THE IMPACT OF THE 1986 AND 1987 QUALIFIED PLAN

REGULATION ON FIRMS' DECISION TO SWITCH FROM

DEFINED BENEFIT TO DEFINED CONTRIBUTION

FOR PLANS LARGER THAN 100 PARTICIPANTS

DISSERTATION

Presented to the Graduate Council of the

University of North Texas in Partial

Fulfillment of the Requirements

For the Degree of

DOCTOR OF PHILOSOPHY

By

Linda Jacobsen Bradley, B.S., M.S., CPA

Denton, Texas

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Prior research has documented the trend since 1974 away
from defined-benefit plans toward defined-contribution plans
as the primary vehicle for employees' retirement income
security. No published research has examined the specific
impact of the four major legislative acts passed during 1986
and 1987 on this trend. The purpose of this research was to
examine the United States population of plans with over 100
participants to determine the extent of the reaction away
from defined benefit plans resulting from the 1986 and 1987
legislation.

This research organized the Internal Revenue Service
form 5500 records into a time-series panel-data format
covering the years 1984 through 1989 for each unique
Employer Identification Number. The LIMDEP statistical
computer package was used to formulate a pooled time-series,
intervention-type, random-effects model. A separate
multinomial logit regression on the population of defined-

benefit plans existing in 1984 and 1985 predicted the probability of plan termination by 1990.

Prior research on the population of plans was achieved by performing cross-sectional regressions on selected years with explanatory variables including size of firm, one-digit SIC industry code, and union status. The present study is the first research of which the author is aware that examined the issue using a time-series approach tracking a specific firm through time. For the logit regression, additional variables unique to a plan (top heavy, integrated, maximum over/under funding, existence of a funding waiver request, change in retirement age) were examined.

Results indicated a decrease in defined-benefit (DB) coverage for 1986 and 1987 greater than expected, given the pre-existing downward trend. Size was positively correlated with the existence of a defined-benefit plan when addressing the entire population of firms reporting for any qualified plan. Surprisingly, size had minimal DB-plan-continuation prediction ability for firms with a pre-existing defined-benefit plan. Union existence and plan integration with Social Security appeared to exert a strong influence against DB plan termination.

TABLE OF CONTENTS

LIST OF TABLES

CHAPTER I

INTRODUCTION TO THE STUDY

Public Policy Issues

The decade of the 1980's witnessed an abundance of
Internal Revenue Code changes in areas relating to qualified
retirement plans. In particular, the years 1986 and 1987
contained numerous amendments to the law governing qualified
plans. In 1986 three Acts were passed that impacted
qualified plans: the Single Employer Pension Plan
Amendments Act of 1986, the Tax Reform Act of 1986, and the
Age Discrimination in Employment Act of 1986. The Omnibus
Budget Reconciliation Act of 1987 followed closely, imposing
a restrictive full funding limitation on defined-benefit
plans.

A critical public policy issue relates to the effect of
legislation on firms' choices concerning type of qualified
retirement plan(s) to sponsor and level of funding of these
plan(s). For over fifty years, the federal government has
sought to encourage the establishment of pension plans
through tax incentives. At the same time, public policy has
been directed toward ensuring that plans are financially
sound and equitable. A major concern is that legislation

intended to make the system more equitable is unintentionally impeding pension growth.

Prior research suggests that the level of funding for existing defined-benefit plans is sensitive to tax incentives (Thomas, 1989). Other research posits that legislation from 1974 through 1985 may have changed the types of plans provided (Clark and McDermed, 1990). Because employers must balance the costs of maintaining a qualified plan against the benefits, the increasing costs resulting from frequent changes in governmental regulations may have altered the plan choice and plan funding decisions.

The fundamental question of interest in this research is: "What impact did the 1986 and 1987 legislations have on firms' decisions regarding qualified plan offerings?" The information obtained should be useful in the public policy debate concerning the issue of distinguishing functional from dysfunctional legislation as it relates to maintaining and expanding the private sector pension system.

Qualified plan terminations are significant due to their resulting impact on future retirement security. Retirement income derives from three sources: Social Security, individual savings, and employer-sponsored pensions. Despite the 1983 legislative "rescue" of the Social Security trust fund, the post-World War II baby boom and subsequent birth patterns coupled with increasing life expectancy of the elderly portend a serious Social Security

funding predicament commencing around the year 2010 and lasting for several decades (Boskin, 1986).

Americans are inadequate savers outside of their pension plans, as evidenced by the fact that the total increase in real (inflation adjusted) US pension assets in the 1980s exceeded the total real increase in the country's wealth. The assets in pension plans in essence provided for all of the decade's national savings (Thornburg, 1992). The average savings rate in the early 1970s was approximately 8%. By the late 1980s it was down to about 4% (Woolsey, 1990).

The current elderly appear to be as well off as the non-elderly in that the poverty rate of the elderly is lower than that of the non-elderly (Andrews and Hurd, 1992, p. 6). The current elderly have not been particularly vulnerable to inflation primarily because of Social Security (Schieber, 1992, p. 34). However, when the baby boom generation retires, their relative income position vis-a-vis other generations and their relative consumption position vis-a-vis their consumption when young and middle-aged may be much different than in the case of current retirees (Kotlikoff, 1992, p. 32).

Taxation of plan benefits and public policy with regard to retirement plans is an issue currently under discussion in the United States. The persistent and increasing federal budget deficits were the major driving force of public

policy in the last half of the decade of the 1980's
(Rappaport and Zeisler, 1992). In essence, Federal revenue
needs have driven retirement income policy, leading to
cutbacks in important tax benefits (Chernoff, 1989).
Proposals were considered in early 1990 to tax short-term
capital gains inside pension plans. Controlling the federal
deficit will require either reduced spending, higher taxes,
or the further limiting of tax preferences. The major tax
preferences currently in force are pensions, other employee
benefits, and home mortgage deductions. The taxation of
pension benefits will inevitably be a target for deficit
reduction in the years ahead.

Economists hold divergent opinions concerning whether
pension funds fuel savings. Munnell and Yohn (1992, p. 133)
argued that individuals tend to reduce their own savings in
response to anticipated benefits, although somewhat less
than dollar for dollar. The U.S. Treasury estimated that
income tax receipts would have been $51 billion greater in
1992 without the special provisions for employer-sponsored
pension plans (Smalhout, 1993, p. A18).

Tax preferences are more valuable to higher-income
taxpayers, and there exists a concern that pension
preferences are being hoarded by a select few for whom the
advantages are most valuable (Lindeman and Utgoff, 1992, p.
184). Munnell contended that pension funds' tax-exempt
status was not buying benefits for the broad populace and

that dissaving at the federal level would decrease without it (Durgin, 1991, p.57).

Both chambers of Congress were concerned about the equity of qualified plan tax provisions when drafting the 1986 Tax Reform Act. The House Ways and Means Committee Report preceding the 1986 Tax Reform Act stated that "...A basic reason for extending significant tax incentives to qualified plans is the delivery of comparable benefits to rank-and-file employees who may not otherwise save for retirement (BNA, 1986, p. 216)." The Senate Finance Committee Report stated that "...The present-law nondiscrimination rules permit greater tax-favored contributions by or on behalf of highly compensated employees without comparable participation by rank-and-file employees (BNA, 1986, p. 503)."

Predicted Effects of the 1986 and 1987 Legislation

McGinn (1987) contended that the Tax Reform Act of 1986 was the beginning of a formal national retirement policy aimed at encouraging defined-benefit plans and discouraging defined-contribution plans. Paustian (1986) predicted that after the Tax Reform Act of 1986, defined-benefit pensions would continue to be the primary retirement vehicle used by corporations. Daniel Walker, Assistant Secretary of Labor, Pension, and Welfare Benefits Administration, predicted that due to the Tax Reform Act of 1986, more new defined-benefit than defined-contribution plans would be started, the

average benefit level would decrease, and overall coverage would broaden (Anonymous, Employee Benefit Plan Review, 1987).

The General Explanation of the Tax Reform Act of 1986, provided by the Joint Conference Committee on Taxation, (CCH, 1987, p. 732) stated that

> Congress concluded that prior law unduly favored defined-contribution plans even though defined-benefit plans can provide better overall retirement income security. Congress believed the relationship between [DB and DC] limits should be adjusted more favorably toward defined-benefit plans because (1) those plans can provide a level of benefits that can be predicted by participants long before retirement, (2) the participants in defined-benefit plans can be better protected against investment loss, and (3) the plans can provide better protection against inflation...the change [resulting from the 1986 Tax Act]...was intended to increase the attractiveness of defined-benefit plans.

Assuming that encouraging defined-benefit plans was Congress's primary intent in the Tax Reform Act of 1986, the unintended result may instead be the demise of a segment of defined-benefit plans. In addition, the 1987 full funding limitation can be construed as a direct contradiction of the position favoring defined-benefit plans.

Many benefits observers call for a national retirement income board to establish national retirement income policy so that legislation can adhere to some sort of a unifying framework. An integrated retirement policy is perceived as preferable to fragmented change tied to each annual tax bill (Rappaport, 1992). Steuerle (1992) noted that one failure

of the 1986 tax reform effort was that pension policy was
never examined in a comprehensive way. He confirmed that
tax policy since World War II has been used increasingly as
a short-term economic tool. The overemphasis of this aspect
of tax policy has prevented policymakers from dealing with
longer-run issues.

Purpose of the Study

This research was exploratory and sought to determine
the extent of the broad-based reaction to the 1986 and 1987
tax law changes. Information about the results of recent
law changes could assist policymakers in evaluating new
legislation.

Only plans with more than 100 participants were
examined, using the Form 5500 annual information documents
filed with the Internal Revenue Service and the Department
of Labor for the years 1984 to 1990. Approximately the
entire population of reporting employers was included on the
machine-readable tapes purchased from the Pension Benefit
Guaranty Corporation. Plans with under 100 participants
generally filed forms 5500C, 5500R, and 5500EZ and were thus
not on the 5500 tape series. The forms for these smaller
plans were not examined, although it is likely that the
impact of the legislation under investigation was much
stronger for these under-100-participant plans. The few
under-100-participant plans that filed 5500's (and were
therefore included on the 5500 tapes) were deleted as an

inadequate representation of their underlying population. This practice is also in conformity with existing research.

Prior research either examined only Compustat firms or performed cross-sectional regressions on the population of pension plans without attempting a time series study. This research extended Compustat-sample research by including non-publicly traded firms and examining the reaction differences between these firms and those with a Cusip designation (e.g., publicly traded). This study inspected specific attributes of individual plans to determine their impact on the resultant plan-termination decisions.

This research used stronger statistical methodologies than prior population research by organizing the firms into time-series panel data, examining expanded and refined explanatory variables, and employing a percentage of defined-benefit-covered employees as a dependent variable rather than the 0,1 (no DB plan, DB plan) dichotomous variable. Use of the percentile as the dependent variable reflected the assumption that some firms maintained a defined-benefit plan for only a subset of their otherwise-eligible employees. The analysis of the effect of legislative changes was extended through 1989, whereas existing population research examined years ending with 1987.

Research Strategy

First, ordinary least squares and panel data regressions were examined to estimate the change in defined-benefit plan participation across the time period 1984-1989. Control variables reflected and extended prior research. Second, results using a post-86 dummy variable were compared to results using individual year dummies to estimate whether the observed change was a smooth time trend or an abrupt and contained event. Third, cross-tabulation analysis was used to highlight the differing behavior of major subpopulations within the general population of firms during this time period. Fourth, Multinomial LOGIT regressions were used to estimate the significance of selected distinguishing characteristics as contributing factors to the termination of defined-benefit plans.

This research approach yielded interesting results. It confirmed the documented pre-existing downward trend in the prevalence of defined-benefit plans relative to defined-contribution plans during the period 1984 to 1989. However, it showed a decrease in defined-benefit coverage for 1986 and 1987 greater than that expected, given the pre-existing downward trend.

As suggested by prior research, size was strongly positively correlated with the existence of a defined-benefit plan when addressing the entire population of firms reporting for a qualified plan. However, for the subset of

the general population made up of those firms already offering a defined-benefit plan, size appeared to have significantly less explanatory ability when addressing the decision to terminate or expand an existing defined-benefit plan.

The significance of the presence of a union was also confirmed and quantified in this study. The previous research incorporating union status into the model (Ippolito, 1990, Gustman and Steinmeier, 1992) also affirmed the importance of union influence. The present research was the first study to examine the subpopulation consisting of pre-existing defined-benefit plans, and results indicated that union existence also exerted a strong influence on the termination decision for firms already offering a defined-benefit plan.

The present research was the first study to incorporate the issues of publicly held firm ownership and the presence of the integration option in the defined-benefit plan agreement. An integrated plan takes a portion of the employee's social security benefits into account in calculating the plan benefits, thereby reducing the required contribution. The defined-benefit plans that integrate plan benefits with social security benefits appeared to be significantly more likely to be maintained than were plans that did not consider social security benefits in calculating the contributions required to attain the plan's

stated benefits. The issue of publicly held ownership evidently exerted a much weaker influence than did integration upon the defined-benefit plan termination decision.

CHAPTER II

LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Explanation of Plan Types

The two principal types of vehicles for delivering cash
pension benefits in the United States are the defined-
benefit plan and the defined-contribution plan. Both types
offer tax deductible contributions and tax deferred
investment returns, with taxability passing to the
participant at the future date of receipt of the funds.

Defined-Benefit Plans

A defined-benefit plan is one in which the benefits are
established in advance by a formula, and employer
contributions are treated as the variable factor (McGill,
1989, p. 105). Defined-benefit formulas are generally
calculated on either a unit benefit or a flat benefit basis.
A unit benefit formula provides for an explicit unit of
benefit, usually a percentage of compensation (e.g., 1% of
final pay), to be credited for each year of recognized
service with the employer. A flat benefit plan provides,
after a minimum period of service, a specified percentage of
compensation at retirement that is unrelated to the years of
service rendered.

In a defined-benefit plan, the fund is a single pool of assets used to pay benefits to all participants, with no allocation of assets to individual participants. The plan sponsor bears the investment risk, and contributions are determined based on the aggregate amount needed to provide plan benefits. Plan benefits are usually paid as lifetime annuities.

Defined-Contribution Plans

In a defined-contribution plan, the plan document defines the yearly contribution to be credited to an individual account for the participant. The ultimate benefit is based solely on the amounts contributed to the participant's account and any expense, investment return, and forfeitures allocated thereto. The size of the ultimate benefit is the variable factor.

Defined-contribution plans can be classified as money purchase pension plans, profit sharing plans (including IRC Section 401(k) plans), or stock bonus plans. The fixed yearly contribution is required to be made in a money purchase pension plan, whereas the year-to-year contribution is discretionary for a profit sharing plan. The total contribution for profit sharing plans is limited to 15% of eligible compensation. Although the total money purchase contribution could be fixed at up to 25% of compensation, many money purchase pension plans are combined with profit sharing or stock bonus plans. A typical combination is a

maximum 15% (of eligible compensation) discretionary profit
sharing plan combined with an 8% (required contribution)
money purchase pension plan. The total contributions for
all combinations of defined-contribution plans cannot exceed
25% of eligible compensation.

Defined-Benefit/Defined-Contribution Comparisons

Generally, defined-benefit plans are the best choice
for companies that want to encourage career employment and
provide relatively high benefits to employees who retire
from active service while minimizing benefits to those who
leave with shorter service and at younger ages. Defined-
benefit plans are more efficient in delivering benefit
dollars per dollar of contribution because the assets are
usually invested to produce a higher yield than in defined-
contribution plans (Rappaport and Zeisler, 1992). A 1984
study found that retirement goals were satisfied more
efficiently by defined-benefit than by defined-contribution
plans in that they provided much greater benefit values
(McGinn, 1987).

The House Ways and Means Committee Report preceding the
1986 Tax Reform Act (BNA, 1986, p.229) stated that "...The
committee focused...also on the relative attractiveness of
defined-contribution and defined-benefit plans...and
concluded that defined-benefit pension plans provide better
overall retirement income security." Apparently, the House
of Representatives strongly favored defined-benefit plans.

The existence of a defined-benefit pension plan is likely to have an influence on employees' decisions about retirement and termination of employment. Defined-benefit plans often assist in the orderly transition between generations of employees. Firms in the process of restructuring offer early retirement "window" programs to help encourage early retirement during a limited period. At about mid-career, employees in companies with generous pension plans become much less likely to accept new employment than those without defined-benefit pension plans.

A primary disadvantage to the firm of maintaining a defined-benefit plan is that it involves a long-term commitment and subjects the employer to substantial financial risk. Defined-benefit plans are also difficult for the employees to understand and generally do not promote job satisfaction among younger employees. Recent law changes are making defined-benefit plans increasingly complex to administer, and the speed and magnitude of these legislative changes are creating a sense of continuing uncertainty and instability.

Conversely, a defined-contribution plan does not involve a long-term commitment and does not subject the employer to financial risk. Defined-contribution plans deliver higher benefits to employees terminating early, and thus make it more expensive to provide the same level of retirement benefits for those employees staying until

retirement. Winger (1991, p. 167) noted that although employees have a preference for participatory defined-contribution plans, care must be taken to separate what is a psychological preference of the modern employee for choice and autonomy in planning for the future and what is illusion in terms of hard economic facts which will have direct bearing on the employee's future income security.

For the participant, a defined-benefit plan is generally preferable if the employee stays with the firm until retirement and if the plan remains in force until the employee's retirement. If a participant terminates prior to early retirement, or the plan is prematurely terminated, a defined-contribution plan is generally preferable. Under a defined-contribution plan, it is difficult to provide adequate benefits to employees who join the firm relatively late in life. In a defined-benefit plan, contributions accrue slowly during a worker's early worklife and rise more than proportionately as retirement age approaches. This phenomenon is known as backloading, and is assumed to be a disincentive to job mobility.

A marked trend of firms switching from a defined-benefit plan as the primary plan to a defined-contribution primary plan has been documented (Chernoff, 1989, Bosworth and Burtless, 1992, Schieber, 1992, p. 35). A switch from a defined-benefit to a defined-contribution plan places all the risk (investment, inflation, inadequate funding)

inherent in planning for an employee's retirement solely upon the employee's shoulders.

Legislative History

Pre-ERISA

Industrial pensions appeared on the American scene during the last quarter of the nineteenth century, but only within the last fifty years have they assumed any significance in the old-age financial picture. In the beginning, private pension benefits were regarded as gratuities from a grateful employer in recognition of long and faithful service (McGill, 1989, p. 16). Another important consideration was the removal of superannuated employees from the payroll. Early pensions were funded on a pay-as-you-go basis.

As time went on, the granting of pensions gradually became a permanent part of employment policy. Management began to realize the desirability of making some advance provisions during the active service lives of employees for pensions to be paid after retirement (Steinberg and Danker, 1983, p. 4).

Tax-deferred status for pensions was first conferred by the Revenue Acts of 1921 and 1926. Contributions to a qualified pension plan (stock bonus, profit sharing, and defined-benefit trusts) were immediately deductible by an employer while the benefits were not taxable income to the employee until paid (Andrews, 1989, xxiii). These Internal

Revenue Code provisions gave considerable impetus to the formation of self-administered funded plans. As Scholes and Wolfson (1992, p. 4) noted, "...Any tax system designed to achieve a variety of social goals inevitably provides considerable private incentives to engage in tax planning."

The Revenue Act of 1942 provided that pensions had to cover a broad cross-section of employees rather than solely executives, plans could not discriminate in the benefits paid to or contributions made for officers, shareholders, or other highly compensated employees, and that plans had to be in writing, be permanent, and be communicated to employees. Although coverage was broadened, management and administration was not regulated (Coleman, 1985).

During and shortly after World War II the number of pensions began to increase rapidly for three reasons. First, wage and price controls prevented employers from increasing worker compensation, but not from providing fringe benefits such as pensions. Second, normal and excess profits taxes were extremely high, leading employers to look for tax deductions such as those provided by pension plan contributions. Third, unions held that pensions were a mandatory subject of collective bargaining.

The Steel Industry Fact Finding Board in 1949 recognized the human depreciation concept as a philosophical basis for funding and vesting (McGill, 1989, pp. 18-19). The human depreciation concept asserts that the cost of

maintaining a human machine both during and after an employee's working life should be a cost of production.

The Welfare and Pension Plans Disclosure Act of 1958 attempted to curb existing abuses, such as exorbitant fees and commissions, kickbacks, and excessively high administration costs. This was Congress's first attempt to regulate plan management and administration.

ERISA

When Studebaker stopped producing automobiles and closed its plants in 1963, over 4,000 workers with vested pension rights lost some or all of their pensions (Coleman, 1985). This influenced the first broad pension reform bill, introduced by Senator Jacob Javits in 1967. After seven years of congressional hearings and legislative action, the Employee Retirement and Income Security Act (ERISA) became law on September 2 (Labor Day), 1974.

Included in ERISA were participation and vesting standards, fiduciary and funding requirements, strengthened reporting and disclosure rules, and insurance against benefit losses arising from private defined-benefit pension plan terminations. In essence, the law is designed to increase the probability that a promised pension is actually received by pension plan participants upon retirement.

ERISA created the Pension Benefit Guaranty Corporation (PBGC), a federal insurance program under which workers would be paid their benefits even if the funding levels in

the plan were insufficient to pay benefits and the firm was unable to make up the difference. The price of the insurance was initially set at $1.00 per participant per year (Ippolito, 1989, p. 3). McGill (1970) warned of the moral hazard problem involved with federal guarantee programs and suggested stricter funding standards, lower benefit guarantees, and tougher standards to qualify for insurance coverage. One explanation for ERISA's apparent naiveté is that, under pressure from corporations and their unions, a deliberate attempt was made to effect transfers to workers and shareholders in troubled firms by creating a generous insurance contract that was not priced in relation to risk and exposure (Yoder, 1992, p. 36A).

Post-ERISA

The rate of legislative change accelerated markedly during the decade 1981-1990, which enclosed ten acts revising the opportunity set regarding pension administration: the Tax Equity and Fiscal Responsibility Act of 1982 (TEFRA), the Deficit Reduction Act of 1984 (DEFRA), the Retirement Equity Act of 1984 (REA), the Single Employer Pension Plan Amendments Act of 1986 (SEPPAA), the Tax Reform Act of 1986 (TRA), the Age Discrimination in Employment Act of 1986 (ADEA), the Omnibus Revenue Reconciliation Act of 1987 (OBRA 87), the Technical and Miscellaneous Revenue Act of 1988 (TAMRA), the Omnibus Budget Reconciliation Act of 1989 (OBRA '89), and the

Revenue Reconciliation Act of 1990 (RRA). A public policy
concern is that because Congress has dealt with pension
issues on a piecemeal basis, the result is unmanageable
complexity for plan providers and a mind-set of being "under
siege" from government regulations.

Highlights of Legislation from 1975 to 1985

TEFRA '82 substantially reduced the maximum limits on
benefit and contribution accruals. The maximum defined-
benefit dollar limit was reduced from $136,425 to $90,000,
payable at age sixty-two. The defined-contribution limit
was reduced from $45,475 to $30,000. The aggregate limit
for participants covered under both a defined-benefit and a
defined-contribution plan was also reduced. TEFRA
introduced restraints on specific targeted plans it
classified as top-heavy. A top-heavy plan
disproportionately benefitted the officers and highly
compensated employees of the sponsoring firm. Top heavy
rules subjected these plans to special minimum benefit and
minimum vesting rules. Top heavy plans were defined as
those for which the present value of accrued benefits (for a
defined-benefit plan) or the account balance (for a defined-
contribution plan) allocated to top-heavy participants
exceeded 60% of the present value of the plan's total
accrued benefits or account balances.

TEFRA also reduced the allowable integration spread,
restricted loans from participants, and instituted minimum

distribution requirements. An integrated plan was one that provided a proportionately higher benefit to highly compensated participants, on the premise that it was an extension of the Social Security program. Leased employees were treated as employees of the employer and cost of living increases could no longer be taken into account until 1986 in determining the maximum deductible contribution.

A significant contribution of TEFRA was that it placed partnerships and self-employed businesses on an equal footing with corporations by making contributions and benefit limits the same for all pension plans (Andrews, 1989, p. 115). This eliminated incentives for professional practices to incorporate their businesses solely to maximize pension contributions.

DEFRA '84 extended the freeze on cost of living increases to 1988 and amended key provisions of TEFRA. The minimum distribution rules were slightly eased, and the definition of top heavy key employee was modified to exclude officers who earned less than 150% of the defined-contribution limit.

REA '84 extended the pension rights traditionally awarded to women. The minimum participation age was lowered from age twenty-five to age twenty-one, years of service after age eighteen were required to be counted for vesting, and break-in-service rules generally allowed an employee to return to employment after a less than five year break

without starting over in accruing pension benefits.
Employees were required to obtain their spouse's permission
in order to waive joint-and-survivor defined-benefit annuity
benefits, and Qualified Domestic Relations Orders enabled
divorced spouses to obtain payment of benefits.

Highlights of 1986 and 1987 Legislation

SEPPAA '86 raised the PBGC premium from $2.60 per
participant to $8.50 per participant. This greatly
increased the relative administrative costs of defined-
benefit plans, because only defined-benefit plans have been
required to purchase federal Pension Benefit Guaranty
Corporation insurance.

SEPPAA resulted from Allis-Chalmers and Wheeling-
Pittsburg Steel Corporation terminating defined-benefit
plans in 1985 with unfunded liabilities of over $400 million
(Ippolito, 1989, p.215.). Before SEPPAA, employers could
terminate their plans at will, regardless of the financial
position of the firm or the plan. After SEPPAA, two types
of voluntary terminations were recognized. Plans could
terminate voluntarily through a standard termination if
their assets could meet their benefit commitments. Other
voluntary terminations were permitted only as distress
terminations contingent upon a determination acknowledgement
from the PBGC. Distress terminations required the plan
administrator to show, using specific criteria, that the
firm was financially unable to continue the plan. The

conditions of employer liability were changed to require the employer to continue payments to the PBGC even after plan termination (Andrews, 1989, pp. 118-119).

The Tax Reform Act of 1986 lowered income tax rates, broadened the base of taxation, and made sweeping changes in qualified plan provisions. The minimum coverage tests (IRC Section 410(b)) revised non-discrimination testing requirements, adding the ratio and average benefits tests. The new IRC Section 414(q) definition of highly compensated employees added to the complexity of non-discrimination testing. IRC Section 401(a)(26) required each plan/benefit structure to cover the lesser of fifty employees or 40% of all employees of the employer. A salary limitation of $200,000 was applied to each year's compensation for use in benefit calculations, causing both defined-contribution and defined-benefit plans to "reverse discriminate" in the case of covered employees earning more than $200,000.

In the case of 401(k)'s, TRA 1986 placed a $7000 cap on elective deferrals and instituted an average deferral percentage test for non-discrimination. Hardship withdrawals were limited to the amount of the employee's elective deferrals.

TRA 86 restricted loans from plans to participants under IRC Section 72(p), revised the integration rules for both defined-benefit and defined-contribution plans (IRC Section 401(1)), and reduced the allowable range of present

value calculations (IRC Section 417(e)). The fundamental changes required by TRA 86 resulted in the legal amendment of most plans in order to sustain compliance with ERISA.

The ADEA in 1986 reduced age discrimination in retirement planning. Pension accruals could no longer be frozen beyond normal retirement age, employees hired after age sixty could no longer be excluded from participation, and mandatory retirement was prohibited by Department of Labor Regulations except for certain higher level executives and college professors.

The Omnibus Budget Reconciliation Act's Revenue Act of 1987 significantly impacted defined-benefit plans. The new full funding limitation (IRC Section 412(c)(7)) stipulated that the end-of-the-year Accrued Benefit Obligation (ABO) must be calculated at specified rates. OBRA's ABO is calculated essentially the same as Statement 87 from the Financial Accounting Standards Board.

The full funding limitation determines the amount of deductible contributions that an employer may make to a qualified defined-benefit plan. Under the Revenue Act of 1987, deductible contributions to a defined-benefit plan could not exceed 150% of current liabilities. This was intended to prevent employers from making excessive contributions to fund liabilities that were not yet owed (CCH, 1987, p. 52). The making of such contributions was

viewed as effectively providing a tax-free savings account
to offset employers' future liabilities under prior law.

Prior to 1987, employers were allowed to take
anticipated wage increases (largely inflation) into account
in making contributions. Because typical defined-benefit
plans promise a benefit based upon the employee's future
salary, each year the firm accrues a marginal cost that
depends on future wage growth as well as current salaries
(Lindeman and Utgoff, 1992, p. 187). The overfunding limit
of 150% of legal vested liabilities (with no allowance for
future wage growth) prevented overfunded firms from making
new tax-deductible contributions. Rapid swings in interest
rates could also push firms over the full funding limits and
thus prohibit firms from making new contributions into the
fund (Clarke and McDermed, 1990, pp. 78-79). OBRA's full
funding limitation may make a future switch to a defined-
contribution plan inevitable because a currently existing
defined-benefit plan would have higher minimum contributions
in the future resulting from this severe limitation on the
current maximum contribution (Smalhout, 1993, p. A18).

The required PBGC insurance premium was increased in
1987 from $8.50 per participant per year to $16.00. A
variable premium was added equal to $6.00 per $1,000 of
unfunded vested benefits per participant. The total maximum
premium was set at $50.00 per participant per year.

Applicable Prior Research

<u>Spot Market/Deferred Wage Theory</u>

The structure of the labor market is crucial to research in pension reporting. The labor market may be characterized by either a lifetime contract between firm and employees for deferring compensation or by a spot market whereby employees receive wages equal to their marginal productivity for each period (Pesando and Clarke, 1983). Pension promises are part of employee compensation, accepted by employees instead of additional cash wages or fringe benefits.

In the spot market model, the rational worker will grant no wage concession in return for a non-vested pension benefit. An essential feature of this model is that there is nothing which binds the worker to the firm for other than the immediate period, and nothing which binds the firm to the worker. The spot labor market clears on the basis of employee productivity and labor costs at each moment in time, and the worker's remuneration in each period equals the value of his/her marginal product in that period (Gustman and Mitchell, 1992, p. 49).

Conversely, the implicit contract model provides for a long-term or lifetime contract, in which competitive forces ensure that the worker's total compensation and value of his marginal product are equated over the worker's lifetime. Implicit contracts have been asserted to bind workers to the

firm, thus reducing the cost of turnover (Lazear, 1979, p. 1272) and to provide incentives for employees to develop firm-specific human capital (Williamson, 1985, p. 243).

Empirical support for the validity of the implicit contract characterization was provided in Kotlikoff and Wise's (1989, p. 42) examination of Bureau of Labor statistics data on wages and benefits. They concluded that sharp changes in average pension accrual did *not* occur at the ages of vesting, early retirement, and normal retirement. This was interpreted as strong evidence that neither wages nor marginal products appeared to adjust at these critical ages to meet the spot market equilibrium condition implied by a legal view of pension contracts.

Ippolito (1985, pp. 1039-1040) reported that implicit pension savings rates (the value the employees assign to each year's pension promises) were approximately constant over the tenure of the pension covered employees. This constancy is congruent with the implicit contract view's characterization of benefits as being earned over employees' careers rather than in discrete units (Stone, 1991).

Studies examining the economic effects of pensions tend to support the conclusion that defined-benefit pensions are part of an implicit contract used to modify worker behavior. If the labor market is in fact characterized by the long term contract model, the prevalent trend of switching from a defined-benefit to a defined-contribution plan as the

primary plan could signify a fundamental shift in the implied labor market contract. To the extent that this switch is driven by changes in the tax laws, governmental legislation and its attendant regulations have interfered with choices that would otherwise be made in a "free market".

Population Research (Form 5500)

Clarke and McDermed (1990) examined the Internal Revenue Service/Department of Labor 5500 forms for the years 1977 to 1983, limiting the study to firms' primary plans containing more than 100 participants. The authors concluded that the price of writing implicit employment contracts that included a defined-benefit pension plan rose during the seven year period examined, resulting in fewer such contracts being adopted. They determined that regulations reduced the benefits to firms from offering defined-benefit plans while simultaneously increasing the administrative and reporting costs of these plans.

Clarke and McDermed's model included three cross-sectional probit regressions (1977, 1980, 1983) with 0 as the dependent variable if a firm had no defined-benefit plan and 1 as the dependent variable if a firm had at least one defined-benefit plan. Thus, if a firm had any defined-benefit plan, it was assumed to be the primary plan, regardless of the percentage of participants covered.

Clarke and McDermed's explanatory variables included employment size of sponsoring firms (number of employees), industry of plan sponsor (two digit SIC industry code), and the year of the oldest plan. Size of firm and age of primary plan were both statistically significant at the 1% level. The industry codes showed varying levels of statistical significance.

The probability of having a defined-benefit plan as explained by these variables decreased from an average of 72.1% in 1977 to 65.1% in 1983, with the smallest firms (less than 500 participants) showing a larger probability decrease (61.4% to 53%) than did the largest firms (84.9% to 82.4% for over 1000 participants). Likelihood ratio tests performed on a set of equations with only one post-ERISA dichotomous variable indicated that the equations across the years were significantly different from each other. They concluded that 80% of the decline in defined-benefit coverage was due to increasing government regulation. Retail trade showed a larger probability decrease than did manufacturing, and over 40% of the firms with defined-benefit pensions were in the manufacturing sector.

Gustman and Steinmeier (1992) examined the 5500 filings for the years 1977, 1981, and 1985. They also used the classification scheme of a dependent variable of 1 if a firm had any defined-benefit plan and 0 if a firm had only defined-contribution plans. Their probit model included as

independent variables size (number of employees), industry
(two digit code) and union status, with union status
represented as 1 if the firm had any plan for collective
bargaining participants and 0 if the plan did not. They
determined union status from the 1977 Employee Benefit
Surveys filed. Any change in union status post-1977 could
not be determined. The inclusion of union status was the
unique contribution of their research.

Gustman and Steinmeier discovered that once the plans
were classified by union status, the drops in percentages of
defined-benefit coverage were less noticeable. For
employees of firms with no collective bargaining agreement
in existence in 1977, the drop in defined-benefit plan
coverage from 1977 to 1985 was 82.9% to 76.8%, whereas for
all firms combined it went from 89.8% to 79.5% between 1979
and 1985. However, the "union status not available" group
declined from 86.8% to 71.1%. Better information on union
status was needed. They concluded that the movement of
workers into non-union jobs explained at least one-half of
the decline in defined-benefit plan coverage, with less than
one-half being the result of the increase in government
regulation and other demographic and economic factors.

Ippolito (1990), Director of Research for the Pension
Benefit Guaranty Corporation, extended the research of both
Clarke and McDermed and Gustman and Steinmeier, using cross-
sectional regressions for the years 1979 and 1987. He found

that when using the 5500 forms for all firms combined, virtually the entire reduction in defined-benefit market share over the period 1979 to 1987 was attributable to employment shifts. Because information about a collective bargaining agreement was requested on the 1987 form 5500, his research accurately represented union status.

However, Ippolito's aggregate results commingled two contrary trends relating to plan size. For plans with more than 100 but fewer than 1,000 participants, there was a clear shift in preferences away from defined-benefit plans. For plans with more than 1,000 participants, there was no evidence of a shift in preferences away from defined-benefit plans and a small drift toward defined-benefit plans was discerned. Thus, the small change in preferences in favor of defined-benefit plans among large firms offset the larger shift in preferences away from defined-benefit plans among smaller firms, resulting in aggregate results that evinced no net change in preferences for defined-benefit plans.

COMPUSTAT-Sample Research

Thomas (1988) examined the link between tax status and corporate defined-benefit plan funding policy for a sample of 677 firms during the 1980-1984 period. Tax status was measured by classifying firms into three categories: those paying taxes, those offsetting current tax losses due against prior years' tax payments (carryback firms), and those with current year losses to be carried forward to

future years (carryforward firms). Results suggested that tax status declines were associated with pension contribution reductions (from time series regressions), reductions in contributions were also related to previous excess contributions, and tax status was related to fund levels, choice of actuarial variables, and the use of defined-benefit plans (from cross sectional regressions). In short, tax status appeared to be an important determinant of pension funding.

Thomas (1989) examined 1,137 defined-benefit plan terminations that each had reversions of plan funds to employers in excess of one million dollars between May 1980 and March 1986. For these firms, terminations of overfunded plans were motivated by cash needs, rather than tax, accounting, or wealth transfer considerations. Results were consistent with the financial slack hypothesis, because terminations were generally preceded by large declines in funds from operations.

Stone (1991) examined fifty-six firms obtained from a PBGC list of defined-benefit plan asset reversions to employers between 1981 and 1985, each in excess of one million dollars. Any existing defined-benefit plan was required to be terminated in order for the firm to receive the plan assets in a reversion. Some of the firms replaced the terminated defined-benefit plan with another defined-benefit plan while some replaced with a defined-contribution

plan. Stone studied the link between financial stress and the defined-benefit plan continuation versus replacement (with a defined-contribution plan) decision and found that firms switching to defined-contribution plans after asset recaptures were more financially stressed than were firms continuing defined-benefit plans after recapture.

Stone reasoned that the long-term implicit contract features of a defined-benefit plan decreased in value to the firm and to its employees as the probability of the firm's bankruptcy increased. The identification of economic reasons why employees of financially stressed firms would support switching to a defined-contribution plan was viewed as contradicting the position frequently taken in public debates that switching is always abusive.

Stone's results indicated that firms switching to defined-contribution plans in 1984-1985 were smaller, more highly leveraged, less solvent, and less profitable than were the firms continuing defined-benefit plans. The difference was statistically significant for only the size variable. This was consistent with Kotlikoff and Smith's (1983, p. 164) discovery that firms sponsoring defined-contribution plans were smaller and Pesando and Clarke's (1983, p. 736) statement that employees would be less willing to enter into implicit contracts with smaller firms.

Stone examined the effect of two confounding factors, employee age and unionization. Her employee age variable

was the proportion of vested benefits divided by total benefits, although she recognized that this was an imperfect proxy for employee age. She used as her union control variable the proportion of union employees divided by total employees, obtained from the firms' 10-K. Surprisingly, neither the union nor employee age control variables were significant when measured alone.

Case Study Research

Winger (1991) found that the tax disincentives for defined-benefit plans in the 1982 TEFRA, 1984 DEFRA, and the 1984 REA caused seven of the firms in her case study of nine major Midwest corporations in the Minneapolis-St Paul area to change their corporate focus from defined-benefit plan to defined-contribution plan. By using the entire population for the data, the herein reported research provides a more broad-based indication of the reaction to legislation. In addition, the legislation through 1987 is able to be examined.

Research Hypotheses

Panel-Data Time-Series Models

A set of time series equations was used first to assist in determining the relative impact of the 1986 and 1987 legislation. The dependent variable was the percentage of participants covered by a defined-benefit plan. Thus, if a firm had one or more defined-contribution plans, but no defined-benefit plan, the dependent variable was 0. If a

firm had a defined-benefit plan that covered all the employer's participants, the dependent variable was 1.0. A firm that had a defined-benefit plan covering 150 participants and a defined-contribution plan covering 600 participants would have a dependent variable of 0.25. The numerator of the dependent variable was the number of the participants in the largest defined-benefit plan of the firm. The denominator was the greater of the number of participants in the largest defined-contribution plan or the number of participants in the largest defined-benefit plan. I originally planned to use the sum of the defined-benefit participants in all plans as the numerator, but upon examination of the data there appeared to be no way to separate replacement defined-benefit plans from original plans and I did not want to double-count the participants. I therefore used the number of defined-benefit participants in the largest defined-benefit plan. It was assumed that it is common for participants in a defined-benefit plan to also be participants in one or more defined-contribution plans.

All prior research has found size of firm to be a significant explanatory variable in determining plan existence and plan type. Therefore, the first hypothesis examined firm size both to confirm existing research and to "partial out" the effects of size so that the effect of a post-86 variable would not be compounded with size. The first hypothesis was therefore as follows:

HA-1.   The percentage of participants covered by a defined benefit plan is positively related to the SIZE variable (Log of total employees).

Null form: The coefficient of SIZE is less than or equal to 0.

Because this was a time series study, and each firm was in effect its own control, any change in size was expected to be significant. As Stone (1991) observed, firms experiencing a contraction in employment would likely have employees who were less likely to prefer a defined-benefit plan.

HA-2.   Industry Code is related to the percentage of participants covered by a defined-benefit plan.

Null form: The coefficients for INDUSTRY CODES are all simultaneously equal to 0.

One of the central reasons a firm expends limited resources to provide employee benefits was the perception that competing employers in the industry were doing so. Thus, it was viewed as necessary for any given firm to meet their competition's commitment to retirement benefits in order to attract and retain skilled workers. In addition, industry-wide economic circumstances may result in different optimum benefit offerings. It is expected that firms in a given industry will have similar reactions to events occurring during a given period of time. As with size, all relevant research has found industry to be a significant factor in determining plan benefits; therefore, this information was included to confirm existing research and

"partial out" the impact of industry from any post-86 changes.

HA-3.   The percentage of participants covered by a defined benefit plan is positively related to the degree of union participation in the firm, measured by the number of union participants divided by the total participants.

Null form: The coefficient on PCUNION is less than or equal to zero.

Both Ippolito (1990) and Gustman and Steinmeier (1992) confirmed that union presence was a significant predictor of whether or not a firm will have a primary defined-benefit plan. Therefore, the union variable was introduced to confirm existing research and "partial out" the effects of union status. The confounding impact of unionization was especially troublesome because the economy was viewed as experiencing a movement of jobs out of the manufacturing sector, which traditionally has been a main provider of defined-benefit plans, into the service sector, which has not historically preferred defined-benefit plans. Thus, it was important to differentiate between the portion of the decrease due to shifts in unionization and the portion due to other factors, including tax law changes.

HA-4.   The percentage of participants covered by a defined-benefit plan is positively related to the state of having ownership publicly held (CUSIP=1) versus closely held (CUSIP=0).

Null form: The coefficient on CUSIP is less than or equal to 0.

Managers of closely-held firms have been found to follow a different strategy from that of publicly-held firms (Trostel and Nichols, 1982). It was expected that publicly-held firms were more likely to have a higher percentage of participants covered by a defined-benefit plan than were closely-held firms.

HA-5.   The percentage of participants covered by a defined benefit plan is positively related to an industry-specific economic indicator.

Null form: The coefficient of INDSTRNG will be less than or equal to 0.

The performance of the economy was expected to exert a strong influence on firms' choice of retirement plan offerings. A growing economy would generally foster defined-benefit plan growth and a shrinking economy would likely inhibit defined-benefit plan growth.

Pre-existing Trend Models

Before a change in trend was discernable, confirmation of any existing trend was needed. It was important that any discovery of a post-86 decrease in defined-benefit coverage first account for the pre-existing trend.

HA-6.   The percentage of participants covered by a defined benefit plan is related to the time dummies for 1984-1990.

Null form: The coefficients on the six time dummies for 1984-1990 are all simultaneously equal to 0.

A trend away from defined-benefit plans has purportedly existed since before the 1974 passage of ERISA. After controlling for the effects of size, industry, union status,

and public ownership, it was still expected that time would have a strong influence over the six year period. A general decline in the percentage of firm participants in a defined-benefit plan was likely to have existed over the entire seven year period.

HA-7.	The coefficients on the 1984-1986 time dummies are greater than the coefficients on the 1987-1990 time dummies.
Null Form	The coefficients on the 1984-1986 time dummies are less than or equal to the coefficients on the 1987-1990 time dummies.

The post-86 time dummies were expected to show a different trend from that existing in the pre-86 period. This would lend support to the general hypothesis that the 1986 and 1987 legislation impacted firms' decisions regarding the defined-benefit to defined-contribution switch.

Multinomial LOGIT Models

Some firms, when faced with the integration-inhibiting provisions of the Tax Reform Act of 1986, would likely terminate their defined-benefit plan(s) rather than include the required amount of non-highly compensated participants. Firms strongly committed to defined-benefit plans might expand their defined-benefit plan coverage to include the requisite non-highly compensated participants. These two movements could confound each other in the time-series panel-data models. To further examine the effect of the 1986 and 1987 legislation, a second regression was proposed.

The sample for the Multinomial LOGIT model will be the firms that had an existing plan in 1985 (Table 14) or 1984 (Table 16) and had a defined-benefit plan sometime during 1984-1989. There were three dependent variables signifying three states: (1) kept the defined-benefit plan essentially intact until the end of the six year period, (2) terminated the pre-existing defined-benefit plan, but replaced it with a defined-contribution plan, or (3) terminated the defined-benefit plan and did not institute another plan.

The first three independent measures were the same as the first three for the prior regression: size, industry code, and union status. Thus, the first hypothesis, consistent with existing research relative to equation B, was as follows:

HB-1a.   Given that a defined-benefit plan existed
                before 1989, the 1989 continued existence of
                a defined-benefit plan is positively related
                to the SIZE variable (Log of total
                employees).

HB-1b.   Given that a defined-benefit plan existed
                before 1989 and that it was terminated by
                1989, the continued existence of a defined-
                contribution plan in 1989 is positively
                related to the SIZE variable.

Null form: The coefficient of SIZE is less than or equal
                to 0.

It was anticipated that firms within the same industry will have the same degree of preference for defined-benefit plans. Therefore, firms within the industry should have the same degree of preference for replacing with a defined-

contribution plan upon a defined-benefit plan termination. The LOGIT regression was able to utilize an expanded set (eight) of SIC codes because LIMDEP personal computing processing capability did not pose limitations on this non-panel data set.

HB-2a.   Given that a defined-benefit plan existed before 1989, the 1989 continued existence of a defined-benefit plan is positively related to the INDCODE variable.

HB-2b.   Given that a defined-benefit plan existed before 1989 and that it was terminated by 1989, the continued existence of a defined-contribution plan in 1989 is positively related to the INDCODE variable.

Null form: The coefficient of INDCODE is less than or equal to 0.

Unions have a strong preference for defined-benefit plans. Some commentators infer there is something of a collusion between a firm's management and their union to promise unfunded benefits with the Pension Benefit Guaranty Corporation being the intended ultimate payor (Yoder, 1992, Ippolito, 1989). It was expected that the presence of unions would decrease the probability of plan termination, and, given the existence of a plan termination, would influence the replacement of a terminated defined-benefit plan with a defined-contribution plan.

HB-3a.   Given that a defined-benefit plan existed before 1989, the 1989 continued existence of a defined-benefit plan is positively related to the PCUNION variable.

HB-3b.   Given that a defined-benefit plan existed before 1989 and that it was terminated by

> 1989, the continued existence of a defined-contribution plan in 1989 is positively related to the PCUNION variable.

Null form: The coefficient of PCUNION is less than or equal to 0.

Additional variables were posited as predisposing a firm to deleterious effects from the 1986 and 1987 legislation. The question of interest was "How did these firms react to tax-induced stressors, given the degree of change required?" Essentially, this regression attempted to determine whether the firms expanded their offerings to the non-highly compensated, as was the intent of the legislation, or removed the defined-benefit retirement option completely.

The fourth independent measure was a 0,1 dummy variable indicating a plan's top-heavy status in 1985. A top-heavy plan was one for which the present value of accrued benefits for highly compensated employees exceeded 60% of the present value of the plan's total accrued benefits. It could be that a top-heavy plan would suffer more from the 1986 TRA's equity and fairness emphasis. On the other hand, a top-heavy plan had a greater percentage of benefits going to the highly compensated, so there might be more emphasis placed on maintaining the plan.

HB-4a.   Given that a defined-benefit plan existed before 1989, the 1989 continued existence of a defined-benefit plan is related to the TOPHEAVY variable.

HB-4b.   Given that a defined-benefit plan existed
               before 1989 and that it was terminated by
               1989, the continued existence of a defined-
               contribution plan in 1989 is related to the
               TOPHEAVY variable.

Null form: The coefficient of TOPHEAVY is equal to 0.

The fifth independent measure was a 0,1 dummy variable indicating plans which were integrated as of the first plan year. Integrated plans provided a proportionately higher benefit to highly compensated participants than to non-highly compensated participants due to inclusion of projected social security benefits into the plan's benefit formula. The Tax Reform Act of 1986 severely restricted the integration options. As with top-heavy plans, there could be pressure to terminate the plan due to necessary changes, or there could be pressure to keep the plan because it disproportionally benefitted the decision-makers.

HB-5a.   Given that a defined-benefit plan existed
               before 1989, the 1989 continued existence of
               a defined-benefit plan is related
               to the INTEGRAT variable.

HB-5b.   Given that a defined-benefit plan existed
               before 1989 and that it was terminated by
               1989, the continued existence of a defined-
               contribution plan in 1989 is related to the
               INTEGRAT variable.

Null form: The coefficient of INTEGRAT is equal to 0.

The sixth independent measure was the presence of a funding waiver request at any time during 1984-1990. If a firm was having difficulty meeting the required minimum funding payments, management might apply for a funding

waiver due to difficult financial circumstances.
Controlling for firms having filed a funding waiver
controlled for firms canceling the defined-benefit plan due
to business reverses instead of the legislation.

HB-6a.   Given that a defined-benefit plan existed
              before 1989, the 1989 continued existence of
              a defined-benefit plan is related
              to the FUNDDEF variable.

HB-6b.   Given that a defined-benefit plan existed
              before 1989 and that it was terminated by
              1989, the continued existence of a defined-
              contribution plan in 1989 is related to the
              FUNDDEF variable.

Null form: The coefficient of FUNDDEF is equal to 0.

The seventh independent measure was the maximum amount
of overfunding per participant a plan experienced during the
1984 through 1990 period. The full funding limitation of
the Revenue Reconciliation Act of 1987 was expected to exert
a strong influence on the plans that had historically been
overfunded. The overfunded status could have been due to a
desire to maximize the tax deduction, create a slush fund,
or to fund for projected benefit obligations. On the one
hand, overfunding could pre-dispose a firm to termination
since the level of permissible overfunding was curtailed and
the ability to transfer plan assets to the firm severely
penalized. On the other hand, a firm overfunding its
defined-benefit plan could be viewed as a firm committed to
a defined-benefit plan. Either way, the 1986 and 1987
legislation altered the options available for overfunding.

46

In addition, the presence of an overfunded plan has
been viewed as a takeover target. Management might choose
to terminate the plan to eliminate this attraction.
However, the Tax Reform Act of 1986 penalty for asset
reversions to sponsoring firms and the further restrictions
in the Revenue Act of 1987 on reversions curtailed
significantly the risk of overfunded plans attracting
takeover activity.

HB-7a.   Given that a defined-benefit plan existed
             before 1989, the 1989 continued existence of
             a defined-benefit plan is related
             to the MXNTOVPP variable.

HB-7b.   Given that a defined-benefit plan existed
             before 1989 and that it was terminated by
             1989, the continued existence of a defined-
             contribution plan in 1989 is related to the
             MXNTOVPP variable.

Null form: The coefficient of MXNTOVPP is equal to 0.

The eighth independent measure was the maximum amount
of underfunding per participant. A firm could underfund as
a motivator for employees, e.g., employees might perceive a
need to be more productive in order for the firm to continue
to be in existence to fund their retirement because the
requisite funds were not residing in the plan. A firm in
financial trouble might be more likely to terminate its
defined-benefit plan because it would not wish to have the
liabilities shown on the balance sheet. In addition, the
employees would be less likely to be willing to forgo

current compensation for future pension promises if the

future of the firm was uncertain.

HB-8a.   Given that a defined-benefit plan existed
               before 1989, the 1989 continued existence of
               a defined-benefit plan is related
               to the MXNTUNPP variable.

HB-8b.   Given that a defined-benefit plan existed
               before 1989 and that it was terminated by
               1989, the continued existence of a defined-
               contribution plan in 1989 is related to the
               MXUNFDPP variable.

Null form: The coefficient of MXUNFDPP is equal to 0.

The ninth independent measure was the change in

retirement age. Both the 1986 and the 1987 legislation

narrowed the parameters of allowable retirement age, leaving

the firms much less room to manipulate the current year's

deduction. After the Tax Reform Act of 1986, early

retirement could not be set at younger than age fifty-five.

It is assumed that plans funding for a much earlier

retirement would be more likely to terminate the defined-

benefit plan and less likely to replace with another

defined-benefit plan.

HB-9a.   Given that a defined-benefit plan existed
               before 1989, the 1989 continued existence of
               a defined-benefit plan is related
               to the CHGRTAGE variable.

HB-9b.   Given that a defined-benefit plan existed
               before 1989 and that it was terminated by
               1989, the continued existence of a defined-
               contribution plan in 1989 is related to the
               CHGRTAGE variable.

Null form: The coefficient of CHGRTAGE is equal to 0.

Most pre-1986 plans had to be amended to comply with the Tax Reform Act of 1986. For the defined-benefit plans covering only a subset of the participants, it might be in those participants' best interests to terminate the plan (with the plan assets transferred to the participants IRA's or frozen to benefit the named participants) and to set up a new plan (defined-benefit or defined-contribution) to cover a much broader group of participants. Therefore, it is expected that firms that cover only a subset of their otherwise eligible participants in a defined-benefit plan would be strongly impacted by the Tax Reform Act of 1986.

CHAPTER III

RESEARCH METHODOLOGY

In order to measure the impact of specific legislation
at a given point in time, it was necessary to track
individual firms through time to determine their reaction to
specific changes. Existing research has attempted to
quantify the impact of continuously constricting pension
legislation by performing isolated cross-sectional
regressions at different points in time. There was a
tendency for newer (smaller) firms to have only defined-
contribution plans and for older, more established firms to
have defined-benefit plans. A trend also existed for
service firms to have defined-contribution plans and
manufacturing firms to have defined-benefit plans.

Jobs have been shifting from manufacturing to service
industries and from larger to smaller firms. These shifts
in the economy have a tremendous effect on plan choice. Any
research endeavoring to determine shifts in preferences due
to legislation requires a time-series panel data approach.
Because the research question is in essence a panel-data
question, a panel-data method was used for this study.

The statistical package LIMDEP by William H. Greene was used to formulate panel-data time-series and LOGIT regressions using various explanatory variables. Kennedy (1992, p. 234) rated LIMDEP as the best computer package for estimation in the context of qualitative and limited dependent variables.

In order to tie this study to existing research it was necessary to use explanatory variables that do not vary over time (industry code, for example) for the panel-data time-series models. This required the use of the random effects model rather than the fixed effects model. The fixed effects model cannot handle explanatory variables with zero variance across time for any cross-sectional member. Further, the population of firms was sufficiently large to exceed the capacity of the LIMDEP personal computer system so that random subsamples had to be drawn for the regressions. The random effects model is more appropriate when inference is to be made from a random subsample of a population (Kennedy, p. 222).

The results from fixed effects model regressions are also presented in Tables 4A, 6A and 8A. In the case where neither the fixed nor the random effects model was appropriate, the instrumental variables model would have to be considered. However, no instrumental variable was found to replace the effects of industry status. In order to test the appropriateness of the random effects model for this

study, a Hausman test for correlation between the error term and the exogenous variables was calculated for a model deleting the time-invariant SIC codes and the CUSIP variable (Tables 4A, 6A and 8A). This reduced model produced a Hausman of 159.297 (p=0.000) for the one-way stratification model for the random sample of the entire population illustrated in Table 4 and 4A. This indicated that the random effects model was appropriate.

For the population of firms that had 0<PCDBPART<1 for 1984 (Tables 8 and 8A), the Hausman produced a 7.77514 (p=.100171) for the one-way stratification. For the population of firms that had PCDBPART=1 (Tables 6 and 6A) for 1984, the Hausman was 13.01616 (p=.011197) for the one-way stratification. The fixed effects models resulted in a significantly higher R squared and adjusted R squared. Tables 4, 4A, 6, 6A, 8 and 8A present the random effects and the fixed effects models.

An appropriate test for homoskedasticity is the Lagrange multiplier test, also known as the Breusch-Pagan test. It is based on the idea that if the hypothesis of homoskedasticity is true, the ordinary least squares estimates of the regression coefficients should not differ significantly from the maximum likelihood estimates that allow for possible heteroskedasticity. As the Lagrange multipliers given in Table 4,6, and 8 show, the random effects models pass the test for heteroskedasticity.

Kmenta (1986, p.491) identified the Lagrange Multiplier test as asymptotically equivalent to the Likelihood Ratio Test and the Wald test. He cautioned that these tests are intended to be used in large samples. This study utilizes random samples of over 3000 firms, for up to six years' data, resulting in over 15,000 observations per regression. Thus, it was assumed that the Lagrange Multiplier Test was appropriate for this study.

It was originally hoped that the entire population could be regressed over the six-year period. However, the personal computer version of LIMDEP would not accommodate a sample the size of the population (up to 30,000 firms for six years) and the mainframe version of LIMDEP was not available. Therefore, repeated random samples were run to determine the effect of sampling error. The unreported results were consistent with the random samples presented herein.

It was also hoped that 1990 could be included in the regressions. However, in the multinomial Logit data format used in this study, missing observations connote information. The 1990 data available from the Department of Labor was not complete, and the missing observations due to an incomplete data tape would be interpreted by the system as missing observations due to no-longer-existing plans. Therefore, the 1990 observations were not included.

The original intention was also to include numerous interactive terms in the time-series equation so that differential reactions to the 1986 and 1987 legislation could be measured. However, these interactive terms had to be dropped due to two difficulties. First, the personal computer LIMDEP package has a limited number of available data cells. Doubling the number of variables required halfing the number of sample observations. It was determined that the larger sample would yield more information than would the interactive terms. Second, the interactive terms had a variance that was not independent of the underlying main effect terms, causing a correlation between the error and the regressors that the random effects model could not handle.

It was also hoped that the effects of administration costs could be included in this study. The popular press often claims that defined-benefit plans are being terminated due to the increasing administrative costs resulting from continuous required amendments to meet legislative changes. An average of administrative costs per year was to be substituted for administrative costs, since the decision to terminate and administrative costs are confounded due to administrative costs being unusually large in the year of termination. However, it was discovered that many firms do not pay their own administrative costs but instead pay them out of the corporation's funds in order to get a tax

deduction for both the administration fees and the qualified plan contribution. The existence of the data for any given firm was thus too inconsistent to make any conclusion from the analysis of administrative costs.

Description of the Data

The data was extracted off tapes purchased from the Pension Benefit Guaranty Corporation, who obtained them from the Department of Labor. Each year was provided separately, with the firms' information on each plan offered as a separate observation. Thus, if a firm had fifteen plans, it appeared as fifteen complete observations. The firms were arranged in numerical ascending order of the employer identification number. Because each state has the same first two digits for the identification number, the states were grouped together. The data was recorded as a continuous string of numbers or letters, with no spaces or markers identifying the position of either the fields or the firms.

COBOL programs were utilized to extract the fields of information needed from the over 2,000 fields for each plan recorded on the tapes. Equivalent information from different years resided in different fields on the tapes, often in different formats. Thus, different programs were needed for different years. In addition, COBOL programs were used to condense the multiple observations for a firm into one line of data per year. A COBOL program provided

the linkage from year to year to convert the data matrix into panel data format, whereby each year for a given firm existed as a separate line in the data table. Lastly, a COBOL program was utilized as a random number generator to produce random samples of a given year's employer identification numbers. These COBOL programs were provided in the appendix.

It was necessary to collapse the multiple observations for a given firm into one line of data before the regressions could be attempted. It was common for a given person to be in more than one defined-contribution plan (for instance, a profit sharing plan maintained separately from an ESOP). Thus, it appeared unwise to add the defined-contribution participants to arrive at a defined-contribution participant total. I considered the total participants in the largest defined-contribution plan to be the defined-contribution participants.

It appears uncommon for a given person to be simultaneously a participant in more than one active defined-benefit plan. However, it was unwise to add the defined-benefits participants together because some of the defined-benefit plans were frozen and new defined-benefit plans added, with any given participant included in both. Therefore, I similarly used the total participants in the largest defined-benefit plan as the defined-benefit

participants. These two values were ultimately used in the calculation of a ratio.

In order to collapse the multiple plans into one line of data, the largest defined-benefit and the largest defined-contribution plan(s) were isolated as described above. The total number of participants (TOTPART) was determined to be the largest of the number of participants of the two plans. The number of defined-benefit participants (DBPART) was divided by TOTPART to obtain the percentage of defined-benefit coverage (PCDBPART) inside the LIMDEP program. PCDBPART became the dependent variable for the panel data time-series regressions. The value for total employees (TOTEES) was determined to be the largest number of employees reported for any plan of a given firm. Each 5500 requested the total employee information.

The determination of largest plan was made independently from year-to-year. If a firm froze certain plans and instituted replacement plans, the program selected only the plan with the largest number of participants for that year.

The first step in either regression was to choose the year for the underlying random sample generation. Thus, if a random sample from the 1985 year was obtained, and a firm did not file a 1985 5500 (DB or DC), that firm could not be in the random sample and would not be in the resulting data set, even though it may have had a plan in some other year

during the six year period under study. After the random
sample was obtained from a given year, another COBOL program
searched through the six years to find the information from
that employer identification number's data for each year.

For the panel-data, time-series study, a problem
occurred when firms dropped out of and back into reporting
status. Many firms had more than one employer
identification number due to operating separate lines of
business, consolidations, or spin-offs. They have been
legally allowed to use any of a group of employer
identification numbers assigned to them.

Hsiao (1992, p.197) suggested treating randomly missing
data in a time-series observation in the same manner as
rotating samples are often handled. However, I omitted the
firms that dropped out-and-back-in for two reasons. One,
because the penalty for non-reporting is quite punitive ($25
per day per plan), I found it unlikely that many firms
intentionally missed reporting for a given year. Two, there
were a number of firms with only one yearly observation. I
found it equally unlikely that a firm would go to the
expense of implementing a plan and then keep it open for
only one year. It usually takes more than one reporting
period to terminate a plan, in any case. Therefore, I
reasoned that the firms with a gap in their reporting were
probably the same firms that showed only one year's report,
but I have no way to match them up. I thus dropped both the

firms with one year's data and the firms with out-and-back-in reporting. Charles Boynton, the chair of my committee, found in his work with the Office of Tax Analysis of the United States Department of the Treasury that firms often intentionally report shifting employer identification numbers, perhaps in the belief it makes tax audits more difficult.

Because I wanted the population studied by the LOGIT regression to mirror the population examined by random samples in the panel data regressions, I also dropped the firms from the LOGIT regression if they reported for only one year or dropped out and back in again. Both regressions included firms that started plans after 1984 (if they filed a 5500 in the year of the underlying random sample) and also included firms that dropped out and stayed out. LIMDEP required a special algorithm to create a variable to instruct the system concerning the number of observations each firm possessed. With this variable, LIMDEP was able to handle the unbalanced matrix.

The data for the LOGIT regression was obtained by first obtaining the entire set of employer identification numbers for the specified year (in this study, 1985), and deleting the firms that either dropped out and back in or had only one observation. Then, the program searched that firm's panel data observation for 1984 for defined-benefit participants. If it found one in 1984, 1984 became the

first year of defined-benefit participation. If it did not find a defined-benefit participant in 1984, the program searched 1985-1989 for a defined-benefit participant. The first year the program discovered a defined-benefit participant is the first year of defined-benefit coverage. Most of the data for the LOGIT regression came from the first year of defined-benefit coverage; there was only one line of data per firm. This matrix configuration enabled the examination of the entire population in spite of the PC version's size limitations.

The values for defined-benefit participants, total employees, total participants, top-heavy indicator, integrated indicator, union percentage, and first retirement age were determined as of the first year of defined-benefit participation. These values did not change over time for the LOGIT regression. The values that did change due to new information were retirement age, maximum overfunding, and maximum underfunding. If a firm did not have defined-benefit participants during any of the six years under study, it was dropped from the LOGIT data set.

Description of the Variables

The dependent variable for the panel-data time-series regression was the percentage of defined-benefit participants divided by total participants (PCDBPART). It ranged in value from 0 (no defined-benefit plan) to 1 (a

defined-benefit plan as large as any existing defined-contribution plan).

The first independent variable was SIZE, measured as the natural log of the total number of employees. The panel data regression used a different SIZE for each year, while the LOGIT regression used the SIZE for the first year of defined-benefit participation.

The second explanatory measure was dummy variables indicating one-digit SIC industry codes. These codes could not be used in a fixed effects model specification because the variance would be absorbed into the unique intercepts. Due to the significance of industry to this study, the random effects model was used. The panel data model used four codes for five industry groupings (manufacturing was the reference) while the LOGIT group used eight with manufacturing as the reference. Both models used whatever the first year's code was for the entire period; any changes in SIC code were not recorded. In my estimation, the five codes used in the panel data model captured the significance of industry, and doubling the codes would require reducing the sample size.

The third measure represented union concentration. Prior population research coded this variable as a 0,1 dummy variable with a 0 indicating no collectively bargained plans and a 1 indicating at least one plan subject to collective bargaining. This research used the ratio of collectively

bargained plan participants divided by the number of total participants in all plans. Therefore, this research used a percentage-of-union-participants measure rather than the 0,1 convention found in prior research.

The fourth measure was a 0,1 dummy variable indicating whether or not a employer had a CUSIP designation. This information became available on the form 5500's during years subsequent to the previous research. The CUSIP designation was assumed to be a surrogate for publicly held versus closely held. A publicly held firm should have had a CUSIP number while a closely held firm should not. This information indicated existing differences between the reaction to the legislation of closely held versus publicly held employers. My interest in the CUSIP variable (having no year-to-year variance) was another reason the random effects model was selected.

The influence of the general economy was a likely factor in employers' decisions regarding what type of retirement plan to offer. In order to measure the general health of an industry, the natural log of the total number of employees for all firms inside the given firm's two-digit industry code was used.

A (0,1) dummy variable was used to indicate pre-and post-86. The final variables were five time dummies for the six years 1984 through 1989. These variables' coefficients

indicated the extent of the trends in decreasing defined-benefit coverage during the six year period.

CHAPTER IV

RESEARCH FINDINGS

The findings of this research confirmed prior studies'
conclusion that a pre-existing downward trend in the
prevalence of defined-benefit plans existed during the 1984
to 1989 period under study. Research results suggested that
the 1986 and 1987 legislative environment appeared to have
had a short-term accelerating impact on this downward trend.
This study confirmed the significance of industry
classification and the presence of unionized participants,
and made a unique contribution by discerning the influence
of integrated status, widely dispersed ownership (CUSIP),
and the insignificance of SIZE on the termination decision
for the subset of firms already sponsoring a defined-benefit
plan. These findings were possible due to the tracing of
individual firms through the six year period via a panel-
data time-series approach.

Overview of Results Tables

Table 4 (4A), Table 6 (6A), and Table 8 (8A) summarize
the findings of three different samples using three
different regression algorithms. Table 4 represents the
findings from a random sample of 3622 firms drawn from the

population of 1984 5500 filers. The data from six years was collected for these firms, for a total of 18652 individual observations. Three different regressions were then performed on this panel data set: OLS, one way random effects, and two way random effects. For Table 4A, three different regressions were performed on this panel data set using the fixed effects model.

Tables 6 (6A) and 8 (8A) resulted from reducing the population of all firms filing 5500's into the subpopulation of firms having at least one defined-benefit participant in 1984. Table 6 (6A) reports the results obtained by regressing a random sample of 3012 firms drawn from the population of firms that had a 1984 defined-benefit plan as large or larger than any then-existing defined-contribution plan (PCDBPART=1). The same three regressions as above were performed. Table 8 (8A) reports on the regressions performed on the 1662 firms making up the population of firms reporting for 1984 with defined-benefit participants greater than zero but less than the maximum number of defined-contribution plan participants (0<PCDBPART<1). Tables 5,7, and 9 provide the relevant descriptive statistics for Tables 4, 6, and 8.

Table 10 compares the results of OLS regressions using alternative forms of time dummies using the same random sample of the entire population as Table 3. Tables 4-10 suggest a change in 1986 and 1987 in the percent of pension

plan participants covered by a defined-benefit plan. Tables 11, 12, and 13 are summary statistics of the population of 1985 filers, stratified in various ways. The intent of these tables was to illustrate some characteristics of the 1985 defined-benefit-reporting population.

Tables 14 and 16 report the marginal effects of two LOGIT regressions on the population to determine what attributes of a given plan were correlated with the firm's decision to terminate or continue the defined-benefit plan. Further evidence of an impact from the 1986 and 1987 legislation was demonstrated if the decision appeared to have been influenced by characteristics adversely impacted by the legislation.

Summary of Results

Table 4 illustrates the comparative strength of the panel data stratification relative to the simple pooled OLS format. The negative coefficient for the post-86 variable confirmed that the three years after 1986 had a lower percentage of defined-benefit participation than did the three years prior to and including 1986. I also performed separate OLS regressions using a post 1985, a post 1987, and a post 1988 variable in place of the post 1986 variable. The post 1986 variable had the strongest t-value of the four, using the same sample and other explanatory variables.

The essence of the results of the two-way

stratification in Table 4 was that even after holding firm and year effect constant and controlling for firm size, industry, unionization, and dispersion of ownership, there remained a seven-percentage-point drop in the percentage of defined-benefit participants relative to total participants in the post-86 era relative to the pre-86 period. Industry strength appeared to be significant in the OLS results, but was found through the stratification process to be insignificant.

Table 6 reports on the sample of firms that maintained a defined-benefit plan covering all eligible participants in 1984. The impact of the post-86 period after a two-way stratification revealed a 5.57% decline with a higher p value (.05 versus .001). It was predictable that the firms most committed to defined-benefit plans (illustrated by their 1984 coverage of 100% of eligible participants) would be less affected by the equity-enhancing provisions of the 1986 Act.

Table 8 reports the regressions for the sample of firms having 1984 defined-benefit participation, but at a level less than that for defined-contribution participation. Again, the stratification process exposed industry strength as a poor indicator of changes in the level of PCDBPART. One interesting result of this analysis was that the size coefficient was again small, negative, and insignificant for all three regressions. A priori, I expected that large

firms would be more likely to keep their defined-benefit
plan (with the expanded required coverage) than would small
firms. However, it appeared that large firms were equally
as likely to terminate a defined-benefit plan as were
smaller firms.

Table 10 is an analysis of comparative OLS regressions
run on the random sample of the entire population. The
purpose of Table 10 was to illustrate that the years 1986
and 1987 were very different from the two before and the two
after. Thus, the decreases in defined-benefit coverage
appear not to be attributable solely to the pre-existing
trend. The OLS regression isolating each year separately
had no more explanatory power than did a regression
combining the effects of 84 and 85 or combining the effects
of 88 and 89 or both. Therefore, the difference between
1984 and 1985 (relative to 1986) was insignificant compared
to the difference between 1985 and 1987 (relative to 1986).
In addition, the difference between 1988 and 1989 (relative
to 1986) was insignificant when compared to the difference
between 1987 and 1988.

Table 11 presents the 1985 defined-benefit plan
population in cross-tabular format. It highlights the
impact of union participation, integration, and number of
plan participants. When the percentage of union
participation dropped to zero, the percentage of firms

keeping their defined-benefit plan until 1989 greatly decreased.

However, the percentages for the firms with partial union coverage did not differ greatly from the firms with total union coverage. Therefore, the convention used in prior research (0 for no union coverage, 1 for any union coverage) appeared to adequately account for union influence.

As the total number of participants decreased, the likelihood of continuing defined-benefit coverage also appeared to decline. However, the regressions indicated that plan size could be confounded with integration. For all categories, an integrated plan was more likely to be maintained than was a non-integrated plan.

Table 12 stratifies the population of 1985 reporting plans into levels based on the total number of participants in the firm's largest plan. The vast majority of firms in this population were under 1000-participant plans. Therefore, this study's underlying population was skewed toward the smaller plan. As the number of participants rose, the mean of union participation rose, the percentage coverage in a defined-benefit plan fell, the percentage of integration provisions rose, and the percentage of firms keeping their defined-benefit plan rose.

Table 13 stratifies the population of 1985 filers into three groups: those keeping a defined-benefit plan, those

replacing with a defined-contribution plan, and those terminating qualified plans altogether. As expected, the mean union participation level was much higher for the firms keeping their defined-benefit plan.

Size, however, was dispersed fairly evenly throughout the three groups. The average integration level was higher for the firms keeping their plan than for the ones switching to a defined-contribution plan or terminating plan coverage. The average maximum net overfunding per participant was higher and the average maximum net underfunding per participant was lower for the firms keeping their defined-benefit plan. The percentage of total employees covered by a plan was higher for the two groups keeping a qualified plan than for the group discontinuing plan coverage. Table 13 concludes with the information that of the defined-benefit participants included in this analysis, 68.03% did not have their defined-benefit plan terminated, 15.60% had their defined-benefit plan terminated and replaced with a defined-contribution plan, and 16.37% had coverage terminated with no replacement by 1989.

Table 14 (16) presents the marginal effects from a LOGIT regression run on the population of 1985 (1984) defined-benefit filers. The dependent variable for this regression was 0 if the defined-benefit plan was maintained until 1989, 1 if it was replaced by a defined-contribution plan by 1989, and 2 if it was terminated without any other

qualified plan by 1989. Again, size was not as significant as expected when predicting the firms terminating qualified plan coverage altogether. Union, as expected, exerted a strong influence on the decision. Integrated plans were more likely to be maintained, and all industry codes except tax-exempt/other were less likely to keep the defined-benefit plan than was manufacturing, the reference.

Formal Hypothesis Results

<u>Panel-Data Time-Series Models</u>

HA-1.   The percentage of participants covered by a defined benefit plan is positively related to the SIZE variable (Log of total employees).

Null form: The coefficient of SIZE is less than or equal to 0.

At the .001 significance level, I can reject the null hypothesis of SIZE being less than or equal to zero as found in Table 4 with Model 1. When addressing the entire population of qualified plan reporters, the correlation between SIZE and the percentage of participants covered by a defined-benefit plan probably did not happen by chance. This finding was strongly supported by previous research (Clark and McDermed, 1990, Gustman and Steinmeier, 1992).

However, once the population was stratified into the subset containing only firms having a defined-benefit pension plan in 1984, the significance of SIZE evaporated. For a random sample of 3012 firms taken from the population of firms that had a defined-benefit plan with number of

participants greater than or equal to the largest defined-contribution plan in 1984 (Table 6), I must fail to reject the null hypothesis. Any correlation between SIZE and the percentage of defined-benefit participation for this subset of the population probably happened by chance.

Similarly, Table 8 reports a regression performed on the 1662 firms that made up the population (as adjusted) of firms having a defined-benefit plan with the number of defined-benefit participants less than the number of defined-contribution participants in 1984. In other words, firms having a defined-benefit plan that did not cover all participants. For this subset of the population, I must fail to reject the null hypothesis. Any correlation between size and the percentage of defined-benefit participation for this subset of the population probably happened by chance.

In summary, once I know that a firm has a defined-benefit plan in existence in 1984, SIZE tells me nothing about whether or not it will increase or decrease relative participation in defined-benefit plan(s) by 1989. If the information concerning any pre-existing defined-benefit plan was unavailable, SIZE was significant in predicting a positive percentage defined-benefit participation.

HA-2.   Industry Code is related to the percentage of
              participants covered by a defined-benefit
              plan.

Null form: The coefficients for INDUSTRY CODES are all
              simultaneously equal to 0.

A joint test of the four regression coefficients (Pindyck and Rubenfeld, p.117) was performed to determine whether or not the industry codes taken together were significant. The SSE from Table 4 was 3835.99. The SSE from this OLS regression without the four industry codes was 3909.93. An F test with 4 and 18647 degrees of freedom yielded 70.41. At the 1% significance level I can reject the null hypothesis of no significance. Thus, the correlation between industry codes and percentage of defined-benefit participation probably did not happen by chance.

An equivalent test was performed on the regressions reported in Table 6 (firms where defined-benefit participation in 1984 was 100%) and Table 8 (firms where defined-benefit participation in 1984 was positive but less than 100%). In both cases, I may reject the null hypothesis of no significance. The correlation between industry and defined-benefit participation appeared not to have happened by chance.

HA-3.   The percentage of participants covered by a defined benefit plan is positively related to the degree of union participation in the firm, measured by the number of union participants divided by the total participants.

Null form: The coefficient on PCUNION is less than or equal to zero.

No matter which population or sub-population was examined, or which regression method was used, the existence

of union participants appeared to be the strongest positive
influence on the percentage of defined-benefit
participation. For a random sample of the entire population
of 1984 qualified-plan filers (defined-benefit plus defined-
contribution), Table 4 reports a t-value ranging from 30.559
(OLS) to 12.303 (two way random effects). Table 6 (a random
sample of the population of plans with 100% DBPART value for
1984) reports a t value ranging from 11.581 (OLS) to 8.081
(two way random effects). Table 8 (the population of plans
with 0<DBPART<1 for 1984) reports a t value ranging from
8.238 (OLS) to 4.790 (two way random effects). All
regressions resulted in a significance level of .001 or
less. The correlation between PCUNION and DBPART probably
did not happen by chance.

HA-4.   The percentage of participants covered
         by a defined-benefit plan is positively
         related to the state of having ownership
         publicly held (CUSIP=1) versus closely
         held (CUSIP=0).

Null form: The coefficient on CUSIP is less than or
         equal to 0.

For the entire population of reporting firms, the
existence of a CUSIP appeared to be positively related to
the percentage of defined-benefit coverage. Table 4
reported a t-value of 3.476 at the 95% confidence level for
the two-way random effects model. However, Table 6,
reporting on a random sample of the population with a 100%
defined-benefit participation in 1984, conveys a small

(-.01720 coefficient) negative value (t=-1.747) for CUSIP.

Table 8, reporting on the population of firms whose largest defined-benefit plan was smaller than their largest defined-contribution plan in 1984, reports a positive (.03914 coefficient) value for CUSIP (t=2.42, p<.05). Because the regressions produced values with conflicting results regarding CUSIP, prudence dictated attributing any correlation to chance.

HA-5.   The percentage of participants covered by a
                         defined benefit plan is positively related to
                         an industry-specific economic indicator.

Null form: The coefficient of INDSTRNG will be less than
                         or equal to 0.

The industry-specific economic indicator used in this study (INDSTRNG) was the log of the total employees for all firms for the year in the firm's two-digit industry code. However, neither the regression on a sample of the entire population (Table 4), the regression on a sample of the population with a defined-benefit plan larger than any defined-contribution plan (Table 6), nor the firms with some defined-benefit participation but less than total DB participation (Table 8) found INDSTRNG significant. Thus, any correlation between INDSTRNG and PCDBPART probably happened by chance.

Pre-Existing Trend Models

HA-6.   The percentage of participants covered by a
                         defined benefit plan is related to the time
                         dummies for 1984-1990.

Null form: The coefficients on the six time dummies for 1984-1990 are all simultaneously equal to 0.

The OLS regression found in Table 10 (a random sample of the entire population) was run without any post-86 or individual time dummies, producing an SSE of 3843.89. When compared with the SSE of 3834.20 for the regression with five time dummies, the resulting F test with 5 and 18651 degrees of freedom produced an F value of 9.42. At the 95% confidence level I may reject the null hypothesis that any correlation between the years and PCDBPART happened by chance. Thus, something was happening to the percentage of defined-benefit participation during this six-year period.

HA-7.   The coefficients on the 1984-1986 time dummies are greater than the coefficients on the 1987-1990 time dummies.

Null Form   The coefficients on the 1984-1986 time dummies are less than or equal to the coefficients on the 1987-1990 time dummies.

The coefficients on the second regression in Table 10 (reference=1986) show that 1984>1985>1986>1987>1988>1989. Therefore, I can conclude that there was a general downward trend in the percentage of defined-benefit participation over the six-year period.

The last three columns of Table 10 show that the trend during 1984-1989 was not a smooth linear downward slope. When 1984 and 1985 were combined, the difference between the SSE was insignificant (.16) when compared with the regression showing all six years. Therefore, the difference

between 1984 and 1985 has much less impact than the difference between either and 1986.

Similarly, when 1988 and 1989 were combined, the difference in SSE (.24) was insignificant when compared with the regression showing all six years. When both 1984/85 and 1988/89 were combined, the SSE was only .08 different from that of the individual year regression. The years between 1984 and 1985 appeared to have a gentle downward slope, as do the years between 1988 and 1989. The period 1986-1987, in contrast, showed a marked decline in PCDBPART. Therefore, it appeared that a significant shift occurred during 1986-1987.

Multinomial LOGIT Models

Table 14 (Table 16) provides the marginal effects (derivatives) from a multinomial LOGIT regression on the population of firms with a defined-benefit plan sometime during 1984-1989 and reporting for some plan in 1985 (1984). The dependent variable had three possible values: 0 if the defined-benefit plan was still in existence in 1989, 1 if the defined-benefit plan had been terminated and replaced by a defined-contribution plan by 1989, and 2 if there was no reporting for any plan by 1989 (termination of all plans was assumed). This table allows the testing of the LOGIT regression hypotheses.

HB-1a.   Given that a defined-benefit plan existed before 1989, the 1989 continued existence of a defined-benefit plan is positively related

> to the SIZE variable (Log of total
> employees).

HB-1b.   Given that a defined-benefit plan existed
                before 1989 and that it was terminated by
                1989, the continued existence of a defined-
                contribution plan in 1989 is positively
                related to the SIZE variable.

Null form: The coefficient of SIZE is less than or equal
                to 0.

As was discovered in the panel data regressions, SIZE

did not have the explanatory power it was a priori expected

to have. A larger firm appeared to be somewhat more likely

to keep its defined-benefit plan, and if the defined-benefit

plan was terminated, it was more likely to switch to a

defined-contribution plan than to terminate all plans.

A much stronger predictor of whether the firm would

terminate the defined-benefit plan or not was the ratio of

total participants divided by the total employees

(PCTPTEES). A firm with a higher percentage of covered

employees appeared to be a firm already committed to its

employees going into the 1984-1989 period. For this subset

of the population of firms having a defined-benefit plan at

some time during 1984-1989, the likelihood of keeping the

defined-benefit plan exceeded the likelihood of terminating

it. If the plan was terminated, a high value of PCTPTEES

predicted the implementation of a replacement defined-

contribution plan

HB-2a.   Given that a defined-benefit plan existed
                before 1989, the 1989 continued existence of

a defined-benefit plan is positively related to the INDCODE variable.

HB-2b.   Given that a defined-benefit plan existed before 1989 and that it was terminated by 1989, the continued existence of a defined-contribution plan in 1989 is positively related to the INDCODE variable.

Null form: The coefficient of INDCODE is less than or equal to 0.

The coefficients on the eight industry codes show that four of the eight were significant at the .01 level, one at the .05 level, and two at the .1 level. Thus, I can reject the null hypothesis of no significance. However, every one of the industries except tax-exempt organizations had a negative probability of retaining the defined-benefit plan. The reference was manufacturing, which has historically been the strongest sponsor of defined-benefit plans.

Tax-exempt organizations appeared to be more likely to keep their defined-benefit plans, which lent credence to the position that the 1986 and 1987 tax legislation reduced the prevalence of defined-benefit plans. These firms were less likely to be subject to changes due to the tax legislation. These firms may also have gone into the period with more equitable plans, which would make them less sensitive to the equity-enhancing provisions of TRA 86.

HB-3a.   Given that a defined-benefit plan existed before 1989, the 1989 continued existence of a defined-benefit plan is positively related to the PCUNION variable.

HB-3b.   Given that a defined-benefit plan existed
               before 1989 and that it was terminated by
               1989, the continued existence of a defined-
               contribution plan in 1989 is positively
               related to the PCUNION variable.

Null form: The coefficient of PCUNION is less than or
               equal to 0.

As found in the panel data regressions, the presence of

participants covered by a collective bargaining agreement

appeared to strongly predispose a firm toward the decision

to keep its defined-benefit plan. The t-value for PCUNION

was three times that of its nearest competitor

(integration). In the rare case where a plan covering

unionized participants was terminated, it was twice as

likely to be replaced by a defined-contribution plan as it

was to be terminated without replacement.

HB-4a.   Given that a defined-benefit plan existed
               before 1989, the 1989 continued existence of
               a defined-benefit plan is related
               to the TOPHEAVY variable.

HB-4b.   Given that a defined-benefit plan existed
               before 1989 and that it was terminated by
               1989, the continued existence of a defined-
               contribution plan in 1989 is related to the
               TOPHEAVY variable.

Null form: The coefficient of TOPHEAVY is equal to 0.

A top-heavy plan was one that had 60% of its benefits

going to officer-employees or the more highly compensated.

Perhaps because a top-heavy plan was more impacted by the

equity-enhancing provisions of the TRA 86, a top-heavy plan

was slightly more likely to be terminated than was a non-

top-heavy plan. However, the percentage was insignificant.

On the other hand, given that the plan was terminated, it was much more likely to be replaced by a defined-contribution plan than it was to have no replacement plan. This was perhaps due to affected participants being more apt to be influential in the decision-making process.

HB-5a.   Given that a defined-benefit plan existed
                before 1989, the 1989 continued existence of
                a defined-benefit plan is related
                to the INTEGRAT variable.

HB-5b.   Given that a defined-benefit plan existed
                before 1989 and that it was terminated by
                1989, the continued existence of a defined-
                contribution plan in 1989 is related to the
                INTEGRAT variable.

Null form: The coefficient of INTEGRAT is equal to 0.

An integrated plan is one that takes social security benefits into account in the plan's benefit structure. Therefore, a given level of benefit is less expensive to fund (because a portion of social security benefits are counted as part of the benefit) and the employees earning in excess of the social security level receive a higher level of benefit at retirement than do the majority of workers earning less than the maximum social security taxation level. Prior to 1986, firms had much more latitude in determining how much of the social security benefit could be counted as a plan benefit. The TRA 86 severely curtailed firms' options regarding integration.

The Senate Finance Committee Report on the Tax Reform Act of 1986 (BNA, 1986, p. 514) noted that "The pre-TRA 86

rules on social security integration, which permit an employer to eliminate any qualified plan benefits for lower-paid employees, undermine the original Congressional policy for providing the tax incentives for qualified plans." Presumably, restricting the integration options resulted in a much higher required contribution level for some firms.

Surprisingly, an integrated plan appeared to be remarkably more likely to be continued than was a non-integrated plan. This was perhaps because integrated plans were less expensive and/or because more influential people had a higher stake in ensuring that it continued. If an integrated plan was terminated, it was weakly more likely to be replaced by a defined-contribution plan than to remain unreplaced by any qualified plan.

HB-6a.   Given that a defined-benefit plan existed
           before 1989, the 1989 continued existence of
           a defined-benefit plan is related
           to the FUNDDEF variable.

HB-6b.   Given that a defined-benefit plan existed
           before 1989 and that it was terminated by
           1989, the continued existence of a defined-
           contribution plan in 1989 is related to the
           FUNDDEF variable.

Null form: The coefficient of FUNDDEF is equal to 0.

A firm suffering from a funding deficiency appeared to be most likely to terminate the defined-benefit plan and not replace it with a defined-contribution plan. The coefficient for termination was significant at the .05 level.

HB-7a.   Given that a defined-benefit plan existed
                before 1989, the 1989 continued existence of
                a defined-benefit plan is related to the
                MXNTOVPP variable.

HB-7b.   Given that a defined-benefit plan existed
                before 1989 and that it was terminated by
                1989, the continued existence of a defined-
                contribution plan in 1989 is related to the
                MXNTOVPP variable.

Null form: The coefficient of MXNTOVPP is equal to 0.

An overfunded plan was expected to be unfavorably

impacted by the provisions of the 1987 legislation limiting

tax-deductible contributions to the actual benefit

obligation rather than the projected benefit obligation.

However, an overfunded plan appeared to be slightly more

likely to be maintained than terminated. Although the t and

p values indicated significance, the coefficients were so

small that the impact does not appear to be noteworthy.

HB-8a.   Given that a defined-benefit plan existed
                before 1989, the 1989 continued existence of
                a defined-benefit plan is related
                to the MXNTUNPP variable.

HB-8b.   Given that a defined-benefit plan existed
                before 1989 and that it was terminated by
                1989, the continued existence of a defined-
                contribution plan in 1989 is related to the
                MXUNFDPP variable.

Null form: The coefficient of MXUNFDPP is equal to 0.

An underfunded plan was perceived to be a public policy

problem due in part to the federal insurance program

administered by the Pension Guaranty Benefit Corporation.

The underfunded plans also appeared to be slightly more

likely to be maintained than terminated. Although the

coefficient was about the same on both overfunding and underfunding, the t-value for underfunding was one-half that of overfunding. If an underfunded plan was terminated, it was less likely to be replaced by a defined-contribution plan. Presumably, a firm in such financial distress that it caused the defined-benefit plan to be terminated was unlikely to expend scarce resources to institute a replacement defined-contribution plan.

HB-9a.   Given that a defined-benefit plan existed
           before 1989, the 1989 continued existence of
           a defined-benefit plan is related
           to the CHGRTAGE variable.

HB-9b.   Given that a defined-benefit plan existed
           before 1989 and that it was terminated by
           1989, the continued existence of a defined-
           contribution plan in 1989 is related to the
           CHGRTAGE variable.

Null form: The coefficient of CHGRTAGE is equal to 0.

The 1986 TRA limited a plan's options regarding permissible retirement ages. Presumably, some firms were manipulating their retirement age so that they could contribute more to the defined-benefit plan to obtain a higher tax deduction in profitable years. It appeared that being forced to change the retirement age did not predispose a firm toward terminating the defined-benefit plan. However, once a plan that had to amend its retirement-age provisions was terminated, it was twice as likely to be replaced by a defined-contribution plan than to be terminated without a replacement. The coefficient on the

replacement by defined-contribution plan was the only one that was significant, however. It did not appear that being required to change the retirement age had a significant effect on the over-100 participant plans.

CHAPTER V

RESEARCH SUMMARY AND CONCLUSIONS

This research provides further evidence on the impact
of tax legislation on the provision of qualified retirement
plan benefits. Prior population research was extended by
using a time-series panel data format. A panel data format
enabled the distinction of a decline in the proportion of
defined-benefit coverage due to new firms' tendency to
sponsor defined-contribution plans from a decline because
firms previously providing a defined-benefit plan had
discontinued to do so. It was impossible to make this
distinction using the research methods of existing cross-
section population research.

This research documented that something happened during
the 1986-1987 period that resulted in a decrease in the
percentage of participants covered by defined-benefit plans.
Although there was a pre-existing decreasing trend in
defined-benefit coverage during the 1984-1989 period, the
period 1986-1987 witnessed a more pronounced decline.

This study found that a large portion of the percentage
decline in defined-benefit plan coverage over the entire
firm population was due to the proliferation of new defined-

contribution plans coupled with the non-existence of new defined-benefit plans. Firms that did not have a pre-existing defined-benefit plan were not likely to start a new one during the 1984-1989 period.

The tendency for firms to terminate existing defined-benefit plans also contributed to this trend. The 1986 and 1987 legislation was correlated with an approximately seven percent decline in the percentage of participants covered by an existing defined-benefit plan.

Unions appeared to be the strongest influence in determining whether or not an existing defined-benefit plan would be terminated. A firm containing collective bargaining participants was much less likely to terminate its defined-benefit plan. Any new plans started were likely to be for a union shop. This could be due to the obvious explanation that unions force the implementation of a defined-benefit plan, or it could be because unionized workers are less concerned about losing their jobs and are therefore more willing to contract for the promises of future benefits a defined-benefit plan offers. Non-unionized employees may be sufficiently unsure they will still be employed by their current employer at retirement that they are unwilling to contract for these future promises.

The presence of integration with Social Security in the plan benefits formula was the second strongest predictor of

whether a defined-benefit plan would be maintained. An integrated plan benefits those with wages over the Social Security taxable wage ceiling more than those with wages under the Social Security wage ceiling. For the firm, it enables a given targeted benefit formula to require lower contributions and is thus less expensive. However, it was significantly more expensive post-86 than it was pre-86.

Integrated plans may be more likely to survive because they are more congruent with workers' desires. The employees earning wages over the Social Security wage ceiling may value future retirement promises more than current earnings while the employees earning under the Social Security wage ceiling may value current salary increases more than future promises. In any case, integrated plans must be working for someone, because they were much more likely to survive the 1984-1989 period.

One contribution of this research was to validate assumptions made in prior research. The weakness of the CUSIP variable indicated that the research applicable to COMPUSTAT-sample research (widely held firms) was generalizable to the broader population. The similarity between the reactions of firms having 100% union participants and union participation positive but less than 100% validated the existing research employing a 0,1 variable for the presence of unions. The lack of difference between the reactions of those that have 100% defined-

benefit coverage and some but less than 100% defined-benefit coverage validated the convention used in existing research of a 0,1 variable for no DB, DB coverage.

Limitations of the Research

This research did not explicitly determine causation. Because many tax influences occurred during the decade of the 1980s it was impossible to partial out all extraneous factors.

In addition, there were so many tax laws passed with staggered effective dates during the 1980s that it was impossible to determine what the reaction was to any one piece of legislation. This is another argument for spacing apart any legislation regulating qualified plans; it is impossible to ascertain the effect of the last alteration before the next one is promulgated. In effect, the United States is driving blind on an issue that is crucial to its citizens' future financial security.

A limitation to the public policy generalizability is that only plans of larger employers (more than 100 participants) were examined. The retirement benefits for the employees of smaller employers (less than 100 participants) were not considered. However, a significant proportion of the nation's workforce was employed by smaller employers.

Of the over-100 participant plans reported in this study, the majority of them cover under 1000 participants.

Because each unique employer identification number was equally weighted, a small firm (under 1000 participants) carried as much impact as did a Fortune-100 multinational.

A further limitation of the study was that change in vesting is not addressed, although it was among the important changes in the 1986 Tax Act. The 5500 forms for 1984-1989 did not give adequate information to track vesting changes over time. There likely were many defined-benefit plans that had 100% cliff vesting at the end of ten years (e.g., 0% vesting until the end of the tenth year). This was no longer allowed post-TRA 86, and a measurement of the strength of the effect of this provision on the plan termination decision would be quite informative.

Suggestions for Future Research

If in fact defined-contribution plans are to be the only option in the retirement landscape of the future, workers need to begin saving for retirement at a much younger age. Defined-contribution plans can provide retirement pensions equivalent to those of defined-benefit plans, but the savings needs to be 10%-15% of salaries over a thirty-five year period (Smalhout, 1993, p. A18). Lump-sum terminations prior to retirement should be added to tax-deferred retirement accounts. Research discerning the tendency of employees to contribute to participatory defined-contribution plans and to rollover termination distributions is needed.

There appears to be a trend toward transferring the responsibility for funding retirement onto the employee's shoulders through matched or unmatched 401(k) plans. Documentation of this tendency by examining the time-series trend of employee contributions as a percent of total contributions and the amount of employer contribution per participant would provide information on the extent of this phenomenon.

Because legislation attempting to curb unfair discrimination results in the discontinuance of some defined-benefit plans, while a significant number of others are discontinued for some other reason, and most existing 401(k) plans will not provide for adequate additional retirement income, research on alternative proposals is indicated. The issue of portability of plan benefits is especially timely. If workforce trends have shifted to the extent that few workers will stay with any one firm for more than five years at a time, perhaps a system of employers funding expanded individual IRA-type accounts is the solution. Possibly some other form of government program should be considered.

A quantification of the impact on job mobility of the defined-benefit to defined-contribution switch is lacking. Because job mobility affects an employee's future earnings profile, and a defined-contribution plan presumably makes employees more mobile, the effect of a switch on job

mobility (and thus earnings) would assist in the public policy debate.

Research on the vehicles used for asset investment in qualified plans is also needed. There appears to be a trend in participant-directed 401(k) plans of investing disproportionately in fixed income investments rather than equities (Damato, January 8, 1993 WSJ, p. C1). Population research could document the extent of this trend. Assuming that it is widespread, case study research is needed to determine how firms are educating their workforce concerning the importance of personal savings for retirement and prudent investment of plan assets in the face of inflation.

Survey research could also be used to determine the extent of resources invested in employee education concerning retirement issues in firms with a 401(k) plan emphasis. Survey research could examine the extent of firms' hesitation in investment direction due to fear of litigation under the fiduciary standards of ERISA. It is possible that one impetus for the growth of 401(k) participant-directed accounts is that employers are concerned about the risk of litigation under ERISA fiduciary standards.

Population research could also attempt to determine the relative administrative cost of participant-directed 401(k) plans versus defined-benefit plans. It is conceivable that the most expensive plan to administer is a participant-

directed 401(k) with numerous investment options. However, as noted in this study, the reporting of administrative costs is not uniformly practiced.

A final public policy question of interest is whether firms with defined-benefit plans are more likely to discriminate against hiring workers who are over the age of 45. Because firms are now unable to exclude workers from plans due to age, and defined-benefit contributions for employees over the age of 45 are much higher than are contributions for employees under the age of 45, firms with defined-benefit plans may strongly prefer younger workers.

APPENDIX A

TABLES

TABLE 1

Regression Models

1. [Tables 4, 6 and 8]

$$PCDBPART_{it} = B_{oit} + B_1 \, SIZE_{it} + B_2 \, OTHER_{it} + B_3 \, TRADE_{it} + B_4 \, SERVICE_{it} + B_5 \, FININRE_{it} + B_6 \, PCUNION_{it} + B_7 \, INDSTRNG_{it} + B_8 \, CUSIP_{it} + B_9 \, POST86_{it}$$

2. [Tables 4A, 6A and 8A]

$$PCDBPART_{it} = B_{oit} + B_1 \, SIZE_{it} + B_2 \, PCUNION_{it} + B_3 \, INDSTRNG_{it} + B_4 \, POST86_{it}$$

3. [Table 10]

$$PCDBPART_{it} = B_{oit} + B_1 \, SIZE_{it} + B_2 \, OTHER_{it} + B_3 \, TRADE_{it} + B_4 \, SERVICE_{it} + B_5 \, FININRE_{it} + B_6 \, PCUNION_{it} + B_7 \, INDSTRNG_{it} + B_8 \, CUSIP_{it} + B_9 \, 1984_{it} + B_{10} \, 1985_{it} + B_{11} \, 1987_{it} + B_{12} \, 1988_{it} + B_{13} \, 1989_{it}$$

4. [Table 10]

$$PCDBPART_{it} = B_{oit} + B_1 \, SIZE_{it} + B_2 \, OTHER_{it} + B_3 \, TRADE_{it} + B_4 \, SERVICE_{it} + B_5 \, FININRE_{it} + B_6 \, PCUNION_{it} + B_7 \, INDSTRNG_{it} + B_8 \, CUSIP_{it} + B_9 \, 1984/85_{it} + B_{10} \, 1987_{it} + B_{11} \, 1988_{it} + B_{12} \, 1989_{it}$$

5. [Table 10]

$$PCDBPART_{it} = B_{oit} + B_1 \, SIZE_{it} + B_2 \, OTHER_{it} + B_3 \, TRADE_{it} + B_4 \, SERVICE_{it} + B_5 \, FININRE_{it} + B_6 \, PCUNION_{it} + B_7 \, INDSTRNG_{it} + B_8 \, CUSIP_{it} + B_9 \, 1984/85_{it} + B_{10} \, 1987_{it} + B_{11} \, 1988/89_{it}$$

6. [Table 14 and 16]

$$DBSTATUS_i = B_{oi} + B_1 \, SIZE_i + B_2 \, PCTPTEES_i + B_3 \, AGFRFS_i + B_4 \, MINCON_i + B_5 \, TRCMUTIL_i + B_6 \, WSTRADE_i + B_7 \, FININRE_i + B_8 \, SERV_i + B_9 \, MDHSR_i + B_{10} \, TXEXOR_i + B_{11} \, PCUNION_i + B_{12} \, TOPHEAVY_i + B_{13} \, INTEGRAT_i + B_{14} \, MXNTOVPP_i + B_{15} \, MXNTUNPP_i + B_{16} \, FUNDDEF_i + B_{17} \, CHGRTAGE_i$$

WHERE: $DBSTATUS_i = 0$ IF PERMDB
              $DBSTATUS_i = 1$ IF DBTODC
              $DBSTATUS_i = 2$ IF DBTONULL

SIC Code Reference: Manufactuing [All Models and Tables]

Year Reference: 1986 [Models 2-4, Table 10]

TABLE 2

Summary of Population and Sample Definition

Populations
Number of Firms Filing Returns

YEAR	PCDBPART = 1	0< PCDBPART < 1	PCDBPART = 0	TOTAL FIRMS FILING
1984	12864	1892	10302	25058
1985	12785	1997	11821	26603
1986	12456	2027	12987	27470
1987	10879	1721	12765	25365
1988	11743	1991	16066	29800
1989	10934	2329	17887	31150

Samples

Sample 1: [Tables 4, 4A & 10] Random sample of 3622 firms (as adjusted) drawn from the 25058 firms reporting in 1984.

Sample 2: [Table 6 and 6A] Random sample of 3978 firms drawn from the 12864 firms reporting in 1984 with PCDBPART = 1 for 1984, adjusted as follows:

Number of firms in sample	3978
Adjustment for firms dropping out of and back into reporting status or reporting for only one year	< 966>
Firms in sample	3012

[2045 reported for the entire 6 years]

Sample 3: [Table 8 and 8A] The 1892 firms reporting in 1984 with 0< PCDBPART < 1 for 1984, adjusted as follows:

Number of firms reporting	1892
Adjustment for firms dropping out of and back into reporting status or reporting for only one year	< 270>
Firms in sample	1622

TABLE 2 (Continued)

Sample 4: [Table 14] The 26,603 firms reporting in 1985, adjusted as follows:

        Number of firms reporting in 1985   26603
        Adjustment for defined-contribution
            only firms and firms that drop
            out of and back into reporting   <u><12460></u>

        Firms in sample   14143

Sample 5: [Table 16] The 25,058 firms reporting in 1984, adjusted as follows:

        Number of firms reporting in 1984   25058
        Adjustment for defined-contribution
            only firms and firms that drop
            out of and back into reporting   <u><11846></u>

        Firms in sample   13212

TABLE 3

Variable Definitions

*PCDBPART = Number of DBParticipants in Largest D.B. Plan
for Year

TOTPART

*TOTPART = The greater of the number of participants in the
largest DB plan or the number of participants in the
largest DC plan for the year

* SIZE = natural log of total employees
4 SIC Industry Codes:
  Other = All industries except manufacturing and TRADE,
    SERVICE, FININRE
  Trade = Wholesale and retail trade [5010-5996]
  Service = All services [7012-8999]
  FININRE = Finance, Insurance and Real Estate [6030-6749]
8 SIC Industry Codes:
  AGFRFS = Agriculture, Forestry, Fishing [0120-0970]
  MINCON = Mining and Construction [1510-1790]
  TRCMUTIL = Transportation, Communication, and Utilities
    [4000-4990]
  WSTRADE = Wholesale and Retail Trade [5010-5996]
  FININRE = Finance, Insurance and Real Estate [6030-6749]
  SERV = All services except medical [7012-7980 and 8111-
    8999]
  MDHLSR = Medical and Health Services [8011-8098]
  TXEXOR = Tax-Exempt Organizations [9002-9904]

*PCTPTEES =   TOTPART

           Total Employees for the firm for the year

*PCUNION =   Number of Union Participants

                              TOTPART

INDSTRNG = Natural log of the number of participants in that
industry's 2 digit SIC code for the year.

CUSIP = "1" if have a CUSIP designation on the 1987-1989
            5500
        "0" Otherwise

POST 86 = "1" if year is 1987, 1988, or 1989

*TOPHEAVY = "1" if any defined benefit plan is topheavy for
first plan year (box checked on 5500)

TABLE 3 (Continued)

*INTEGRATED = "1" if any defined benefit plan is integrated for first plan year

$$MXNTOVPP = \frac{\text{Maximum amount of overfunding - Maximum amount of underfunding}}{\text{DB participants in first plan year where maximum overfunding > maximum underfunding for the 6 years}}$$

MXNTUNPP = same as MXNTOVPP except maximum overfunding < absolute value of maximum underfunding for the 6 years

FUNDDEF = Have applied for a funding deficiency waiver [Box checked on 5500]

CHGRTAGE = Maximum retirement age - Retirement age for first DB year

* For the LOGIT regression, these values are set as of the first plan year and remain unchanged over the six year period

DBSTATUS = 0 if a firm has DB participants in 1989
            1 if a firm has no DB participants, but has DC participants in 1989
            2 if a firm has no reporting in 1989

TABLE 4

OLS & Random Effects Models: Unrestricted Sample
of 3622 Firms From 1984

	OLS	Random Effects	
		One Way*	Two Way**
CONSTANT	-0.30918	0.42604	0.38379
	(-5.683)[a]	(7.933)[a]	(6.895)[a]
SIZE	0.05144	0.01758	0.01794
	(22.73)[a]	(7.585)[a]	(7.869)[a]
OTHER	0.08266	0.00127	0.00527
	(6.930)[a]	(0.053)	(0.220)
TRADE	-0.12475	-0.17790	-0.17543
	(-11.265)[a]	(-7.725)[a]	(-7.613)[a]
SERVICE	0.00230	-0.02541	-0.02465
	(0.260)	(-1.340)	(-1.299)
FININRE	0.10018	0.05096	0.05322
	(8.744)[a]	(2.102)[c]	(2.194)[c]
PCUNION	0.34810	0.25375	0.25092
	(30.559)[a]	(12.338)[a]	(12.303)[a]
INDSTRNG	0.03565	0.00200	0.00563
	(9.969)[a]	(0.582)	(1.616)
CUSIP	0.01567	0.08647	0.08543
	(1.397)	(3.519)[a]	(3.476)[b]
POST86	-0.04077	-0.03965	-0.07004
	(-6.070)[a]	(-15.931)[a]	(-6.672)[a]

Dependent Variable: PCDBPART

R^2	.1126	.0925	.0920
AdjR^2	.1122		
SSE	3835.99		
F	262.79		
p	.0000		
Lagrange Multiplier		29709.5	29710.4
P-Value For Lagrange		.0000	.0000
Estimated Autocorrelation of e (i, t)		.0535	.0550

a. significant at .001
b. significant at .01
c. significant at .05
d. significant at .1
* Stratified by Firm   ** Stratified by Firm and By Year

TABLE 4A

OLS, Fixed & Random Effects Models: Unrestricted
Sample of 3622 Firms From 1984

	OLS	Fixed Effects	Random Effects
		One Way*	One Way*
CONSTANT	-0.27651	n/a	0.34768
	(-5.69)[a]	n/a	(6.491)[a]
SIZE	0.05221	0.0065	0.0202
	(24.04)[a]	(2.306)[c]	(8.298)[a]
PCUNION	0.34939	0.07535	0.27910
	(31.343)[a]	(2.078)[c]	(13.402)[a]
INDSTRNG	0.03352	-0.00461	0.00507
	(10.155)[a]	(-1.121)	(1.414)
POST86	-0.04072	-0.03844	-0.03999
	(-6.006)[a]	(-14.257)[a]	(-14.905)[a]

Dependent Variable: PCDBPART

R^2	.09491	.8965	.07602
AdjR^2	.09472	.8715	
SSE	3912.4	447.39	
F	488.84	35.90	
p	0.0000	0.0000	
Lagrange Multiplier			29993.15
P-Value For Lagrange			0.0000
Hausman Test			159.297
P-Value For Hausman			0.0000
Estimated Autocorrelation of e (i, t)			0.053097

a. significant at .001
b. significant at .01
c. significant at .05
d. significant at .1

* Stratified by Firm

TABLE 5

Descriptive Statistics for Table 4, 4A and Table 10:
Unrestricted Random Sample From 1984

[For 1984]

Variable	Mean	S.D.	N.	Minimum	Maximum
PCDBPart	0.5858	0.4803	3622	0.00	1.00
SIZE	6.4799	1.5392	3622	0.00	13.36
OTHER	0.1220	0.3274	3622	0.00	1.00
TRADE	0.1331	0.3397	3622	0.00	1.00
SERVICE	0.2258	0.4182	3622	0.00	1.00
FININRE	0.1171	0.3215	3622	0.00	1.00
PCUNION	0.0999	0.2841	3622	0.00	1.00
INDSTRNG	14.3460	1.0470	3622	6.399	16.00
CUSIP	0.0997	0.2996	3622	0.00	1.00

[For 1984-1989 Pooled Data]

Variable	Mean	S.D.	N.	Minimum	Maximum
PCDBPart	0.5728	0.4814	18652	0.00	1.00
SIZE	6.5771	1.5643	18652	0.00	13.47
OTHER	0.1175	0.3220	18652	0.00	1.00
TRADE	0.1326	0.3391	18652	0.00	1.00
SERVICE	0.2287	0.4200	18652	0.00	1.00
FININRE	0.1175	0.3220	18652	0.00	1.00
PCUNION	0.1150	0.3037	18652	0.00	1.00
INDSTRNG	14.4230	1.0203	18652	6.37	16.16
CUSIP	0.1147	0.3187	18652	0.00	1.00
POST86	0.4358	0.4959	18652	0.00	1.00
1984	0.1942	0.3956	18652	0.00	1.00
1984/85	0.3884	0.4874	18652	0.00	1.00
1985	0.1942	0.3956	18652	0.00	1.00
1987	0.1592	0.3659	18652	0.00	1.00
1988	0.1454	0.3525	18652	0.00	1.00
1988/89	0.2767	0.4474	18652	0.00	1.00
1989	0.1313	0.3377	18652	0.00	1.00

TABLE 6

OLS & Random Effects Models: Random Sample of 3012
Firms Where DB Participants = Total
Participants In 1984

	OLS	Random Effects	
		One Way*	Two Way**
CONSTANT	0.91107	0.94861	0.88863
	(30.986)[a]	(23.905)[a]	(19.229)[a]
SIZE	0.001857	0.001406	0.001945
	(1.590)	(0.873)	(1.223)
OTHER	0.01164	0.00959	0.014814
	(1.829)[d]	(0.976)	(1.500)
TRADE	-0.03211	-0.03118	-0.02755
	(-4.542)[a]	(-2.852)[b]	(-2.514)[c]
SERVICE	0.00565	0.00518	0.007400
	(1.159)	(0.684)	(0.972)
FININRE	0.00919	-0.01218	-0.010056
	(-1.461)	(-1.253)	(-1.033)
PCUNION	0.0627	0.06359	0.06849
	(11.862)[a]	(7.674)[a]	(8.081)[a]
INDSTRNG	0.002443	0.000099	0.003343
	(1.262)	(0.038)	(1.292)
CUSIP	-0.01960	-0.01989	-0.01720
	(-3.231)[b]	(-2.055)[c]	(-1.747)[d]
POST86	-0.07950	-0.07774	-0.05557
	(-21.215)[a]	(-24.713)[a]	(-2.163)[c]

Dependent Variable: PCDBPART

R^2	0.03988	0.03973	0.03682
AdjR^2	0.03933		
SSE	830.493		
F	71.775		
p	0.0000		
Lagrange Multiplier		5979.52	7774.57
P-Value For Lagrange		0.0000	0.0000
Estimated Autocorrelation of e (i, t)		0.04908	0.05493

a. significant at .001
b. significant at .01
c. significant at .05   *   Stratified by Firm
d. significant at .1   **   Stratified by Firm and by Year

TABLE 6A

OLS, Fixed & Random Effects Models: Random Sample of 3012
Firms Where DB Participants = Total
Participants In 1984

	OLS	Fixed Effects One Way*	Random Effects One Way*
CONSTANT	0.91684 (35.137)[a]	n/a n/a	0.95223 (27.030)[a]
SIZE	-0.000019 (-0.086)	0.0000275 (0.132)	0.00000719 (0.037)
PCUNION	0.06471 (12.874)[a]	0.12624 (3.658)[a]	0.06582 (8.294)[a]
INDSTRNG	0.002665 (1.482)	-0.00774 (-1.813)[d]	0.000199 (0.082)
POST86	-0.079795 (-21.294)[a]	-0.07604 (-24.753)[a]	-0.0777 (-25.766)[a]

Dependent Variable: PCDBPART

R^2	0.03670	0.5245	0.03654
AdjR^2	0.03645	0.4103	
SSE	833.262	411.298	
F	14.818	4.591	
p	0.0000	0.0000	

Lagrange Multiplier	6040.771
P-Value For Lagrange	0.0000
Hausman Test	13.0162
P-Value For Hausman	0.011197
Estimated Autocorrelation of e (i, t)	0.049163

a. significant at .001
b. significant at .01
c. significant at .05
d. significant at .1

* Stratified by Firm

TABLE 7

Descriptive Statistics for Table 6 and 6A: Random
Sample of Firms Where DB Participants =
Total Participants in 1984

[For 1984]

Variable	Mean	S.D.	N.	Minimum	Maximum
PCDBPart	1.0000	0.0000	3012	1.00	1.00
SIZE	6.7193	1.6651	3012	0.00	13.50
OTHER	0.1258	0.3317	3012	0.00	1.00
TRADE	0.0913	0.2881	3012	0.00	1.00
SERVICE	0.2424	0.4286	3012	0.00	1.00
FININRE	0.1252	0.3310	3012	0.00	1.00
PCUNION	0.1596	0.3492	3012	0.00	1.00
INDSTRNG	14.396	1.0456	3012	6.399	16.00
CUSIP	0.1056	0.3074	3012	0.00	1.00

[For 1984-1989 Pooled Data]

Variable	Mean	S.D.	N.	Minimum	Maximum
PCDBPart	0.9322	0.2358	15561	0.00	1.00
SIZE	6.7960	1.6724	15561	0.00	13.50
OTHER	0.1289	0.3351	15561	0.00	1.00
TRADE	0.0907	0.2873	15561	0.00	1.00
SERVICE	0.2448	0.4300	15561	0.00	1.00
FININRE	0.1230	0.3285	15561	0.00	1.00
PCUNION	0.1822	0.3697	15561	0.00	1.00
INDSTRNG	14.459	1.0324	15561	6.370	16.16
CUSIP	0.1213	0.3265	15561	0.00	1.00
POST86	0.43705	0.4960	15561	0.00	1.00

TABLE 8

OLS & Random Effects Models: Population (As Adjusted)
of 1662 Firms Where 0 < PCDBPART < 1 for 1984

	OLS	Random Effects	
		One Way*	Two Way**
CONSTANT	0.59370	0.70267	0.72206
	(9.258)[a]	(7.968)[a]	(8.046)[a]
SIZE	-0.001389	-0.002011	-0.001647
	(-0.609)	(-0.604)	(-0.495)
OTHER	0.10170	0.08443	0.08371
	(6.810)[a]	(3.237)[b]	(3.202)[b]
TRADE	0.007445	-0.000083	0.0000183
	(0.582)	(-0.004)	(0.001)
SERVICE	0.008893	0.003235	0.00362
	(0.833)	(0.171)	(0.191)
FININRE	0.14620	0.14040	0.14119
	(13.723)[a]	(7.456)[a]	(7.479)[a]
PCUNION	0.10359	0.10662	0.10465
	(8.238)[a]	(4.894)[a]	(4.790)[a]
INDSTRNG	0.00468	-0.002340	-0.00270
	(1.115)	(-0.410)	(-0.470)
CUSIP	0.03805	0.04248	0.03914
	(4.231)[a]	(2.656)[b]	(2.420)[c]
POST86	-0.04013	-0.04512	-0.07881
	(-5.473)[a]	(-8.475)[a]	(-3.684)[a]

Dependent Variable: PCDBPART

R^2	0.036225	.035767	.032847
AdjR^2	0.03527		
SSE	1096.92		
F	37.89		
p	0.0000		
Lagrange Multiplier		5403.98	5404.59
P-Value For Lagrange		0.0000	0.0000
Estimated Autocorrelation of e (i,t)		0.02276	0.02323

a. significant at .001
b. significant at .01
c. significant at .05   * Stratified by Firm
d. significant at .1   ** Stratified by Firm and Year

TABLE 8A

OLS, Fixed & Random Effects Models: Population (As Adjusted)
of 1662 Firms Where 0 < PCDBPART < 1 for 1984

	OLS	Fixed Effects One Way*	Random Effects One Way*
CONSTANT	0.75844	n/a	0.80510
	(13.594)[a]	n/a	(10.097)[a]
SIZE	0.000222	-0.00203	-0.001069
	(0.104)	(-3.76)	(-0.335)
PCUNION	0.07490	0.12396	0.08497
	(6.112)[a]	(2.1)[c]	(3.993)[a]
INDSTRNG	-0.00383	-0.00925	-0.006486
	(-1.005)	(-1.168)	(-1.206)
POST86	-0.039191	-0.04643	-0.04498
	(-5.271)[a]	(-8.705)[a]	(-8.509)[a]

Dependent Variable: PCDBPART

R^2	0.007202	0.60789	0.00693
AdjR^2	0.006764	0.51987	
SSE	1129.96	446.28	
F	16.463	6.91	
p	0.0000	0.0000	

Lagrange Multiplier	5736.52
P-Value For Lagrange	0.0000
Hausman Test	7.775
P Value for Hausman	0.1002
Estimated Autocorrelation of e (i,t)	0.022699

a. significant at .001
b. significant at .01
c. significant at .05
d. significant at .1

* Stratified by Firm

TABLE 9

Descriptive Statistics for Table 8 and 8A: Random Sample
of Firms Where 0 < PCDBPART < 1

[For 1984]

Variable	Mean	S.D.	N.	Minimum	Maximum
PCDBPart	0.7277	0.2502	1662	0.001534	0.9997
SIZE	7.3055	1.7671	1662	2.944	13.03
OTHER	0.0842	0.2778	1662	0.00	1.00
TRADE	0.1161	0.3205	1662	0.00	1.00
SERVICE	0.1859	0.3892	1662	0.00	1.00
FININRE	0.1943	0.3958	1662	0.00	1.00
PCUNION	0.1335	0.2971	1662	0.00	1.00
INDSTRNG	14.425	0.98625	1662	8.063	16.00
CUSIP	0.2702	0.4442	1662	0.00	1.00

[For 1984-1989 Pooled Data]

Variable	Mean	S.D.	N.	Minimum	Maximum
PCDBPart	0.6971	0.3540	9083	0.00	1.00
SIZE	7.3808	1.7919	9083	0.00	13.06
OTHER	0.0843	0.2779	9083	0.00	1.00
TRADE	0.11351	0.3172	9083	0.00	1.00
SERVICE	0.1867	0.3897	9083	0.00	1.00
FININRE	0.1883	0.3909	9083	0.00	1.00
PCUNION	0.1455	0.3104	9083	0.00	1.00
INDSTRNG	14.479	0.9785	9083	5.407	16.16
CUSIP	0.2945	0.4559	9083	0.00	1.00
POST86	0.4594	0.4984	9083	0.00	1.00

TABLE 10

Comparative OLS Regressions for Yearly Analysis:
Unrestricted Random Sample of 3622
Firms From 1984

	OLS Post 86	OLS Separate Years	OLS 84/85 Combined	OLS 88/89 Combined	OLS 84/85 & 88/89 Combined
CONSTANT	-0.30918 (-5.683)[a]	-0.33109 (-6.008)[a]	-0.33321 (-6.048)[a]	-0.32968 (-5.984)[a]	-0.33180 (-6.024)[a]
SIZE	0.05144 (22.73)[a]	0.05154 (22.775)[a]	0.05155 (22.780)[a]	0.05153 (22.770)[a]	0.05154 (22.775)[a]
OTHER	0.08266 (6.930)[a]	0.08382 (7.023)[a]	0.08377 (7.019)[a]	0.08368 (7.012)[a]	0.08363 (7.008)[a]
TRADE	-0.12475 (-11.265)[a]	-0.12392 (-11.188)[a]	-0.12394 (-11.190)[a]	-0.12401 (-11.196)[a]	-0.12402 (-11.198)[a]
SERVICE	0.00230 (0.260)	0.00266 (0.301)	0.00268 (0.303)	0.00264 (0.298)	0.00266 (0.300)
FININRE	0.10018 (8.744)[a]	0.10074 (8.792)[a]	0.10075 (8.794)[a]	0.10066 (8.786)[a]	0.10067 (8.787)[a]
PCUNION	0.34810 (30.559)[a]	0.34875 (30.614)[a]	0.34878 (30.618)[a]	0.34869 (30.609)[a]	0.34872 (30.613)[a]
INDSTRNG	0.03565 (9.969)[a]	0.03655 (10.181)[a]	0.03652 (10.176)[a]	0.03646 (10.159)[a]	0.03643 (10.154)[a]
CUSIP	0.01567 (1.397)	0.01583 (1.411)	0.01589 (1.416)	0.01584 (1.412)	0.01589 (1.417)
POST86	-0.04077 (-6.070)[a]				
1984		0.01396 (1.277)		0.01395 (1.277)	
1984/85			0.01490 (1.560)		0.01490 (1.560)
1985		0.008791 (0.808)		0.008791 (0.808)	
1987		-0.016958 (-1.481)	-0.01445 (-1.257)	-0.01697 (-1.482)	-0.01446 (-1.258)
1988		-0.03599 (-3.068)[c]	-0.03348 (-2.841)[c]		
1988/89				-0.04241 (-4.203)[a]	-0.03990 (-3.931)[a]
1989		-0.04954 (-4.098)[a]	-0.04703 (-3.874)[c]		
DEPENDENT VARIABLE: PCDBPART					
R²	.1126	.1130	.1130	.1129	.1130
ADJ R²	.1122	.1124	.1125	.1124	.1125
SSE	3835.99	3834.20	3834.04	3834.44	3834.28
F	262.79	182.65	197.95	197.77	215.84
p	.0000	.0000	.0000	.0000	.0000

a. Significant at .001   c. Significant at .05
b. Significant at .01   d. Significant at .1

TABLE 11

Summary of Population (Adjusted) of Firms With
Defined-Benefit Plans During 1984-1989 and
Reporting for 1985: Stratified by
PCUNION and PCDBPART

Section 1:　　　100% Union Participation
　　　　　　　　100% D.B. Participation

Total Partici-pants	Integrated or Non-Integrated	Number of Firms	% Remain DB	% Switch to DC	% Terminate Plans
≥ 1000	Integrated	193	88.60	4.15	7.25
≥ 1000	Non-Int	79	70.88	10.13	18.99
< 1000	Integrated	461	86.33	4.56	9.11
< 1000	Non-Int	727	81.43	6.05	12.52

Section 2:　　　0 < % Union Participation < 1
　　　　　　　　100% D.B. Participation

Total Partici-pants	Integrated or Non-Integrated	Number of Firms	% Remain DB	% Switch to DC	% Terminate Plans
≥ 1000	Integrated	211	89.58	7.58	2.84
≥ 1000	Non-Int	30	70.00	26.67	3.33
< 1000	Integrated	395	89.87	8.86	1.27
< 1000	Non-Int	186	83.87	16.13	0.00

Section 3:　　　0% Union Participation
　　　　　　　　100% D.B. Participation

Total Partici-pants	Integrated or Non-Integrated	Number of Firms	% Remain DB	% Switch to DC	% Terminate Plans
≥ 1000	Integrated	1274	62.72	14.44	22.84
≥ 1000	Non-Int	355	44.51	16.62	38.87
< 1000	Integrated	5320	58.91	15.68	25.41
< 1000	Non-Int	2725	39.92	22.50	37.58

TABLE 11 (Continued)

Section 4:   100% Union Participation
                0 < % DB Participation < 1

Total Partici- pants	Integrated or Non- Integrated	Number of Firms	% Remain DB	% Switch to DC	% Terminate Plans
≥ 1000	Integrated	63	87.30	11.11	1.59
≥ 1000	Non-Int	11	45.46	54.54	0.00
< 1000	Integrated	36	75.00	19.44	5.56
< 1000	Non-Int	25	64.00	32.00	4.00

Section 5:   0<% Union Participation < 1
                0<% D.B. Participation < 1

Total Partici- pants	Integrated or Non- Integrated	Number of Firms	% Remain DB	% Switch to DC	% Terminate Plans
≥ 1000	Integrated	161	86.33	9.94	3.73
≥ 1000	Non-Int	34	76.47	20.59	2.94
< 1000	Integrated	82	84.15	14.63	1.22
< 1000	Non-Int	68	61.77	33.82	4.41

Section 6:   0% Union Participation
                0 < % D.B. Participation < 1

Total Partici- pants	Integrated or Non- Integrated	Number of Firms	% Remain DB	% Switch to DC	% Terminate Plans
≥ 1000	Integrated	409	56.72	24.70	18.58
≥ 1000	Non-Int	101	38.61	42.58	18.81
< 1000	Integrated	824	46.97	38.47	14.56
< 1000	Non-Int	373	36.46	45.31	18.23

TABLE 12

Summary of Population of Firms with Defined Benefit Plans
During 1984-1989 and Reporting for 1985: Stratified
by Level of Total Participants

LEVEL OF TOTAL PARTICIPANTS	NUMBER OF FIRMS	MEAN % UNION	MEAN % OF TOTAL PARTI- CIPANTS IN D.B. PLAN	MEAN INTE- GRATED % OF TOTAL PLANS	% REMAIN- ING D.B. IN 1989	% SWITCH TO D.C. BY 1989	% TERMI- NATE PLANS BY 1989
= 100 to < 1000	11,222	14.48	96.97	63.42	57.03	18.83	24.14
= 1000 to < 5,000	2,298	15.15	91.90	77.20	62.58	16.19	21.24
= 5,000 to < 10,000	324	20.53	88.50	85.19	70.68	15.43	13.89
=10,000 to < 50,000	265	28.16	81.16	87.17	73.96	13.59	12.45
=50,000 and Over	35	49.38	74.06	88.57	80.00	14.29	5.71

TABLE 13

Descriptive Statistics for Population (Adjusted)
of Firms With Defined Benefit Plans During
1984-1989 and 1985 Reporting: Stratified
By Plan Status as of 1989

	MEAN	S.D.	N.	MINIMUM	MAXIMUM
		[PERM D.B. = 1]			
PCDBPART	0.96134	0.1333	8290	0.00381	1.00
SIZE	6.8642	1.5866	8290	0.0000	16.53
PCTPTEES	0.61835	0.2784	8290	0.00001	1.00
AGFKFS	0.02955	0.1694	8290	0.0000	1.00
MINCON	0.02992	0.0299	8290	0.0000	1.00
TRCMUTIL	0.24620	0.2462	8290	0.0000	1.00
WSTRADE	0.05742	0.0574	8290	0.0000	1.00
FININRE	0.08154	0.0815	8290	0.0000	1.00
SERV	0.12207	0.1221	8290	0.0000	1.00
MDHLSR	0.02835	0.0283	8290	0.0000	1.00
TXEXOR	0.17129	0.1713	8290	0.0000	1.00
PCUNION	0.21545	0.3855	8290	0.0000	1.00
TOPHEAVY	0.03703	1.8885	8290	0.0000	1.00
INTEGRATED	0.71834	0.4498	8290	0.0000	1.00
MXNTOVPP	994.86	5169.1	8290	0.0000	282100.
MXNTUNPP	-38.76	495.61	8290	-35420.	0.00
FUNDDEF	0.01206	0.1092	8290	0.0000	1.00
CHGRTAGE	0.09650	1.1386	8290	0.0000	55.00
		[DB TO DC = 1]			
PCDBPART	0.9156	0.1992	2576	0.00153	1.00
SIZE	6.5700	1.4392	2576	2.1970	13.50
PCTPTEES	0.6387	0.2601	2576	0.0013	1.00
AGFRFS	0.03999	0.1960	2576	0.0000	1.00
MINCON	0.03183	0.1756	2576	0.0000	1.00
TRCMUTIL	0.22011	0.4144	2576	0.0000	1.00
WSTRADE	0.04426	0.2057	2576	0.0000	1.00
FININRE	0.14402	0.3512	2576	0.0000	1.00
SERV	0.16848	0.3744	2576	0.0000	1.00
MDHLSR	0.03843	0.1923	2576	0.0000	1.00
TXEXOR	0.11724	0.3218	2576	0.0000	1.00
PCUNION	0.06587	0.2262	2576	0.0000	1.00
TOPHEAVY	0.0555	0.2290	2576	0.0000	1.00
INTEGRATED	0.6048	0.4890	2576	0.0000	1.00
MXNTOVPP	506.38	2401.6	2576	0.0000	104900
MXNTUNPP	-54.403		2576	-33250.	0.00
FUNDDEF	0.01009	0.9998	2576	0.0000	1.00
CHGRTAGE	0.03610	0.3423	2576	0.0000	10.00

TABLE 13 (Continued)

	MEAN	S.D.	N.	MINIMUM	MAXIMUM
		[DB to NULL = 1]			
PCDBPART	0.9741	0.1120	3277	0.01235	1.00
SIZE	6.9041	1.7640	3277	0.0000	12.44
PCTPTEES	0.5696	0.3228	3277	0.00062	1.00
AGFRFS	0.0320	0.1762	3277	0.0000	1.00
MINCON	0.0497	0.2174	3277	0.0000	1.00
TRCMUTIL	0.2341	0.4235	3277	0.0000	1.00
WSTRADE	0.05097	0.2200	3277	0.0000	1.00
FININRE	0.09399	0.2919	3277	0.0000	1.00
SERV	0.1337	0.3403	3277	0.0000	1.00
MDHLSR	0.3509	0.1840	3277	0.0000	1.00
TXEXDR	0.1477	0.3549	3277	0.0000	1.00
PCUNION	0.0535	0.2224	3277	0.0000	1.00
TOPHEAVY	0.0308	0.1729	3277	0.0000	1.00
INTEGRATED	0.5847	0.4929	3277	0.0000	1.00
MXNTOVPP	682.33	2385.3	3277	0.0000	83160.
MXNTUNPP	-93.70	1361.00	3277	-66640.	0.00
FUNDDEF	0.0171	0.1296	3277	0.0000	1.00
CHGRTAGE	0.05371	0.3758	3277	0.0000	8.00

Number Participants in Perm D.B. by 1989:   11,298,441   68.03%
Number Participants in D.B. to D.C. by 1989:   2,591,198   15.60%
Number Participants in D.B. to NULL by 1989:   2,718,435   16.37%

TABLE 14

Marginal Effects From Logit Regression on Population
(As adjusted) of Firms Reporting in 1985 and
Having a D.B. Plan Between 1984 and 1989

	MARGINAL EFFECTS PERM D.B.	MARGINAL EFFECTS D.B. TO D.C.	MARGINAL EFFECTS D.C. TO NULL
CONSTANT	-0.05091	-0.02520	0.07611
	(-1.418)	(-2.070)[d]	(2.818)
SIZE	0.01043	-0.00958	-0.00085
	(2.761)[b]	(-7.158)[a]	(-0.302)
PCTPTEES	0.10782	0.02475	-0.13257
	(5.209)[a]	(3.535)[a]	(-8.177)[a]
AGFRFS	-0.04819	0.05129	-0.00310
	(-1.927)[d]	(6.860)[a]	(-0.158)
MINCON	-0.11080	0.02320	0.08760
	(-3.571)[a]	(2.288)[c]	(4.172)[a]
TRCMUTIL	-0.02805	0.01828	0.00977
	(-1.981)[c]	(3.774)[a]	(0.928)
WSTRADE	-0.03659	0.01738	0.01921
	(-1.534)	(2.104)[c]	(1.090)
FININRE	-0.06018	0.08196	-0.02178
	(-3.821)[a]	(16.440)[a]	(-1.716)[d]
SERV	-0.05149	0.05080	0.00069
	(-3.442)[a]	(10.117)[a]	(0.059)
MDHLSR	-0.04449	0.04462	-0.00013
	(-1.705)[d]	(5.552)[a]	(-0.006)
TXEXOR	0.07149	-0.05065	-0.02084
	(4.410)[a]	(-8.216)[a]	(-1.734)[d]
PCUNION	0.45576	-0.15136	-0.30440
	(56.591)[a]	(-20.318)[a]	(-19.815)[a]
TOPHEAVY	-0.01239	0.06023	-0.04784
	(-0.745)	(12.136)[a]	(-2.886)[b]
INTEGRAT	0.17732	-0.07004	-0.10728
	(17.136)[a]	(-19.294)[a]	(-13.138)[a]
MXNTOVPP	0.00002	-0.00002	0.0000007
	(3.491)[b]	(-8.677)[a]	(0.253)
MXNTUNPP	0.00002	-0.000006	-0.00002
	(1.943)[d]	(-3.668)[a]	(-2.364)[c]
FUNDDEF	-0.05733	-0.02731	0.08464
	(-1.124)	(-1.639)	(2.488)[d]
CHGRTAGE	0.02504	-0.01947	-0.00557
	(1.563)	(-2.907)[b]	(-0.527)

DEPENDENT VARIABLE: D.B. STATUS (PERMDB, DBTODC, DBTNULL)

Chi-Squared = 1674.06
p Value = 0.0000

a. Significant at .001
b. Significant at .01
c. Significant at .05
d. Significant at .1

TABLE 15

Descriptive Statistics for Tables 11 - 14

	Mean	S.D.	N.	Minimum	Maximum
PCDBPART	0.956	0.1447	14143	0.00153	1.00
SIZE	6.820	1.6086	14143	0.00	16.53
PCTPEES	0.6108	0.2871	14143	0.00001	1.00
AGFRFS	0.0320	0.1761	14143	0.00	1.00
MINCON	0.0349	0.1834	14143	0.00	1.00
TRCMUTIL	0.2386	0.4263	14143	0.00	1.00
WSTRADE	0.0535	0.2251	14143	0.00	1.00
FININRE	0.0958	0.2943	14143	0.00	1.00
SERV	0.1332	0.3398	14143	0.00	1.00
MDHLSR	0.0318	0.1753	14143	0.00	1.00
TXEXOR	0.1560	0.3629	14143	0.00	1.00
PCUNION	0.1507	0.3374	14143	0.00	1.00
TOPHEAVY	0.0390	0.1935	14143	0.00	1.00
INTEGRAT	0.6667	0.4714	14143	0.00	1.00
MXNTOVPP	833.47	4250.8	14143	0.00	282100.
MXNTUNPP	-54.34	827.77	14143	-66640.	0.00
FUNDDEF	0.0129	0.1127	14143	0.00	1.00
CHGRTAGE	0.0756	0.9026	14143	0.00	55.00

TABLE 16

Marginal Effects From Logit Regression on Population
(As Adjusted) of Firms Reporting in 1984 and
Having a D.B. Plan Between 1984 and 1989

	MARGINAL EFFECTS PROBABILITY PERM D.B.	MARGINAL EFFECTS PROBABILITY D.B. TO D.C.	MARGINAL EFFECTS PROBABILITY D.C. TO NULL
CONSTANT	-0.07120 (-1.942)[d]	-0.00709 (-0.574)	0.07829 (2.823)[b]
SIZE	0.01188 (3.101)[c]	-0.00996 (-7.343)[a]	-0.00192 (-0.666)
PCTPTEES	0.11038 (5.211)[a]	0.01611 (2.267)[c]	-0.12649 (-7.627)[a]
AGFRFS	-0.04262 (-1.640)	0.04627 (6.079)[a]	-0.00365 (-0.177)
MINCON	-0.11331 (-3.598)[a]	0.02309 (2.376)[c]	0.09022 (4.223)[a]
TRCMUTIL	-0.01988 (-1.383)	0.01169 (2.399)[c]	0.008199 (0.760)
WSTRADE	-0.04253 (-1.782)[d]	0.02107 (2.601)[b]	0.02146 (1.204)
FININRE	-0.05018 (-3.168)[b]	0.07627 (15.574)[a]	-0.02609 (-1.999)[c]
SERV	-0.05639 (-3.672)[a]	0.05074 (10.060)[a]	0.00565 (0.470)
MDHLSR	-0.06201 (-2.215)[c]	0.04447 (5.401)[a]	0.01754 (0.843)
TXEXOR	0.07796 (4.693)[a]	-0.06103 (-9.599)[a]	-0.01693 (-1.377)
PCUNION	0.44941 (51.303)[a]	-0.15527 (-20.240)[a]	-0.29414 (-18.906)[a]
TOPHEAVY	-0.00906 (-0.572)	0.07093 (16.355)[a]	-0.06187 (-3.498)[a]
INTEGRAT	0.17999 (16.932)[a]	-0.07321 (-19.542)[a]	-0.10678 (-12.705)[a]
MXNTOVPP	0.00002 (3.646)[a]	-0.00002 (-9.333)[a]	0.000001 (0.501)
MXNTUNPP	0.00002 (1.768)[d]	-0.000005 (-3.083)[b]	-0.00001 (-2.137)[c]
FUNDDEF	-0.05126 (-1.033)	-0.01645 (-1.032)	0.06771 (2.001)[c]
CHGRTAGE	0.02756 (1.712)[d]	-0.02093 (-3.079)[b]	-0.00663 (-0.614)

DEPENDENT VARIABLE: D.B. STATUS (PERMDB, DBTODC, DBTNULL)

Chi-Squared = 1565.70
p Value = 0.0000

a. Significant at .001
b. Significant at .01
c. Significant at .05
d. Significant at .1

TABLE 17

Descriptive Statistics for Table 16

	Mean	S.D.	N.	Minimum	Maximum
PCDBPART	0.956	0.1453	13212	0.00153	1.00
SIZE	6.842	1.6008	13212	0.00	16.53
PCTPEES	0.6120	0.2848	13212	0.000001	1.00
AGFRFS	0.0306	0.1722	13212	0.00	1.00
MINCON	0.0355	0.1851	13212	0.00	1.00
TRCMUTIL	0.2401	0.4272	13212	0.00	1.00
WSTRADE	0.0548	0.2276	13212	0.00	1.00
FININRE	0.0959	0.2945	13212	0.00	1.00
SERV	0.1303	0.3367	13212	0.00	1.00
MDHLSR	0.0304	0.1718	13212	0.00	1.00
TXEXOR	0.1587	0.3654	13212	0.00	1.00
PCUNION	0.1520	0.3386	13212	0.00	1.00
TOPHEAVY	0.0359	0.1860	13212	0.00	1.00
INTEGRAT	0.6668	0.4714	13212	0.00	1.00
MXNTOVPP	851.69	4172.2	13212	0.00	282100
MXNTUNPP	-53.18	839.36	13212	-66640	0.00
FUNDDEF	0.0132	0.1140	13212	0.00	1.00
CHGRTAGE	0.0780	0.9309	13212	0.00	55.00

APPENDIX B

SUMMARY OF HYPOTHESES

Time-Series Panel-Data Models:

HA-1.   The percentage of participants covered by a defined benefit plan is positively related to the SIZE variable (Log of total employees).

Null form: The coefficient of SIZE is less than or equal to 0.

HA-2.   Industry Code is related to the percentage of participants covered by a defined-benefit plan.

Null form: The coefficients for INDUSTRY CODES are all simultaneously equal to 0.

HA-3.   The percentage of participants covered by a defined benefit plan is positively related to the degree of union participation in the firm, measured by the number of union participants divided by the total participants.

Null form: The coefficient on PCUNION is less than or equal to zero.

HA-4.   The percentage of participants covered by a defined-benefit plan is positively related to the state of having ownership publicly held (CUSIP=1) versus closely held (CUSIP=0).

Null form: The coefficient on CUSIP is less than or equal to 0.

HA-5.   The percentage of participants covered by a defined benefit plan is positively related to an industry-specific economic indicator.

Null form: The coefficient of INDSTRNG will be less than or equal to 0.

Pre-Existing Trend Models

HA-6.   The percentage of participants covered by a defined benefit plan is related to the time dummies for 1984-1990.

Null form: The coefficients on the six time dummies for
               1984-1990 are all simultaneously equal to 0.

HA-7.   The coefficients on the 1984-1986 time
               dummies are greater than the coefficients on
               the 1987-1990 time dummies.

Null Form   The coefficients on the 1984-1986 time
               dummies are less than or equal to the
               coefficients on the 1987-1990 time dummies.

Multinomial Logit Models:

HB-1a.   Given that a defined-benefit plan existed
               before 1989, the 1989 continued existence of
               a defined-benefit plan is positively related
               to the SIZE variable (Log of total
               employees).

HB-1b.   Given that a defined-benefit plan existed
               before 1989 and that it was terminated by
               1989, the continued existence of a defined-
               contribution plan in 1989 is positively
               related to the SIZE variable.

Null form: The coefficient of SIZE is less than or equal
               to 0.

HB-2a.   Given that a defined-benefit plan existed
               before 1989, the 1989 continued existence of
               a defined-benefit plan is positively related
               to the INDCODE variable.

HB-2b.   Given that a defined-benefit plan existed
               before 1989 and that it was terminated by
               1989, the continued existence of a defined-
               contribution plan in 1989 is positively
               related to the INDCODE variable.

Null form: The coefficient of INDCODE is less than or
               equal to 0.

HB-3a.   Given that a defined-benefit plan existed
               before 1989, the 1989 continued existence of
               a defined-benefit plan is positively
               related to the PCUNION variable.

HB-3b.   Given that a defined-benefit plan existed
               before 1989 and that it was terminated by

1989, the continued existence of a defined-contribution plan in 1989 is positively related to the PCUNION variable.

Null form: The coefficient of PCUNION is less than or equal to 0.

HB-4a.   Given that a defined-benefit plan existed before 1989, the 1989 continued existence of a defined-benefit plan is related to the TOPHEAVY variable.

HB-4b.   Given that a defined-benefit plan existed before 1989 and that it was terminated by 1989, the continued existence of a defined-contribution plan in 1989 is related to the TOPHEAVY variable.

Null form: The coefficient of TOPHEAVY is equal to 0.

HB-5a.   Given that a defined-benefit plan existed before 1989, the 1989 continued existence of a defined-benefit plan is related to the INTEGRAT variable.

HB-5b.   Given that a defined-benefit plan existed before 1989 and that it was terminated by 1989, the continued existence of a defined-contribution plan in 1989 is related to the INTEGRAT variable.

Null form: The coefficient of INTEGRAT is equal to 0.

HB-6a.   Given that a defined-benefit plan existed before 1989, the 1989 continued existence of a defined-benefit plan is related to the FUNDDEF variable.

HB-6b.   Given that a defined-benefit plan existed before 1989 and that it was terminated by 1989, the continued existence of a defined-contribution plan in 1989 is related to the FUNDDEF variable.

Null form: The coefficient of FUNDDEF is equal to 0.

HB-7a.   Given that a defined-benefit plan existed before 1989, the 1989 continued existence of

a defined-benefit plan is related to the MXNTOVPP variable.

HB-7b.   Given that a defined-benefit plan existed before 1989 and that it was terminated by 1989, the continued existence of a defined-contribution plan in 1989 is related to the MXNTOVPP variable.

HB-8a.   Given that a defined-benefit plan existed before 1989, the 1989 continued existence of a defined-benefit plan is related to the MXNTUNPP variable.

HB-8b.   Given that a defined-benefit plan existed before 1989 and that it was terminated by 1989, the continued existence of a defined-contribution plan in 1989 is related to the MXUNFDPP variable.

Null form: The coefficient of MXUNFDPP is equal to 0.

HB-9a.   Given that a defined-benefit plan existed before 1989, the 1989 continued existence of a defined-benefit plan is related to the CHGRTAGE variable.

HB-9b.   Given that a defined-benefit plan existed before 1989 and that it was terminated by 1989, the continued existence of a defined-contribution plan in 1989 is related to the CHGRTAGE variable.

Null form: The coefficient of CHGRTAGE is equal to 0.

APPENDIX C

COBOL PROGRAMS USED IN MANIPULATING 5500 DATA

COBOL Program to Compress 1988 data into a single line per firm

```
//IG90CP2     JOB   (IG90,:10,35),'L
BRADLEY',PASSWORD=HWWRMJ,                    COM00010
//          CLASS=A,MSGLEVEL=(0,0)
        COM00020
/*ROUTE      PRINT UNTVM1.IG90
        COM00030
//STEP1      EXEC COBCLG,PARM.COB=(NOSOURCE,NOSXREF)
        COM00040
     **********************************
        COM00050
   IDENTIFICATION DIVISION.
        COM00060
     **********************************
        COM00070
   PROGRAM-ID.        COMPRS88.
        COM00080
     **********************************
        COM00090
   ENVIRONMENT DIVISION.
        COM00100
     **********************************
        COM00110
   INPUT-OUTPUT SECTION.
        COM00120
   FILE-CONTROL.
        COM00130
     SELECT IN-FILE
        COM00140
        ASSIGN TO FILEIN.
        COM00150
     **********************************
        COM00160
   DATA DIVISION.
        COM00170
     **********************************
        COM00180
   FILE SECTION.
        COM00190
   FD  IN-FILE
        COM00200
     LABEL RECORDS ARE STANDARD
        COM00210
     BLOCK CONTAINS 100 RECORDS
        COM00220
     RECORD CONTAINS 169 CHARACTERS.
        COM00230
```

```
01  IN-REC.
COM00240
   05 IN-EIN.
COM00250
       10 IN-EIN-STATE-CODE        PIC X(2).
COM00260
       10 IN-EIN-REST              PIC X(7).
COM00270
   05 IN-FIRST-PLAN-RPT-IND        PIC X(1).
COM00280
   05 IN-AMENDED-RPT-IND           PIC X(1).
COM00290
   05 IN-FINAL-RPT-IND             PIC X(1).
COM00300
   05 IN-BUSINESS-CODE.
COM00310
       10 IN-BUSINESS-CODE-A       PIC X(2).
COM00320
       10 FILLER                   PIC X(2).
COM00330
   05 IN-CUSIP-ISS-NUM             PIC X(6).
COM00340
   05 IN-TYPE-PLAN-ENTITY-IND      PIC X(1).
COM00350
   05 IN-PLAN-EFFECT-DATE          PIC X(6).
COM00360
   05 IN-DEF-CONTR-TYPE            PIC X(1).
COM00370
   05 IN-CASH-DEFERRED-IND         PIC X(1).
COM00380
   05 IN-FULLY-VESTED-CNT          PIC X(7).
COM00390
   05 IN-NON-VESTED-CNT            PIC X(7).
COM00400
   05 IN-TOT-ACTIVE-PART-CNT       PIC X(8).
COM00410
   05 IN-PLAN-TERM-IND             PIC X(1).
COM00420
   05 IN-PLAN-ASS-DIST-IND         PIC X(1).
COM00430
   05 IN-TERM-ADOPT-IND            PIC X(1).
COM00440
   05 IN-PLAN-MRGD-CONSLD-IND      PIC X(1).
COM00450
   05 IN-COLLECT-BARGAIN-IND       PIC X(1).
COM00460
   05 IN-BENFIT-PLAN-MFS-IND       PIC X(1).
COM00470
   05 IN-CONTR-PLAN-MFS-IND        PIC X(1).
COM00480
```

```
      05 IN-FUND-DEFIC-AMT            PIC X(12).
      COM00490
      05 IN-TOP-HEAVY-PLAN-IND        PIC X(1).
      COM00500
      05 IN-TOTAL-EMP-CNT             PIC X(8).
      COM00510
      05 IN-ELIGIBLE-PART-CNT         PIC X(8).
      COM00520
      05 IN-PLAN-INTEGRTD-SS-IND      PIC X(1).
      COM00530
      05 IN-PBGC-TERM-INSURE-IND      PIC X(1).
      COM00540
      05 IN-LEGAL-FEES                PIC X(13).
      COM00550
      05 IN-TOTAL-ADMIN-FEES          PIC X(13).
      COM00560
      05 IN-ADMIN-FEES-NOT-RPT-IND    PIC X(1).
      COM00570
      05 IN-FUND-DEF-IND              PIC X(1).
      COM00580
      05 IN-DEF-AMORT-CY-IND          PIC X(1).
      COM00590
      05 IN-ACTUARIAL-GL              PIC X(11).
      COM00600
      05 IN-ACCUM-FUND-DEF            PIC X(10).
      COM00610
      05 IN-TOTAL-CHARGES             PIC X(11).
      COM00620
      05 IN-TOTAL-CREDITS             PIC X(11).
      COM00630
      05 IN-FND-STD-PRE-RTMT-AGE-IND PIC X(2).
      COM00640
      05 IN-AGE-40-MALE-RATIO-PRCT    PIC X(3).
      COM00650
      05 IN-TYPE-PENSION-BEN-IND      PIC X(1).
      COM00660
**********************************
      COM00670
  WORKING-STORAGE SECTION.
      COM00680
**********************************
      COM00690
  01  WORK-VARIABLES.
      COM00700
      05 EIN-COUNT         PIC S9(7) VALUE ZERO.
      COM00710
      05 CURRENT-EIN       PIC X(9)  VALUE SPACE.
      COM00720
      05 REC-COUNT         PIC S9(7) VALUE ZERO.
      COM00730
```

```
      05 EDIT-COUNT          PIC Z,ZZZ,ZZ9.
COM00740
      05 FILE-FLAG           PIC X      VALUE 'N'.
COM00750
         88 END-FILE                    VALUE 'Y'.
COM00760
      05 SKIP-FLAG           PIC X      VALUE 'N'.
COM00770
         88 SKIPPED                     VALUE 'Y'.
COM00780
      05 WORK-EMP-CNT        PIC 9(8) VALUE ZERO.
COM00790
      05 WORK-ACTIVE-PART-CNT  PIC 9(8) VALUE ZERO.
COM00800
      05 WORK-ADMIN-FEES      PIC 9(12) VALUE ZERO.
COM00810
      05 WORK-DEFIC-AMT       PIC 9(10) VALUE ZERO.
COM00820
      05 WORK-AGE-IND         PIC 9(2)  VALUE ZERO.
COM00830
      05 WORK-MALE-RATIO-PRCT  PIC 9(3)  VALUE ZERO.
COM00840
      05 WORK-ACCUM-FUND-DEF   PIC 9(10) VALUE ZERO.
COM00850
      05 WORK-TOTAL-CREDITS    PIC 9(10) VALUE ZERO.
COM00860
      05 WORK-LEGAL-FEES       PIC 9(13) VALUE ZERO.
COM00870
01  WS-OUT-REC.
COM00880
      05 OUT-EIN.
COM00890
         10 OUT-EIN-STATE-CODE     PIC X(2).
COM00900
         10 OUT-EIN-REST           PIC X(7).
COM00910
      05 OUT-BUSINESS-CODE         PIC X(2).
COM00920
      05 OUT-MAX-DB-PARTICIPATION  PIC 9(10).
COM00930
      05 OUT-MAX-PARTICIPATION-CNT PIC 9(10).
COM00940
      05 OUT-PLAN-TERM-IND         PIC X(1).
COM00950
      05 OUT-TERM-ADOPT-IND        PIC X(1).
COM00960
      05 OUT-PLAN-MRGD-CONSLD-IND  PIC X(1).
COM00970
      05 OUT-PLAN-INTEGRTD-SS-IND  PIC X(1).
COM00980
```

```
       05 OUT-ACCUM-FUND-DEF          PIC 9(10).
     COM01050
       05 OUT-TOTAL-CHARGES           PIC 9(10).
     COM01060
       05 OUT-TOTAL-CREDITS           PIC 9(10).
     COM01070
       05 OUT-DB-ADMIN-FEES           PIC 9(10).
     COM01080
       05 OUT-DC-ADMIN-FEES           PIC 9(10).
     COM01090
       05 OUT-CUSIP-IND               PIC X(1).
     COM01100
       05 OUT-UNION-TOT-PART          PIC 9(8).
     COM01110
 ********************************
     COM01120
  PROCEDURE DIVISION.
     COM01130
 ********************************
     COM01140
  000-MAIN.
     COM01150
     OPEN INPUT IN-FILE.
     COM01160
     PERFORM 800-READ-FILE.
     COM01170
     MOVE '????????  BEGIN OF DATA ********' TO
     COM01180
         WS-OUT-REC.
     COM01190
     PERFORM 100-PROCESS
     COM01200
         UNTIL END-FILE.
     COM01210
     PERFORM 200-BREAK.
     COM01220
     MOVE REC-COUNT TO EDIT-COUNT.
     COM01230
     DISPLAY '???????? TOTAL RECORDS:  ' EDIT-COUNT.
     COM01240
     MOVE EIN-COUNT TO EDIT-COUNT.
     COM01250
     DISPLAY '???????? TOTAL EINS   : ' EDIT-COUNT.
     COM01260
     CLOSE IN-FILE.
     COM01270
     STOP RUN.
     COM01280
  100-PROCESS.
     COM01290
```

```
          ADD 1 TO REC-COUNT.
COM01300
          IF IN-EIN NOT EQUAL CURRENT-EIN
COM01310
               PERFORM 200-BREAK.
COM01320
          MOVE IN-TOTAL-EMP-CNT TO
COM01330
               WORK-EMP-CNT.
COM01340
          MOVE IN-TOT-ACTIVE-PART-CNT TO
COM01350
               WORK-ACTIVE-PART-CNT.
COM01360
          IF WORK-ACTIVE-PART-CNT GREATER
COM01370
             OUT-MAX-PARTICIPATION-CNT
COM01380
               MOVE WORK-ACTIVE-PART-CNT TO
COM01390
                    OUT-MAX-PARTICIPATION-CNT
COM01400
               MOVE IN-BUSINESS-CODE-A TO
COM01410
                    OUT-BUSINESS-CODE
COM01420
               MOVE IN-TOTAL-EMP-CNT TO
COM01430
                    OUT-TOTAL-EMP-CNT.
COM01440
          IF IN-COLLECT-BARGAIN-IND EQUAL '1'
COM01450
             IF WORK-ACTIVE-PART-CNT GREATER
COM01460
                OUT-UNION-TOT-PART
COM01470
                  MOVE WORK-ACTIVE-PART-CNT TO
COM01480
                       OUT-UNION-TOT-PART.
COM01490
          IF IN-CUSIP-ISS-NUM NUMERIC
COM01500
             MOVE '1' TO OUT-CUSIP-IND.
COM01510
          IF IN-TYPE-PENSION-BEN-IND EQUAL '1'
COM01520
             PERFORM 150-DO-THE-A
COM01530
          ELSE
COM01540
```

```
            PERFORM 125-DO-THE-B.
       COM01550
        PERFORM 800-READ-FILE.
       COM01560
     125-DO-THE-B.
       COM01570
        IF IN-TOTAL-ADMIN-FEES NUMERIC
       COM01580
           MOVE IN-TOTAL-ADMIN-FEES TO
       COM01590
                WORK-ADMIN-FEES
       COM01600
           ADD WORK-ADMIN-FEES TO
       COM01610
                OUT-DC-ADMIN-FEES.
       COM01620
        IF IN-LEGAL-FEES NUMERIC
       COM01630
           MOVE IN-LEGAL-FEES TO WORK-LEGAL-FEES
       COM01640
           SUBTRACT WORK-LEGAL-FEES FROM
OUT-DC-ADMIN-FEES.            COM01650
      150-DO-THE-A.
       COM01660
        IF WORK-ACTIVE-PART-CNT GREATER
       COM01670
           OUT-MAX-DB-PARTICIPATION
       COM01680
             MOVE WORK-ACTIVE-PART-CNT TO
       COM01690
                OUT-MAX-DB-PARTICIPATION.
       COM01700
        IF IN-PLAN-TERM-IND EQUAL '1'
       COM01710
           MOVE '1' TO OUT-PLAN-TERM-IND.
       COM01720
        IF IN-TERM-ADOPT-IND EQUAL '1'
       COM01730
           MOVE '1' TO OUT-TERM-ADOPT-IND.
       COM01740
        IF IN-PLAN-MRGD-CONSLD-IND EQUAL '1'
       COM01750
           MOVE '1' TO OUT-PLAN-MRGD-CONSLD-IND.
       COM01760
        IF IN-PLAN-INTEGRTD-SS-IND EQUAL '1'
       COM01770
           MOVE '1' TO OUT-PLAN-INTEGRTD-SS-IND.
       COM01780
        IF IN-TOP-HEAVY-PLAN-IND EQUAL '1'
       COM01790
```

```
          MOVE '1' TO OUT-TOP-HEAVY-PLAN-IND.
COM01800
 IF IN-FUND-DEF-IND EQUAL '1'
COM01810
     MOVE '1' TO OUT-FUND-DEF-IND.
COM01820
 IF IN-FUND-DEFIC-AMT NUMERIC
COM01830
     MOVE IN-FUND-DEFIC-AMT TO WORK-DEFIC-AMT
COM01840
     IF WORK-DEFIC-AMT GREATER
COM01850
        OUT-FUND-DEFIC-AMT
COM01860
         MOVE WORK-DEFIC-AMT TO
COM01870
              OUT-FUND-DEFIC-AMT.
COM01880
 IF IN-FND-STD-PRE-RTMT-AGE-IND NUMERIC
COM01890
     MOVE IN-FND-STD-PRE-RTMT-AGE-IND TO
COM01900
         WORK-AGE-IND
COM01910
     IF WORK-AGE-IND LESS
COM01920
        OUT-FND-STD-PRE-RTMT-AGE-IND
COM01930
         MOVE WORK-AGE-IND TO
COM01940
              OUT-FND-STD-PRE-RTMT-AGE-IND.
COM01950
 IF IN-AGE-40-MALE-RATIO-PRCT NUMERIC
COM01960
     MOVE IN-AGE-40-MALE-RATIO-PRCT TO
COM01970
         WORK-MALE-RATIO-PRCT
COM01980
     IF WORK-MALE-RATIO-PRCT GREATER
COM01990
        OUT-AGE-40-MALE-RATIO-PRCT
COM02000
         MOVE WORK-MALE-RATIO-PRCT TO
COM02010
              OUT-AGE-40-MALE-RATIO-PRCT.
COM02020
 IF IN-ACCUM-FUND-DEF NUMERIC
COM02030
     MOVE IN-ACCUM-FUND-DEF TO
COM02040
```

```
                        WORK-ACCUM-FUND-DEF
COM02050
        IF WORK-ACCUM-FUND-DEF GREATER
COM02060
            OUT-ACCUM-FUND-DEF
COM02070
            MOVE WORK-ACCUM-FUND-DEF TO
COM02080
                    OUT-ACCUM-FUND-DEF.
COM02090
    IF IN-TOTAL-CREDITS NUMERIC
COM02100
        MOVE IN-TOTAL-CREDITS TO
COM02110
            WORK-TOTAL-CREDITS
COM02120
        IF WORK-TOTAL-CREDITS GREATER
COM02130
            OUT-TOTAL-CREDITS
COM02140
            MOVE WORK-TOTAL-CREDITS TO
COM02150
                    OUT-TOTAL-CREDITS
COM02160
        IF IN-TOTAL-CHARGES NUMERIC
COM02170
                MOVE IN-TOTAL-CHARGES TO
COM02180
                    OUT-TOTAL-CHARGES.
COM02190
    IF IN-TOTAL-ADMIN-FEES NUMERIC
COM02200
        MOVE IN-TOTAL-ADMIN-FEES TO
COM02210
            WORK-ADMIN-FEES
COM02220
        ADD WORK-ADMIN-FEES TO
COM02230
            OUT-DB-ADMIN-FEES.
COM02240
    IF IN-LEGAL-FEES NUMERIC
COM02250
        MOVE IN-LEGAL-FEES TO WORK-LEGAL-FEES
COM02260
        SUBTRACT WORK-LEGAL-FEES FROM
OUT-DB-ADMIN-FEES.          COM02270
        200-BREAK.
COM02280
    ADD 1 TO EIN-COUNT.
COM02290
```

```
          DISPLAY WS-OUT-REC.
COM02300
          MOVE SPACE TO WS-OUT-REC.
COM02310
          MOVE IN-EIN TO OUT-EIN.
COM02320
          MOVE IN-BUSINESS-CODE-A TO OUT-BUSINESS-CODE.
COM02330
          MOVE ZERO TO OUT-MAX-DB-PARTICIPATION
COM02340
                       OUT-MAX-PARTICIPATION-CNT
COM02350
                       OUT-TOTAL-EMP-CNT
COM02360
                       OUT-FUND-DEFIC-AMT
COM02370
                       OUT-ACCUM-FUND-DEF
COM02380
                       OUT-TOTAL-CHARGES
COM02390
                       OUT-TOTAL-CREDITS
COM02400
                       OUT-DB-ADMIN-FEES
COM02410
                       OUT-DC-ADMIN-FEES
COM02420
                       OUT-UNION-TOT-PART
COM02430
                       OUT-AGE-40-MALE-RATIO-PRCT.
COM02440
          MOVE '0' TO  OUT-PLAN-TERM-IND
COM02450
                       OUT-TERM-ADOPT-IND
COM02460
                       OUT-PLAN-MRGD-CONSLD-IND
COM02470
                       OUT-PLAN-INTEGRTD-SS-IND
COM02480
                       OUT-TOP-HEAVY-PLAN-IND
COM02490
                       OUT-CUSIP-IND
COM02500
                       OUT-FUND-DEF-IND.
COM02510
          MOVE 99 TO OUT-FND-STD-PRE-RTMT-AGE-IND.
COM02520
          MOVE IN-EIN TO CURRENT-EIN.
COM02530
*         IF EIN-COUNT GREATER 1200
COM02540
```

```
*                       MOVE 'Y' TO FILE-FLAG.
     COM02550
 800-READ-FILE.
     COM02560
      READ IN-FILE
     COM02570
         AT END MOVE 'Y' TO FILE-FLAG.
     COM02580
      MOVE 'Y' TO SKIP-FLAG.
     COM02590
      IF NOT END-FILE
     COM02600
         PERFORM 850-READ-MORE
     COM02610
            UNTIL NOT SKIPPED.
     COM02620
 850-READ-MORE.
     COM02630
      MOVE 'N' TO SKIP-FLAG.
     COM02640
      IF IN-TYPE-PENSION-BEN-IND GREATER '2' OR
     COM02650
         IN-TYPE-PENSION-BEN-IND LESS      '1'
     COM02660
            MOVE 'Y' TO SKIP-FLAG.
     COM02670
      IF IN-TOTAL-EMP-CNT NOT NUMERIC
     COM02680
         MOVE 'Y' TO SKIP-FLAG
     COM02690
      ELSE
     COM02700
         MOVE IN-TOTAL-EMP-CNT TO WORK-EMP-CNT
     COM02710
         IF WORK-EMP-CNT EQUAL ZERO
     COM02720
            MOVE 'Y' TO SKIP-FLAG.
     COM02730
      IF IN-TOT-ACTIVE-PART-CNT NOT NUMERIC
     COM02740
         MOVE 'Y' TO SKIP-FLAG
     COM02750
      ELSE
     COM02760
         MOVE IN-TOT-ACTIVE-PART-CNT TO WORK-EMP-CNT
     COM02770
         IF WORK-EMP-CNT EQUAL ZERO
     COM02780
            MOVE 'Y' TO SKIP-FLAG.
     COM02790
```

```
            IF SKIPPED
       COM02800
              READ IN-FILE
       COM02810
                 AT END MOVE 'Y' TO FILE-FLAG
       COM02820
                    MOVE 'N' TO SKIP-FLAG.
       COM02830
      **************END OF PROGRAM*************
       COM02840
/*
       COM02850
//GO.FILEIN DD  UNIT=SYSDA,VOL=SER=ACAD00,
       COM02860
//        DSNAME=USER.IG90.FLS88S,DISP=(OLD,KEEP,KEEP)
       COM02870
//
       COM02880
```

COBOL Program to Create a Random Sample From the Population

```
DECLARE FUNCTION getran% (arg%)
'Create a list of random EIN numbers
CLS
DIM ct AS LONG
RANDOMIZE TIMER
PRINT "Create a list of random EIN numbers"
PRINT
INPUT "Enter name of date file to extract numbers from:";
ifile$
INPUT "Enter name of output file in which to put EIN's:";
ofile$
INPUT "Enter name of EIN miscellaneous file (EXCLEIN) :";
efile$
IF efile$ = "" THEN efile$ = "EXCLEIN"
INPUT "Enter number of EIN's:"; einct%
DIM eintbl$(20)
OPEN "i", #1, efile$
DO WHILE NOT EOF(1)
LINE INPUT #1, einrec$
IF LEFT$(einrec$, 4) = "EIN:" THEN
    ein$ = MID$(einrec$, 5, 9)
    ec% = ec% + 1
    PRINT ein$
    eintbl$(ec%) = ein$
ELSE
    cm% = INSTR(einrec$, ",")
    IF cm% = 0 THEN cm% = 1
    IF LEFT$(einrec$, cm% - 1) = ifile$ THEN
```

```
        PRINT einrec$
        ercnt& = VAL(MID$(einrec$, cm% + 1))
        PRINT "Suggested record count:"; ercnt&
        INPUT "Use this count (Y/N)"; Ucnt$
    END IF
END IF

LOOP
CLOSE 1
PRINT "EIN's excluded:"; ec%
PRINT
IF Ucnt$ <> "Y" AND Ucnt$ <> "y" THEN
   PRINT "stand by, counting records in file"
   OPEN "i", #1, ifile$
   ct = 0
   DO WHILE NOT EOF(1)
   LINE INPUT #1, r$
   ct = ct + 1
   LOOP
   CLOSE 1
ELSE
   ct = ercnt&
END IF
   OPEN "o", #2, ofile$

   PRINT "record count is"; ct
PRINT
PRINT "Creating random EIN's now"
intv% = (ct \ einct%) * 2
PRINT "skip interval is"; intv%
DIM sk%(intv%)
OPEN "i", #1, ifile$
done% = 0
DO WHILE done% = 0
r1% = getran%(intv%)
sk%(r1%) = sk%(r1%) + 1
FOR x% = 1 TO r1% - 1
   IF EOF(1) THEN
      x% = r1%
   ELSE
      LINE INPUT #1, r$
   END IF
NEXT x%
IF EOF(1) THEN
   done% = 1
ELSE
   LINE INPUT #1, r$
   ein$ = LEFT$(r$, 9)
   GOSUB searchein:
   IF fein% = 0 THEN
      ctr% = ctr% + 1
```

```
        PRINT #2, ein$
        p% = VAL(LEFT$(ein$, 1))
        d%(p%) = d%(p%) + 1
        IF ctr% = einct% THEN
            done% = 1
        END IF
    END IF
END IF
LOOP
CLOSE 1, 2
PRINT "total ein's obtained:   "; ctr%
PRINT "EIN's are dumped"
PRINT
PRINT
PRINT "0's    "; d%(0)
PRINT "1's    "; d%(1)
PRINT "2's    "; d%(2)
PRINT "3's    "; d%(3)
PRINT "4's    "; d%(4)
PRINT "5's    "; d%(5)
PRINT "6's    "; d%(6)
PRINT "7's    "; d%(7)
PRINT "8's    "; d%(8)
PRINT "9's    "; d%(9)
END

searchein:
fein% = -1
ecp% = 1
DO WHILE fein% = -1
    IF ecp% > ec% THEN
        fein% = 0
    ELSE
        IF ein$ = eintbl$(ecp%) THEN
            fein% = 1
        ELSE
            ecp% = ecp% + 1
        END IF
    END IF
LOOP
RETURN

FUNCTION getran% (arg%)
loopit:
r% = RND(99) * arg%
IF r% = 0 THEN GOTO loopit:
getran% = r%
END FUNCTION
```

COBOL Program to Stratify a Random (or Population) Sample
Into Three Stratified Subsamples


```
DECLARE FUNCTION getran% (arg%)
'Create a list of random EIN numbers into three files
CLS
DIM ct AS LONG
PRINT "Create a list of ALL EIN numbers"
PRINT
INPUT "Enter name of date file to extract numbers from:";
ifile$
PRINT
PRINT "Enter name of output EIN file where the"
INPUT "Max DB particpation equals the Max particpation
count:"; ofile1$
PRINT
PRINT "Enter name of output EIN file where 0<PCDBPART<1"
INPUT "the EIN's
:"; ofile2$
PRINT
PRINT "Enter name of output EIN file where for"
INPUT "the max DB participation equals zero
:"; ofile3$
PRINT
GOSUB message:
OPEN "i", #1, ifile$
OPEN "o", #2, ofile1$
OPEN "o", #3, ofile2$
OPEN "o", #4, ofile3$
DO WHILE NOT EOF(1)
LINE INPUT #1, r$
ein$ = LEFT$(r$, 9)
ctr% = ctr% + 1
mxdbpt& = VAL(MID$(r$, 12, 10))
mxpt& = VAL(MID$(r$, 22, 10))
IF mxdbpt& = 0 THEN
    PRINT #4, ein$
    cnt3% = cnt3% + 1
ELSE
    IF mxdbpt& = mxpt& THEN
        PRINT #2, ein$
        cnt1% = cnt1% + 1
    ELSE
        PRINT #3, ein$
        cnt2% = cnt2% + 1
    END IF
END IF
    p% = VAL(LEFT$(ein$, 1))
    d%(p%) = d%(p%) + 1
LOOP
```

```
CLOSE 1, 2, 3, 4
PRINT "total ein's obtained:   "; ctr%
PRINT "total ein's in file "; ofile1$; " is :"; cnt1%
PRINT "total ein's in file "; ofile2$; " is :"; cnt2%
PRINT "total ein's in file "; ofile3$; " is :"; cnt3%
PRINT "EIN's are dumped"
PRINT
PRINT "0's    "; d%(0)
PRINT "1's    "; d%(1)
PRINT "2's    "; d%(2)
PRINT "3's    "; d%(3)
PRINT "4's    "; d%(4)
PRINT "5's    "; d%(5)
PRINT "6's    "; d%(6)
PRINT "7's    "; d%(7)
PRINT "8's    "; d%(8)
PRINT "9's    "; d%(9)
END

FUNCTION getran% (arg%)
loopit:
r% = RND(99) * arg%
IF r% = 0 THEN GOTO loopit:
getran% = r%
END FUNCTION
```

Merge File to Create the Time-Series Panel-Data Records

```
DECLARE FUNCTION getrec$ (recnum%)
DECLARE FUNCTION getein$ ()
'Merge the yearly files to a limdep file 4: MERGEFL4.BAS
DIM infile$(7), icfile$(7)
infile$(1) = "file84.new"
infile$(2) = "file85.new"
infile$(3) = "file86.new"
infile$(4) = "file87.new"
infile$(5) = "file88.new"
infile$(6) = "file89.new"
infile$(7) = "file90.new"
icfile$(1) = "icode84.dat"
icfile$(2) = "icode85.dat"
icfile$(3) = "icode86.dat"
icfile$(4) = "icode87.dat"
icfile$(5) = "icode88.dat"
icfile$(6) = "icode89.dat"
icfile$(7) = "icode90.dat"
DIM icodes&(99, 7)
CLS
```

```
PRINT "Merge the yearly files to a limdep file 4"
PRINT "This program creates 4 binary variables for industry
codes"
PRINT "This is the latest version of the merge program"
PRINT "This is the program that will include ALL of the
records,"
PRINT "not just the EIN's where there is a record for every
year"
PRINT
INPUT "Enter number of years to look at (default is 6):";
fct%
IF fct% = 0 THEN fct% = 6
PRINT "CURRENTLY PRINTING ONLY 84 -"; 83 + fct%
INPUT "Do you want to print EIN's?  n(y) :"; pe$
IF LEN(pe$) = 0 THEN pe$ = "n"
PRINT
INPUT "enter the ein file name:"; efile$
INPUT "enter the output file name:"; ofile$
GOSUB loadic:
OPEN "I", #1, efile$
OPEN "O", #2, ofile$
IF pe$ = "y" THEN
    LPRINT "We are looking at"; fct%; "years                ";
DATE$; "  "; TIME$
    LPRINT " "
    LPRINT "EIN file used:"; efile$
    LPRINT "Merge file   :"; ofile$
    LPRINT " "
    LPRINT "EIN number     Found in file?"
    LPRINT "_____"
END IF
FOR x% = 1 TO fct%
OPEN "i", x% + 2, infile$(x%)
NEXT x%
FOR x% = 1 TO fct%
    rec$(x%) = getrec$(x%)
NEXT x%
ein$ = getein$
eqcnt% = 0
DO WHILE ein$ <> "999999999"
ecnt% = ecnt% + 1
eqcnt% = 0
FOR z% = 1 TO fct%: fd$(z%) = " ": NEXT z%
  FOR x% = 1 TO fct%
      DO WHILE LEFT$(rec$(x%), 9) < ein$
          rec$(x%) = getrec$(x%)
      LOOP
      IF LEFT$(rec$(x%), 9) = ein$ THEN
          eqcnt% = eqcnt% + 1
          fd$(x%) = "+"
      END IF
```

```
   NEXT x%
IF eqcnt% = fct% THEN
   ocnt& = ocnt& + 1
END IF
GOSUB Checkcont:
IF chcc% = 1 THEN
    GOSUB equalein:
    prtit$ = " ***"
ELSE
    prtit$ = "    "
END IF
IF pe$ = "y" THEN
   LPRINT ein$; ">"; fd$(1); fd$(2); fd$(3); fd$(4); fd$(5);
fd$(6); fd$(7); "<"; prtit$
ELSE
   PRINT ein$; ">"; fd$(1); fd$(2); fd$(3); fd$(4); fd$(5);
fd$(6); fd$(7); "<"; prtit$
END IF
   ein$ = getein$
   eqcnt% = 0
LOOP
CLOSE 1, 2
PRINT "The file is printed"
PRINT "Input EIN file used:"; efile$
PRINT "output merge file  :"; ofile$
PRINT
PRINT "number of EIN's in EIN file...............:"; ecnt%
PRINT
PRINT "Number of EIN's where"
PRINT "all of the years were used................:"; ocnt&
PRINT
PRINT "number of EIN's in the output file........:"; pcnt&
PRINT
PRINT "number of total records in the output file:"; rcnt&

PRINT
INPUT "Press <Enter> to exit the program"; ans$
SYSTEM
END

equalein:
IF fd$(5) = "+" THEN
    cp$(5) = MID$(rec$(5), 111, 1)
ELSE
    cp$(5) = " "
END IF
IF fd$(6) = "+" THEN
    cp$(6) = MID$(rec$(5), 111, 1)
ELSE
    cp$(6) = " "
END IF
```

```
IF fd$(7) = "+" THEN
    cp$(7) = MID$(rec$(5), 111, 1)
ELSE
    cp$(7) = " "
END IF
IF cp$(5) = "1" OR cp$(6) = "1" OR cp$(7) = "1" THEN
    cp$(1) = "1"
    cp$(2) = "1"
    cp$(3) = "1"
    cp$(4) = "1"
ELSE
    cp$(1) = "0"
    cp$(2) = "0"
    cp$(3) = "0"
    cp$(4) = "0"
END IF
GOSUB calcunion:
buscode1$ = "?"
pcnt& = pcnt& + 1
FOR x% = 1 TO fct%
IF fd$(x%) = "+" THEN
   rcnt& = rcnt& + 1
   GOSUB DOCALC:
   PRINT #2, USING "##### # ###### ###### ######  # # # #
########## !"; pcnt&; x%; MXDBPART&; MXPARTCT&; TOTEMPCNT&;
b%(1); b%(2); b%(3); b%(4); empcnt&; cp$(x%);
   PRINT #2, USING " ######## ######## ######## ########
########## ########## ! !"; dbadm&; dcadm&; unnrtio(x%);
unionprt&; totcharg#; totcredt#; plntrmind$; trmadtind$
END IF
NEXT x%
RETURN

DOCALC:
rc$ = rec$(x%)
MXDBPART& = VAL(MID$(rc$, 12, 10))
MXPARTCT& = VAL(MID$(rc$, 22, 10))
TOTEMPCNT& = VAL(MID$(rc$, 38, 8))
dbadm& = VAL(MID$(rc$, 91, 10))
dcadm& = VAL(MID$(rc$, 101, 10))
totcharg# = VAL(MID$(rc$, 71, 10))
totcredt# = VAL(MID$(rc$, 81, 10))
plntrmind$ = MID$(rc$, 32, 1)
trmadtind$ = MID$(rc$, 33, 1)
buscode$ = MID$(rc$, 10, 2)
IF x% > 4 THEN
    unionprt& = VAL(MID$(rc$, 112, 8))
ELSE
    unionprt& = 0
END IF
```

```
'calculate the business code binary values
IF buscode1$ = "?" THEN
    buscode1$ = MID$(rc$, 10, 1)
    buscode$ = MID$(rc$, 10, 2)
END IF
buscode% = VAL(buscode$)
empcnt& = icodes&(buscode%, x%)


'code for 4 binary values
FOR z% = 1 TO 4: b%(z%) = 0: NEXT z%
bb% = INSTR("0123456789", buscode1$)
IF bb% = 0 THEN bb% = 2
bbb% = VAL(MID$("1100324331", bb%, 1))
b%(bbb%) = 1
RETURN

'code for 9 binary values
FOR z% = 1 TO 9: b%(z%) = 0: NEXT z%
bb% = INSTR("0123456789", buscode1$)
IF bb% <> 0 AND bb% <> 3 THEN
    b%(bb%) = 1
END IF
RETURN

calcunion:
sigma = 0: scnt% = 0
FOR z% = 5 TO fct%
IF fd$(z%) = "+" THEN
    scnt% = scnt% + 1
    nmr = VAL(MID$(rec$(z%), 112, 8))
    dnr = VAL(MID$(rec$(z%), 22, 10))
    sigma = sigma + (nmr / dnr)
    unnrtio(z%) = (nmr / dnr) * VAL(MID$(rec$(z%), 22, 10))
ELSE
    unnrtio(z%) = 0
END IF
NEXT z%
IF scnt% > 0 THEN
    unnrtavg = sigma / scnt%
ELSE
    unnrtavg = 0
END IF
FOR z% = 1 TO 4
unnrtio(z%) = VAL(MID$(rec$(z%), 22, 10)) * unnrtavg
NEXT z%
RETURN

Checkcont:
chcc% = 0
IF eqcnt% < 2 THEN RETURN
```

```
chk$ = " "
chkcnt% = 0
FOR y% = 1 TO fct%
IF fd$(y%) <> chk$ THEN
    IF chk$ = " " THEN
        chkcnt% = chkcnt% + 1
    END IF
    chk$ = fd$(y%)
END IF
NEXT y%
IF chkcnt% < 2 THEN chcc% = 1
RETURN


loadic:
PRINT "loading the industry code files"
FOR x% = 1 TO fct%
PRINT "  opening file "; icfile$(x%)
OPEN "i", #1, icfile$(x%)
DO WHILE NOT EOF(1)
INPUT #1, icode$, empcnt&
icode% = VAL(icode$)
icodes&(icode%, x%) = empcnt&
LOOP
CLOSE 1
NEXT x%
RETURN


FUNCTION getein$
IF EOF(1) THEN
    getein$ = "999999999"
ELSE
    LINE INPUT #1, getein$
END IF
END FUNCTION


FUNCTION getrec$ (recnum%)
IF EOF(recnum% + 2) THEN
    getrec$ =
"999999999xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx"
ELSE
    LINE INPUT #recnum% + 2, R$
    getrec$ = R$
END IF
END FUNCTION
```

Program to Set Up the Multinomial Logit Database

```
DECLARE FUNCTION getrec$ (recnum%)
DECLARE FUNCTION getein$ ()
```

```
'Regression #2:   REGRESS2.BAS
DIM infile$(7), icfile$(7), mxdbpart&(7)
infile$(1) = "file84.new"
infile$(2) = "file85.new"
infile$(3) = "file86.new"
infile$(4) = "file87.new"
infile$(5) = "file88.new"
infile$(6) = "file89.new"
infile$(7) = "file90.new"
icfile$(1) = "icode84.dat"
icfile$(2) = "icode85.dat"
icfile$(3) = "icode86.dat"
icfile$(4) = "icode87.dat"
icfile$(5) = "icode88.dat"
icfile$(6) = "icode89.dat"
icfile$(7) = "icode90.dat"
DIM icodes&(99, 7)
CLS
PRINT "Regression program #2"
PRINT
fct% = 6
PRINT "CURRENTLY PRINTING ONLY 84 -89"
INPUT "Do you want to print EIN's?  n(y) :"; pe$
IF LEN(pe$) = 0 THEN pe$ = "n"
PRINT
INPUT "enter the ein file name:"; efile$
INPUT "enter the output file name:"; ofile$
PRINT "here we go"
'GOSUB loadic:
OPEN "I", #1, efile$
OPEN "O", #2, ofile$
IF pe$ = "y" THEN
    LPRINT "We are looking at"; fct%; "years               ";
DATE$; "   "; TIME$
    LPRINT " "
    LPRINT "EIN file used:"; efile$
    LPRINT "Merge file    :"; ofile$
    LPRINT " "
    LPRINT "EIN number     Found in file?"
    LPRINT "_____"
END IF
FOR x% = 1 TO fct%
OPEN "i", x% + 2, infile$(x%)
NEXT x%
FOR x% = 1 TO fct%
    rec$(x%) = getrec$(x%)
NEXT x%
ein$ = getein$
eqcnt% = 0
DO WHILE ein$ <> "999999999"
ecnt% = ecnt% + 1
```

```
eqcnt% = 0
FOR z% = 1 TO fct%: fd$(z%) = " ": NEXT z%
  FOR x% = 1 TO fct%
      DO WHILE LEFT$(rec$(x%), 9) < ein$
        rec$(x%) = getrec$(x%)
      LOOP
      IF LEFT$(rec$(x%), 9) = ein$ THEN
         eqcnt% = eqcnt% + 1
         fd$(x%) = "+"
      END IF
  NEXT x%
IF eqcnt% = fct% THEN
  ocnt% = ocnt% + 1
END IF
GOSUB Checkcont:
IF chcc% = 1 THEN
    GOSUB equalein:
    PRINT #2, USING "! ! !  ######## ######## ########  \\
"; permdb$; stoppeddb$; stoppedplan$; mxdbpart&; mxpartct&;
totempcnt&; frstretage$;
    PRINT #2, USING "\\  ! ! ! !  ######## ########
########  "; maxretage$; topheavy$; integss$; funddef$;
planterm$; unionpart#; maxoverfnd#; maxundfnd#;
    PRINT #2, USING "# # # # # # # # #"; b%(1); b%(2); b%(3);
b%(4); b%(5); b%(6); b%(7); b%(8); b%(9)
    prtit$ = " ***"
ELSE
    prtit$ = "    "
END IF
IF pe$ = "y" THEN
  LPRINT ein$; ">"; fd$(1); fd$(2); fd$(3); fd$(4); fd$(5);
fd$(6); fd$(7); "<"; prtit$; "   "; permdb$; " ";
stoppeddb$; " "; stoppedplan$
  LPRINT "           >"; db$(1); db$(2); db$(3); db$(4);
db$(5); db$(6); db$(7); "<"; prtit$
ELSE
   PRINT ein$; ">"; fd$(1); fd$(2); fd$(3); fd$(4); fd$(5);
fd$(6); fd$(7); "<"; prtit$; "   "; permdb$; " ";
stoppeddb$; " "; stoppedplan$
   PRINT "           >"; db$(1); db$(2); db$(3); db$(4);
db$(5); db$(6); db$(7); "<"; prtit$
END IF
  ein$ = getein$
  eqcnt% = 0
LOOP
CLOSE 1, 2
PRINT "The file is printed"
PRINT "Input EIN file used:"; efile$
PRINT "output merge file  :"; ofile$
PRINT
PRINT "number of EIN's in EIN file              :"; ecnt%
```

```
PRINT
PRINT "Number of records in output limdep file:"; pcnt&
PRINT "Number of records where all years used :"; ocnt&
PRINT
INPUT "Press <Enter> to exit the program"; ans$
SYSTEM
END

equalein:
GOSUB calcunion:
pcnt& = pcnt& + 1
rc$ = rec$(firstdb%)
mxdbpart& = VAL(MID$(rc$, 12, 10))
mxpartct& = VAL(MID$(rc$, 22, 10))
totempcnt& = VAL(MID$(rc$, 38, 8))
frstretage$ = MID$(rc$, 56, 2)
topheavy$ = "0"
integss$ = "0"
funddef$ = "0"
planterm$ = "0"
maxretage$ = frstretage$
maxoverfnd# = 0
maxundfnd# = 0
unionpart# = unnrtio(firstdb%)
IF firstdb% > 4 THEN
    unionprt& = VAL(MID$(rc$, 112, 8))
ELSE
    unionprt& = 0
END IF
IF firstdb% > 4 THEN
    unionprt& = VAL(MID$(rc$, 112, 8))
ELSE
    unionprt& = 0
END IF

'code for 9 business code binary values
buscode$ = MID$(rc$, 10, 1)
FOR z% = 1 TO 9: b%(z%) = 0: NEXT z%
bb% = INSTR("0123456789", buscode$)
IF bb% <> 0 AND bb% <> 3 THEN
    b%(bb%) = 1
END IF

FOR x% = firstdb% TO fct%
IF fd$(x%) = "+" AND db$(x%) = "^" THEN
    rc$ = rec$(x%)
    IF MID$(rc$, 36, 1) = "1" THEN topheavy$ = "1"
    IF MID$(rc$, 37, 1) = "1" THEN funddef$ = "1"
    IF MID$(rc$, 35, 1) = "1" THEN integss$ = "1"
    IF MID$(rc$, 56, 2) > maxretage$ THEN maxretage$ =
MID$(rc$, 56, 2)
```

```
    IF MID$(rc$, 32, 1) = "1" OR MID$(rc$, 33, 1) = "1" THEN
planterm$ = "1"
    totcharg# = VAL(MID$(rc$, 71, 10))
    totcredt# = VAL(MID$(rc$, 81, 10))
    sum# = totcredt# - totcharg#
    IF sum# > maxoverfnd# THEN maxoverfnd# = sum#
    IF sum# < maxundfnd# THEN maxundfnd# = sum#
END IF
NEXT x%
RETURN

'code for 4 binary values
FOR z% = 1 TO 4: b%(z%) = 0: NEXT z%
bb% = INSTR("0123456789", buscode1$)
IF bb% = 0 THEN bb% = 2
bbb% = VAL(MID$("1100324331", bb%, 1))
b%(bbb%) = 1
RETURN

calcunion:
sigma = 0: scnt% = 0
FOR z% = 5 TO fct%
IF fd$(z%) = "+" THEN
    nmr = VAL(MID$(rec$(z%), 112, 8))
    dnr = VAL(MID$(rec$(z%), 22, 10))
    sigma = sigma + (nmr / dnr)
    unnrtio(z%) = VAL(MID$(rec$(z%), 112, 10))
    scnt% = scnt% + 1
ELSE
    unnrtio(z%) = 0
END IF
NEXT z%
IF scnt% > 0 THEN
    unnrtavg = sigma / scnt%
ELSE
    unnrtavg = 0
END IF
FOR z% = 1 TO 4
unnrtio(z%) = VAL(MID$(rec$(z%), 22, 10)) * unnrtavg
NEXT z%
RETURN

Checkcont:
chcc% = 0
FOR x% = 1 TO fct%: db$(x%) = " ": NEXT x%
IF eqcnt% < 2 THEN RETURN
permdb$ = "0"
stoppeddb$ = "0"
stoppedplan$ = "0"
chkcnt% = 0
chkcnt2% = 0
```

```
yrcnt% = 0
firstdb% = 0
lastdb% = 0
FOR y% = 1 TO fct%
   IF fd$(y%) = "+" THEN
      yrcnt% = yrcnt% + 1
      rc$ = rec$(y%)
      mxdbpart&(y%) = VAL(MID$(rc$, 12, 10))
      IF mxdbpart&(y%) > 0 THEN
         db$(y%) = "^"
         IF chkcnt% = 0 THEN
             firstdb% = y%
         END IF
         chkcnt% = chkcnt% + 1
         lastdb% = y%
      END IF
      IF firstdb% > 0 THEN
         chkcnt2% = chkcnt2% + 1
      END IF
   END IF
NEXT y%
IF chkcnt% = 0 THEN
    RETURN
ELSE
    chcc% = 1
    IF chkcnt% = chkcnt2% THEN
        IF lastdb% = fct% THEN
            permdb$ = "1"
        ELSE
            stoppedplan$ = "1"
        END IF
    ELSE
        stoppeddb$ = "1"
    END IF
END IF
RETURN

loadic:
PRINT "loading the industry code files"
FOR x% = 1 TO fct%
PRINT "  opening file "; icfile$(x%)
OPEN "i", #1, icfile$(x%)
DO WHILE NOT EOF(1)
INPUT #1, icode$, empcnt&
icode% = VAL(icode$)
icodes&(icode%, x%) = empcnt&
LOOP
CLOSE 1
NEXT x%
RETURN
```

```
FUNCTION getein$
IF EOF(1) THEN
    getein$ = "999999999"
ELSE
    LINE INPUT #1, getein$
END IF
END FUNCTION

FUNCTION getrec$ (recnum%)
IF EOF(recnum% + 2) THEN
    getrec$ =
"999999999xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx"
 ELSE
    LINE INPUT #recnum% + 2, r$
    getrec$ = r$
END IF
END FUNCTION
```

APPENDIX D

1988 Form 5500 and Schedule B

Form **5500** Department of the Treasury Internal Revenue Service Department of Labor Pension and Welfare Benefits Administration Pension Benefit Guaranty Corporation	**Annual Return/Report of Employee Benefit Plan** **(With 100 or more participants)** This form is required to be filed under sections 104 and 4065 of the Employee Retirement Income Security Act of 1974 and sections 6039D, 6057(b), and 6058(a) of the Internal Revenue Code, referred to as the Code. ▶ For Paperwork Reduction Act Notice, see page 1 of the Instructions.	OMB No. 1210-0016 **1988** This form is open to public inspection

For the calendar plan year 1988 or fiscal plan year beginning _____ , 1988, and ending _____ , 19 ___

☑ If your plan year changed since the last return/report filed, check this box ▶ . . . . ☐

Type or print in ink all entries on this form, schedules, and attachments. If an item does not apply, enter "N/A." File the originals.

If (i) through (iii) do not apply to this year's return/report, leave the boxes unmarked. This return/report is:

☑ (i) ☐ the first return/report filed for the plan; (ii) ☐ an amended return/report; or (iii) ☐ the final return/report filed for the plan.

▶ Welfare benefit plans and fringe benefit plans need only complete certain items—see the instructions "What To File."

▶ If you have been granted an extension of time to file this form, you must attach a copy of the approved extension to this form.

Use IRS label. Other-wise, please print or type.	**(1a)** Name of plan sponsor (employer if for a single-employer plan)	**(1b)** Employer identification number
	Address (number and street)	**1c** Telephone number of sponsor ( )
	City or town, state, and ZIP code	**(1d)** Business code number
	(2a) Name of plan administrator (if same as plan sponsor, enter "Same")	**(1e)** CUSIP issuer number
	Address (number and street)	**(2b)** Administrator's employer identification no.
	City or town, state, and ZIP code	**2c** Telephone number of administrator ( )

3 Are the name, address, and employer identification number (EIN) of the plan sponsor and/or plan administrator the same as they appeared on the last return/report filed for this plan? ☐ Yes ☐ No. If "No," enter the information from the last return/report in a and/or b, and complete c.

a Sponsor ▶ .... EIN .... Plan number ....

b Administrator ▶ .... EIN ....

c If a indicates a change in the sponsor's name and EIN, is this a change in sponsorship only? (See specific instructions for definition of sponsorship.) ☐ Yes ☐ No

4 Check the appropriate box to indicate the type of plan entity (check only one box):

a ☐ Single-employer plan   c ☐ Multiemployer plan   e ☐ Multiple-employer plan (other)

b ☐ Plan of controlled group of corporations or common control employers   d ☐ Multiple-employer-collectively-bargained plan   f ☐ Group insurance arrangement (of welfare plans)

5a (i) Name of plan ▶ ....   **(5b)** Effective date of plan ▶

    (ii) ☐ Check if name of plan changed since last return/report   **(5c)** Enter three-digit plan number . . ▶

6a ☐ Welfare benefit plan (plan numbers 501 through 999) must check applicable items (A) through (P) and 6c.

   (i) ☐ Type

(A) ☐ Health (other than dental or vision)	(F) ☐ Temporary disability (accident & sickness)	(K) ☐ Scholarship (funded)
(B) ☐ Life insurance	(G) ☐ Prepaid legal	(L) ☐ Death benefits other than life insurance
(C) ☐ Supplemental unemployment	(H) ☐ Long-term disability	(M) ☐ Code section 120 (group legal services plan)
(D) ☐ Dental	(I) ☐ Severance pay	(N) ☐ Code section 125 (cafeteria plan)
(E) ☐ Vision	(J) ☐ Apprenticeship & training	(O) ☐ Code section 127 (educational assistance program)
		(P) ☐ Other (specify) ▶ ....

   (ii) If you checked (M), (N), or (O), check if plan is: ☐ funded or ☐ unfunded.

6b ☐ Pension benefit plan (plan numbers 001 through 500) must check applicable items in (i) through (vii) and answer 6c through 6f.

   (i) ☐ Defined benefit plan

   (ii) ☐ Defined contribution plan—(indicate type of defined contribution):   (A) ☐ Profit-sharing   (B) ☐ Stock bonus

     (C) ☐ Target benefit   (D) ☐ Other money purchase   (E) ☐ Other (specify) ▶ ....

   (iii) ☐ Defined benefit plan with benefits based partly on balance of separate account of participant (Code section 414(k))

   (iv) ☐ Annuity arrangement of certain exempt organizations (Code section 403(b)(1))

   (v) ☐ Custodial account for regulated investment company stock (Code section 403(b)(7))

   (vi) ☐ Pension plan utilizing individual retirement accounts or annuities (described in Code section 408) as the sole funding vehicle for providing benefits

   (vii) ☐ Other (specify) ▶

▶ **Caution:** A penalty for the late or incomplete filing of this return/report will be assessed unless reasonable cause is established.

Under penalties of perjury and other penalties set forth in the instructions, I declare that I have examined this return/report, including accompanying schedules and statements, and to the best of my knowledge and belief, it is true, correct, and complete.

Date ▶ ....   Signature of employer/plan sponsor ▶ ....

Date ▶ ....   Signature of plan administrator ▶ ....

Form **5500** (1988)

6c Other plan features:　*(i)* ☐ ESOP　　*(ii)* ☐ Leveraged ESOP　　*(iii)* ☐ Participant-directed account plan
(iv) ☐ Pension plan maintained outside the United States　　*(v)* ☐ Master trust (see instructions)
(vi) ☐ 103-12 investment entity (see instructions)　　*(vii)* ☐ Common/collective trust　　*(viii)* ☐ Pooled separate account

----

		Yes	No
d Single-employer plans enter the tax year end of the employer in which this plan year ends ▶ Month .... Day .... Year			
e Is the employer a member of an affiliated service group?	e		
f Does this plan contain a cash or deferred arrangement described in Code section 401(k)?	f		

7 Number of participants as of the end of the plan year (welfare plans complete only a(iv), b, c, and d):

a Active participants: *(i)* Number fully vested	a(I)	
(ii) Number partially vested	(II)	
(iii) Number nonvested	(III)	
(iv) Total	(iv)	
b Retired or separated participants receiving benefits	b	
c Retired or separated participants entitled to future benefits	c	
d Subtotal (add a(iv), b, and c)	d	
e Deceased participants whose beneficiaries are receiving or are entitled to receive benefits	e	
f Total (add d and e)	f	

		Yes	No
g *(i)* Was any participant(s) separated from service with a deferred vested benefit for which a Schedule SSA (Form 5500) is required to be attached to this form?	g(i)		
(ii) If "Yes," enter the number of separated participants required to be reported ▶			

		Yes	No
8a Were any plan amendments adopted during the plan year?	8a		
b Did any amendment result in the retroactive reduction of accrued benefits for any participant?	b		
c Enter the date the most recent amendment was adopted ▶ Month .... Day .... Year			
d If a is "Yes," did any amendment change the information contained in the latest summary plan descriptions or summary description of modifications available at the time of the amendment?	d		
e If d is "Yes," has a summary plan description or summary description of modifications that reflects the plan amendments referred to in d been furnished to participants and filed with the Department of Labor?	e		

		Yes	No
9a Was this plan terminated during this plan year or any prior plan year? If "Yes," enter the year ▶...................	9a		
b Were all plan assets either distributed to participants or beneficiaries, transferred to another plan, or brought under the control of PBGC?	b		
c Was a resolution to terminate this plan adopted during this plan year or any prior plan year?	c		
d If a or c is "Yes," have you received a favorable determination letter from IRS for the termination?	d		
e If d is "No," has a determination letter been requested from IRS?	e		
f If a or c is "Yes," have participants and beneficiaries been notified of the termination or the proposed termination?	f		
g If a is "Yes" and the plan is covered by PBGC, is the plan continuing to file a PBGC Form 1 and pay premiums until the end of the plan year in which assets are distributed or brought under the control of PBGC?	g		
h During this plan year, did any trust assets revert to the employer for which the Code section 4980 excise tax is due?	h		
i If h is "Yes," enter the amount of tax paid with your Form 5330 ▶			

10a In this plan year, was this plan merged or consolidated into another plan(s), or were assets or liabilities transferred to another plan(s)? ☐ Yes ☐ No

If "Yes," identify other plan(s)	c Employer identification number(s)	d Plan number(s)
b Name of plan(s) ▶ -----------------------------	---------------------------	---------------------
-----------------------------		

e Has Form 5310 been filed? ☐ Yes ☐ No

11 Enter the plan funding arrangement code (see instructions)　　**12** Enter the plan benefit arrangement code (see instructions)

		Yes	No
13a Is this a plan established or maintained pursuant to one or more collective bargaining agreements?	13a		
b If a is "Yes," enter the appropriate six-digit LM number(s) of the sponsoring labor organization(s) (see instructions): ▶ *(i)* _____ *(ii)* _____ *(iii)* _____			
14 If any benefits are provided by an insurance company, insurance service, or similar organization, enter the number of Schedules A (Form 5500), Insurance Information, that are attached. If none, enter "-0-." ▶			

Form 5500 (1988) · Page **3**

WELFARE PLANS DO NOT COMPLETE ITEMS 15 THROUGH 27. GO TO ITEM 28

		Yes	No
15a	If this is a defined benefit plan, is it subject to the minimum funding standards for this plan year?	15a	
	If "Yes," attach Schedule B (Form 5500).		
b	If this is a defined contribution plan, i.e., money purchase or target benefit, is it subject to the minimum funding standards? (If a waiver was granted, see instructions.)	b	

If "Yes," complete (i), (ii), and (iii) below:

(i) Amount of employer contribution required for the plan year under Code section 412 — **b(i)** $

(ii) Amount of contribution paid by the employer for the plan year . . . . — **b(ii)** $

Enter date of last payment by employer ► Month _____ Day _____ Year _____

(iii) If (i) is greater than (ii), subtract (ii) from (i) and enter the funding deficiency here; otherwise, enter zero. (If you have a funding deficiency, file Form 5330.) — **b(iii)** $

			Yes	No
16	Has the plan been top-heavy at any time beginning with the 1984 plan year?	16		
17	Has the plan accepted any transfers or rollovers with respect to a participant who had attained age 70½? . . .	17		
18a	If the plan distributed any annuity contracts this year, did these contracts contain a requirement that the spouse consent before any distributions under the contract are made in a form other than a qualified joint and survivor annuity?	18a		
b	Did the plan make distributions to participants or spouses in a form other than a qualified joint and survivor annuity (a life annuity if a single person) or qualified preretirement survivor annuity (exclude deferred annuity contracts)?	b		
c	Did the plan make distributions or loans to married participants and beneficiaries without the required consent of the participant's spouse?	c		
d	Upon plan amendment or termination, do the accrued benefits of every participant include the subsidized benefits that the participant may become entitled to receive subsequent to the plan amendment or termination? . . .	d		
19	Were the spousal consent requirements for distributions under Code section 417(e) complied with?	19		
20	Have any contributions been made or benefits accrued in excess of the Code section 415 limits, as amended by the Tax Reform Act of 1986?	20		
21	Has the plan made the required distributions in 1988 under Code section 401(a)(9)?	21		

			Number
22a	Does the plan satisfy the percentage test of Code section 410(b)(1)(A)?	22a	
	If a is "Yes," complete b through I. If "No," complete only b and c below and see specific instructions.		
b	(i) Number of employees who are aggregated with employees of the employer as a result of the employer being aggregated with any employer covered by this plan under Code section 414(b), (c), or (m)	b(i)	
	(ii) Number of individuals who performed services as leased employees under Code section 414(n) including leased employees of employers in (i).	b(ii)	
c	Total number of employees (including any employees aggregated in b)	c	
d	Number of employees excluded under the plan because of (i) minimum age or years of service, (ii) employees on whose behalf retirement benefits were the subject of collective bargaining, or (iii) nonresident aliens who receive no earned income from United States sources	d	
e	Total number of employees not excluded (subtract d from c)	e	
f	Employees ineligible (specify reason) ►	f	
g	Employees eligible to participate (subtract f from e)	g	
h	Employees eligible but not participating	h	
i	Employees participating (subtract h from g)	i	

			Yes	No
23a	Is it intended that this plan qualify under Code section 401(a)?	23a		
	If "Yes," complete b and c.			
b	Enter the date of the most recent IRS determination letter . . . . Month _____ Year _____			
c	Is a determination letter request pending with IRS?	c		
24a	If this is a plan with Employee Stock Ownership features, was a current appraisal of the value of the stock made immediately before any contribution of stock or the purchase of the stock by the trust for the plan year covered by this return/report?	24a		
b	If a is "Yes," was the appraisal made by an unrelated third party?	b		
25	Is this plan integrated with social security or railroad retirement?	25		
26	Does the employer/sponsor listed in 1a of this form maintain other qualified pension benefit plans?	26		
	If "Yes," enter the total number of plans, including this plan ►			
27	If this plan is an adoption of a master, prototype, or uniform plan, indicate which type by checking the appropriate box: a ☐ Master b ☐ Prototype c ☐ Uniform			

Page 4

		Yes	No

28a Did any person who rendered services to the plan receive directly or indirectly $5,000 or more in compensation from the plan during the plan year (except for employees of the plan who were paid less than $1,000 in each month)? . . . | **28a** | |

If "Yes," complete Part I of Schedule C (Form 5500).

  b Did the plan have any trustees who must be listed in Part II of Schedule C (Form 5500)? . . . . | **b** | |

  c Has there been a termination in the appointment of any person listed in d below? . . . . | **c** | |

  d If c is "Yes," check the appropriate box(es), answer e and f, and complete Part III of Schedule C (Form 5500):

    (i) ☐ Accountant *(ii)* ☐ Enrolled actuary *(iii)* ☐ Insurance carrier *(iv)* ☐ Custodian —

    (v) ☐ Administrator *(vi)* ☐ Investment manager *(vii)* ☐ Trustee

  e Have there been any outstanding material disputes or matters of disagreement concerning the above termination? | **e** | |

  f If an accountant or enrolled actuary has been terminated during the plan year, has the terminated accountant/actuary been provided a copy of the explanation required by Part III of Schedule C (Form 5500) with a notice advising them of their opportunity to submit comments on the explanation directly to DOL? . . . . . . | **f** | |

  g Enter the number of Schedules C (Form 5500) that are attached. If none, enter -0- ►

29a Is this plan exempt from the requirement to engage an independent qualified public accountant? . . . . . | **29a** | |

  b If a is "No," attach the accountant's opinion to this return/report and check the appropriate box. This opinion is:

    (i) ☐ Unqualified

    (ii) ☐ Qualified/disclaimer per Department of Labor Regulations 29 CFR 2520.103-8 and/or 2520.103-12(d)

    (iii) ☐ Qualified/disclaimer other

    (iv) ☐ Adverse

    (v) ☐ Other (explain)

  c If a is "No," do the financial statements or notes to the financial statements attached to this return/report disclose *(i)* a loss contingency indicating that assets are impaired or liability incurred; *(ii)* significant real estate or other transactions in which the plan and (A) the sponsor, (B) plan administrator, (C) the employer(s), or (D) the employee organization(s) are jointly involved; *(iii)* that the plan has participated in any related party transactions; or, *(iv)* any unusual or infrequent events or transactions occurring subsequent to the plan year-end that might significantly affect the usefulness of the financial statements in assessing the plan's present or future ability to pay benefits? . . . . | **c** | |

  d If c is "Yes," provide the total amount involved in such disclosure ►

30 If 29a is "No," during the plan year:

  a Did the plan have assets held for investment? . . . . | **30a** | |

  b Were any loans by the plan or fixed income obligations due the plan in default as of the close of the plan year or classified during the year as uncollectible? . . . . | **b** | |

  c Were any leases to which the plan was a party in default or classified during the year as uncollectible? . . . . | **c** | |

  d Were any plan transactions or series of transactions in excess of 5% of the current value of plan assets? . . . . | **d** | |

  e Do the notes to the financial statements accompanying the accountant's opinion disclose any nonexempt transactions with parties-in-interest? . . . . | **e** | |

  f Did the plan engage in any nonexempt transactions with parties-in-interest not reported in e? . . . . . . | **f** | |

  g Did the plan hold qualifying employer securities that are not publicly traded? . . . . | **g** | |

  h Did the plan purchase or receive any nonpublicly traded securities that were not appraised in writing by an unrelated third party within 3 months prior to their receipt? . . . . | **h** | |

  i Did any person manage plan assets who had a financial interest worth more than 10% in any party providing services to the plan or receive anything of value from any party providing services to the plan? . . . . . . | **i** | |

If a, b, c, d, e, or f is checked "Yes," schedules of those items in the format set forth in the instructions are required to be attached to this return/report.

31 Did the plan acquire individual whole life insurance contracts during the plan year? . . . . | **31** | |

32 During the plan year:

  a *(i)* Was this plan covered by a fidelity bond? . . . . | **32a** | |

    (ii) If (i) is "Yes," enter amount of bond ► ....

  b *(i)* Was there any loss to the plan, whether or not reimbursed, caused by fraud or dishonesty? . . . . . . | **b** | |

    (ii) If (i) is "Yes," enter amount of loss ►

33a Is the plan covered under the Pension Benefit Guaranty Corporation termination insurance program?

    ☐ Yes   ☐ No   ☐ Not determined

  b If a is "Yes" or "Not determined," enter the employer identification number and the plan number used to identify it.

    Employer identification number ►   Plan number ►

34 Current value of plan assets and liabilities at the beginning and end of the plan year. Combine the value of plan assets held in more than one trust. Allocate the value of the plan's interest in a commingled trust containing the assets of more than one plan on a line-by-line basis unless the trust meets one of the specific exceptions described in the instructions. Do not enter the value of that portion of an insurance contract which guarantees, during this plan year, to pay a specific dollar benefit at a future date. Round off amounts to the nearest dollar. Plans with no assets at the beginning and the end of the plan year, enter zero on line 34f.

Assets		(a) Beginning of year	(b) End of Year
a Total noninterest-bearing cash	a		
b Receivables (net):			
(i) Employer contributions	b(i)		
(ii) Participant contributions	(ii)		
(iii) Income	(iii)		
(iv) Other	(iv)		
(v) Total	(v)		
c General investments:			
(i) Interest-bearing cash (including money market funds)	c(i)		
(ii) Certificates of deposit	(ii)		
(iii) U.S. Government securities	(iii)		
(iv) Corporate debt instruments	(iv)		
(v) Corporate stocks:			
(A) Preferred	(v)(A)		
(B) Common	(B)		
(vi) Partnership/joint venture interests	(vi)		
(vii) Real estate:			
(A) Income-producing	(vii)(A)		
(B) Nonincome-producing	(B)		
(viii) Loans (other than to participants) secured by mortgages:			
(A) Residential	(viii)(A)		
(B) Commercial	(B)		
(ix) Loans to participants:			
(A) Mortgages	(ix)(A)		
(B) Other	(B)		
(x) Other loans	(x)		
(xi) Value of interest in certain investment arrangements (see instructions)	(xi)		
(xii) Value of funds held in insurance company general account (unallocated contracts)	(xii)		
(xiii) Other	(xiii)		
(xiv) Total	(xiv)		
d Employer-related investments:			
(i) Employer securities	d(i)		
(ii) Employer real property	(ii)		
e Buildings and other property used in plan operation	e		
f Total assets	f		
Liabilities			
g Benefit claims payable	g		
h Operating payables	h		
i Acquisition indebtedness	i		
j Other liabilities	j		
k Total liabilities	k		
Net Assets			
l Line f minus line k	l		

35 Plan income, expenses, and changes in net assets for the plan year.

Include all income and expenses of the plan, including any trust(s) or separately maintained fund(s), and any payments/receipts to/from insurance carriers. Round off amounts to the nearest dollar.

Income		(a) Amount	(b) Total
a Contributions:			
(i) Received or receivable from:			
(A) Employers	a(i)(A)	✓	
(B) Participants	(B)	✓	
(C) Others	(C)	✓	
(ii) Noncash contributions	(II)	✓	✓
b Earnings on investments:			
(i) Interest:			
(A) Interest-bearing cash (including money market funds)	b(i)(A)	✓	
(B) Certificates of deposit	(B)	✓	
(C) U.S. Government securities	(C)	✓	
(D) Corporate debt instruments	(D)	✓	
(E) Mortgage loans	(E)	✓	
(F) Other loans	(F)	✓	
(G) Other	(G)	✓	✓
(ii) Dividends:			
(A) Preferred stock	b(ii)(A)	✓	
(B) Common stock	(B)	✓	✓
(iii) Rents	(III)		✓
(iv) Net gain (loss) on sale of assets:			
(A) Aggregate proceeds	b(iv)(A)	✓	
(B) Aggregate costs	(B)	✓	✓
(v) Unrealized appreciation (depreciation) of assets	(v)		✓
(vi) Net investment gain (loss) from certain investment arrangements—see instructions . . .	(vi)		✓
c Other income	c		✓
d Total income (add a, b, and c)	d		✓
Expenses			
e Benefit payment and payments to provide benefits:			
(i) Directly to participants or beneficiaries	e(i)	✓	
(ii) To insurance carriers for the provision of benefits	(ii)	✓	
(iii) Other	(iii)	✓	✓
f Interest expense	f		✓
g Administrative expenses:			
(i) Salaries and allowances	g(i)	✓	
(ii) Accounting fees	(ii)	✓	
(iii) Actuarial fees	(iii)	✓	
(iv) Contract administrator fees	(iv)	✓	
(v) Investment advisory and management fees	(v)	✓	
(vi) Legal fees	(vi)	✓	
(vii) Valuation/appraisal fees	(vii)	✓	
(viii) Trustees fees/expenses (including travel, seminars, meetings, etc.) . . .	(viii)	✓	
(ix) Other	(ix)	✓	✓
h Total expenses (add e, f, and g)	h		✓
i Net income (loss) (d minus h)	i		✓
j Transfers to (from) the plan (see instructions)	j		✓
k Net assets at beginning of year (line 34l, column (a))	k		✓
l Net assets at end of year (line 34l, column (b))	l		✓

	Yes	No
36 Did any employer sponsoring the plan pay any of the administrative expenses of the plan that were not reported in 35g?		

SCHEDULE B (Form 5500) Department of the Treasury Internal Revenue Service Department of Labor Pension and Welfare Benefits Administration Pension Benefit Guaranty Corporation	Actuarial Information	OMB No. 1210-0016

Actuarial Information

This schedule is required to be filed under section 104 of the Employee Retirement Income Security Act of 1974, referred to as ERISA, and section 6059(a) of the Internal Revenue Code, referred to as the Code.

► Attach to Forms 5500, 5500-C, 5500-R, or 5500EZ if applicable.

1988

This Form Is Open to Public Inspection

For calendar plan year 1988 or fiscal plan year beginning _____ , 1988, and ending _____ , 19 ____

► Please complete every item on this form. If an item does not apply, enter "N/A." ► Round off amounts to nearest dollar.
► Caution: A penalty of $1,000 will be assessed for late filing of this report unless reasonable cause is established.

Name of plan sponsor as shown on line 1a of Form 5500, 5500-C, 5500-R, or 5500EZ

Employer Identification number

Name of plan

Enter three-digit plan number ►

		Yes	No
1	Has a waiver of a funding deficiency for this plan been approved by the IRS?		
	If "Yes," attach a copy of the IRS approval letter.		
2	Is a waived funding deficiency of a prior plan year being amortized in this plan year?		
3	Have any of the periods of amortization for charges described in Code section 412(b)(2)(B) been extended by IRS? . . .		
	If "Yes," attach a copy of the IRS approval letter.		
4a	Was the shortfall funding method the basis for this plan year's funding standard account computations?		
b	Is this plan a multiemployer plan which is, for this plan year, in reorganization as described in Code section 418 or ERISA section 4241?		
	If "Yes," you are required to attach the information described in the instructions.		
5	Has a change in funding method for this plan year been made?		
	If "Yes," attach either a copy of the letter showing IRS approval or state applicable Revenue Procedure authorizing approval if used.		

6 Operational information:

a Enter most recent actuarial valuation date ► ....

b Enter date(s) and amount of contributions received this plan year for prior plan years and not previously reported:

Date(s) ► .... Amount ► _____

c Current value of the assets accumulated in the plan as of the beginning of the plan year . . . .

d Present value of vested benefits as of the beginning of the plan year:

   (i) For retired participants and beneficiaries receiving payments . . . .

   (ii) For other participants . . . .

   (iii) Total . . . .

e Present value of nonvested accrued benefits as of the beginning of the plan year . . . .

f Number of persons covered (included in the most recent actuarial valuation):

   (i) Active participants . . . .

   (ii) Terminated participants with vested benefits . . . .

   (iii) Retired participants and beneficiaries of deceased participants . . . .

7 Contributions made to the plan for the plan year by employer(s) and employees:

(a) Month Year	(b) Amount paid by employer	(c) Amount paid by employees	(a) Month Year	(b) Amount paid by employer	(c) Amount paid by employees
			Total . . .		

Statement by Enrolled Actuary (see instructions before signing):

To the best of my knowledge, the information supplied in this schedule and on the accompanying statement, if any, is complete and accurate, and in my opinion the assumptions used in the aggregate (a) are reasonably related to the experience of the plan and to reasonable expectations, and (b) represent my best estimate of anticipated experience under the plan.

_____ _____
Signature of actuary   Date

_____ _____
Print or type name of actuary   Enrollment number

_____ _____
Name and address   Telephone number (including area code)

For Paperwork Reduction Act Notice, see the Instructions for Form 5500.

Schedule B (Form 5500) 1988

8 Funding standard account and other information:

a. Accrued liabilities as determined for funding standard account as of (enter date) ► _____

b. Value of assets as determined for funding standard account as of (enter date) ► _____

c. Unfunded liability for spread-gain methods with bases as of (enter date) ► _____

d. (i) Actuarial gains or (losses) for period ending ► _____

   (ii) Shortfall gains or (losses) for period ending ► _____

e. Amount of contribution certified by the actuary as necessary to reduce the funding deficiency to zero, from 9m or 10h (or the attachment for 4b if required) . . . .

9 Funding standard account statement for this plan year ending ► _____

Charges to funding standard account: a. Prior year funding deficiency, if any . . . .

b. Employer's normal cost for plan year as of mo. _____ day _____ yr. _____ . . . . .

c. Amortization charges

   (i) Funding waivers (outstanding balance as of mo. _____ day _____ yr. _____ ► $ _____)

   (ii) Other than waivers (outstanding balance as of mo. _____ day _____ yr. _____ ► $ _____)

d. Interest as applicable to the end of the plan year on a, b, and c . . . .

e. Total charges (add a through d) . . . .

Credits to funding standard account:

f. Prior year credit balance, if any . . . .

g. Employer contributions (total from column (b) of item 7) . . . .

h. Amortization credits (outstanding balance as of mo. _____ day _____ yr. _____ ► $ _____)

i. Interest as applicable to end of plan year on f, g, and h . . . .

j. Other (specify) ► _____

k. Total credits (add f through j) . . . .

Balance:

l. Credit balance: if k is greater than e, enter the difference . . . .

m. Funding deficiency: if e is greater than k, enter the difference . . . .

10 Alternative minimum funding standard account (omit if not used):

a. Was the entry age normal cost method used to determine entries in item 9 above? . . . . ☐ Yes ☐ No

   If "No," do not complete b through h.

b. Prior year alternate funding deficiency, if any . . . .

c. Normal cost . . . .

d. Excess, if any, of value of accrued benefits over market value of assets . . . .

e. Interest on b, c, and d . . . .

f. Employer contributions (total from column (b) of item 7) . . . .

g. Interest on f . . . .

h. Funding deficiency: if the sum of b through e is greater than the sum of f and g, enter difference . . . . .

11 Actuarial cost method used as the basis for this plan year's funding standard account computation:

a. ☐ Attained age normal   b. ☐ Entry age normal   c. ☐ Accrued benefit (unit credit)

d. ☐ Aggregate   e. ☐ Frozen initial liability   f. ☐ Individual level premium

g. ☐ Other (specify) ►

12 Checklist of certain actuarial assumptions:	A Used for items 6d and e— value of accrued benefits				B Used for items 8, 9, or 10— funding standard account			
	Pre-retirement		Post-retirement		Pre-retirement		Post-retirement	
	Yes	No	Yes	No	Yes	No	Yes	No
a. Rates specified in insurance or annuity contracts								
b. Mortality table code:								
(i) Males								
(ii) Females								
c. Interest rate		%		%		%		%
d. Retirement age								
e. Expense loading		%		%		%		%
f. Annual withdrawal rate:	Male	Female			Male	Female		
(i) Age 25		%	%			%	%	
(ii) Age 40		%	%			%	%	
(iii) Age 55		%	%			%	%	
g. Ratio of salary at normal retirement to salary at:								
(i) Age 25						%	%	
(ii) Age 40						%	%	
(iii) Age 55						%	%	
h. Investment return on actuarial value of plan assets for the year ending on the valuation date								%

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