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**AN INVESTIGATION OF MOTIVATION FOR VOLUNTARILY TERMINATING
OVERFUNDED PENSION PLANS**

City University of New York

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AN INVESTIGATION OF MOTIVATION FOR
VOLUNTARILY TERMINATING OVERFUNDED
PENSION PLANS

by


AHMED EL-SAYED HAMDALLAH

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CHAPTER I
INTRODUCTION

Pension funds have become a major factor influencing the nation's savings and capital formation. A recent survey of the 1981 financial data of the forty largest industrial companies shows that pension costs averaged 6.3 percent of payroll.¹

There are two types of pension plans; defined benefit plans and defined contribution plans. Under a defined benefit plan, the employer sets a definite benefit which will be paid at retirement. The plan sponsor thereafter contributes whatever amounts may be necessary to assure that this benefit will be paid. Under a defined contribution plan, on the other hand, the plan sponsor contributes a fixed amount of money to an employee's account. The employee's benefits at retirement are determined by the amount of contributions increased by any accumulated plan earnings.

In 1974, the congress enacted the Employee Retirement Income Security Act, the pension law which seeks to protect employees who are covered by employer sponsored pension and welfare benefit plans. The provisions of the Act are administered and enforced jointly by the Department of Labor, the Internal Revenue Service (IRS),

and the Pension Benefit Guaranty Corporation (PBGC).

The rules of the Employee Retirement Income Security Act (ERISA) and the Internal Revenue Code require employers to provide minimum funding contributions to their defined benefit pension plans. Also, the Code provides a maximum deduction for contributions. Funding calculations are based on predictions of, among other things, the future investment return of the plan. Thus, the plan must assume an interest rate for future earnings.

A pension plan is considered overfunded if the amount of net assets available for benefits exceeds the actuarial present value of accumulated plan benefits. Plan overfunding may result because the company contributes more funds to the plan than it has to and/or it adopts a successful investment policy for its pension funds. In addition, a plan may appear overfunded if a high interest rate is used for calculating the present value of future retirement benefits. The higher the interest rate, the lower the present value of future retirement benefits, and correspondingly the lower the amount of assets required to cover these benefits.

The provisions of ERISA discourage employers from terminating underfunded retirement plans by imposing liability on the employer for benefits that have not been funded. Under section 4062 of Title IV of ERISA, an

employer who terminates a defined benefit pension plan with insufficient assets is liable to the PBGC for the unfunded benefits.² The liability equals the current value of the plan's guaranteed benefits minus the current value of the plan's assets both computed as of termination date.

When a defined benefit pension plan is terminated, all accrued benefits of plan participants become vested liabilities of the plan. However, after all liabilities to the participants of an overfunded plan have been satisfied any remaining "surplus" assets may be returned to the employer. This return of assets is called "reversion" of excess assets to employers. The provisions of ERISA permit the reversion of excess assets to the employer as long as all liabilities to participants have been satisfied and the plan provides for such a reversion.³

THE PROBLEM STATEMENT

Recently, an increasing number of U.S. corporations have voluntarily terminated their overfunded defined benefit pension plans, set up new plans with only the funds needed to cover their employees, and used the excess funds for general corporate purposes.

The PBGC at the request of the House Select Committee on Aging provided a list of those employers

which received reversion of "excess assets" of at least \$1 million. According to that list (as of 3/27/1984), one hundred sixty six corporations received over \$1.3 billion for the termination of 178 pension plans since 1980. If pending applications and terminations involved in litigation are counted, the potential amount of total reversion would exceed \$1.5 billion. Among terminations and those that are pending or in litigation are some of the largest reversions of excess assets, such as the Occidental Petroleum Corporation's recapture of \$400 million, and the Great Atlantic & Pacific Tea Company's recapture of \$200 million.

The reaction from Congress, pension experts and employees to pension plans termination is negative. The House Select Committee on Aging has expressed its objection to such terminations and indicated that the reversion of plan assets to employers subsequent to plan termination poses a threat to the retirement security of the millions of workers covered by defined benefit pension plans. The committee has accused both the Department of Labor and the IRS of failing to take any enforcement or other administrative action that would discourage the continued plan termination. The House Committee scheduled a hearing on September 28, 1983 to examine the problems associated with plan termination.

The committee's examination of plan termination

indicates that the vast majority were not terminated because of bankruptcy or other financial distress of the plan sponsor. Pension plan terminations appear to be motivated by the desire to use the expected asset reversion for general corporate purposes such as funding acquisitions, retiring long-term debt, fighting off takeovers, increasing liquidity or to boost profits to make a favorable impression on the corporation's financial statements.

Pension experts have different views regarding the issue of "overfunded" plan terminations. For example, when testifying before the House Select Committee on Aging, one witness said ⁴ "when a company terminates a defined benefit pension plan it breaks a promise that it has made to its employees and retirees: a promise that they will have income security in their old age." This witness believes that pension fund assets are the deferred income of the employees. As such, these assets should be considered the property of the beneficiaries of the pension trust and be used for their exclusive benefit. Another witness⁵ objects to certain abuses which have arisen in connection with the reversion of excess assets. In particular, he believes there have been abuses in the following situations:

- (1) where the plan assets are distributed to participants in the form of lump sum cash benefits, rather than lifetime annuities, and the

employer obtains an extremely high interest rate for use in calculating the lump sum benefits which reduce the amounts paid out to participants and in turn increases the reversion to the employer.

- (2) where an employer terminates a pension plan not because it is unable to continue funding the plan or for some other legitimate business reason, but rather solely for the purpose of financing corporate takeover strategies or other business transactions not necessarily in the best interest of the Plan's participants.

On the other hand, another witness⁶ points out that it is legitimate for employers to terminate plans if they fund vested benefits. After all, the employer voluntarily established the pension plan and voluntarily determined the level of benefit. He adds that the employer can easily terminate the pension plan for an individual employee by merely terminating the employee's service. If the employer was conservative in funding the plan, meaning that it put more money in the fund than it had to, and/or it was successful in investing retirement funds, then it should have the right to remove some of the excess funds, especially since the employee is getting what he was promised up to that point. It should be emphasized that the private pension system in this country is entirely voluntary. ERISA does not require any employer to have a plan; nor does it prevent an employer from terminating its plan. In the Department of Labor's view,⁷ the decision to terminate a plan is a business decision, not a fiduciary decision. Consequently, employers should not be prevented

from terminating the overfunded plans they sponsor as long as the benefits earned by participants and beneficiaries are protected.

An examination of recent plan terminations indicates that, in many cases, the termination of a defined benefit pension plan is not in the best interest of plan participants. For instance, in order to satisfy all liabilities to plan participants, employers have selected one of the following:

- (1) Employers have distributed a lump-sum of the present value of their accrued from pension plan at termination. In this case, employees may invest the lump-sum payment themselves. If this investment does not realize a rate of return as high as the interest rate assumption used in calculating the lump-sum, then the employee will receive less than he or she is entitled to receive. This approach seems to have two major problems. First, firms have a high degree of flexibility in changing the interest rates used in determining the lump sum. It may be plausible for a firm to reduce the present value of its pension obligations by as much as 25 percent by just changing its interest rate assumptions from 6 percent to 9 percent. Texaco, American Airlines and RCA Corporation, for example, are among corporations that have raised the interest rate in recent years to the

consternation of retiring employees (Pensions and Investment Age - May 10, 1982). Second, firms have the power to decide, through the plan, whether a specific employee will be permitted to receive a lump sum benefit.

- (2) Employers have replaced defined benefit plans with defined contribution plans. Plan participants often do not receive the benefits they would have received under the old plan. One common form of defined contribution plan is the Employee Stock Ownership Plan. The plan does not guarantee the employee a fixed monthly benefit at retirement. The income the plan participant receives is entirely dependent on the investment performance of his or her account, and the employee bears the risk that the account will grow at a rate sufficient to provide adequate retirement income. Further, benefits under defined contribution plans are not protected by the PBGC's termination insurance program.

In short, when terminating overfunded pension plans, employers have attempted to maximize the amount of excess assets returning to them by using a high interest rate in calculating the present value of employees' accrued benefits. In addition, employees cease to accrue any additional retirement benefits as a result of plan termination, hence they earn less than they expected at

retirement. If the terminated plan is replaced with a defined contribution plan, employees would be at a disadvantage since the new plan does not offer employees a fixed benefit each month after retirement. Accordingly, overfunded pension plan terminations would negatively affect employees' retirement benefits.

THE OBJECTIVES OF THE STUDY

The major objective of the current study is to develop and test motivating factors which can predict or explain the management decision to terminate versus not terminate the firm's overfunded defined benefit pension plans. In addition, this study examines the behavior of stock prices of firms that terminated their overfunded pension plans around the date on which a firm files its notice of intent to terminate with the PBGC.

This study attempts to determine if economic reasoning can be used to determine why firms terminate overfunded pension plans. Identifying the economic motives that influence managers to terminate overfunded plans could be useful in indicating how these incentives could be altered. The results of this study could also aid policy-makers in predicting which corporations are most likely to voluntarily terminate their overfunded pension plans.

In addition, this research may be important to some

agencies such as the Congress and both the Department of Labor and the IRS that are concerned with plan termination. These agencies have expressed their concern about the effects of terminating pension plans on employees security. Identifying employers' motivations to terminate overfunded pension plans may aid these agencies in proposing changes to ERISA to govern future plan termination.

ORGANIZATION OF THE DISSERTATION

In the next chapter defined benefit pension plans prior to and after ERISA are described. Also, the administrative and accounting issues related to the termination of defined benefit pension plans are discussed. In addition the chapter includes a review of related research.

Chapter III analyzes management's motivations to terminate the firm's overfunded plans and describes the research design. Chapter IV presents the empirical results and their interpretation.

Chapter V examines the stock market reaction to the termination of overfunded plans. Chapter VI presents the research summary and conclusions and suggestions for future research.

CHAPTER I

FOOTNOTES

1. This survey is conducted annually by BEA Associates, Inc, (Regan, 1982).
2. For any plan termination, the plan administrator must first file a notice of intent to terminate with the PBGC at least 10 days before the proposed date of termination. The actual termination starts when the PBGC issues a notice of sufficiency. Upon receiving this notice, the plan administrator must distribute plan assets to participants and beneficiaries within 90 days of the date of the notice.
3. Section 4044(d) of ERSIA states that any residual assets of a plan may be distributed to the employer if:
 - (a) all liabilities of the plan to participants and their beneficiaries have been satisfied,
 - (b) the distribution does not contravene any provision of law, and
 - (c) the plan provides for such a distribution in these circumstances.
4. Thomas Woodruff, a former executive director of the President's Commission on Pension Policy.
5. Howard Young, a Special Consultant to the President and Director, Social Security Department, UAW.
6. Testimony of Arthur Williams, Vice-President Pension Fund Investment - Merrill, Lynch, Penner and Smith, Inc., before the House Select Committee on Aging.
7. Testimony of Jeffrey Clayton, former administrator of the Pension and Welfare Benefit Programs, before the Select Committee on Aging.

CHAPTER II
DEFINED BENEFIT PENSION PLANS:
ADMINISTRATIVE AND ACCOUNTING ISSUES
AND RELATED RESEARCH

DEFINED BENEFIT PENSION PLANS BEFORE AND AFTER ERISA

Pension experts agree that defined benefit pension plans are more complicated to analyze than defined contribution pension plans. At any given time, the present value of a pension in a defined contribution plan is simply the amount of money currently in the plan. Pension costs in any year are simply the amounts of contribution for that year. The valuation of defined benefit pension obligations, on the other hand, is a more controversial issue.

Although defined benefit plans are complicated, a large number of firms use these plans. Prior to ERISA there were at least four reasons that justified the use of such plans. First, defined benefit plans were used to shelter income from the corporate tax. A defined contribution plan is always fully funded, i.e., never overfunded or underfunded. Thus, if there is a tax advantage to overfunding a pension plans, the advantage could only be acquired through having a defined benefit

plan. In the "debt capacity" model (Miller, 1977), the tax advantage to overfunding the pension plan comes from holding bonds in the pension fund that earn interest at the pre-tax corporate rate.

In addition, Bulow et al (1982) argue that, with expectation of a falling corporate tax rate, there is an incentive for corporations paying taxes to overfund the plan. These authors add that, prior to ERISA, it was relatively easy to move money into and out of a pension plan because there were no minimum funding standards.

Second, there may be some information conveyed by the form of the pension plan. For instance, employees might receive early retirement benefits in lieu of severance pay. With a defined benefit plan, the firm accumulates severance pay in a tax free account, and formalizes the arrangement with employees. Employees, leaving the firms early, know what severance pay they will receive, and they know that they will earn it whether they decide to leave the firm or are fired by the firm.

Third, Bulow et al (1982) point out that the defined benefit plan provides an easy way to skew pension compensation towards older employees while still appearing to be somewhat evenhanded in the treatment of all employees. It appears that older employees, by this approach, tend to save more for retirement than younger employees. In a defined contribution plan, however, it is

difficult to skew benefits.

Finally, because a defined benefit pension plan provides a definite benefit at retirement, employee groups tend to exercise pressure on corporations to establish such a plan.

With ERISA, the legal claims of firms and beneficiaries of a defined benefit plan changed. Most important was the introduction of a form of plan termination "insurance" program that guaranteed the employees' vested benefits (Bulow et al., 1982, p. 14). With this insurance program beneficiaries of underfunded plans gained at the expense of the PBGC. If the interest rates had not risen and, thereby, reducing the present value of these claims the PBGC would have faced many more terminations than actually did occur since ERISA.

In addition, ERISA tightened the standards that apply to a fiduciary managing pension fund. The new rules restrict the movement of assets to the corporation from the pension plan. Thus, it became more costly to overfund the plan and to pull back the funds as needed.

ADMINISTRATIVE ISSUES RELATED TO THE TERMINATION OF DEFINED BENEFIT PENSION PLANS

ERISA was passed in 1974 to cure a number of plan abuses which threatened retirement benefits. It was designed to insure that defined benefit plans could be

adequately funded as well as to establish fiduciary duties to govern the use of pension plan assets.

According to ERISA, if the amount of assets of a terminated plan exceeds the amounts required to fund all benefits, excess assets may revert to the employer so long as all liabilities to participants have been satisfied and the plan provides for such a reversion.¹ A provision permitting reversion of excess assets to the employer should be present in the plan from its inception.

As to when a plan may provide for such a distribution, the PBGC has taken a position that a plan that provides that assets shall not revert to the employer cannot at any time be amended to include an otherwise acceptable provision for reversion of the excess amounts to the employer.

The first step in the actual termination involves amending the plan to terminate it. This amendment should explicitly provide that all benefits to participants are vested.² The administrator of a terminated plan must file a notice of intent to terminate with the PBGC at least ten days before the proposed date of termination. Also, the administrator must notify all covered employees that the notice of intent to terminate has been filed.

The PBGC, after reviewing plan documents, issues a notice of sufficiency. Upon receiving such a notice, the plan administrator must distribute plan assets to participants within 90 days of the date of the notice.

Furthermore, the plan administrator must notify the IRS of a plan termination on the appropriate line in the annual return report (Form 5500 Series) for the plan year in which the termination occurred. Finally, a final annual report must be filed for the year in which a complete distribution of plan assets is made. This report is filed not later than seven months after the date as of which all plan assets are distributed to participants and beneficiaries.³

ACCOUNTING ISSUES RELATED TO TERMINATION OF DEFINED BENEFIT PENSION PLANS

Generally accepted accounting principles for accounting for pensions by employers are prescribed in Accounting Principles Board (APB) Opinion No. 8, Accounting for Cost of Pension Plans, issued in 1966. That Opinion deals primarily with accounting for plans that are not expected to terminate. Paragraph 16 of Opinion 8 states: ". . . the Board believes that, in the absence of convincing evidence that the company will reduce or discontinue the benefits called for in a pension plan, the cost of the plan should be accounted for on the assumption that the company will continue to provide such benefits."

In April 1983, the Financial Accounting Standards Board (FASB) issued the second Discussion Memorandum (DM)

of its project on employers' accounting for pensions and other postemployment benefits. This DM addresses, among other things, the issue of how an employer should account for the event of termination of a defined benefit pension plan. The DM discusses plan terminations in situations in which the employer is expected to continue to exist. However, the DM indicates that if a plan is being terminated because the employer is going out of business, then immediate recognition of gains or losses is unavoidable.

The DM points out that the AICPA's Accounting Standards Executive Committee at a meeting in September 1982, discussed recognition of a gain when a pension plan is terminated and excess assets are returned to the sponsor. That committee found that predominant present practice is to recognize such a gain only if the replacement plan is clearly a defined contribution arrangement or if there is no replacement.

Accounting for termination of a defined pension plan is addressed by FASB Interpretation No. 3, Accounting for the Cost of Pension Plans Subject to the Employee Retirement Income Security Act of 1974, as follows:

When there is convincing evidence that a pension plan will be terminated, evidence perhaps by a formal commitment by management to terminate the plan, and the liability on termination will exceed fund assets and related prior accruals, the excess liability shall be accrued. If the amount of the excess liability cannot be reasonably determined, disclosure of the

circumstances shall be made in the notes to the financial statements, including an estimate of the possible range of the liability. [Paragraph 5.]

Recently, the Securities and Exchange Commission (SEC) issued Staff Accounting Bulletin (SAB) No. 52 which outlines the staff's views concerning accounting for terminations of overfunded defined benefit pension plans. The staff believes that recognition of gain is appropriate on termination of a company's overfunded pension plan if the following conditions are met:

- All obligations under the terminated plan are fully funded, and
- The substituted employee benefit arrangements are not linked to the prior plan.

However, the staff points out that when benefit provisions under the new plan are based on such factors as past employee service or guaranteed minimum benefits, gain should not be recognized because the substituted plan would be considered as a continuation of the terminated plan.

The staff adds that termination of a pension plan meets the criteria for classification as an extraordinary item under APB Opinion No. 30, and thus, the gain should be reported in that manner in the corporation's income statement. The staff believes that termination of pension plans is of an unusual nature and not expected to recur as a consequence of customary and continuing business

activities.

Currently, companies are required to disclose, among other things, information about the present value of accumulated pension benefits and net assets available for benefits on the notes to their financial statement (FASB Statement No. 36). Hence, overfunded plans can be identified and the amount of overfunding can be determined (the excess of plan assets over accumulated benefits). If an overfunded plan is voluntarily terminated, the plan administrator will use the proceeds from liquidating plan assets to satisfy all obligations to plan participants and any surplus will revert to the employer.

In practice, the accounting treatment of the resulting surplus involves increasing both cash and/or identifiable assets and "gain on termination of pension plans." The gain is included in the "other income" item which is shown on the company's statement of earnings.

Finally, it should be noted that a pension fund has special tax status. Specifically, earnings in the fund are not taxed and the employers' contributions to the pension fund (subject to maximum limitations) are deductible immediately. This tax structure provides a powerful economic incentive for a company to fund its pension plans. The benefits of setting up a funding scheme will be larger the higher the marginal tax bracket the company is in and the less chance there is of plan

termination with default of some pension benefits. In addition, the tax structure may provide an incentive for a company to increase the level of its contribution to the plan when the company's income is high and to terminate the overfunded plans when the company has a tax loss carryforward.

RELATED RESEARCH

A. Research Related to the Corporate Pension Area

Most of the research in the corporate pension area has concentrated on two related issues: the effect of unfunded pension obligations on stock prices and the effect of taxation on corporate pension policy.

Research on the effect of unfunded pension obligations on stock prices has provided evidence that stock prices are adversely affected by a company's unfunded pension obligations. For example, Oldfield (1977) runs a cross-sectional regression of the Modigliani-Miller stock valuation model with unfunded vested benefits (as a measure of a firm's unfunded pension liability) as an additional variable. He finds that the coefficient of unfunded vested benefit is close to -1.5 and is significantly different from zero. This implies that the unfunded pension obligations for vested benefits somewhat understates the firm's true unfunded pension obligations. Gersovitz (1980) follows Oldfield's (1977)

estimation procedure but allows for a separate estimation of the coefficient of unfunded vested benefits in excess of the PBGC guaranty. He finds that a firm's stock prices are unaffected by the portion of unfunded vested benefits above 30 percent of the firm's net worth.⁴

Feldstein and Seligman (1981) examine the effect of unfunded pension obligations on corporate share prices using information on inflation-adjusted income and assets. They provide evidence consistent with the conclusion that share prices fully reflect the value of unfunded pension obligations.

Bulow (1982) indicates that theoretically, if the "ongoing plan" implicit contract holds, then the market value of a firm should be negatively correlated with all unfunded vested benefits. On the other hand, without the "ongoing plan" assumption, a firm's market value should be correlated only with the maximum liability the firm would incur in terminating the plan.⁵

With respect to corporate pension fund policy, Sharpe (1976) shows that funding and investment policy will have no effect on the value of the total compensation of employees (current wages and pensions) as long as the employees are rational, the capital market is perfect, and individuals and corporations have equal access to the capital market. In this world, Sharpe argues that the corporation will have to pay the price of providing

risk-free pension promises. However, if the funding and investment strategy is risky, employees or the PBGC will demand that the corporation acquire insurance to protect their claims or pay them excess current wages so that they can acquire it themselves. Black (1976) shows that when the level of the compensation package is fixed, the level of funding and the investment policy should not affect shareholder value.

Tepper and Affleck (1974) utilize the Modigliani-Miller model with corporate taxes. They conclude that, given the tax status of a corporate pension plan (employer contributions are deductible and earnings in the fund are not taxed), a firm could enhance shareholder value by borrowing to fund the pension plan. In addition, Tepper (1981) suggests that pension plans should be fully funded and invested totally in bonds as opposed to equities. This suggestion follows from the fact that the return on debt held in a firm pension fund is passed through the firm to the stockholder and is taxed at the lower personal tax rate on equities; the stockholder will pay less taxes than if the debt were held in his personal portfolio.

In their study of corporate financial structure and the funding of private pension plans, Arnott and Gersovitz (1981) argue that employers can affect the riskiness of workers' pension claims by changing the debt/equity ratio

of the firm, because bonds, in the event of bankruptcy or voluntary termination, usually rank senior to unfunded pension obligations.

Bulow and Scholes (1982) address the question "who owns the assets in a defined benefit pension plan." They point out that, in the augmented balance sheet model of pension finance, the shareholders own the assets in the pension plan. In the group model,⁶ however, the employees and the shareholders share ownership of these assets. Bulow and Scholes also indicate that the shareholders have an equity position in the pension fund at least equal to the market value of the assets in the pension fund minus the present value of the obligations of the funds. They add that, if the right to put the obligations to the PBGC, the "pension put," has value, the shareholders have a more valuable claim. On the other hand, if the "pension put" has no value, i.e., a well-funded plan, then the shareholders are the sole gainers (losers) from increases (decreases) in the market value of the pension fund. The shareholders, not the employees, are concerned with the "wasting" of excess assets in a well-funded pension plan.

Recent events, however, imply that this separation of the claims on the plan assets is not applied in all cases. For example, in the case of the termination of A&P's pension plan, although no contract specified a division of the surplus, the surplus in the pension fund

was split into two parts, one part to the firm and the other part to the employees through increased benefits.

B. Research Related to Management's Choices

The current study examines choices available for management with respect to the termination of overfunded pension plans and suggests possible economic factors which motivate management to terminate versus continue the pension plan. Research related to management's choices is therefore reviewed in this section.

Recently, a large body of research has dealt with management's motivation for choosing or lobbying for one accounting technique versus another. This research has either extended or tested the positive accounting theory developed by Watts and Zimmerman (1978).

This positive theory suggests that the accounting techniques adopted by a firm are systematically related to certain characteristics of the firm and/or its industry. Watts and Zimmermsn (1978) propose that management's preferences with regard to accounting alternatives depend on the relative income effects of the accounting alternatives and the size of the firm. Specifically, they hypothesize that larger firms will tend to adopt accounting techniques which will reduce (or delay) the reported income. The work of Watts and Zimmerman (1978), Hagerman and Zmijewski (1979), Dhaliwal (1980), Zmijewski

and Hagerman (1981), Bowen, Lacey and Noreen (1981), and Lilien and Pastena (1982) all provide evidence consistent with the hypothesized relationship between firm size and the income effect of the accounting techniques of the firm.

Watts (1977), based on Jensen and Meckling's (1976) analyses, suggests that debt covenants might affect the choice of accounting policies. Following Watts (1977), Collins, Rozeff and Dhaliwal (1981), Dhaliwal (1980), Holthausen (1981), Leftwich (1981), Bowen et al (1981) and Lilien and Pastena (1982) argue that the higher the debt/equity ratio of the firm, the more binding are the debt covenants of the firm. In attempting to better remain with the restrictions imposed by these covenants, the firm chooses accounting policies that increase reported earnings. Hence, they hypothesize that firms with high debt/equity ratios will tend to choose accounting methods which increase reported earnings and, with the exception of Holthausen (1981), they provide evidence consistent with this hypothesis.

CHAPTER II

FOOTNOTES

1. Section 4044 (d) of ERSIA.
2. Title IV of ERISA.
3. For a complete discussion see Neerken (1982).
4. A firm's liability to PBGC in case of termination of underfunded pension plans is limited to 30 percent of its net worth.
5. According to the "ongoing plan" implicit contract, firms agree to make future compensation payments in excess of whatever would have been paid had the firm used either no pension plan or a defined contribution plan, plus any legal liabilities that have been accrued to date (Bulow, 1982).
6. Bulow and Scholes (1982) define the group model as that in which employees are considered as a member of a group.

CHAPTER III

AN ANALYSIS OF MANAGEMENT'S MOTIVATION FOR TERMINATING OVERFUNDED PENSION PLANS

To date, research in accounting has neither determined the characteristics of firms that voluntarily terminate their overfunded pension plans, nor explained management's motivations to voluntarily terminate such plans. The current research attempts to develop and test empirically possible factors which motivate managements to terminate their firm's overfunded pension plans. In order to identify the determinants of management's motivations, it is important to examine the agency relationships between managers, shareholders and bondholders as well as the choices available to management with regard to the termination of overfunded pension plans and their effects on accounting numbers. These issues are discussed below.

MANAGER-STOCKHOLDER-BONDHOLDER CONTRACTING AND THE CHOICE TO TERMINATE OVERFUNDED PENSION PLANS

Recent research in economics and finance has described the firm as a set of contracts among individuals, which are factors of team production. These factors are motivated to maximize their own wealth which is partly determined by the performance of the entire team

or firm [Jensen and Meckling (1976) and Fama (1980)]. Jensen and Meckling's (1976) agency theory suggests that there are at least two agency relationships among individuals constituting a firm. The first is the relationship between stockholders (the principals) and the managers (the agent) and the second relationship is between the bondholders (the principals) and the manager (the agent). Because the compensation of individuals involved in these relationships is determined differently, conflicts of interests arise. To reduce these conflicts, certain contractual agreements have been utilized. The potential conflicts between stockholders, bondholders and managers are discussed below.

(a) The Stockholder-Manager Conflict of Interests

As Chow (1982) points out, one characteristic of modern firms is the separation of ownership and management. Because a manager owns only a small portion of his firm's shares, he has incentives to allocate the firm's resources in ways that are not necessarily consistent with the non-managing equity owners. The smaller the portion of shares owned by the manager, the greater are the manager's incentives to affect such wealth transfers from shareholders to him. Jensen and Meckling (1976) point out that as the manager's percentage ownership of a firm's residual claims decreases, increases

in the value of those claims have less of an impact on the manager's wealth. Thus, the manager has less incentive to maximize the value of the residual claims.

Jensen and Meckling (1976) and Fama (1980) indicate that, in a competitive market, shareholders anticipate the manager's wealth transfer activities and are able to allow for this expected loss in setting executive compensation. The manager, as a result, bears the expected cost of wealth transfer from shareholders. If a manager could guarantee to shareholders that he is to restrict his departure from maximizing their wealth, he would receive an increase in pay equal to shareholders' reduction in expected losses. The expected cost of negotiating and executing such contracts, however, is borne by the manager.

To assure the shareholders that their interests will be protected (i.e., to mitigate the shareholder-manager conflict of interests), the manager could agree to contracts with the shareholders that give him the incentive to maximize the present value of the common equity. These contracts include executive compensation packages, often based on accounting numbers and contractual limitations on the manager's power to allocate firm resources. Bonuses in compensation plans that are based on accounting earnings often are constrained to a maximum amount determined as a percentage of dividends

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paid to stockholders, a fixed dollar amount, or salaries paid to eligible managers.

(b) Shareholder-Bondholder Conflict of Interests

Fama and Miller (1972), Black and Scholes (1973), Jensen and Meckling (1976), and Myers (1977), among others, have investigated the potential conflict between shareholders and bondholders. These authors point out that when a firm's capital structure includes risky debt, shareholders have incentives to undertake financing-investing-production activities which benefit themselves at the expense of the bondholders. The wealth-transfer mechanisms between shareholders and bondholders include paying out the saved outlays as dividends, changing the variance of return of the firm and diluting coverage on the existing debt by issuing new debt with the same or a higher priority than the existing debt.

The shareholder-bondholder conflict of interests may be a zero-sum or a negative-sum game. If the conflict of interests is a zero-sum game, i.e., the gain that the stockholders receive from a wealth transfer is equal to the bondholder's loss from that wealth transfer, then shareholders are indifferent between obtaining the wealth transfer, or costlessly, guaranteeing to the bondholders that the transfers will not be attempted, thus, getting a higher price when the bonds are issued (Chow, 1982). On

the other hand, if the conflict is a negative-sum game, i.e., the bondholders loss from a wealth transfer is larger than the stockholders' gain, then the shareholders are not indifferent to the form of the contract which limits the decisions the firm may take since the bondholders charge for those expected losses in setting the price of the bonds. In this case, the shareholders' wealth is affected by the contractual arrangement and they will seek to reduce those costs associated with the conflict of interests.

Debt covenants also play an important role in limiting the shareholder-bondholder conflict of interests. Debt covenants impose restrictions on the borrowing firms' investment and financing decisions. For example, the firm is not permitted to issue new debt, pay dividends, or engage in new financing if working capital is below certain amounts stated in the covenant and/or leverage is above certain specified amounts (Smith and Warner, 1979). In case of violating the required working capital and leverage constraints, the firm is in "technical default" which gives the bondholders the right to accelerate the maturity of the debt or renegotiate the contract.

In this study, management voluntarily terminates overfunded pension benefit plans and recaptures the resulting surplus or excess assets. Such a termination decreases financial leverage because it increases net

tangible assets as well as stockholders' equity. Consequently, the firm's ability to issue additional debt, merge or pay dividends will be affected.

MANAGEMENT'S ACCOUNTING CHOICES

Recently research has provided empirical evidence that managements have incentives to maximize management compensation, minimize political costs and relax the binding effects of restrictive debt covenants. Watts and Zimmerman (1978), Bowen, Noreen and Lacey (1981), and Lilien and Pastena (1982) have pointed out that firms which are subject to political pressure through additional taxation or regulation will lobby for or adopt accounting policies which will minimize net income. Dhaliwal (1980), Holthausen (1981), Leftwich (1981) and Lilien and Pastena (1982) have indicated that firms are motivated to adopt policies that will maximize net income and asset balances if their leverage positions approach its maximum specified in the debt covenant.

This research examines the effect of the treatment of overfunded pension plans upon the preceding types of consideration. For purposes of this study, management's choices are determined in terms of their effect on income and asset balances.

An overfunded pension plan is a plan in which the amount of net assets available for plan benefits exceeds

the present value of accumulated plan benefits. If a pension plan is overfunded, management may choose to terminate it. Because plan benefits have to be provided on a continuous basis as specified in ERISA, management sets up new plans with only the funds needed to cover the present value of plan benefits and uses the excess funds for general corporate purposes. Excess assets resulting from plan termination are recognized as a gain and treated as an extraordinary item in the corporation's income statement (this treatment is recommended by the SEC's Staff Accounting Bulletin No. 52). Thus, termination of an overfunded pension plan may result in a gain which increases income, and assets and shareholder's equity.

Another choice available to management is not to terminate a company's overfunded pension plan. Rather than termination, companies may continue the plan and take advantage of overfunding by reducing contributions in subsequent years, providing additional benefits, such as death or health benefits, or merging significantly overfunded plans with less well-funded plans.

In summary, the current research frames the choices available to managements of firms with overfunded pension plans as terminating these plans or not terminating them.

DETERMINANTS OF MANAGEMENT'S CHOICES

This section discusses possible motivating factors

which can be used to predict or explain the management decision to terminate versus continue the firm's overfunded pension plans.

1. Management Compensation Plans

Management compensation plans often allow managers to share profits in excess of certain level. This level is typically stated in terms of reported earnings.

Terminating overfunded pension plans which result in the company's reversion of excess assets would increase income and shareholders equity. Thus, managers with compensation plans defined in terms of reported income are motivated to terminate such plans in order to increase their wealth. hence, the research hypothesis is:

H₁: The existence of management compensation plans defined in terms of reported income will be positively correlated with the terminating choice.

2. Leverage

Corporate lending contracts impose restrictions, expressed in terms of accounting numbers, on the activities of the borrowing companies. For instance lending contracts rely on accounting numbers to restrict the borrower's ability to issue additional debt, merge and pay dividends. Smith and Warner (1979) argue that the purpose of the constraints is to limit the ability of shareholders to expropriate the wealth of the bondholders.

Because restrictive covenants can lead to a

technical default, managers have incentives to reduce the probability of default on the loan covenants [Smith and Warner (1979), Holthausen (1981), and Leftwich (1981)].

Empirical evidence suggests that firms with higher debt/equity ratios are more likely to adopt accounting techniques which increase the present value of reported income [Dhaliwal (1980), Bowen et al. (1981), Zmijewski and Hagerman (1981) and Lilien and Pastena (1982)].

Based on the above arguments, the researcher proposes that highly leveraged firms are motivated to terminate their overfunded pension plans to receive reversion of excess assets which will increase income and shareholders equity and, in turn, ease covenant's constraints. Thus, the hypothesis is:

H₂: Leverage is positively correlated with the terminating choice.

3. Political costs

A company's reported income numbers can determine the political actions taken for or against the company. For example, due to the increased profitability of oil and gas companies in the 1970's, these companies were subject to reduced oil depletion deductions, the excess profit tax, regulation by the Department of Energy and certain regulations by Congress (Lilien and Pastena, 1982). When companies in a certain industry recognize unusually high profits, many constituencies will have incentives to lobby

for wealth transfers from those companies. such lobbying can take a form of political and regulatory action (e.g., taxation, rate regulation, or divestiture). If firms face potential political costs, they have incentives to choose or to lobby for those accounting techniques which reduce the present value of reported income.

Most studies use size as a surrogate for political costs and assume that the larger the firm size the larger the political costs. The results of empirical research suggests that large firms sometimes act to reduce reported earnings [Watts and Zimmerman (1978), Bowen et al. (1981), and Lilien and Pastena (1982)]. Moreover, large firms often become a target of concern or criticism by both the regulatory bodies and the general public because of their importance in the economy. Therefore, it is hypothesized that large firms are less likely to terminate their overfunded pension plans than small firms.

H₃: Firm size and termination of overfunded plans are negatively correlated.

4. Pension Plans Cover Union Versus Non-Union Employees

Modern firms are expected to be concerned about developing good relations, including offering a satisfactory pension system with their employees, especially those employees who are covered by union plans. These firms will avoid any action to antagonize the union or possibly violate the terms of union contracts.

An attempt by a firm to terminate overfunded pension plans which cover union employees may risk organized union resistance possibly resulting in strikes or other disruptions. Thus, the hypothesis is:

- H₄: Firms are less likely to terminate overfunded plans which cover union employees.

5. Liquidity

Liquidity measures have had a long history as explanatory variables in many studies. The concept stems from the relevance of the availability of funds to different kinds of discretionary spending. Adequate liquidity gives the company the flexibility not only to meet its dividend and working capital requirements, but also to take advantage of acquisitions or other investments which may enhance the company's future. Dukes, Dyckman and Elliot (1980), for example, examine the association of liquidity position and research and development activity.

It is expected that companies which face liquidity problems will have incentives to terminate their overfunded pension plans and receive reversion of excess assets. Such reversion would increase net income and improve liquidity position as well, hence the company would be able to meet its current operations as well as dividend requirements. Thus, the hypothesis is stated as follows:

H₅: Firms which face liquidity problems are more likely to select the terminating choice.

6. The Firm's Ownership Control Style

Managerial economics literature provides theory and evidence that the set of accounting techniques adopted by the firm is related to the type of its ownership control. For instance, Williamson (1964) and Mosen and Downs (1965) indicate that the managers of management-controlled firms have considerable discretion in guiding the affairs of their firms and that this discretion is usually used to divert some resources from the shareholders. Hindley (1970) points out that the managers of management-controlled firms control the information released regarding firm operations and hence they attempt to present the results of firm performance in a most favorable way.

Hindley argues that the attempt to control information by the managers of management-controlled firms is intended to keep the firm's shareholders satisfied and unwilling to support any takeover attempt by outside groups. Based on these arguments Dhaliwal, Salamon and Smith (1982) predict that the managers of management-controlled firms are likely to choose accounting principles which result in higher or early reported income and higher reported equity. These authors study whether owner-controlled and manager-controlled firms use

different depreciation methods for reporting purposes.¹ The results of their study support their prediction that manager-controlled firms are more likely to use straight-line depreciation as opposed to accelerated depreciation.

Based on the above arguments, the researcher proposes that highly manager-controlled firms are more likely to terminate the firms' overfunded pension plans in order to capture the resulting excess assets which increase net income and shareholder's equity. In addition, managers of management-controlled firms may choose to terminate overfunded pension plans in order to use the resulting excess assets to buy some of the company's stock and contribute it to an employee stock ownership plan, and consequently, prevent loss of management control. Thus, the hypothesis is:

H₆: The higher the percentage of managers' ownership in the firm, the more likely the firm is to terminate its overfunded pension plans.

7. Tax Loss Carryforwards

The tax code allows firms to carry forward tax benefits associated with losses if those losses exceed the amount of taxable income reported in previous years. Managements of firms with large amounts of loss carryforwards have increased incentives to voluntarily terminate the firms' overfunded pension plans because the

gain from termination will be tax-free. The excess assets received by the firm as a result of termination will be used to offset the loss carryforwards and, therefore, reduce or eliminate the amount of taxes to be paid in the year of termination. For instance, The Wall Street Journal (November 3, 1983) reported that GAF Corp. received a total of \$57 million in residual assets as a result of terminating its salaried employees retirement plan. This article added that GAF Corp. said: "The \$57 million is expected to have minimal tax consequences because of the availability of tax-loss carry-forwards." In other words, through utilization of the company's tax-loss carryforwards, the reversion of excess assets to the company will be effectively tax-free. Thus, the researcher hypothesizes the following:

H₇: Firms with tax-loss carryforwards are more likely to terminate their overfunded pension plans.

RESEARCH DESIGN

1. Sample Selection and Data Collection

The sample consists of firms which receive reversion of excess assets as a result of terminating their overfunded pension plans. The PBGC at the request of the House Select Committee on Aging provided a list of 166 firms which terminated their overfunded plans and received reversion of more than \$1 million during the period 1980-1983. This list was used as a basis for the sample

selection.

The following firms were eliminated from the above list:

- (1) Firms in the finance industry.
- (2) Firms which did not have financial data available on the annual reports or the 10-K's filed with the SEC because they were subsidiaries, division of or acquired by other firms.
- (3) Firms which were not required to file financial information with the SEC.

The final sample consisted of 40 firms that terminated their overfunded plans and received reversion of excess assets and for which the financial data was available in the annual reports of the 10-K's filed with the SEC.

A comparison group was selected from firms that did not terminate overfunded pension plans. The sample was obtained from the Financial Accounting Statement No. 36 data tape available at Columbia University. This tape includes among other things, information about accumulated (vested and non-vested) plan benefits, the amount of net assets available for benefits, and interest rates used to determine the present value of accumulated benefits.

It should be noted that if the industry variable is not controlled for, an independent variable may appear to differ between firms that terminate and firms that

continue overfunded plans simply because the independent variable differs across industry. In other words, an independent variable may have nothing to do with the decision to terminate overfunded plans and yet it may appear to be a significant explanatory variable simply because its value differs across industries.

Accordingly, the study adopted a matched-pairs design in which each firm that terminated its overfunded plans is matched with a firm that continued its overfunded plans in the same four-digit industry code. The amount of plan overfunding deflated by net assets available for benefits was also used as a matching criterion in addition to the industry codes in order to take into account differences in the amount of overfunding between the two groups of firms (Appendix A provides a list of firms in the sample).

A second comparison group which did not provide for industry matching was also used (Appendix B presents a list of firms in this sample).

The financial data collected for this study were the beginning balances of the fiscal year in which the termination occurred.

The annual report and the 10-K for each firm in the sample were used to compute the following variables:

LEV = Leverage, measured by the ratio of long term debt to total assets. Long term debt excludes

obligations under capital leases and deferred credits.

SIZE = Log of net sales.

LIQ = Liquidity, measured by the ratio of current assets to current liabilities.

TAX = Tax loss carryforwards (1 if a firm has a tax loss carryforward and 0 otherwise).

Also, proxy statements were examined to determine which firm had management compensation plans (MCP) explicitly tied to income numbers, whether a pension plan covers non-union employees or otherwise (UNP) and to compute the percentage of common shares owned by management (MOWN)

where:

MCP = 1 if exists and 0 otherwise

UNP = 1 if plan covers non-union employees and 0 otherwise

MOWN = shared owned by management/total outstanding shares

In some cases, information about (UNP) was not clear and judgment was required to classify the firm's type of employees covered by the pension plan. Specifically, plans that clearly stated that they cover non-union employees were given a value of one. Plans that indicated that they cover the majority of or substantially all employees were considered to cover union employees and hence were given a zero value.

2. Empirical Tests

Both univariate and multivariate statistical procedures are employed to assess the statistical significance of the motivating variables described above and to test whether these variables can predict whether firms with overfunded pension plans will or will not terminate their plans. The dependent variable is represented by the choice terminate/not terminate while the motivating variables are the independent variables. The multivariate model is as follows:

$$Z_i = b_0 + b_1 \text{MCP} + b_2 \text{LEV} + b_3 \text{SIZE} + b_4 \text{UNP} + b_5 \text{LIQ} + b_6 \text{MOWN} + b_7 \text{TAX} + e_i$$

where

$Z_i = 1$ if firm terminated its overfunded pension plan and 0 otherwise

MCP, LEV, SIZE, UNP, LIQ, MOWN and TAX are as previously defined.

b_0 & b 's = regression coefficients

e_i = error term

Given a dichotomous dependent variable, ordinary least squares regression yields estimates of the parameters that are unbiased but inefficient and the usual statistical tests are inappropriate.²

An alternative statistical technique is the n-chotomous probit analysis (PA) which was developed by McKelvey and Zavonia (1975) to deal with dichotomous dependent variables. It is assumed in PA that the

dependent variable has a continuous underlying normal distribution and that the error terms, e_i , are independent and identically distributed normal random variables. Given these assumptions, the objective of the PA is to estimate the regression coefficients of the true underlying regression model by use of the maximum likelihood estimation (MLE) procedure. These estimates are asymptotically efficient and have a known asymptotic sampling distribution. Accordingly, hypothesis tests on the significance of both the overall model and the individual independent variables can be performed.

This study applies PA to the above multivariate model and uses the likelihood ratio to test the overall model. The significance of the estimated coefficients of the independent variables is tested by using the asymptotic t-test. Regression analysis is also used for comparison. PA was used by Hagerman and Zmijewski (1979), Kaplan and Urwitz (1979), Zmijewski and Hagerman (1981), Bowen et al (1981), Dhaliwal et al.(1982) and Lilien and Pastena (1982).

A feasible alternative to PA for this study is Logit Analysis (LA). LA is a maximum likelihood estimating procedure which applies a logarithmic transformation to the nominal dependent variable. It assumes that the distribution has the shape of a logistic density function. Chow (1982) used LA and found the results in his study

were almost identical to those obtained from PA.

The PA rather than LA is used in this study for the following reasons: (1) as Neter and Wasserman (1974) point out, the interpretation of the logit coefficients is not simple, unlike the straightforward interpretation of the coefficients in the probit model. The reason is that the logit coefficients represent incremental effects of X (the independent variable) on the log odds ratio $[\text{Ln}(p/(1-p))]$, where p is the probability the dependent variable = 1 and (1-p) is the probability the dependent variable = 0]. PA has the desirable property that inferences can be made more readily with it than with LA, and (2) PA was used in most of the research in the choice area. Using PA in the current study provides results that are comparable to those of previous research.

CHAPTER III

FOOTNOTES

1. The authors classified firms as owner-controlled if one party owned 10 percent or more of the voting stock and is represented on the board of directors, or if one party owned 20 percent or more of the voting stock. Management-controlled firms, on the other hand, are firms for which no one party controls more than 5 percent of the voting stock.
2. Hagerman and Zmijewski (1979) illustrate the limitations of ordinary least square regression where the dependent variable is nominal (takes the value of 0 or 1).

CHAPTER IV
EMPIRICAL RESULTS

1. Descriptive Statistics

Table 1 (Panel 1) presents summary statistics for each of the continuous variables for the matched-pairs sample. The data indicate that firms that terminated their overfunded plans have higher mean values for LEV and MOWN and lower mean values for SIZE and IIQ than do firms that continued their overfunded plans.

Panel 2 provides summary statistics for each of the discrete independent variables for the same sample. The data show that the number of firms that had MCP, UNP, and TAX in the firms that terminated their overfunded plans are larger than that in the firms that did not terminate their plans.

To have a better idea as to the shape of the distribution of each continuous independent variable, a five-number-summary as well as a graphical representation of the data were examined.¹ A five-number-summary consists of the smallest observation (X_1), the first quartile (Q_1), the median, the third quartile (Q_3), and the largest observation (X_n). Table 1 (panel 3) presents the five-number summary for the continuous independent

variables of the matched-pairs sample. As shown in Table 1 (panel 3), except for LEV, the distance from Q_1 to the median is not equal to that from the median to Q_3 . In addition, the distance from X_1 to Q_1 is not equal to that from Q_3 to X_n . This is true for all the variables examined. Moreover, a comparison between the mean and the median of each variable indicate that they are not equal. These results show that the distributions of the examined variables are not symmetrical.

A box-and-whisker plot was also utilized to provide a graphical representation of the data. Figure 1 depicts such a plot for each continuous variable in the matched-pairs sample. As shown in figure 1, the + sign appears within each box represents the median value in the data. The vertical lines at the left and the right sides of the box represent the location of Q_1 and Q_3 respectively. The lower 25% of the data are represented by a dashed line (a whisker) connecting the left side of the box to the location of the smaller value (X_1), while the upper 25% of the data are represented by a dashed line connecting the right side of the box to X_3 . An examination of Figure 1 shows that the lengths of the whiskers are not equivalent. Moreover, note that the median is far from the center of the box for most of the variables.

In sum, the results of the five-number-summary and

the box-and-whisker plot suggest that the continuous independent variables are not symmetrically distributed.

Table 2 and figure 2 provide summary statistics and graphical representations for the second comparison sample. The results are almost the same as for the matched-pairs sample.

Univariate as well as multivariate tests are used to assess the statistical significance of the difference between the two groups in each sample.

2. Univariate Tests

2.1. Univariate Tests for Discrete Independent Variables

The effects of the dichotomous independent variables on the decision to terminate overfunded plans were tested using a Chi-Square test. This test tests whether two variables are independent. Specifically, it tests whether a significant difference exists between the observed and the expected frequencies in each category of the tested variables.²

2.1.1. Management Compensation Plan (MCP)-Test of H1

It was hypothesized that if the management compensation plan is explicitly defined in terms of reported earnings, there are incentives for management to terminate the firm's overfunded pension plan(s).

The results of both samples were consistent with the notion that firms with MCP tied with reported

TABLE 1
Summary Statistics of Independent Variables
Matched-Pair Sample (N=40)

Panel 1-Continuous Independent Variables

Variable	R a n g e							
	Mean		Std. Dev.		Min.		Max.	
	T ^a	C ^b	T	C	T	C	T	C
LEV	.255	.175	.173	.098	.023	0.00	.731	.390
SIZE	5.528	6.139	.595	.579	4.350	5.248	6.875	7.439
LIQ	1.975	2.035	1.043	.857	.515	.176	4.506	4.719
MOWN	.153	.073	.164	.106	0.000	.002	.657	.469

Panel 2 - Discrete Independent Variables

Type of firm	Variable	Firms with MCP**	%	Firms with plans cover union Employees	%	Firms with Tax-loss Carry-Forwards	%
Firms Terminated	Overfunded Plans	36	90%	13	32.5%	24	60%
Firms continued	Overfunded Plans	24	60%	36	90.0%	5	12.5%

^a Firms terminated their overfunded plans.

^b Firm continued their overfunded plans.

*The variables are defined as follows:

LEV - Leverage (long term debt/total assets).

SIZE - Log og net sales.

LIQ - Liquidity (current assets/current liabilities).

MOWN - Shares owned by management/total outstanding shares.

MCP - Management compensation plan (1 if exists and 0 otherwise).

TABLE 1 (Continued)
 Panel 3 - Five-Number Summary for Continuous
 Independent Variables

Variable*	Median		^c Q ₁		^d Q ₃		Min. (X ₁)		Max. (X _n)	
	T ^a	C ^b	T	C	T	C	T	C	T	C
LEV	.240	.184	.140	.091	.341	.238	.023	.000	.731	.390
SIZE	5.482	6.035	5.174	5.646	5.883	6.537	4.350	5.248	6.875	7.440
LIQ	1.847	1.934	1.094	1.506	2.596	2.622	.515	.176	4.506	4.720
MOWN	.102	.026	.034	.009	.244	.084	.000	.002	.657	.470

*The variables are as defined above.

^aFirms that terminated their overfunded plans.

^bFirms that continued their overfunded plans.

^cThe first quartile.

^dThe third quartile

Figure 1: Box-and Whisker plots for the distributions of SIZE, LIQ, MOWN, and LEV- the Matched-Pairs sample.

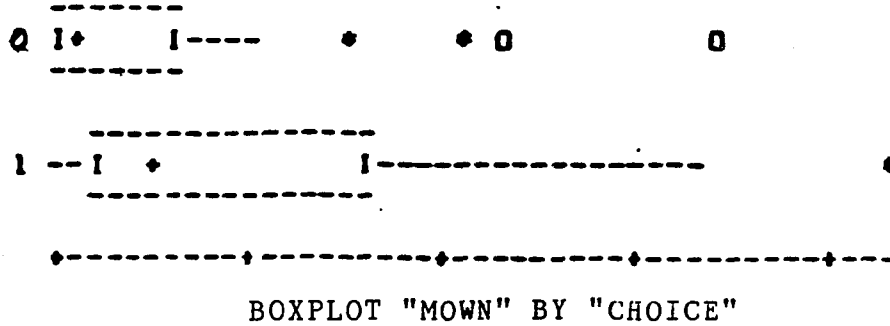
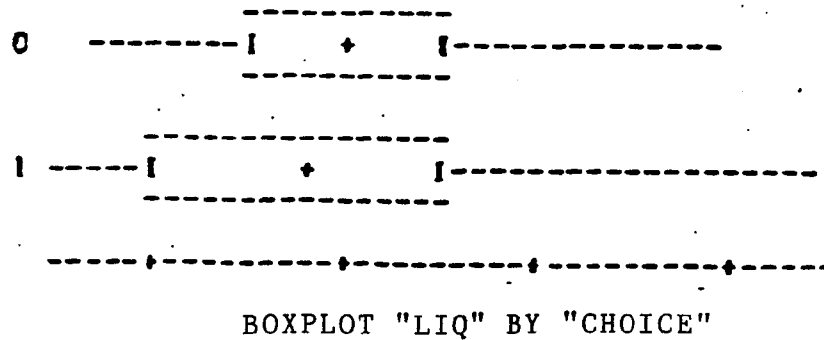
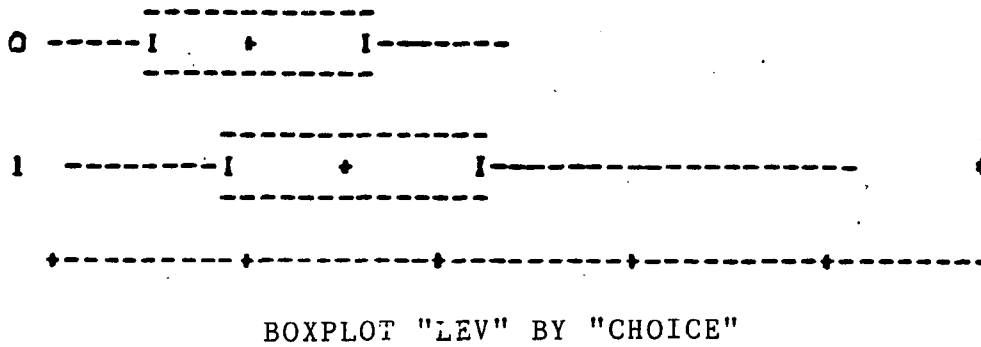
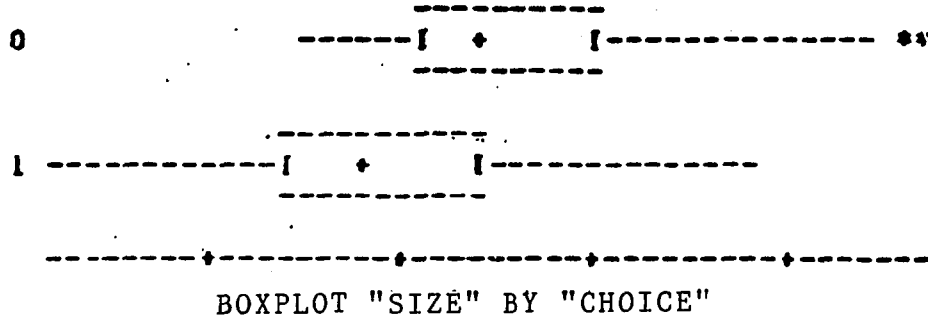


Table 2

Summary Statistics of Independent Variables

Second Comparison Sample (N=40)

Panel 1 - Continuous Independent Variables

Variable*	<u>range</u>							
	<u>Mean</u>		<u>Std. Dev.</u>		<u>Min</u>		<u>Max.</u>	
	T ^a	T ^b	T	C	T	C	T	C
LEV	.255	.170	.173	.104	.023	.007	.731	.359
SIZE	5.528	6.096	.595	.574	4.350	5.295	6.875	7.536
LIQ	1.975	2.050	1.043	.773	.515	.732	4.506	3.953
MOWN	.153	.073	.164	.112	0.000	.001	.657	.512

Panel 2 - Discrete Independent Variables

Variable Type of Firm	Firms With MCP		Firms With Plans Cover Union Employees		Firms With Tax-Loss Carry- Forwards	
		%		%		%
Firms Terminated Overfunded Plans	36	90.0	13	32.5	24	60.0
Firms Continued Overfunded Plans	29	72.5	35	87.5	2	5.0

^aFirms terminated their overfunded plans.

^bFirms continued their overfunded plans.

*The variables are as defined in Table 1.

Table 2 (Continued)
 Panel 3 - Five-Number Summary for Continuous
 Independent Variables

Variable*	Median		Q ₁ ^c		Q ₃ ^d		Min. (X ₁)		Max. (X _n)	
	T ^a	C ^b	T	C	T	C	T	C	T	C
LEV	.240	.168	.140	.082	.341	.258	.023	.007	.731	.359
SIZE	5.482	5.950	5.174	5.682	5.883	6.348	4.350	5.295	6.875	7.540
LIQ	1.847	2.108	1.094	1.501	2.596	2.630	.515	.732	4.506	3.953
MOWN	.102	.025	.034	.009	.244	.096	.000	.001	.657	.512

*The variables are as defined above.

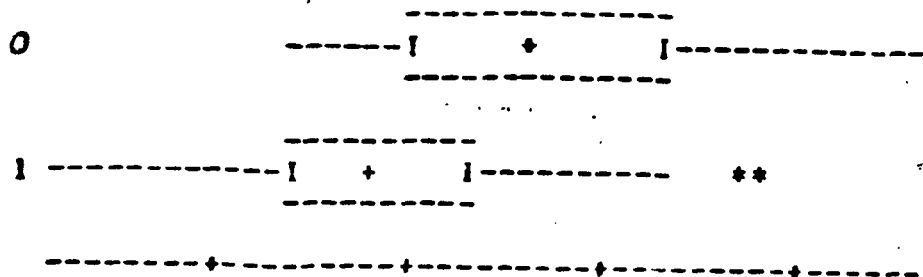
^aFirms that terminated their overfunded plans.

^bFirms that continued their overfunded plans.

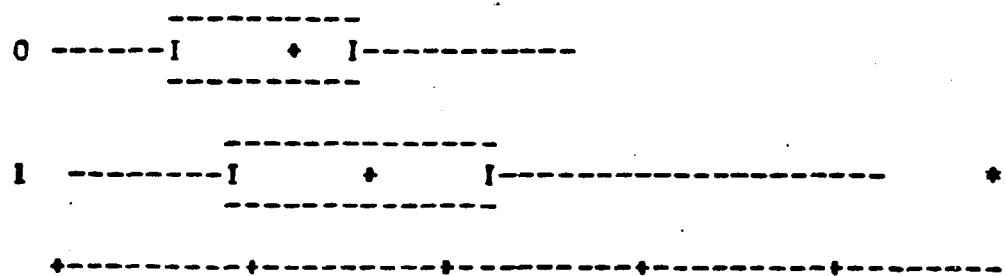
^cThe first quartile.

^dThe third quartile.

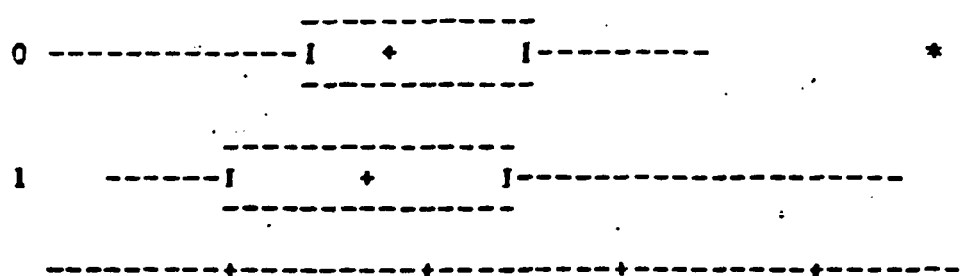
Figure 2: Box-and Whisker plots for the distributions of SIZE, LIQ, MOWN, and LEV - the Second Comparison Sample



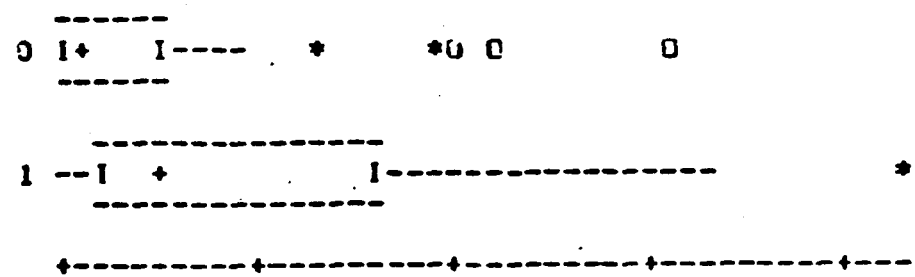
BOXPLOT "SIZE" BY "CHOICE"



BOXPLOT "LEV" BY "CHOICE"



BOXPLOT "LIQ" BY "CHOICE"



BOXPLOT "MOWN" BY "CHOICE"

earnings are more likely to terminate overfunded plans.

The computed chi-squares, for one degree of freedom, were 8.067 and 3.805 for the matched-pairs and the second comparison sample respectively. The first chi-square value is significant at the .0045 level while the second is significant at the .0511 level. Thus, it appears that firms with management compensation plans tied to reported income are more likely to terminate overfunded plans than firms without such plans.

2.1.2. Type of Employees Covered by the Pension Plan-Test of H4

It was hypothesized earlier that firms may not attempt to terminate overfunded plans which cover union employees in order to avoid organized union resistance that may result in strikes or other disruptions. The type of employees covered by the pension plan was measured by UNP. UNP was given a value of one when a pension plan stated that it covers non-union employees and a value of zero otherwise. For the matched-pairs sample, the computed chi-square was 25.49. The computed chi-square for the second comparison sample was 25.208. The significance level of both values is better than .001. These results support the hypothesis that firms are more likely to terminate overfunded plans that cover non-union employees. However, the results reported here

should be interpreted with some caution since judgment was used in determining whether the pension plan covers non-union employees or otherwise as discussed earlier.

2.1.3. Tax-Loss Carryforwards-Test of H7

It was argued earlier that the existence of tax loss carryforwards provides incentives for firms to terminate overfunded plans because the gain resulting from termination will be effectively tax-free. The computed chi-square for the matched-pairs was 17.525. The result for the second comparison sample was even stronger. The chi-square was 27.578. For both tests, the significance level is better than .001. These results indicate that the null hypothesis that firms with tax-loss carryforwards being more likely to terminate overfunded plans cannot be rejected.

Moreover, an analysis of the multiway contingency table of the discrete variables was performed to understand the relationship between these variables.³ The log-linear model was utilized to perform tests of associations of all interactions.⁴ The results show that models with two-factor interactions are significant, while models with three-factor interaction are not different from zero. The relative importance of an effect is determined through the tests of partial and marginal association for each subset of factors. These

tests can be simultaneously used to screen the various interactions to determine whether or not they are necessary in the model for the data being used.

The results show that models including MCP, UNP, and TAX as independent variables are significant. Therefore, such variables are important and should be included in the final model. The results also show a significant association between UNP and TAX. Moreover, an examination of the signs of the estimates of the log-linear parameters (λ) indicates that firms with management compensation plans tied to reported earnings (MCP), those that have tax-loss carryforwards, and those that have pension plans that cover only non-union employees are more likely to terminate their overfunded pension plans.

Finally, the backward elimination process was used to determine which model should be chosen as the "best-fitting" model. The study started with Model CM, CU, CT, MU, MT, UT (where C, M, U, and T are choice, MCP, UNP, and TAX respectively) and deleted in turn each simple effect. The results reveal that the best model found is CM, CU, CT, MU, UT. This model includes the association of choice and MCP, choice and UNP, and choice and TAX,. Moreover, the model states that given management's choice, UNP is not independent of MCP or TAX.

2.2 Univariate Tests of the continuous Independent Variables

The non-parametric Mann-Whitney U Test was used to compare each continuous independent variable for firms that terminated their overfunded plans and those which did not terminate them.⁵ A non-parametric test was used since the results of the five-number-summary as well as the box-and whisker plot provide evidence of lack of symmetry in the distributions of the variables.

2.2.1. Leverage-Test of H2

Some debt covenants impose restrictions on the activities of the borrowing firms, such as issuing new debt, if their leverage ratios reach certain maximum level. Terminating overfunded plans can improve this ratio since the resulting gains increase both income and shareholders' equity. If it is assumed that both firms in the matched-pairs or in the random sample are faced with similar constraints on leverage ratios, the firm with the larger leverage ratio should be more likely to terminate overfunded plans.

Leverage was measured by LEV (long term debt/total assets). As shown in Table 3, the mean rank of LEV for firms that terminated their overfunded pension plans was larger than that for firms that continued these plans in both samples. Using the Mann-Whitney U test, the

Table 3
Results of Mann - Whitney U Tests on the
Continuous Independent Variables

Panel 1 - Matched-Pairs Sample (N=80)					
Hypothesis	Variable*	Terminate Mean Rank	Non-Terminate Mean Rank	Z-Score	Level of Significance
H ₂	LEV	45.81	35.19	-2.045	.020
H ₃	SIZE	29.71	51.29	-4.1522	.000
H ₅	LIQ	38.95	42.05	-0.597	.275
H ₆	MOWN	47.65	33.35	-2.762	.003
Panel 2 - Second Comparison Sample (N=80)					
Hypothesis	Variable*	Terminate Mean Rank	Non-Terminate Mean Rank	Z-Score	Level of Significance
H ₂	LEV	46.24	34.76	-2.209	.014
H ₃	SIZE	30.51	50.49	-3.844	.000
H ₅	LIQ	38.65	42.35	-0.712	.238
H ₆	MOWN	48.30	32.70	-3.003	.001

*The variables are as defined in Table 1.

probability that the observed results could have occurred by chance is less than .025.⁶

2.2.2. Political Costs-Test of H3

It was argued that if firms face potential political costs, they have incentives to make decisions which reduce the present value of reported income. Size, measured by log of net sales, was used as a surrogate for political costs. It was assumed that large firms, because of their importance in the economy, are targets of political actions. Therefore, these firms are less likely to terminate overfunded plans than small firms. As reported in Table 3, the mean rank for SIZE is smaller for firms which terminated their plans than that for firms which continued their plans in both samples. The significance level for the Mann-Whitney U test is better than .001. This supports the hypothesized relationship between firm size and the decision to terminate overfunded plans.

2.2.3. Liquidity-Test of H5

It was expected that firms which face liquidity problems would have incentives to terminate overfunded plans. Accordingly, it was hypothesized that the smaller the liquidity ratio, the more likely the firm is to terminate overfunded plans. Liquidity was measured by LIQ (current assets/current liabilities). The results reported in Table 3 show that the mean rank of LIQ is

smaller for firms which terminated their overfunded plans than that for firms which did not in both the matched-pairs as well as the second comparison samples. Although these results agree with the hypothesized direction, the significance levels indicate that the probability that results are favorable to the null hypothesis could have occurred by chance is relatively high. Thus, it appears that liquidity does not explain the firm's decision to terminate its overfunded plans.

2.2.4. The Firm's Ownership Control Style-Test of H5

In order to test whether the type of ownership control has a significant impact on the decision to terminate overfunded plans, the study compared the percentage of common shares owned by managers between firms that did and those that did not terminate their overfunded plans. The results of this test is shown in Table 3 under H_6 . As predicted, the percentage of common shares owned by managers was higher for firms that terminated their overfunded plans relative to that for firms which did not terminate their plans. The significance level for the Mann-Whitney U test is better than .003 suggesting that the percentage of shares owned by managers seems to be an important determinant of the firm's decision to terminate overfunded plans.

Summary of the Results of the Univariate Tests

The results of the univariate tests reported in this study support the hypothesized relationship between MCP, LEV, SIZE, UNP, MOWN and TAX and the firm's decision to terminate its overfunded pension plans. On the other hand, the results for LIQ show that this variable was insignificantly different between the two group of firms, but in the expected direction.

In addition to the above univariate tests, the equality of group means of the continuous independent variables was tested simultaneously by the multivariate Hotelling's T^2 (Morrison, 1967). The test statistic is equivalent and can be transformed to an F statistic. The test results for the matched-pairs sample indicate that the computed T^2 value is 26.825 and the associated F is 6.441 with 4 and 73 degrees of freedom. This F value is significant at the .0002 level which suggests that mean vectors (SIZE, LEV, LIQ, and MOWN) for firms that terminated overfunded pension plans are not equal to those for firms that continued their overfunded plans.

To understand which variables led to the rejection of the equality of group means hypothesis, the univariate t-statistics of the independent variables were examined. The results are consistent with those of the Mann-Whitney U tests. The t-statistic for SIZE is negative and significant at the .001 level. This supports the

hypothesis that small firms are more likely to terminate overfunded plans than large firms. In addition, MOWN and LEV have positive and significant t values. This is consistent with the hypothesized relationship between MOWN and LEV and the choice to terminate overfunded plans. On the other hand, the t-statistic for LIQ is insignificant, however in the expected direction. This result is inconsistent with the hypothesis that firms with less liquidity are more likely to terminate overfunded plans. These results indicate that SIZE, MOWN, and LEV are the variables that led to the rejection of the equality of group means hypothesis tested above.⁷

3. Multivariate Tests

Multivariate tests have been widely used to determine the impact of various independent variables on both choice of accounting principles as well as the decisions that firms make. It is expected that better predictions may be achieved as a result of combining the independent variables in a multivariate model. In addition, multivariate tests serve as a check on the results of the univariate tests. If the independent variables are highly correlated, some of the results of the univariate tests may be misleading. For example, it is possible that an irrelevant variable appears to be significant in a univariate test if it is a surrogate for

another variable.

Accordingly, a preliminary analysis was performed by examining the correlations among the independent variables. As reported in Table 4, SIZE is negatively correlated with MOWN, UNP and TAX. In fact, the relationship between SIZE and MOWN seems reasonable since the percent of shares owned by managers in small firms is likely to be larger than that in large firms. Also, TAX is significantly and positively correlated with MCP, LEV and UNP and significantly and negatively correlated with SIZE. In general, the results do not appear to be indicative of severe multicollinearity.

For purposes of this study, the multivariate test of the relevant hypotheses is the probit model discussed in the preceding chapter. A probit analysis was performed for each of the two samples. Tables 5 and 6 present the results of the probit analysis for the matched-pairs and the second comparison sample respectively.

Inspection of the results presented in Table 5 shows that, with respect to the matched-pairs sample, the signs of the coefficients of all the independent variables are as predicted. The coefficient associated with MCP is significant at the .005 level. This is consistent with the argument that firms with management compensation plans defined in terms of reported earnings

Table 4
Correlations Among the Independent Variables*

Panel 1 - Matched-Pairs Sample (N=80)							
	MCP	LEV	SIZE	UNP	LIQ	MOWN	TAX
MCP	1.0						
LEV	-.030	1.0					
SIZE	-.005	-.241	1.0				
UNP	.163	.176	-.308	1.0			
LIQ	.042	.190	-.176	.029	1.0		
MOWN	.060	-.098	-.500	.194	.224	1.0	
TAX	.195	.267	-.316	.466	-.089	.062	1.0
Panel 2 - Second Comparison Sample (N=80)							
	MCP	LEV	SIZE	UNP	LIQ	MOWN	TAX
MCP	1.0						
LEV	-.133	1.0					
SIZE	.049	-.169	1.0				
UNP	.196	.249	-.309	1.0			
LIQ	.004	-.102	-.304	.001	1.0		
MOWN	.042	.036	.532	.212	.042	1.0	
TAX	.197	.250	.266	.468	-.167	.100	1.0

*See Table 1 for definitions of the variables.

are more likely than firms without such plans to terminate overfunded pension plans. Leverage is also significant at the .060 level. This supports the belief that highly leveraged firms attempt to relax the constraints on debt agreements by making decisions that increase the present value of reported income. The coefficient of SIZE is significant at the .025 level. This is consistent with the hypothesis that large firms, on the average, will avoid making decisions that result in reporting large profits such as the decision to terminate overfunded plans.

The relationship between the type of employees covered by the pension plans (UNP) and the decision to terminate overfunded plans is significant at the .005 level. This result is consistent with the univariate findings and supports the hypothesis that firms are more likely to terminate overfunded plans which cover non-union employees.

Inconsistent with the univariate findings, the coefficient associated with LIQ is significant at the .080 level. The relationship between the liquidity position and the choice to terminate overfunded plans is in the hypothesized direction. This result means that after holding other factors constant, liquidity does help explain the choice to terminate overfunded plans.

The coefficient associated with MOWN is positive

Table 5

Probit Analysis of the Decision to Terminate Overfunded Pension Plans*

Matched-Pairs Sample (N=80)

Expected Sign		(+)	(+)	(-)	(+)	(-)	(+)	(+)	X ²	Percent Correctly Classified
Independent Variables**	Constant	MCP	LEV	SIZE	UNP	LIQ	MDWN	TAX		
Maximum Likelihood Estimate	3.2190	1.739	3.680	-0.978	1.945	-0.377	3.650	0.890	64.747	88.8%
t-Statistic		2.861	1.630	-2.232	3.397	-.457	1.729	1.754	7(d.f.)	
Level of Significance		(.005)	(.060)	(.025)	(.005)	(.080)	(.050)	(.050)		

*The estimated R² is .831 and the adjusted R² is .814.

**See Table 1 for definitions of the variables.

Table 6

Probit Analysis of the Decision to Terminate Overfunded Pension Plans*

Second Comparison Sample (N=80)

Expected Sign		(+)	(+)	(-)	(+)	(-)	(+)	(+)	X ²	Percent Correctly Classified
Independent Variables**	Constant	MCP	LEV	SIZE	UNP	LIQ	MOWN	TAX		
Maximum Likelihood Estimate	4.731	1.001	2.968	-1.118	1.202	-0.287	1.490	2.059	59.200	86.2%
t-Statistic		1.709	1.624	-2.204	2.728	-1.010	.893	3.002	7(d.f.)	
Level of Significance		(.050)	(.065)	(.050)	(.005)	(.140)	(.180)	(.005)		

*The estimated R^2 is .811 and the adjusted R^2 is .793.

**See Table 1 for definitions of the variables.

and significant at the .050 level. This is consistent with the argument that the percentage of common stock owned by managers has an important impact on firm's decision. On average, firms with higher percentage of shares owned by managers tended to terminate their overfunded plans.

Consistent with the univariate results, the coefficient of TAX is significant at the .050 level. This result supports the hypothesized relationship between the existence of tax loss carryforwards and the firm's decision to terminate overfunded plans.

To test the overall model, the log of the likelihood ratio is multiplied by -2. The resulting statistics is distributed as a chi-square with K-1 degrees of freedom.⁸ The chi-square statistic reported in Table 5 shows that the model is significant at the .001 level.

In summary, the results of the matched-pairs sample indicated that the multivariate findings support the univariate tests. As expected, MCP, LEV, UNP, MOWN and TAX are positively and significantly associated with the firm's decision to terminate its overfunded plan, while SIZE and LIQ are negatively and significantly correlated with such a decision.

The probit results of the second comparison sample are presented in Table 6. The signs of the coefficients

of the independent variables are as expected. Consistent with matched-pairs results, MCP, LEV, SIZE, UNP and TAX are significantly associated with the decision to terminate overfunded plans. On the other hand, the coefficients of LIQ and MOWN are insignificant. The results of MOWN is not consistent with either the matched-pairs or the univariate findings. One explanation for these results is that MOWN is correlated with SIZE and UNP and LIQ is correlated with SIZE. This correlation might cause the sets of test results to diverge. Another possibility is that the combined effect of the other variables dominates the models.

Daley and Vigeland (1983) argue that since industries differ with respect to their optimal leverage ratio, matching firms on industry classification should add power to the leverage test by controlling somewhat for the lack of cross-sectional consistency. The results shown in Tables 5 and 6 provide some support for their argument. The coefficient of LEV is more highly significant in the matched-pairs model than in the non-matched model. This means that the matching process creates a more powerful test on the leverage variable.

4. Sensitivity Analyses

It is desirable to examine the sensitivity of the results to the exclusion of the independent variable

which is highly correlated with other independent variables in the model as well as to the use of alternative multivariate model. This section describes the sensitivity of the results to (1) the exclusion of the correlated independent variables and (2) the use of regression analysis in lieu of probit analysis.

1. Exclusion of Correlated Independent Variables

To assess the impact of the correlated independent variables on the results, different probit models were run for the matched-pairs sample without including the correlated variables together in the same model. The results of these runs are presented in Table 7. The model was first run without UNP, which is significantly correlated with LEV, MOWN, SIZE and TAX. As a result, the coefficient of TAX became more highly significant than when UNP was in the model. However, the coefficients of LEV and MOWN became less significant than when UNP was in the model. This is not surprising since LEV and MOWN are significantly and negatively correlated with SIZE, a variable which was in the model. In the second run, SIZE was dropped from the model. The results show that the significance level of the coefficients of both LEV and MOWN increased sharply as compared with the first run while that of TAX decreased because of the correlation between TAX and UNP.

Finally, the probit model was run without LEV.

Table 7

Probit Analysis of the Decision to Terminate Overfunded Pension Plans
Matched Pairs Sample (N=80)

Expected Sign		(+)	(+)	(-)	(+)	(-)	(+)	(+)	χ^2	Percent Correctly Classified
Independent Variables	Constant	MCP	LEV	SIZE	UNP	LIQ	MOWN	TAX		
Run (1)										
Maximum Likelihood Estimate	4.129	1.492	2.332	-1.012		-.242	2.656	1.249	49.11	81.2%
t-Statistic		3.039*	1.416***	-2.558*		-1.114****	1.492***	2.969*	6(d.f.)	
Run (2)										
Maximum Likelihood Estimate	-3.206	1.541	5.123		1.942	-.203	4.956	1.008	59.13	86.2
t-Statistic		2.741*	2.418**		3.599*	.854****	2.624*	2.117**	6(d.f.)	
Run (3)										
Maximum Likelihood Estimate	5.867	1.446		-1.205	1.745	-.496	3.064	0.925	61.60	88.7
t-Statistic		2.806*		-2.838*	3.153*	-2.083****	1.500***	1.875****	6(d.f.)	

*Significant at the .005 level.

**Significant at the .05 level.

***Significant at the .10 level.

****Significant at the .20 level.

This created a more powerful test on the LIQ and the TAX variables. Note that the significance of the overall model, as measured by its chi-square value, as well as the percent correctly classified were improved.

2. Regression vs. Probit

It is interesting to compare the results of the probit model with those obtained from the use of regression analysis. The stepwise regression results for both the matched-pairs sample and the second comparison sample are shown in Table 8. The results of regression analysis show that the signs of the coefficients of the independent variables are as expected. Although the coefficients are different between the two models, the level of significance of most of them are virtually identical. However, LEV, LIQ and MOWN of both samples became insignificant, while TAX in the second comparison sample is more significant.

In sum, the results of both univariate and multivariate tests generally supported the hypothesized effect of size, leverage, management compensation plan and the type of employees covered by the pension plan on the decision to terminate overfunded pension plans. The importance of the percentage of shares owned by managers, the existence of tax-loss carryforwards and the lack of liquidity was also supported. A comparison between regression results and probit results indicated that they were almost identical.

Table 8

Stepwise Regression Analysis of the Decision to Terminate Overfunded Plans

Matched Pairs Sample (N=80)

Expected Sign		(+)	(+)	(-)	(+)	(-)	(+)	(+)
Independent Variables	Constant	MCP	LEV	SIZE	UNP	LIQ	MOWN	TAX
The Matched-Pairs Sample (m=80)*								
Coefficients	1.326	.296	.389	-.187	.376	-.044	.320	.157
t-Score		3.162	1.288	2.398	3.993	.986	.975	1.599
The Second Comparison Sample (N=80)**								
Coefficients	1.041	.161	.360	-.164	.277	-.023	.234	.361
t-Score		1.451	1.200	1.882	2.789	.452	.682	3.402

*The adjusted R^2 is 0.511 and the overall F is 12.799. This F value is significant at the .01 level.

**The adjusted R^2 is 0.473 and the overall F is 11.135. This F value is significant at the .01 level.

CHAPTER IV

FOOTNOTES

1. Detailed discussions of this method are provided by Berenson and Levine (1983).
2. The test statistic was computed by dividing the squared difference between the observed and expected frequencies by the expected frequencies summed up over all categories of the test variables.
3. Detailed discussions of the analysis of multiway contingency tables are provided by Berenson, Levine, and Goldstein (1983).
4. BMDP program 4F was used to perform these tests.
5. This test makes minimal assumptions about the form of the underlying distribution. It tests whether two groups are from the same population. When it is used as a test for location, it implicitly assumes equality of variability between the two groups. The test method involves combining the two groups and ranking them in order of increasing size. The U statistic is computed as the number of times a score from the first group precedes a score from the second group.
6. LEV was also measured by the ratio of long term debt/shareholders' equity. The results of the Mann-Whitney U test were virtually identical to those obtained above.
7. The BMDP program 3D was used to perform this test. The program's output displays the results for both the multivariate and the univariate tests.
8. Detailed discussions of this test are provided in McKelvey and Zavonia (1975),

CHAPTER V
STOCK MARKET REACTION TO THE TERMINATION
OF OVERFUNDED PENSION PLANS

This chapter examines whether the termination of overfunded pension plans has a significant impact on the performance of stock prices of firms terminated their overfunded plans and received reversion of excess assets around the termination announcement date. Since there is a cash flow effect associated with the termination of overfunded plans, as a result of the reversion of excess assets, it is expected that the common stock of firms terminating their pension plans will experience positive abnormal performance around the date on which the termination is announced.

SAMPLE AND METHODOLOGY

Sample Selection

The list of firms that terminated their overfunded plans provided by the BGC was used as a basis for the sample selection. Given this list of firms, the following criteria were applied: (1) firms are listed on NYSE or AMEX and (2) daily stock return data must be available on the CRSP daily return tape for the study period of 231 trading dates.

The imposition of the above criteria reduced the initial list of firms to the final sample of 25 firms. Most of the deleted firms were closely held firms whose common stock is not traded on the NYSE or AMEX. In addition, a few of the deleted firms were the over-the-counter firms for which no return data are available on the CRSP tape.

Methodology

The basic model to be employed throughout this section is the conventional market model used in early studies by Ball and Brown (1968), Sunder (1973, 1975), Kaplan and Roll (1972), Lev (1979), and others. This model is as follows:

$$R_{it} = \alpha_i + \beta_i R_{mt} + e_{it}$$

where:

R_{it} = the return on the stock of firm i for day t

R_{mt} = the return on the value weighted market index
for day t

α_i = the intercept

β_i = the slope of the regression equation which

represents the estimate of the systematic risk

e_{it} = the residual which reflects that portion of the security i 's return which varies independently of the market return.

The above market model classifies events that affect

a security's return into one of two types: (a) events which have an impact on all securities in the market (e.g., increases or decreases in the inflation rate), that are reflected by the market return, R_{mt} ; and (b) events that effect only security i (e.g., a dividend announcement or, as in the case of the current study, an overfunded pension plan termination announcement), which are reflected by the residual e_{it} . Given that the current study examines the possible impact of pension plan terminations on stock returns of firms terminated their overfunded plans, the focus in the following will be on that portion of the stock returns reflected by the residual e_{it} .

The current study examines daily return data, obtained from the CRSP daily return tape. Daily returns, rather than weekly or monthly returns, are examined since the evidence on capital market efficiency suggests that the impact of new information is fully reflected in stock prices within a few days (Foster, 1978, pp. 350-52). Moreover, as Lev (1979) points out, a period of a week is considered too long for taking a single return observation and attributing it to a specific information item (e.g., the termination of overfunded plans).

Daily return observations allow a more refined analysis of the relationship between stock price performance and the announcement of pension plan

termination. As Holthausen (1981) argues, if the event is expected with probability less than one, and if the event has an impact on the stock prices, the use of daily data increases the probability that the effect of the event can be estimated without contaminating the measurement with the effects of other news announcements.

The value weighted market index is used since the empirical evidence provided by Lorie and Hamilton (1973), Fama, Fisher, Jensen and Roll (1969) and Sharpe and Cooper (1973) suggests that selection of a specific index will not have a substantial impact on the market model parameter estimates. In addition, Foster (1978) has argued for the preferability of a value-weighted index to other indices because certain properties of the market model parameter estimates obtained using such an index are consistent with the implication of the CAPM. Moreover, in a study of the effects of holding gains disclosure, Abdel-Khalik and McKeown (1978) have found that a value-weighted index was superior to the equal weighted index in terms of the internal consistency and interpretability of their results.

Based on the above discussions, the market model (1) is run by means of ordinary least squares for each firm over the 200 trading days ending 20 days before the announcement of the termination of an overfunded pension plan in order to provide parameter estimates (α 's and β 's)

for the prediction of the abnormal residuals around the plan termination announcement date (the event date). The event date is the date on which a firm files a notice of intent to terminate its overfunded pension plan with the PBGC. The abnormal residuals are examined for the period 10 trading days before to 10 trading days after the event date. Examining a short period of 20 trading days (four weeks) around the event date would increase the probability that the effect of the event can be estimated without contaminating the measurement with the effects of other news announcements.¹

Scholes and Williams (1977) have shown that due to non-synchronous trading phenomenon with daily data, ordinary least squares estimators are biased. To reduce the problems associated with non-trading, Scholes and Williams (SW) have presented an alternative estimation procedure in which they include lead and lag market terms in the market model.² Thus, this study also utilizes the SW estimation procedure in estimating the parameters of the market model for comparison.

The estimated parameters (α 's and β 's) are used to derive for each sampled firm predicted returns for the test period (day -10 to day +10). These predictors are compared with the actual returns of each firm during the test period to determine the residual (unexpected) returns u_{it} in the following manner:

$$\mu_{it} = R_{it} - [\alpha_i + \beta_i R_{mt}]$$

If there is no change in the level of returns during the announcement period relative to the pre-announcement period (200 days), then the distribution of residuals estimated for the announcement period μ_{it} should not be significantly different from the distribution of e_{it} . The μ_{it} 's will therefore reflect the price reaction, if any, to the termination announcement. The residual returns μ_{it} 's are summed for each day across firms yielding daily sample average residual (unexpected) returns (AR_d). Thus, the AR_d for each day (d) relative to the event date for all n securities is given by

$$AR_d = \frac{1}{n} \sum_{i=1}^n \mu_{id}$$

The cumulative abnormal returns (CAR) are then calculated by summing the AR_d over time starting 10 days before the event date. Thus, the CAR_j for day j is given by

$$CAR_j = \sum_{d=-10}^j AR_d$$

To sum up, if the termination of overfunded pension plans is expected to affect the equilibrium values of firms' equity securities and given efficient capital markets, then a reaction by stock prices to the announcement of termination resulting from investor reassessment of stock values should be observed. Thus, by

examining the behavior of stock prices of firms terminating their overfunded plans during the announcement period, inferences can be made regarding the potential impact of pension plan termination on capital markets.

Since this study attempts to discover whether the termination of overfunded plans has a significant impact on the performance of stock prices of firms terminating their overfunded pension plans, a test of significance of the stock price effects in likely periods of market reaction is performed. Periods that are tested include long period around the event date (day -5 to day +10, day -5 to day +5 and day -5 to day +1) as well as short periods around that date (day -2 to day +5, day -2 to day +1 and a single day before or after the event).

Under the assumption that the average residuals are distributed normally, the following student t test is used:

$$t = \text{CAR}_j / \sigma(\text{AR}_n) \sqrt{j}$$

where $\text{CAR}_j = \sum_{a=b}^c \text{AR}_a$, b and c are the first and the last day respectively over which the CAR_j is cumulated, j is the number of days over which the event is cumulated = c-b+1, and

$$\sigma(\text{AR}_n) = \sqrt{\left(\sum_{a=d}^e (\text{AR}_a - \frac{\sum_{a=d}^e \text{AR}_a}{n})^2 \right) / (n-1)},$$

where d and e are the first and last day respectively over

which $\sigma(\text{AR}_n)$ is calculated, n is the number of days over which $\sigma(\text{AR}_n)$ is calculated = $e-d+1$. $\sigma(\text{AR}_n)$ is estimated for each test period over the period day -10 to the day before the test period for significance abnormal return begins (i.e., day = b).

The null hypothesis is that the stock prices of firms terminating their overfunding pension plans experience positive abnormal performance around the event date that is not different from zero.

Furthermore, in order to examine the impact of overfunded pension plan terminations on stock prices while controlling for differences, in the magnitude of excess assets received by a firm, the sample is partitioned into two portfolios based on the ratio of a firm's excess assets to its total assets. This ratio is used to rank firms into descending order. Firms in the highest half represent high excess assets portfolio, while firms in the other half represent low excess assets portfolio. Then, AR and CAR for each portfolio are calculated and significance tests are conducted.

The high excess assets portfolio is expected to outperform the low excess asset portfolio in terms of its abnormal returns during the test period. In addition, given both that high excess assets portfolio involves a remarkable effect on firms' cash flow and that the capital market is efficient, a more significant reaction should be

observed for the high portfolio than for the low portfolio immediately around the event date.

EMPIRICAL RESULTS

The Entire Sample

News in the Wall Street Journal Index were examined for each sampled firm during the test period to see if any information was released (such as earnings or dividend announcement) during this period which could affect the stock prices. News with potentially positive implications for three firms were found. These three firms were deleted from the sample. Hence, the final sample is reduced to 22 firms.

Both Ordinary Least Squares (OLS) regression and SW estimation procedures were used to estimate the parameters (α 's and β 's) of the market model from daily return data over the 200 trading days ending 20 days before the event date. Table 9 provides summary statistics of the estimated betas. The mean beta estimated by SW technique of .874 is higher than that of .816 estimated by means of OLS. However, the t-test statistic of the equality of two means, assuming equal variances, is -.45 which is significant at the .655 level. This suggests that the two mean betas are not statistically different from each other.

Table 10 presents the results of AR and CAR and

Figures 3 and 4 depict AR and CAR respectively of portfolio of 22 firms that received excess assets as a result of terminating their overfunded pension plans over the 20 days around the termination announcement (day -10 to day +10). The daily average residuals were computed by means of OLS as well as SW estimation procedures. Note the close similarity in the results of both estimation techniques. In particular, the timing of the turning points as well as the magnitude of the residuals under the two procedures are almost identical. Accordingly the same inferences apply to the resulting residuals and their significance. Thus, only the results calculated by means of OLS will be discussed.

Inspection of the results shown in Table 10 shows that over the 10 trading days (about two weeks) prior to the event date,³ the portfolio earns an abnormal return of 2.38 percent. In the week before the event date, abnormal performance is .20 percent. In the two weeks surrounding the event date (day -5 to day +5), the abnormal return is 2.67, while in the period immediately surrounding the event (day -2 to day +1), the abnormal return is 1.49. Over the entire 21 days, the firms' abnormal performance is 4.60 percent. In day 0, the abnormal performance is 1.38, while it is 1.36 in day 4. The performance in day 0 is the highest one over the entire period examined. These results suggest that

Table 9
Summary Statistics of Systematic Risk (Beta)*

	Mean	Std. Dev.	Minimum	Maximum
Beta-OLS	.816	.410	.191	1.650
Beta-SW	.874	.396	.094	1.611

*Appendix C provides a list of firms in the sample and their systematic risk (beta).

different inferences may be made depending on the period examined. The problem here is to capture the days in which the market reacts to the event studied. Market reaction can take place immediately around the event date, or it may have been anticipated earlier if the pension plan termination announcement was leaked.

Thus, it is important to determine the significance of the stock price effects in different likely periods of market reaction. The Wald-Wolfowitz one-sample-runs test for randomness⁴ was first performed to determine whether or not the daily average abnormal returns (AR) follow a random sequence over time. The test results indicate that for the 21 abnormal returns, 11 are equal to or above the median abnormal returns (.0027), while 10 are below the median abnormal returns. The observed number of runs (U) is 14. The critical values of the runs test suggest that the null hypothesis of randomness would be rejected at the .05 level if $U \geq 17$ or $U \leq 6$. Since the observed number of runs (U) is 14, the null hypothesis that abnormal returns follow a random sequence cannot be rejected at the .05 level. This result suggests that the t-statistic discussed above is appropriate to determine whether the abnormal performance indicated in Table 10 is statistically significant from zero.

The results of this test are presented in Table 11. As shown in Table 11, the t-statistic for day-5 to day +10

Table 10
Residual Returns of the Portfolio of Firms That
Terminated Overfunded Pension Plans

Day	Using OLS		Using SW Technique	
	AR	CAR	AR	CAR
-10	.0027	.0027	.0028	.0028
-9	-.0026	.0001	-.0032	-.0004
-8	.0099	.0100	.0097	.0093
-7	.0072	.0172	.0067	.0160
-6	.0046	.0218	.0047	.0207
-5	.0002	.0220	.0008	.0215
-4	.0117	.0337	.0119	.0334
-3	-.0088	.0249	-.0089	.0245
-2	.0029	.0278	.0034	.0279
-1	-.0040	.0238	-.0037	.0242
0	.0138	.0376	.0139	.0381
1	.0022	.0398	.0023	.0404
2	-.0074	.0324	-.0074	.0330
3	.0048	.0372	.0036	.0366
4	.0136	.0508	.0132	.0498
5	-.0023	.0485	-.0027	.0471
6	-.0078	.0407	-.0082	.0389
7	-.0024	.0383	-.0022	.0367
8	.0027	.0410	.0036	.0403
9	.0069	.0479	.0064	.0467
10	-.0019	.0460	-.0014	.0453

Figure 3: Average Residuals of Firms Terminated Overfunded Plans

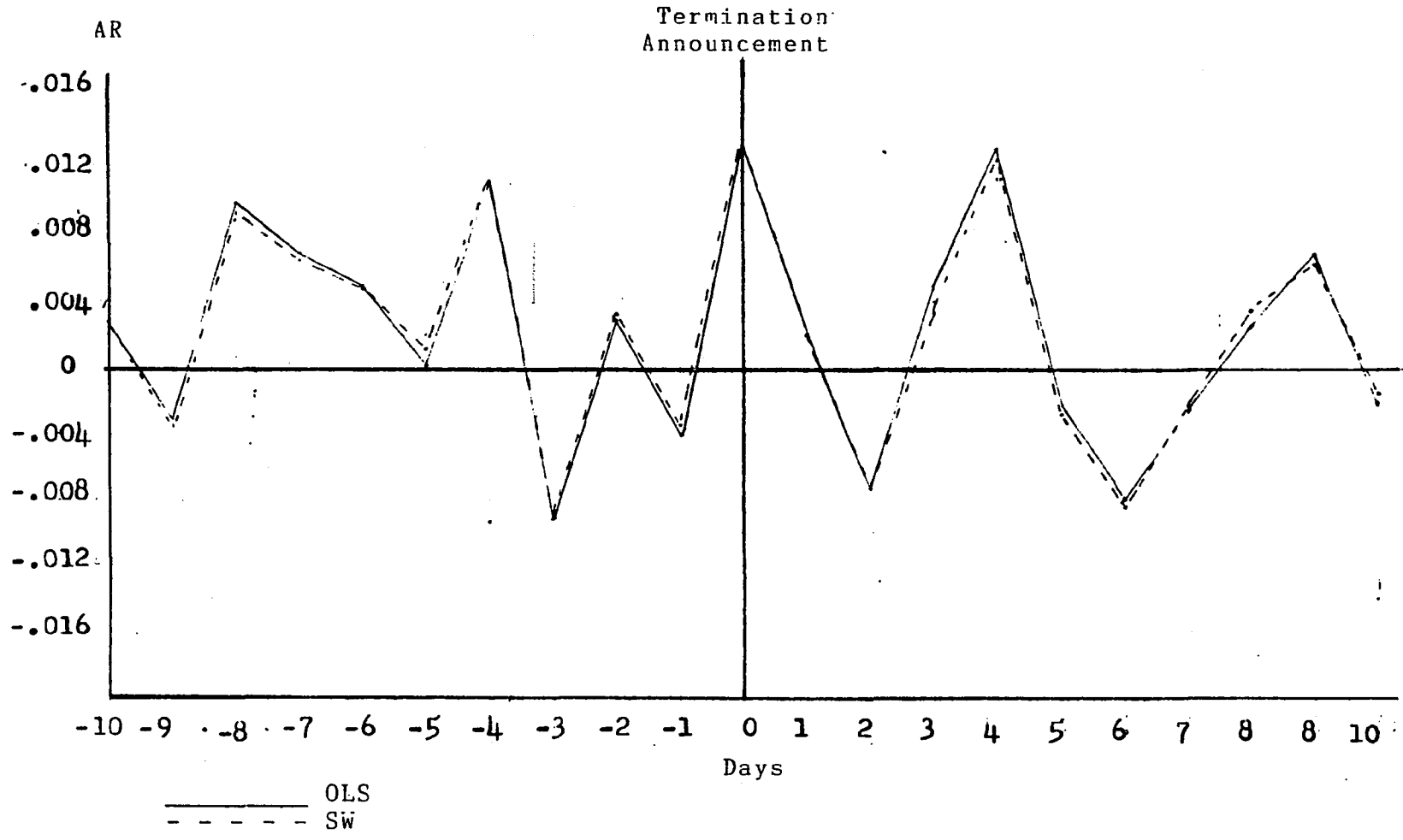
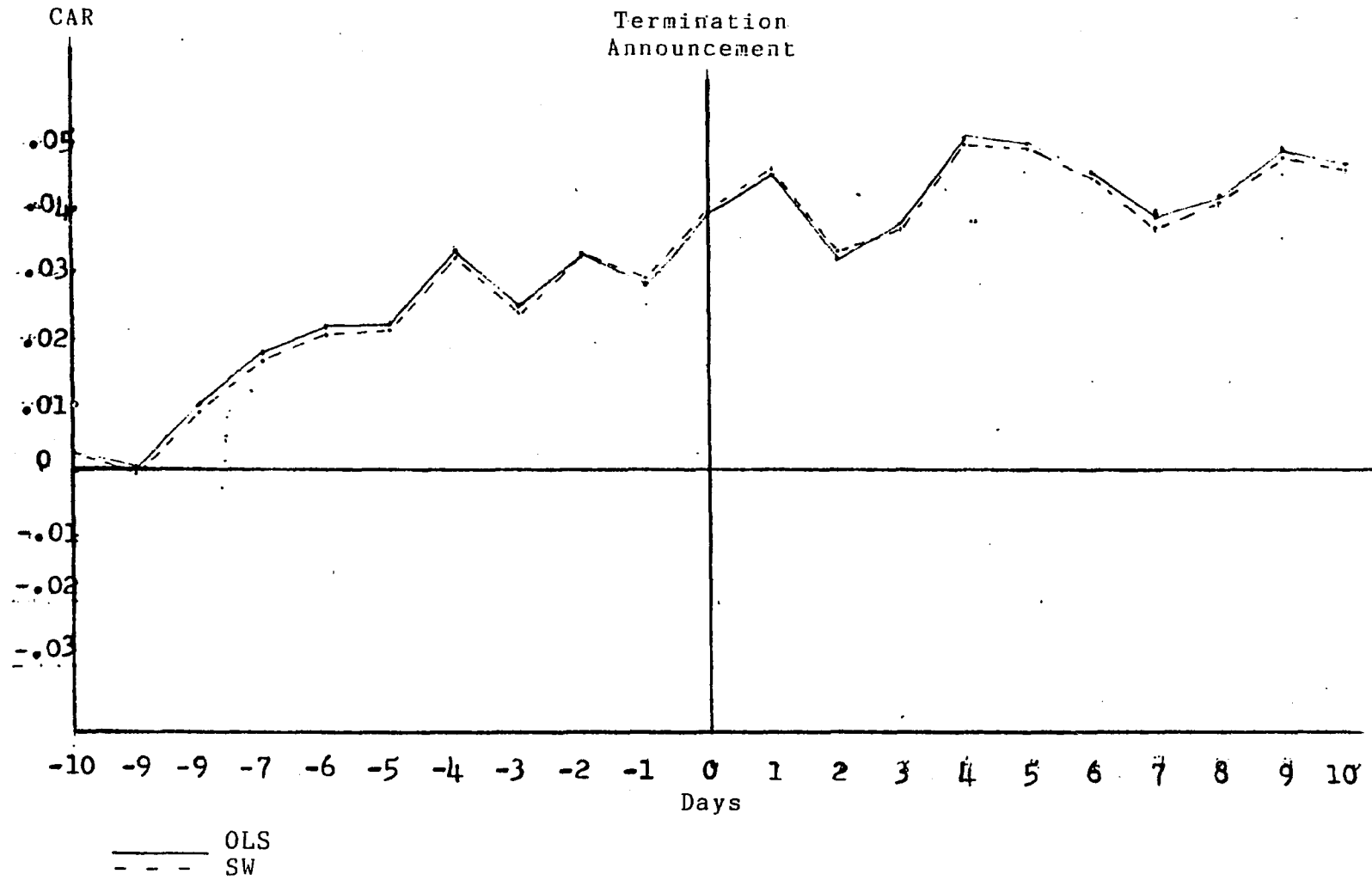


Figure 4: Cumulative Average Residuals of Firms Terminated Overfunded Plans



is 1.276 with 4 degrees of freedom. The null hypothesis of zero positive abnormal returns can be rejected at the .150 level of significance. For the two weeks around the event date (day -5 to day +5), the t-statistic is 1.698. This indicates that the null hypothesis can be rejected at the .09 level of significance. The period from day -2 to day +5 has a t-statistic of 1.235 with 7 degrees of freedom. This indicates that the performance of the portfolio during this period is statistically different from zero at the .14 level. The t-statistics for the periods from day -2 to day +2 and from day -2 to day +1 are .500 and 1.102 respectively with 7 degrees of freedom. These suggest that the null hypothesis of zero positive abnormal returns cannot be rejected at a reasonable significance level. The t-statistic for the event date, day 0, is 2.166, while it is 2.008 for day +4. These t-statistics are significant at the .03 and .04 levels respectively.

The results presented so far suggest that, on average, stock prices of firms that received excess assets as a result of terminating their overfunded pension plans experience positive abnormal returns around the date of termination announcement. The stock prices reaction appears to occur in day 0, while the period with the more significant market reaction is the five days before until 5 days after a firm files its intention to terminate

Table 11
Statistics of Significance Testing for
Likely Periods of Market Reactions

Period	CAR	t-statistic	Level of Significance
-5 to +10	.0242	1.276	.150
-5 to +5	.0267	1.698	.090
-5 to +1	.0180	1.435	.115
-2 to +5	.0236	1.235	.140
-2 tp +2	.0075	.500	.250
-2 tp +1	.0149	1.102	.160
day 0	.0138	2.166	.030
day 4	.0136	2.008	.040

overfunded plans with the PBGC.

High and Low Excess Assets Portfolios

The OLS estimation procedure was used to calculate AR and CAR for both low and high excess assets portfolios. Table 12 provides the results of AR and CAR of low and high excess assets portfolios. Figures 5 and 6 depict AR and CAR respectively of both portfolios. Note the close similarity in the pattern of the abnormal return of the low and high portfolios during the period day -10 to day -3. However, during the period immediately around the event date (day -2 to day +1), the AR of low excess assets portfolio turns upward on days -2 and 0 and downward on day -1, while the AR of high excess assets portfolio increases on days -2, 0, and 1. In addition, while the positive abnormal returns of low excess assets portfolio during the period day -2 to day +1 are not particularly large relative to those of the period before day -2, the positive abnormal returns of high excess assets portfolio are large relative to those of the period before day -2. Overall, the abnormal performance of high excess assets portfolio is 2.47 percent during the period day -2 to day +1, while that of low excess assets portfolio is .51 percent during the same period. Over the entire period (21 days), the high excess assets portfolio earns abnormal returns of 4.78 percent while the low excess portfolio

Table 12
Residual Returns of High and Low
Excess Assets Portfolios*

DAY	High Excess Assets		Low Excess Assets	
	AR	CAR	AR	CAR
-10	-.0032	-.0032	.0086	.0086
-9	-.0060	-.0092	.0008	.0094
-8	.0152	.0060	.0046	.0140
-7	.0066	.0126	.0078	.0218
-6	.0075	.0201	.0017	.0235
-5	.0014	.0215	-.0010	.0225
-4	.0076	.0291	.0158	.0383
-3	-.0057	.0234	-.0119	.0264
-2	.0059	.0293	.0001	.0263
-1	-.0030	.0263	-.0050	.0213
0	.0181	.0444	.0095	.0308
1	.0037	.0481	.0007	.0315
2	-.0092	.0389	-.0056	.0259
3	.0002	.0391	.0094	.0353
4	.0273	.0664	-.0001	.0352
5	.0028	.0692	-.0074	.0278
6	-.0053	.0639	-.0103	.0175
7	-.0119	.0520	.0071	.0246
8	.0027	.0547	.0027	.0273
9	-.0039	.0508	.0177	.0450
10	-.0030	.0478	-.0008	.0442

*Appendix D provides a list of firms in each portfolio.

Figure 5: Average Residuals of High and Low Excess Assets Portfolios

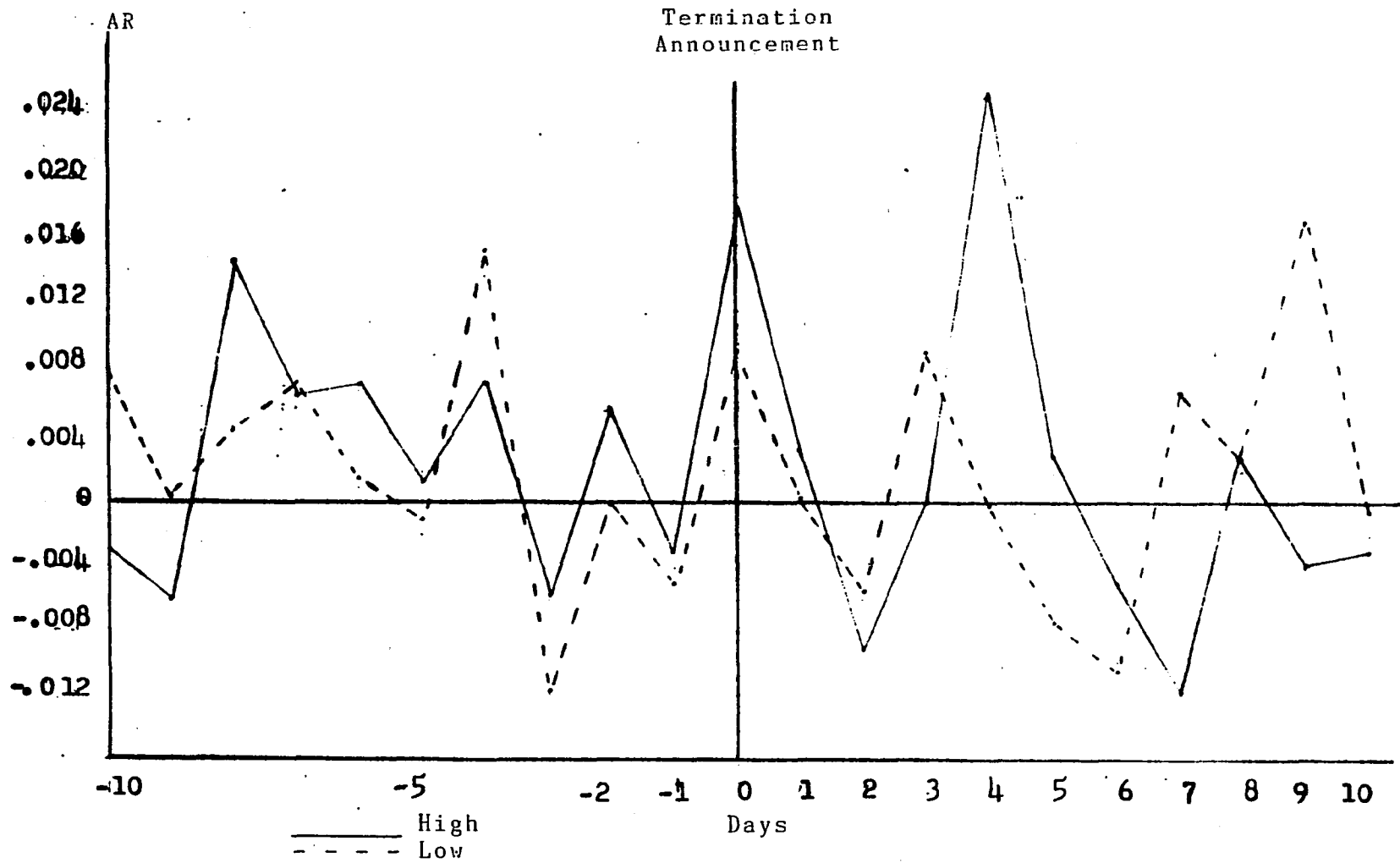
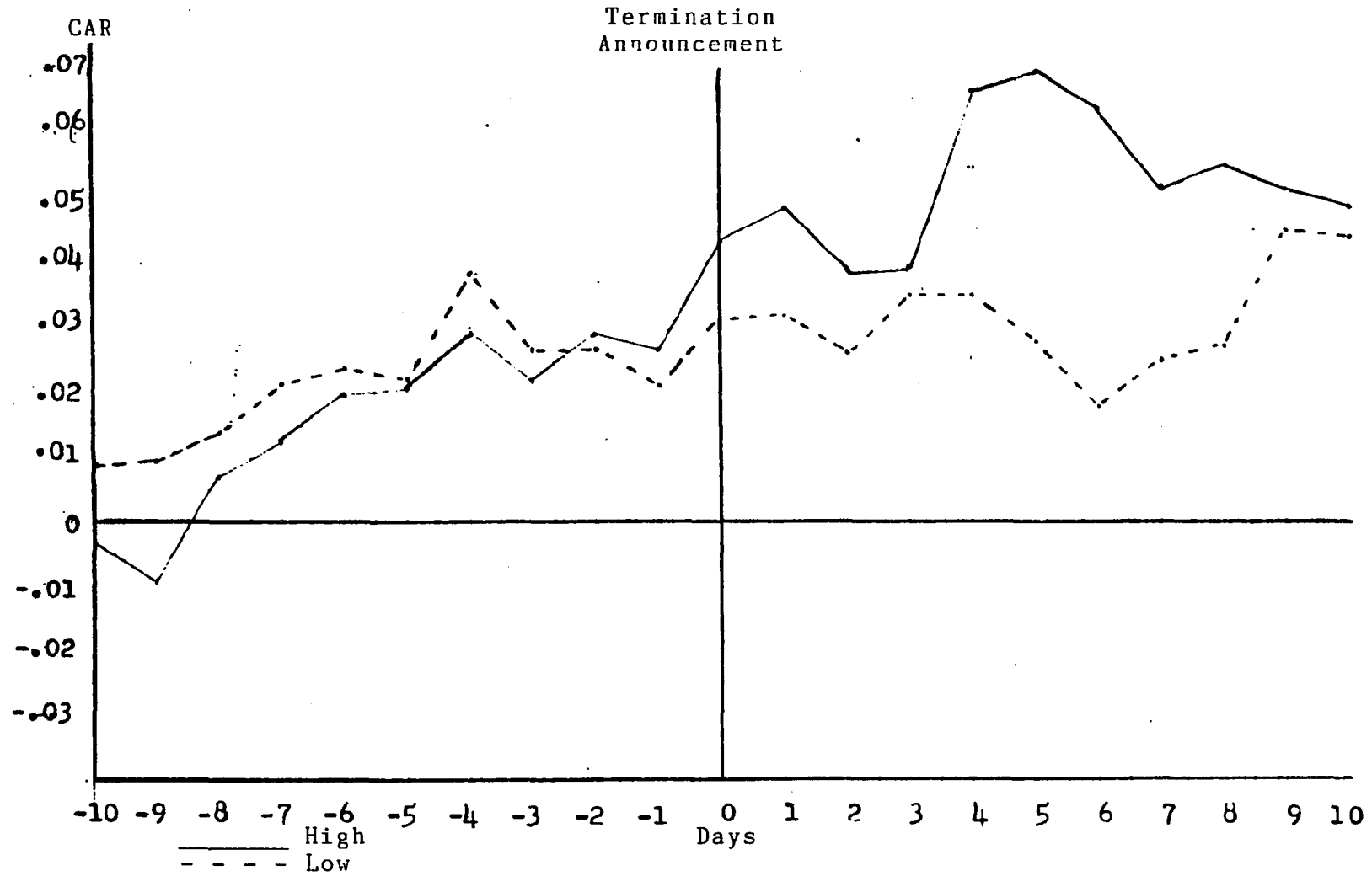


Figure 6: Cumulative Average Residuals of High and Low Excess Assets Portfolios



earns 4.42 percent.

The t test was performed to test the significance of abnormal returns of low and high excess assets portfolios in different periods around the event date. The results of this test are presented in Table 13. As shown in Table 13, except for period day -5 to day +10 and day 0, the t-statistics for the low excess assets portfolio in all periods tested suggest that the null hypothesis of zero positive abnormal performance cannot be rejected at any reasonable significance level. On the other hand, the t-statistics for high excess assets portfolio are 2.131, 1.625, 1.654, 2.58 for the periods day -2 to day +5, day -2 to day +1, day -5 to day +5 and the event day, 0, respectively. These t values are significant at the .04, .07, .09 and .02 levels respectively. These results suggest that stock prices of high excess assets portfolio react to the termination of pension plans in short periods immediately surrounding the event date. These results are consistent with the contention that low and high excess assets portfolios experience different market reactions to the termination of overfunded pension plans.

In sum, the results presented in this study provide evidence that suggests that the termination of overfunded plans has a significant impact on the stock prices of firms terminating their plans with the most significant impact occurring in the short period surrounding the date of termination announcement.

Table 13
 Statistics of the Test of Significance of the
 High and Low Excess Assets Portfolios*

Period	High Excess Assets			Low Excess Assets		
	CAR	t- statistic	sig- nificance	CAR	t- statistic	sig- nificance
-5 to +10	.0277	.806	.23	.0207	1.295	.14
-5 to +5	.0471	1.654	.09	.0040	.302	*
-5 to +1	.280	1.233	.15	.0080	.756	.25
-2 to +5	.0458	2.131	.04	.0014	.061	*
-2 to +2	.0157	.934	.18	-.0001	*	*
-2 to +1	.0247	1.625	.07	.0051	.315	*
day 0	.0181	2.582	.02	.0095	1.243	.13

*Significant at more than the .25 level.

CHAPTER V

FOOTNOTES

1. Holthausen (1981) argues that the use of very small period is most likely to capture the effects of the event provided that the event is unanticipated and not leaked.
2. The ordinary least square unbiased and consistent estimators are as follows:

$$a_i = \frac{1}{T-2} \sum_{t=2}^{T-1} r_{it}^s - B^* \frac{1}{T-2} \sum_{t=2}^{T-1} r_{mt}^s$$

where the subscript s denotes the observed rate of return; and

$$B_i^* = (B_i^- + B_i + B_i^+) / (1 + 2\hat{\rho}_m)$$

where B_i , B_i^- , and B_i^+ are the ordinary least squares estimators obtained by regressing r_{it} on $r_{m,t-1}$, r_{mt} and $r_{m,t+1}$ respectively, and $\hat{\rho}_m$ is the autocorrelation coefficient for the market index.

3. Day 0 is defined as the event date, the date on which a firm files a notice of intent to terminate its overfunded pension plan with the PBGC.
4. See Berenson and Levine (1983) for detailed discussions about this test.

CHAPTER VI
SUMMARY AND CONCLUSIONS

The major objective of the study is to develop and test motivating factors which can predict or explain the management decisions to terminate versus not terminate the firm's overfunded defined benefit pension plans. The study also examines the stock prices reaction to the termination of overfunded pension plans around the termination announcement date.

Following arguments developed by Watts and Zimmerman (1978) and others, the decision to terminate overfunded plans may be attributable to: (a) the existence of management compensation plans tied to reported earnings, (b) proximity of debt/equity ratio to debt covenant restrictions, (c) firm size, (d) type of employees covered by the pension plan, (e) liquidity position, (f) type of firm's ownership control, and (g) the existence of a tax-loss carryforwards.

The application of the sample selection criteria resulted in a final sample of 40 firms that terminated their overfunded pension plans and received reversion of excess assets. Each of these firms was matched with a firm that did not terminate its overfunded plan's in the

same four-digit industry code. Another sample of firms that did not terminate their overfunded plans and did not provide for industry matching was also used.

Both univariate and multivariate statistical procedures were employed to assess the statistical significance of the hypothesized relationships between the motivating factors (the independent variables) and the decision to terminate overfunded plans (the dependent variable). The results of the univariate and the multivariate tests are almost identical and support the proposed relationships between the motivating factors and the decision to terminate overfunded plans. The existence of management compensation plans tied with reported earnings, leverage, the type of employees covered by the pension plan, the percentage of shares owned by managers and the existence of a tax-loss carryforwards are positively associated with the choice to terminate overfunded plans. Size and liquidity position, on the other hand, are negatively associated with such a choice. In general, the results are consistent with the findings of previous studies.

In examining the stock prices reaction to the termination of overfunded plans, the sample selection criteria admitted 22 firms in the sample. Unexpected (abnormal) returns of these firms were examined during the 20 days around the day on which firms filed their

intention to terminate their overfunded plans with the PBGC (the event date). The results suggest that the termination of overfunded plans has an impact on the stock prices of firms terminating their plans. Significant market reaction is found on day 0 and during the period from day +5 to day +5.

In addition, based on the ratio of a firm's excess assets resulting from plan termination to its total assets, firms were partitioned into two equal portfolios, high and low excess assets portfolios. Abnormal performance were examined for both portfolios during the same test period. The results show evidence of differential market responses to the termination of overfunded plans between both portfolios.

Future research should replicate this study on an industry by industry basis. Because of their distinct characteristics, certain industries may have different motivations for terminating their overfunded plans. In addition, an interesting extension to this study would be to examine the explanatory power of the variables discussed in hypotheses 1 to 7 on the stock returns using a multiple regression technique. The dependent variable in this model would be the average daily abnormal returns for the period surrounding the termination announcement date. The independent variables would be the motivating factors discussed above.

APPENDIX A

THE EXPERIMENTAL AND THE MATCHED SAMPLE FIRMS

No.	SIC Code	Name	
		Experimental	Matched
1	2033	A & P Corp.	Safeway Corp.
2	2037	United Foods, Inc.	Dart & Kraft Co.
3	2087	Ingredient Technology Corp	The Coca Cola Co.
4	2211	Dan River, Inc.	Cannon Mills Corp.
5	2211	Graniteville Co.	West Point Pepperell Corp.
6	2335	Bobbie Brooks, Inc.	Jonathan Logan, Inc.
7	2452	Butler Manufacturing Co.	hoover Universal, Inc.
8	2631	Mead Corporation	Weyerheuser Co.
9	2731	Harper & Row Publishers	CBS, Inc.
10	2865	Crompton & Knowles Corp.	Pfizer, Inc.
11	2869	GAF Corp.	American Cyanamid Co.
12	2874	Beker Industries, Inc.	W. R. Grace & Co.
13	2911	Cities Service Co.	American Petrofina, Inc.
14	2911	Commonwealth Oil Ref. Co.	Canadian Occidental
15	2911	Occidental Petroleum Corp.	Atlantic Richfield Corp.
16	2911	OKC Corp.	Quaker State Oil Co.
17	3312	Chemetron Corp.	Ball Corp.
18	3351	Triangle Industries, Inc.	Handy & Harman Corp.
19	3357	Whitaker Cable Corp.	Carlisle Corp.
20	3531	CMI Corp. & Subs.	PMC Corporation
21	3585	Fedders Corp.	Masco Corp.
22	3621	Emerson Electric Co.	Thiocol Corp.
23	3633	Whirlpool Corp.	The Singer Co.
24	3634	Scoville, Inc.	Fieldcrest Mills, Inc.
25	3651	Superscope, Inc.	Zenith Radio Corp
26	3714	Questor Corporation	TRW, Inc.
27	3714	Sheller Globe Corp.	Bandag, Inc.
28	3843	Dentsplay Intl., Inc.	Pennwalt Corp.
29	3911	Swank, Inc.	Carnation Co.
30	3944	Mattel, Inc.	Milton Bradley Co.
31	3995	Boyertown Casket, Inc.	AMF Corp.
32	4213	Mid-American Lines, Inc.	Overnight Transportation
33	4411	Gotass-Larsen, Ltd.	Ogden Corp.
34	4511	Continental Air Lines	Frontier Air Lines, Inc.
35	4511	Texas Intl. air Lines	Ozark Air Lines
36	4511	Western Air Lines, Inc.	American Air Lines
37	5082	AM International, Inc.	Itel Corp.
38	5812	Gino's, Inc.	Pepsico, Inc.
39	5621	Charming Shoppes, Inc.	K-Mart Corp.
40	7379	Booth Financial Corp.	Enterra Corp

APPENDIX B

THE SECOND COMPARISON SAMPLE

No.	Name	No.	Name
1	Akzona Corp.	2	Campbell Taggart Co.
3	CTS Corp.	4	DeSoto, Inc.
5	Dravo Corp.	6	Figgie Intl. Corp.
7	Genetal Dynamic Corp.	8	General electric Co.
9	Gillette Co.	10	Harcourt Brace Jovan Corp.
11	Heck's Corp.	12	Hughes Tools Co.
13	IBM Corp.	14	Interlakce, Inc.
15	Interpace Corporated	16	Itek Corp.
17	Leasway Transportation	18	Levitz Furniture, Inc.
19	Malco Chemical Corp.	20	Marshall Field & Co.
21	McGraw-Hill, Inc.	22	Mohaso Corp.
23	Ocean Drilling Corp.	24	Pittway Corp.
25	Poxboto Corp.	26	PSA. Inc.
27	Sabine Co.	28	St. Regis Paper Co.
29	Shall Oil Co.	30	Stauffer Chemical Co.
31	Stone Containers Co.	32	Sun Co.
33	Sybron corp.	34	Texas Instruments
35	Times Merror Co.	36	U A L Corp.
37	UMC Industries	38	Union Pacific Corp.
39	VF Corp.	40	Williams Co.

APPENDIX C
THE SYSTEMATIC RISK OF FIRMS THAT TERMINATED
OVERFUNDED PENSION PLANS

No.	Name	Announcement Date	Systematic Risk (Beta)	
			OLS	SW
1	AMAX, Inc.	8/19/83	1.611	1.397
2	Beker Inds. Corp.	7/31/83	.952	1.046
3	Beneficial Corp.	10/01/83	.671	.963
4	Crompron & Knowles	12/25/82	.584	.916
5	Dentsplay Intl. Inc.	6/01/82	.653	.470
6	Emerson Electric Co.	3/31/81	.757	.834
7	Fedders Corp.	2/28/81	1.245	.927
8	G A F Corp.	12/31/82	1.341	1.248
9	Graniteville Co.	5/06/83	.191	.094
10	Humana, Inc.	12/31/82	1.374	1.489
11	Ingredient Tech. Co.	9/06/83	.634	.568
12	Occidental Pete Corp.	6/10/83	.890	.789
13	Reynolds Metals Co.	8/22/83	.919	1.279
14	Scoville, Inc.	4/30/83	.462	.795
15	Sheller Globe Corp.	5/12/81	.506	.802
16	Superscope, Inc.	10/28/82	.940	1.105
17	Swank, Inc.	11/30/82	.545	.623
18	Triangle Inds., Inc.	12/17/81	.402	.464
19	United Nuclear Corp.	6/30/83	.658	.816
20	Western Air Lines	4/29/82	1.650	1.611
21	Whirlpool Corp.	12/30/82	.937	1.138
22	Whitaker Cable Corp.	11/30/80	.340	.257

APPENDIX D

HIGH AND LOW EXCESS ASSETS PORTFOLIOS

No.	High Excess Assets Portfolio	Low Excess Assets Portfolio
1	AMAX. Inc.	Beker Industries, Inc.
2	Dentsplay International, Inc.	Beneficial Corp.
3	Fedders Corp.	Crompton & Knowles Corp.
4	G A F Corp.	Emerson Electric Corp.
5	Graniteville Co.	Occidental Pete. Corp.
6	Humana, Inc.	Scoville, Inc.
7	Ingredient Technology Corp.	Sheller Globe Corp.
8	Reynolds Metals Co.	Triangle Industries, Inc.
9	Superscope, Inc.	United Nuclear Corp.
10	Swank, Inc.	Western Air Lines, Inc.
11	Whitaker Cable Corp.	Whirlpool Corp.

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