)
-36.2966(	170)	166.6104(	140)
-19.6139(	1)	204.9697(	119)
-19.1095(	3)	614.1197(	180)
-13.1027(	82)	1027.022(	178)

Missing Value	.
Count	49
% Count/Nobs	26.34

Acquiring Firms: Paired Ttest Results for Pre/Post Acquisition Performance Variables (1973-1992).

EARNINGS:

Moments

N	152	Sum Wgts	152
Mean	-0.50017	Sum	-76.026
Std Dev	22.03668	Variance	485.6153
Skewness	-5.03715	Kurtosis	54.91691
USS	73365.94	CSS	73327.91
CV	-4405.83	Std Mean	1.787411
T:Mean=0	-0.27983	Pr> T	0.7800
Num ^= 0	49	Num > 0	29
M(Sign)	4.5	Pr>= M	0.2529
Sgn Rank	202.5	Pr>= S	0.0427

Quantiles(Def=5)

100% Max	113.2167	99%	45.91533
75% Q3	0	95%	9.333333
50% Med	0	90%	4.596
25% Q1	0	10%	-0.45667
0% Min	-203	5%	-2.4
		1%	-104.333
Range	316.2167		
Q3-Q1	0		
Mode	0		

Extremes

Lowest	Obs	Highest	Obs
-203	(40)	14.48449	(108)
-104.33	(41)	24.03333	(179)
-61	(84)	26.7	(92)
-15.930	(82)	45.91533	(79)
-8.1	(1)	113.2167	(181)

Missing Value	.
Count	34
% Count/Nobs	18.28

Frequencies of Acquiring Firms Performing Positively/Negatively in Post-Acquisition Period (1973-1992).

EQUITY	Frequency	Percent	Cumulative Frequency	Cumulative Percent
+	56	36.4	56	36.4
-	98	63.6	154	100.0

SALES	Frequency	Percent	Cumulative Frequency	Cumulative Percent
+	82	53.2	82	53.2
-	72	46.8	154	100.0

ASSETS	Frequency	Percent	Cumulative Frequency	Cumulative Percent
+	95	61.7	95	61.7
-	59	38.3	154	100.0

GROWTH	Frequency	Percent	Cumulative Frequency	Cumulative Percent
+	129	69.4	129	69.4
-	57	30.6	186	100.0

EARNINGS	Frequency	Percent	Cumulative Frequency	Cumulative Percent
+	29	34.9	29	34.9
-	54	65.1	83	100.0

APPENDIX C

APPENDIX C: SUPPLEMENTARY TABLES AND FIGURES

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APPENDIX C
SUPPLEMENTARY TABLES & FIGURES

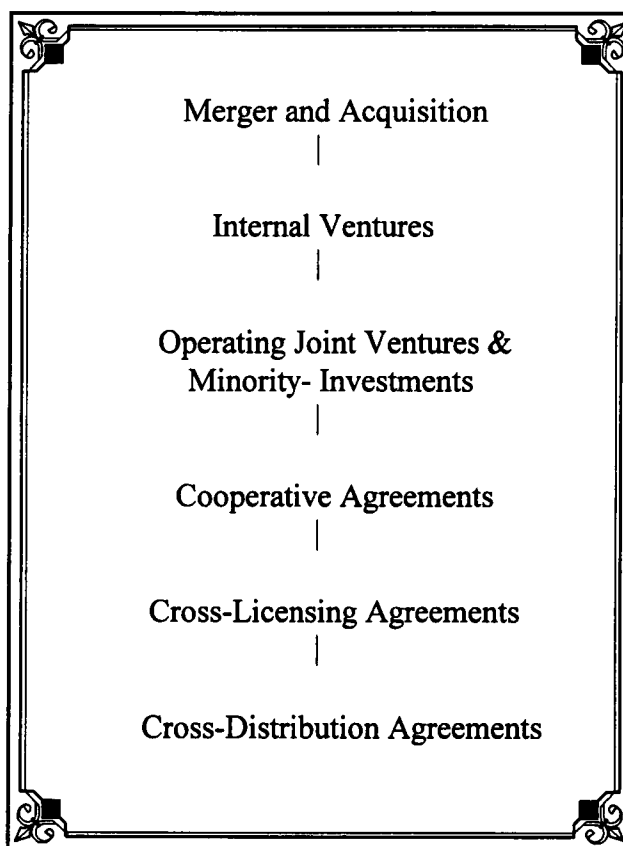


Figure A-1. Strategic Alliance Types

VARIABLES	OPERATIONALIZATION
Market-To-Book Value (M/B)	$(\text{Price at Close} \times \text{Common Shares}) \div \text{Total Common Equity}$
Firm Size	Total Assets
Price-Earnings Ratios (P/E)	$\text{Stock Price per Share} \div \text{Earnings per Share}$
Return-On-Equity (ROE)	$\text{Income} \div (\text{Preferred Stock} + \text{Common Equity})$
Growth	Change in Net Sales given in % per year
Liquidity	$(\text{Cash} + \text{Receivables} - \text{Current Liabilities}) \div \text{Total Assets}$
Leverage	$\text{Long-Term Debt} \div (\text{Preferred Stock} + \text{Common Equity})$
Earnings-Per-Share (EPS)	Earnings Per Share
Cash Flow	$\text{Income} - (\text{Interest Expense} + \text{Taxes} + \text{Preferred Dividends} + \text{Common Dividends}) \div \text{Total Assets}$
Return-On-Sales (ROS)	$\text{Net Sales} \div (\text{Preferred Stock} + \text{Common Equity})$
Return-On-Assets (ROA)	$\text{Total Assets} \div (\text{Preferred Stock} + \text{Common Equity})$

Figure A-2. Operationalization of Variables

Market-To-Book Value Average Prior to M&A:

$$\text{PMB1} = (\text{VAR24} \times \text{VAR25}) / \text{VAR60}$$

$$\text{PMB2} = (\text{VARB24} \times \text{VARB25}) / \text{VARB60}$$

$$\text{PMB3} = (\text{VARBB24} \times \text{VARBB25}) / \text{VARBB60}$$

$$\text{PMBAVG} = \text{mean (of PMB1 PMB2 PMB3)}$$

Market-To-Book Value Average Post M&A:

$$\text{FMB1} = (\text{VARP24} \times \text{VARP25}) / \text{VARP60}$$

$$\text{FMB2} = (\text{VARBP24} \times \text{VARBP25}) / \text{VARBP60}$$

$$\text{FMB3} = (\text{VARBBP24} \times \text{VARBBP25}) / \text{VARBBP60}$$

$$\text{FMBAVG} = \text{mean (of FMB1 FMB2 FMB3)}$$

Average Firm Size Prior to M&A:

$$\text{PFSAVG} = \text{mean (of VAR6 VARB6 VARBB6)}$$

Average Firm Size Post M&A:

$$\text{FFSAVG} = \text{mean (of VARP6 VARBP6 VARBBP6)}$$

Price-Earnings Average Prior to M&A:

$$\text{PPE1} = \text{VAR24} / \text{VAR58}$$

$$\text{PPE2} = \text{VARB24} / \text{VARB58}$$

$$\text{PPE3} = \text{VARBB24} / \text{VARBB58}$$

$$\text{PPEAVG} = \text{mean (of PPE1 PPE2 PPE3)}$$

Price-Earnings Average Post M&A:

$$\text{FPE1} = \text{VARP24} / \text{VARP58}$$

$$\text{FPE2} = \text{VARBP24} / \text{VARBP58}$$

$$\text{FPE3} = \text{VARBBP24} / \text{VARBBP58}$$

$$\text{FPEAVG} = \text{mean (of FPE1 FPE2 FPE3)}$$

Return-On-Equity Average Prior to M&A:

$$\text{PROE1} = \text{VAR18} / (\text{VAR10} + \text{VAR11})$$

$$\text{PROE2} = \text{VARB18} / (\text{VARB10} + \text{VARB11})$$

$$\text{PROE3} = \text{VARBB18} / (\text{VARBB10} + \text{VARBB11})$$

$$\text{PROEAVG} = \text{mean (of PROE1 PROE2 PROE3)}$$

Return-On-Equity Average Post M&A:

$$\text{FROE1} = \text{VARP18} / (\text{VARP10} + \text{VARP11})$$

$$\text{FROE2} = \text{VARBP18} / (\text{VARBP10} + \text{VARBP11})$$

$$\text{FROE3} = \text{VARBBP18} / (\text{VARBBP10} + \text{VARBBP11})$$

$$\text{FROEAVG} = \text{mean (of FROE1 FROE2 FROE3)}$$

Figure A-3. Variables Created For Acquiring Firms, Target Firms and Non-Active Firms

Growth Average Prior to M&A:

$$\text{PGRWTH1} = [(\text{VARB12} - \text{VAR12}) / \text{VARB12}] \times 100$$

$$\text{PGRWTH2} = [(\text{VARBB12} - \text{VARB12}) / \text{VARBB12}] \times 100$$

$$\text{PGRWTHAVG} = \text{mean (of PGRWTH1 PGRWTH2)}$$

Growth Average Post M&A:

$$\text{FGRWTH1} = [(\text{VARBP12} - \text{VARP12}) / \text{VARBP12}] \times 100$$

$$\text{FGRWTH2} = [(\text{VARBBP12} - \text{VARBP12}) / \text{VARBBP12}] \times 100$$

$$\text{FGRWTHAVG} = \text{mean (of FGRWTH1 FGRWTH2)}$$

Average Liquidity Prior to M&A:

$$\text{PLIQD1} = (\text{VAR1} + \text{VAR2} - \text{VAR5}) / \text{VAR6}$$

$$\text{PLIQD2} = (\text{VARB1} + \text{VARB2} - \text{VARB5}) / \text{VARB6}$$

$$\text{PLIQD3} = (\text{VARBB1} + \text{VARBB2} - \text{VARBB5}) / \text{VARBB6}$$

$$\text{PLIQDAVG} = \text{mean (of PLIQD1 PLIQD2 PLIQD3)}$$

Average Liquidity Post M&A:

$$\text{FLIQD1} = (\text{VARP1} + \text{VARP2} - \text{VARP5}) / \text{VARP6}$$

$$\text{FLIQD2} = (\text{VARBP1} + \text{VARBP2} - \text{VARBP5}) / \text{VARBP6}$$

$$\text{FLIQD3} = (\text{VARBBP1} + \text{VARBBP2} - \text{VARBBP5}) / \text{VARBBP6}$$

$$\text{FLIQDAVG} = \text{mean (of FLIQD1 FLIQD2 FLIQD3)}$$

Leverage Average Prior to M&A:

$$\text{PLEV1} = \text{VAR9} / (\text{VAR10} + \text{VAR11})$$

$$\text{PLEV2} = \text{VARB9} / (\text{VARB10} + \text{VARB11})$$

$$\text{PLEV3} = \text{VARBB9} / (\text{VARBB10} + \text{VARBB11})$$

$$\text{PLEVAVG} = \text{mean (of PLEV1 PLEV2 PLEV3)}$$

Leverage Average Post M&A:

$$\text{FLEV1} = \text{VARP9} / (\text{VARP10} + \text{VARP11})$$

$$\text{FLEV2} = \text{VARBP9} / (\text{VARBP10} + \text{VARBP11})$$

$$\text{FLEV3} = \text{VARBBP9} / (\text{VARBBP10} + \text{VARBBP11})$$

$$\text{FLEVAVG} = \text{mean (of FLEV1 FLEV2 FLEV3)}$$

Average Earnings-Per-Share Prior to M&A:

$$\text{PEPSAVG} = \text{mean (of VAR52 VARB52 VARBB52)}$$

Average Earnings-Per-Share Post M&A:

$$\text{FEPSAVG} = \text{mean (of VARP52 VARBP52 VARBBP52)}$$

Figure A-3 (Continued)

Average Cash Flow Prior to M&A:

$$PCF1 = [VAR13 - (VAR15 + VAR16 + VAR19 + VAR21)] / VAR6$$

$$PCF2 = [VARB13 - (VARB15 + VARB16 + VARB19 + VARB21)] / VARB6$$

$$PCF3 = [VARBB13 - (VARBB15 + VARBB16 + VARBB19 + VARBB21)] / VARBB6$$

$$PCFAVG = \text{mean (of PCF1 PCF2 PCF3)}$$

Average Cash Flow Post M&A:

$$FCF1 = [VARP13 - (VARP15 + VARP16 + VARP19 + VARP21)] / VARP6$$

$$FCF2 = [VARBP13 - (VARBP15 + VARBP16 + VARBP19 + VARBP21)] / VARBP6$$

$$FCF3 = [VARBBP13 - (VARBBP15 + VARBBP16 + VARBBP19 + VARBBP21)] / VARBBP6$$

$$FCFAVG = \text{mean (of FCF1 FCF2 FCF3)}$$

Average Return-On-Sales Prior to M&A:

$$PROS1 = VAR12 / (VAR10 + VAR11)$$

$$PROS2 = VARB12 / (VARB10 + VARB11)$$

$$PROS3 = VARBB12 / (VARBB10 + VARBB11)$$

$$PROSAVG = \text{mean (of PROS1 PROS2 PROS3)}$$

Average Return-On-Sales Post M&A:

$$FROS1 = VARP12 / (VARP10 + VARP11)$$

$$FROS2 = VARBP12 / (VARBP10 + VARBP11)$$

$$FROS3 = VARBBP12 / (VARBBP10 + VARBBP11)$$

$$FROSAVG = \text{mean (of FROS1 FROS2 FROS3)}$$

Average Return-On-Assets Prior to M&A:

$$PROA1 = VAR6 / (VAR10 + VAR11)$$

$$PROA2 = VARB6 / (VARB10 + VARB11)$$

$$PROA3 = VARBB6 / (VARBB10 + VARBB11)$$

$$PROAAVG = \text{mean (of PROA1 PROA2 PROA3)}$$

Average Return-On-Assets Post M&A:

$$FROA1 = VARP6 / (VARP10 + VARP11)$$

$$FROA2 = VARBP6 / (VARBP10 + VARBP11)$$

$$FROA3 = VARBBP6 / (VARBBP10 + VARBBP11)$$

$$FROAAVG = \text{mean (of FROA1 FROA2 FROA3)}$$

Figure A-3 (Continued)

FIRM TYPE	SIC CODE	FREQUENCY	PERCENT
Hardware,Garden	5200	5	2.8
Lumber & Building	5211	4	2.2
Department Stores	5311	8	4.5
Variety Stores	5331	10	5.6
Misc. General Merch.	5399	3	1.7
Grocery Stores	5411	15	8.4
Convenience	5412	1	0.6
Auto Dealers, Gas	5500	3	1.7
Auto/Home Supply	5531	2	1.1
Apparel & Access.	5600	12	6.7
Women's Clothing	5621	9	5.0
Family Clothing	5651	6	3.4
Shoe Stores	5661	1	0.6
Home Furn. & Equip	5700	3	1.7
Furniture Stores	5712	4	2.2
Radio/Elec. Stores	5731	3	1.7
Record & Tape	5735	1	0.6
Eating Places	5812	36	20.1
Misc. Retail	5900	10	5.6
Drug Stores	5912	20	11.2
Misc. Shop. Goods	5940	5	2.8
Hobby & Toy	5945	1	0.6
Catalog, Mail-Order	5961	14	7.8
Retail Stores	5990	3	1.7

Figure A-4. Descriptive Statistics for Acquiring Firms

FIRM TYPE	SIC CODE	FREQUENCY	PERCENT
Hardware, Garden	5200	1	0.3
Lumber & Building	5211	14	4.6
Mobile Home	5271	4	1.3
Department Stores	5311	5	1.7
Variety Stores	5331	18	6.0
Misc. General Merch.	5399	7	2.3
Food Stores	5400	1	0.3
Grocery Stores	5411	18	6.0
Convenience Stores	5412	3	1.0
Auto Dealers, Gas	5500	7	2.3
Auto/Home Supply	5531	13	4.3
Apparel and Access.	5600	3	1.0
Women's Clothing	5621	2	0.7
Family Clothing	5651	4	1.3
Shoe Stores	5661	5	1.7
Home Furn. & Equip.	5700	2	0.7
Furniture Stores	5712	6	2.0
Radio/Elec. Stores	5731	8	3.0
Computer & Software	5734	15	5.0
Eating and Drinking	5810	3	1.0
Eating Places	5812	73	24.2
Misc. Retail	5900	17	5.6
Drug Stores	5912	16	5.3
Misc. Shop. Goods	5940	3	1.0

Figure A-5. Descriptive Statistics for Target Firms

FIRM TYPE	SIC CODE	FREQUENCY	PERCENT
Jewelry Stores	5944	2	0.7
Hobby & Toy	5945	7	2.3
Nonstore Retail	5960	5	1.7
Catalog,Mail-Order	5961	24	7.9
Retail Stores	5990	15	5.0

Figure A-5 (Continued)

FIRM TYPE	SIC CODE	FREQUENCY	PERCENT
Hardware, Garden	5200	3	1.6
Lumber & Building	5211	5	2.6
Mobile Home	5271	0	0
Department Stores	5311	6	3.1
Variety Stores	5331	31	16
Misc. General Merch.	5399	4	2.1
Food Stores	5400	0	0
Grocery Stores	5411	31	16
Convenience Stores	5412	0	0
Auto Dealers, Gas	5500	5	2.6
Auto/Home Supply	5531	8	4.1
Apparel and Access.	5600	5	2.6
Women's Clothing	5621	6	3.1
Family Clothing	5651	10	5.2
Shoe Stores	5661	0	0
Home Furn. & Equip.	5700	0	0
Furniture Stores	5712	5	2.6
Radio/Elec. Stores	5731	3	1.6
Computer & Software	5734	1	0.5
Record & Tape	5735	0	0
Eating and Drinking	5810	0	0
Eating Places	5812	26	13.4
Misc. Retail	5900	3	1.6
Drug Stores	5912	15	7.7

Figure A-6. Descriptive Statistics for Non-Active Firms

Misc. Shop. Goods	5940	3	1.6
Jewelry Stores	5944	3	1.6
Hobby & Toy	5945	5	2.6
Nonstore Retail	5960	1	0.5
Catalog,Mail-Order	5961	15	7.7
Retail Stores	5990	0	0.0

Figure A- 6 (Continued)

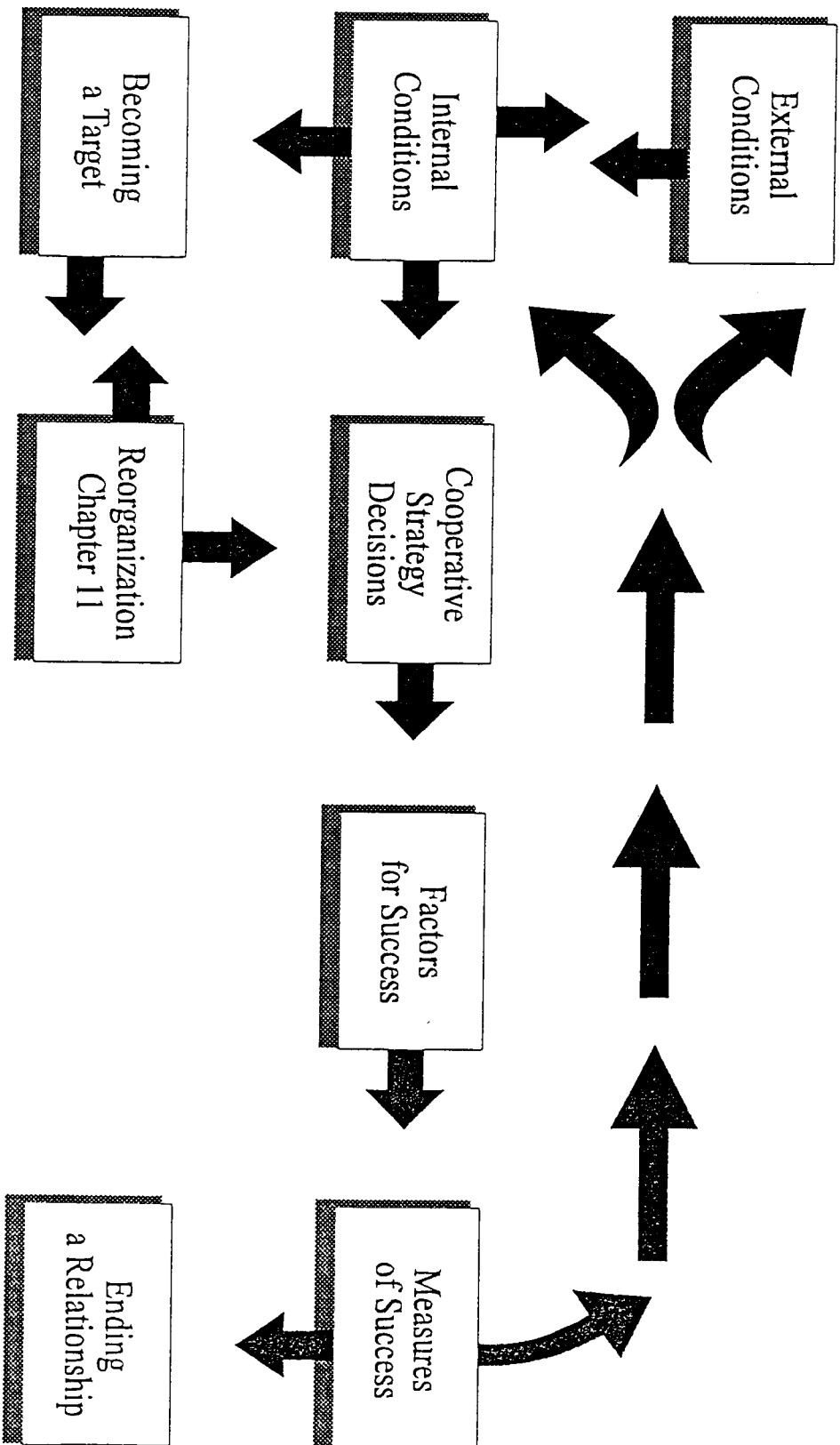


Figure A-7. Conceptual Framework

Table A-1

Stepwise Discriminant Analysis Class Level Information

Source	Frequency	Proportion	Prior Probability
Acquiring Firms	160	36.28%	.33333
Target Firms	148	33.56%	.33333
Non-Active Firms	133	30.16%	.33333

Table A-2

**Variance Inflation Factors for Return-On-Equity Regression
And Return-On-Sales Regression Models**

Variable	Variance Inflation
Intercept	0.0000
Firm Size	1.0481
Market-To-Book	1.4108
Cash Flow	1.734
Leverage	1.0242
Earnings-Per-Share	1.043
Liquidity	1.6443
Growth	1.8974

**** Values greater than 10 are considered to be indicative of colinearity problems**

Table A-3

TABLE OF MEANS FOR INDEPENDENT VARIABLES BY M&A ACTIVITY TYPE

----- ACQUIRING FIRMS -----					
Variable	N	Mean	Std Dev	Minimum	Maximum
PMBAVG	165	2.1709646	3.5476506	-16.1986861	38.4935570
PPEAVG	163	12.1584169	31.6711639	-231.2500000	226.9703815
PEPSAVG	162	3.2606192	18.8829804	0	203.0000000
PLEVAVG	164	0.7426460	2.3743228	-5.0732178	26.8156139
PFSAVG	165	730.8869073	1921.31	4.8753328	14347.67
PCFAVG	164	0.0790598	0.0542500	-0.1452636	0.2108822
PLIQDAVG	164	-0.0841605	0.1686984	-0.3749025	0.7813928
PROEAVG	163	0.1647740	0.2002328	-0.5327592	2.1527690
PROSAVG	163	5.3141723	6.6497273	-54.3164439	40.5272303
PROAAVG	164	2.6220418	3.3753617	-7.7961356	37.7778945
----- TARGET FIRMS -----					
Variable	N	Mean	Std Dev	Minimum	Maximum
PMBAVG	243	1.6842689	26.9229980	-142.2758750	248.2691357
PPEAVG	236	8.1329453	88.0474557	-675.7999400	793.3585835
PEPSAVG	234	2.4190006	11.5117037	-2.2299995	96.3333333
PLEVAVG	243	1.7260698	21.2312171	-107.6806947	306.3159187
PFSAVG	243	138.8311881	378.3666348	0.1350000	3686.80
PCFAVG	242	0.0105598	0.2606055	-2.6390244	0.3429917
PLIQDAVG	243	-0.1096539	0.3294935	-2.4518519	0.9267063
PROEAVG	148	0.0666768	1.6481248	-19.2742755	3.5840757
PROSAVG	243	-1.0577578	142.0583822	-2181.53	264.7845647
PROAAVG	243	3.2597581	36.3915031	-341.3444176	434.4955156
----- NON-ACTIVE FIRMS -----					
Variable	N	Mean	Std Dev	Minimum	Maximum
PMBAVG	141	614.7492321	3913.03	-0.1736581	44992.55
PPEAVG	143	61.6203925	501.0795082	-2.2945855	5609.04
PEPSAVG	145	185.4523962	722.9919996	0.2813333	7728.91
PLEVAVG	140	3.2945482	11.2541599	-0.3812799	126.5702534
PFSAVG	141	159.8996057	603.3869794	-14.7799997	6602.15
PCFAVG	138	-40.3245528	89.6411023	-720.9736504	189.2145739
PLIQDAVG	137	370.2475909	4085.57	-45.6635813	47837.82
PROEAVG	140	5.3298950	10.4915846	-28.9005451	73.7690087
PROSAVG	140	3.0715579	12.7785600	0	149.9790714
PROAAVG	140	5.1609984	14.6798852	-1.4780000	139.7138486

Table A-4

TABLE OF SOURCE BY YEAR

SOURCE	YEAR							
Frequency								
Percent								
Row Pct								
Col Pct	73	74	75	76	77	78	79	Total
-----+-----+-----+-----+-----+-----+-----+-----+								
1	7	5	0	6	6	8	9	179
	1.04	0.74	0.00	0.89	0.89	1.19	1.33	26.52
	3.91	2.79	0.00	3.35	3.35	4.47	5.03	
	25.93	23.81	0.00	23.08	20.00	16.33	39.13	
-----+-----+-----+-----+-----+-----+-----+-----+								
2	20	16	20	20	24	18	14	302
	2.96	2.37	2.96	2.96	3.56	2.67	2.07	44.74
	6.62	5.30	6.62	6.62	7.95	5.96	4.64	
	74.07	76.19	100.00	76.92	80.00	36.73	60.87	
-----+-----+-----+-----+-----+-----+-----+-----+								
3	0	0	0	0	0	23	0	194
	0.00	0.00	0.00	0.00	0.00	3.41	0.00	28.74
	0.00	0.00	0.00	0.00	0.00	11.86	0.00	
	0.00	0.00	0.00	0.00	0.00	46.94	0.00	
-----+-----+-----+-----+-----+-----+-----+-----+								
Total	27	21	20	26	30	49	23	675
	4.00	3.11	2.96	3.85	4.44	7.26	3.41	100.00

NOTE:

Source 1 = Acquiring Firms

Source 2 = Target Firms

Source 3 = Non-Active Firms

Table A-4 (Continued)

TABLE OF SOURCE BY YEAR

SOURCE	YEAR							
Frequency								
Percent								
Row Pct								
Col Pct	80	81	82	83	84	85	86	Total
-----+-----+-----+-----+-----+-----+-----+-----+								
1	4	10	10	10	16	14	10	179
	0.59	1.48	1.48	1.48	2.37	2.07	1.48	26.52
	2.23	5.59	5.59	5.59	8.94	7.82	5.59	
	19.05	31.25	19.61	33.33	44.44	16.67	14.71	
-----+-----+-----+-----+-----+-----+-----+-----+								
2	17	22	14	20	20	28	15	302
	2.52	3.26	2.07	2.96	2.96	4.15	2.22	44.74
	5.63	7.28	4.64	6.62	6.62	9.27	4.97	
	80.95	68.75	27.45	66.67	55.56	33.33	22.06	
-----+-----+-----+-----+-----+-----+-----+-----+								
3	0	0	27	0	0	42	43	194
	0.00	0.00	4.00	0.00	0.00	6.22	6.37	28.74
	0.00	0.00	13.92	0.00	0.00	21.65	22.16	
	0.00	0.00	52.94	0.00	0.00	50.00	63.24	
-----+-----+-----+-----+-----+-----+-----+-----+								
Total	21	32	51	30	36	84	68	675
	3.11	4.74	7.56	4.44	5.33	12.44	10.07	100.00

NOTE:

Source 1 = Acquiring Firms

Source 2 = Target Firms

Source 3 = Non-Active Firms

Table 4 (Continued)

TABLE OF SOURCE BY YEAR

SOURCE	YEAR						
Frequency							
Percent							
Row Pct							
Col Pct	87	88	89	90	91	92	Total
1	11	16	11	10	7	9	179
	1.63	2.37	1.63	1.48	1.04	1.33	26.52
	6.15	8.94	6.15	5.59	3.91	5.03	
	40.74	64.00	14.86	66.67	100.00	100.00	
2	16	9	4	5	0	0	302
	2.37	1.33	0.59	0.74	0.00	0.00	44.74
	5.30	2.98	1.32	1.66	0.00	0.00	
	59.26	36.00	5.41	33.33	0.00	0.00	
3	0	0	59	0	0	0	194
	0.00	0.00	8.74	0.00	0.00	0.00	28.74
	0.00	0.00	30.41	0.00	0.00	0.00	
	0.00	0.00	79.73	0.00	0.00	0.00	
Total	27	25	74	15	7	9	675
	4.00	3.70	10.96	2.22	1.04	1.33	100.00

NOTE:

Source 1 = Acquiring Firms

Source 2 = Target Firms

Source 3 = Non-Active Firms

VITA

Linda M. Cushman was born in Marion, North Carolina on February 11, 1964. She attended schools in Arden, North Carolina and graduated from T. C. Roberson High School in May, 1982. She entered The University of Tennessee at Knoxville in the fall of 1982 to study retailing in the College of Human Ecology. In 1985, Linda left the University of Tennessee and was married to Jack W. Cushman. She re-entered the University of Tennessee at Knoxville and completed here undergraduate degree in the spring of 1990 and began graduate school there in January of 1991. Linda received a Ph.D. in August of 1995 in Human Ecology with a concentration in Consumer Environments.

She is presently an Assistant Professor at Kansas State University in Manhattan, Kansas. Linda teaches and carries out research in the area of Apparel and Textile Marketing.