1988

A Study to Investigate the Effects of State Taxation and Plan Type on Small Employer Retirement Plan Cost.

W. Robert Smith

Louisiana State University and Agricultural & Mechanical College

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A study to investigate the effects of state taxation and plan type on small employer retirement plan cost

Smith, W. Robert, Ph.D.
The Louisiana State University and Agricultural and Mechanical Col., 1968
A STUDY TO INVESTIGATE THE EFFECTS OF STATE TAXATION AND PLAN TYPE ON SMALL EMPLOYER RETIREMENT PLAN COST

A DISSERTATION

Submitted to the Graduate Faculty of the Louisiana State University and Agricultural and Mechanical College in partial fulfillment of the requirements for the degree of Doctor of Philosophy in

The Department of Accounting

by

W. Robert Smith
B.S., Louisiana State University
M.B.A., Louisiana State University
August 1988
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ABSTRACT

Congress enacted legislation in 1978 [Revenue Act of 1978] that created a new type of retirement plan, the simplified employee plan. Congress believed that the administration costs associated with existing plans, especially qualified plans, were an undesirable obstacle to plan adoption and maintenance among small employers. Qualified plan participants, i.e., employees, in many cases are able to receive substantial reductions in the amount of tax due on retirement plan distributions. One of the primary differences between qualified plans and the simplified employee plans mentioned above is that under certain circumstances the tax due on distributions from qualified plans may be computed using a special federal averaging computation. Some states allow similar tax relief for distributions from qualified
retirement arrangements. Simplified employee plans do not qualify for this preferential federal tax treatment. Therefore, even if simplified employee plans reduce the administration costs incurred by employers, the amount actually available to plan participants after taxes under a simplified employee plan may be substantially lower than the amount available to participants in qualified retirement plans. This paper describes a computer simulation of the costs small employers incur to provide after-tax retirement benefits to employees. These costs were analyzed to determine if simplified employee plans actually lowered the costs small employers incur. In this study, the after-tax costs small employers incur under both qualified plans and simplified employee plans were compared to determine if the creation of simplified employee plans achieved the congressional objective of cost reduction for small employers. Of particular interest were the tax costs small employers incur because of the various methods of taxing plan participants at the state level.
CHAPTER 1

INTRODUCTION

Retirement plan assets are a significant component of aggregate investment in the United States, and the continued growth of retirement plan assets may have broad, long-range implications for the national economy and for state and local economies.\(^1\) Congress enacted legislation in 1978 [Revenue Act of 1978] that created a new type of retirement plan, the simplified employee plan. Congress believed that the administration costs associated with existing plans, especially qualified plans, were an undesirable obstacle to plan adoption and maintenance among small employers:

\(^1\)See, Economic Committee [1964] (discussion of the social and economic effects of retirement arrangements, especially on savings and investment and the mobility of labor and capital) and Berle [1959] (discussion of the effects of power concentration in the hands of a few individuals or institutions who do not actually own substantial amounts of property).
The committee is aware that many qualified pension plans have been terminated in the recent past due, in part, to the complex and burdensome rules they are required to satisfy. The committee believes that these rules have also had the effect of retarding the introduction of new plans. The committee is concerned that, because of the expense [emphasis added] and effort required to comply with present rules for tax qualified plans, many employees, particularly the employees of small businesses [emphasis added], will not earn employer-provided retirement benefits [S. Rept. No. 1263].

In many cases, qualified plan participants, i.e., employees, are required to pay a tax on plan distributions that is substantially less than the tax that would have been due on similar distributions from a simplified employee plan. Indeed, one of the primary differences between qualified plans and simplified employee plans is that under certain circumstances employees may compute the tax due on distributions from qualified plans using a special federal averaging method. Some states allow similar tax relief for distributions from qualified retirement arrangements. Because simplified employee plans do not receive this preferential federal tax treatment, the amount actually available to plan participants after employee taxes are deducted may be substantially lower under a simplified employee plan than under a qualified retirement plan.

The question is, did the creation of a new type of retirement plan, the simplified employee plan, actually lower employer costs, thereby making employers more
likely to offer retirement benefits to their employees? Plan administration costs may be lower for simplified employee plans than for qualified plans, but the cost of paying after-tax benefits to employees may not have been reduced.

This cost, i.e., the cost of paying after-tax retirement benefits, seems relevant because the intent of Congress was for employees to "earn employer-provided retirement benefits." That is, Congress's purpose for creating simplified employee plans was to place benefits into the hands of employees, not to lower plan administration costs. Apparently, Congress believed that lowering plan administration costs would lower the cost employers incur to provide plan benefits. The answer to the question posed above turns on whether the tax benefits available to plan participants under qualified plans outweigh the lower administration costs associated with simplified employee plans.

As an example, suppose an employee participated in an employer-sponsored qualified plan for ten years and that during each year of plan participation the employer made a plan contribution of five percent of the employee's $30,000 annual salary or an annual contribution of $1,500. If these annual contributions earned a ten percent rate of return they would result in a pre-tax, lump sum distribution to the employee of
$23,906. Assume that in addition to the $1,500 annual contributions, the employer paid $200 per year in plan administration costs that were attributable to the employee. That is, the employer could cause the employee to receive a $23,906 pre-tax lump sum payment by making ten annual payments of $1,700.

If a simplified employee plan had been adopted by the employer the same pre-tax lump sum payment could have been made by contributing only $1,500 per year, assuming no plan administration costs for simplified employee plans. If the entire $1,700 per year had been invested in a simplified employee plan that earned ten percent, the employer would receive a pre-tax, lump sum distribution of $27,094. That is, as a result of a $1,700 annual contribution the employee would receive a pre-tax, lump sum distribution of $23,906 if the employer adopted a qualified plan or $27,094 if the employer adopted a simplified employee plan.

Congress's intent was to put benefits into the hands of employees, not just to lower plan administration costs. Clearly, administration costs could be lowered in this example by adopting a simplified plan, but at what cost to the employee? If the employee in this example is assumed to have $5,000 per year of taxable income, in addition to any lump sum retirement arrangement distribution, the employee will
pay a tax of $1,643 on the plan distribution if the federal averaging computation for qualified plans is elected.\(^2\) If a simplified employee plan were adopted the employee would not be allowed to use the special averaging method to compute the federal income tax, and the tax on a $27,094 pre-tax, lump sum distribution would be $6,206.\(^3\)

The result under the facts assumed is that an employer's annual contribution of $1,700 would yield $22,263 (i.e., $23,906 - $1,643) after paying the federal income tax if the employer adopts a qualified plan or $20,888 (i.e., $27,094 - $6,206) if the employer adopts a simplified employee plan.

Under these circumstances, the employee would be better off if the employer adopted a qualified plan. However, if the facts were slightly different, a simplified employee plan could result in more after-tax employee benefit. For example, assume that all facts are the same as above except that the employee has no taxable income after plan separation and files a joint return. Under these circumstances, the employee would pay a tax of $1,643 if a qualified plan were adopted and

\(^2\)In this case, ten year forward averaging and 1986 tax rates were used to compute the tax. Chapter 4 describes the availability of this and other methods for computing the federal tax on plan distributions.

\(^3\)This tax was based on 1986 tax rates and assumes that the taxpayer was single.
$3,876 if a simplified employee plan were adopted. The after-tax, lump sum benefit would be $22,263 (i.e., $23,906 - $1,643) under a qualified plan or $23,218 (i.e., $27,094 - $3,876) under a simplified employee plan. Table 1-1 summarizes the results of the examples above.

The preceding examples have ignored the effect of any state income tax on plan distributions. State income taxes cause the differences between qualified plans and simplified employee plans to be greater in many cases. For example, some states tax distributions from simplified employee plans as ordinary income and allow some qualified plan distributions to escape taxation completely.\(^4\)

This paper describes a computer simulation of the costs small employers incur to provide after-tax, lump sum retirement benefits to employees. These costs were analyzed to determine if simplified employee plans actually lowered the costs small employers incur to provide after-tax dollars of lump sum retirement benefits. In this study, the after-tax costs small employers incurred under both qualified plans and simplified employee plans were compared to determine if the creation of simplified employee plans achieved the

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\(^4\)See Chapter 4 for a detailed discussion of how states tax plan distributions.
congressional objective of cost reduction for small employers.

The first three sections of this chapter examine briefly certain conceptual and economic issues and provide a summary of retirement arrangement taxation. Next, the research questions addressed by this study are presented and are followed by a section that describes the method used to answer the research questions. The method section is followed by a section on study limitations and assumptions. The final section in this chapter discusses the contributions of this study.

In the chapters that follow, each of the above topics is discussed in more detail. Chapters 2, 3, and 4 address conceptual issues, economic issues, and retirement arrangement taxation, respectively. Chapter 5 describes the method used to answer the research questions, and Chapter 6 reports the results of the study. Chapter 7 presents some conclusions based on the results of this study and indicates some areas that appear to be productive areas for future research.

CONCEPTUAL ISSUES

Crucial to the issue of retirement arrangement cost is the proposition, which has been extensively studied and discussed by other researchers, that employer payments to retirement arrangements are, indeed, costs.
Pension benefits were originally viewed as gratuities from employers [Pesando and Rea, 1977 and McGill, 1984]. This approach, however, is inconsistent with economic theory and practice, and De Roode [1913] offered another theory in which pensions were treated as one part of a compensation package. This deferred compensation theory has since been replaced or supplemented by other theories because, as Stone [1982] observed, deferred wage theory does not provide a satisfactory explanation for at least three empirically observable situations:

1. deferred vesting provisions are present in many plans;
2. many firms integrate pension benefits with social security benefits; and
3. some United States and Canadian firms make unilateral, upward adjustments in the pensions of retired employees.

Option pricing theory and agency theory have been used to give more rigorous explanations of pension behavior [e.g., Treynor, Regan, and Priest, 1976 and Logue, 1979]. Option pricing theory requires that employees place a value, at least implicitly, on conditional future payments as if employees purchased an option on future benefits. Of course, such an approach, if done explicitly, would involve a complex weighing of individual utility functions and probability estimates.
Agency theory has been used [Logue, 1979] to explain a variety of behavior patterns. For example, why would employers, employees, and investors choose uncertain future payments in exchange for certain current payments? One possible explanation is that certain costs may be reduced if future payments, which include an adjustment for the amount of time until payment, are used. Each of the above conceptual difficulties will be treated at greater length in the next chapter.

ECONOMIC ISSUES

Federal and state tax policies have played an important role in bringing about the current level of emphasis on retirement arrangements by both employers and employees [See, Lewellen, 1975; Galper and Zimmerman, 1977; Feldstein, 1976; Fredland et al., 1968; Romans and Ganti, 1979; Eaton and Rosen, 1980; Keeley, 1980; Hemming, 1980; and Brannigan, 1985]. However, the exact nature of the role of taxation is not known.

This is true especially in the case of small businesses and local economies. For example, increased investment in a state economy may only displace other investments. Most of the research to date that has been concerned with the effects of state and local taxation
has focused on explanations for interjurisdictional
differences in economic variables instead of
explanations for the aggregate level of economic
variables. This emphasis probably is due to the
relative difficulty of explaining the aggregate prices
of capital, labor, and other economic variables.

Many of Due's [1961] early observations concerning
interjurisdictional tax differentials appear to remain
ture today, and there seems to be no reason to doubt
that these observations apply to retirement plan tax
differentials. First, even relatively high state and
local tax levels, acting alone, do not appear to have
the drastic effects on firm behavior that might be
predicted on the basis of casual observations of
taxation differences among jurisdictions. Second, tax
considerations may have an effect on firm location
decisions if most or all of the other relevant factors
are equal. For example, lower property taxes might
cause a firm to locate in a state if the alternative is
a neighboring state with similar levels of other taxes.
Finally, certain areas might be excluded from
consideration by a firm because of a general perception
that the area does not have a healthy business
environment. This means that in some cases all
available alternatives may not be evaluated because of
the initial screening process for suitable business locations.

**RETIREMENT PLAN TAXATION**

Under current federal tax laws, much variation exists in the amount of tax an employee must pay as a result of a retirement arrangement distribution. Several methods are available to compute the federal and state income tax due on a plan distribution: some are elective and some are mandatory. The degree of flexibility afforded taxpayers, generally, is a function of the type of plan from which a distribution was made and the manner of payment.

At the federal level, distributions from a qualified plan are taxable as capital gain if attributable to pre-1974 service. Any remaining qualified plan distributions are treated as ordinary income and are taxed under rules applicable to annuities. If all qualified plan benefits are received within one taxable year a special ten-year forward averaging method was available to compute the tax, prior to 1987, on any ordinary income components of plan distributions. Taxpayers were allowed to elect to treat the entire amount of a qualified lump-sum distribution as ordinary income under the old ten-year averaging rules, forgoing the benefit of capital gain treatment.
for distributions attributable to pre-1974 service. After 1985 a five-year averaging computation is available. Taxpayers who were 50 years old on or before January 1, 1986 may elect to be taxed under either the old ten-year forward averaging rules or the new five-year forward averaging rules.

Simplified employee plans and individual retirement accounts are treated identically for most federal tax purposes. For example, distributions from these two plans do not qualify for the special averaging computations and are taxed, generally, as ordinary income as received by employees. Individual retirement accounts may be used to avoid current taxation on qualified plan distributions if a taxpayer properly transfers assets from a qualified plan in a partial or complete rollover.

A variety of state tax policies exist with respect to plan distributions, ranging from no state taxation to ordinary income treatment [See, Curatola, 1986]. Both federal and state taxation of plan distributions are discussed in greater detail in Chapter 4.

RESEARCH QUESTIONS

The above summary of the rules related to retirement plan taxation considered the taxation of retirement plan distributions only from an employee
From an employer's point of view, the federal and state tax treatment of both simplified employee plans and qualified plans are fairly consistent. Employer contributions to a retirement plan generally are deductible, and any plan earnings are allowed to accumulate without the imposition of an income tax. The purpose of this study is to investigate the effects of plan type and state tax policy on the cost small employers incur to provide certain after-tax employee benefits. This investigation will take into account the economic variables, and their corresponding frequency distributions, that determine plan cost. The following research questions were examined:

1. Does retirement plan type affect the cost small employers incur to provide after-tax retirement benefits to employees?

2. Does state income tax policy with respect to retirement arrangements affect the cost small employers incur to provide after-tax retirement benefits to employees?

The first research question is primarily a federal tax issue concerning the effectiveness of simplified employee plans as a method for reducing small employer costs. The second question addresses, at once, a federal tax policy issue and a state tax policy issue. That is, state tax policies could cause inconsistent, inefficient, or ineffective implementation of federal tax policies. The economic effects of state tax
policies have consequences for individual states as well.

METHOD

A model was defined that describes the way inputs to retirement arrangements result in employer costs and employee benefits. In the system, employers were assumed to make contributions to retirement arrangements over some period of employee plan participation. Then, employees were assumed to withdraw the employer contributions, along with any earnings, in a lump sum. The model provides an index of the average cost to employers of paying lump sum, after-tax dollars to employees in three categories of states and under three types of retirement arrangements.

The Model

The problem was to determine the amount of employer contribution, i.e., cost, required to provide after-tax benefits to employees, taking into account the fact that employers and employees have certain attributes which affect the employer contributions required to pay after-tax benefits. The model also had to reflect the fact that employer and employee attributes have some probability of occurrence. Simply stated, the cost employers incur to provide retirement benefits is a function of many variables: some
variables can be viewed as characteristics of employers, for example the number of plan participants, and some variables can be viewed as characteristics of employees who receive plan distributions, for example the amount of taxable income employees receive from sources other than retirement arrangements. The model used in this study is discussed in more detail in Chapter 5, but a short description of the model is presented below.

If an individual employer and an individual employee are examined for a given plan type and state tax policy, a cost function, C, can be defined such that C is an index of after-tax plan cost. In the model used for this study the index of after-tax plan cost is a

5The number of plan participants could be expected to affect plan cost in at least two ways. Fixed plan administration costs decrease on a per employee basis as the number of plan participants increases. Variable plan administration costs increase total administration costs incurred by an employer as the number of plan participants increases but remain constant on a per employee basis as the number of plan participants increases.

6Employee taxable income from sources other than the retirement plan under consideration affects the cost employers incur to provide after-tax plan benefits because of the progressive nature of the United States income tax system. For example, a $2 pre-tax plan distribution would be required to pay an employee $1 of after-tax plan benefit if the employee were taxed at a rate of 50 percent on plan distributions. A plan distribution of $1.25 would result in a $1 plan benefit to an employee in a 20 percent marginal tax bracket. Because total taxable income determines an employee's marginal tax rate, taxable income from all sources must be considered in the computation of employer after-tax cost.
ratio, the numerator of which is the sum of all employer contributions to a retirement arrangement, including the payment of plan administration costs, and the denominator is the after-tax payments to employees that result from employer contributions. If \( R \) is defined to be a function that describes employer contributions, in future value terms on the date of distribution, and if \( G \) is defined to be a function which describes the resulting after-tax distributions, then \( C \) can be represented in the following manner:

\[
C = \frac{R(\alpha_1, \alpha_2, \ldots, \alpha_m, \beta_1, \beta_2, \ldots, \beta_n)}{G(\alpha_1, \alpha_2, \ldots, \alpha_m, \beta_1, \beta_2, \ldots, \beta_n)} \quad (1-1)
\]

where

- \( C \) = an index of the cost of providing after-tax benefits to employees;
- \( R \) = the functional relationship between the future value at the date of distribution of all employer contributions and two types of variables: 1) employer characteristics \( \alpha_1 \) to \( \alpha_m \) and 2) employee characteristics \( \beta_1 \) to \( \beta_n \);
- \( G \) = the functional relationship between the after-tax amounts received by employees and two types of variables: 1) employer characteristics \( \alpha_1 \) to \( \alpha_m \) and 2) employee characteristics \( \beta_1 \) to \( \beta_n \);
- \( \alpha_1, \alpha_2, \ldots, \alpha_m \) = employer characteristics 1, 2, \ldots, \( m \);
- \( \beta_1, \beta_2, \ldots, \beta_n \) = employee characteristics 1, 2, \ldots, \( n \).
Design

A nested design was used to answer the research questions, plan type and state income tax policy being the factors of interest. The observations were the cost indices of providing after-tax employee benefits under three retirement arrangements in three state income tax categories.

Plan Type Factor. The plan type factor was examined at three levels. The research question addressed by the plan type factor was directed at the differences in employer costs for simplified employee plans and qualified plans. Qualified plans, however, are so varied that discovering a representative cost for such plans was thought to be impossible. Therefore, two levels of the plan type factor were used, one a low cost qualified plan alternative and one a high cost qualified plan alternative. The third level of the plan type factor included simplified employee plans.

State Tax Policy Factor. Three levels of the state tax policy factor were examined. The first state tax policy level included states with no income tax. This level, obviously, represented an extreme method of taxing distributions and served as a control group to determine if other state tax policies significantly affect the cost of providing employee benefits. Many
states fall into this category.\textsuperscript{7} The second level of the state tax policy factor included states that tax plan distributions as ordinary income at regular state income tax rates. The third level of the state tax policy factor included state tax policies that fall between the extremes of the first two levels.\textsuperscript{8}

**Procedure**

The procedure for gathering data on small employer costs was to simulate responses, i.e., costs, based on empirical and theoretical frequency distributions for the input variables $\alpha_1, \alpha_2, \ldots, \alpha_m, \beta_1, \beta_2, \ldots,$ and $\beta_n$. The use of empirical variable distributions does not assure a good approximation of the true underlying distribution, but this method is generally thought to be the best course of action in the absence of evidence about a true variable distribution [Conover, 1980].

**Data Analysis**

Because the responses were determined in a random manner, statistical testing of the responses was appropriate [See, Cochran and Cox, 1957; Kleijner, 1980].

\textsuperscript{7}Alaska, Florida, Nevada, South Dakota, Texas, Washington, and Wyoming do not have an individual income tax. New Hampshire and Tennessee tax only interest and dividends (i.e., distributions from retirement arrangements are not taxed in these states).

\textsuperscript{8}For a detailed discussion of retirement plan taxation at the state level, see Curatola, 1986.
The following model was used to test for the significance of factors:

\[ C_{ijk} = U + S_i + P_j(i) + e_k(ij) \]  

where

- \( C_{ijk} \) = the cost index of the kth observation for plan type j in state tax policy i,
- \( U \) = the overall mean effect,
- \( S_i \) = the effect of the ith level of factor S, the state tax policy effect,
- \( P_j(i) \) = the effect of the jth level of factor P, the plan type factor effect, within state tax policy i, and
- \( e_k(ij) \) = the random error present in the kth observation for plan type j in state tax policy i.

LIMITATIONS AND ASSUMPTIONS

This study relied heavily upon two assumptions about lump sum distributions paid to the employees of small businesses. The first assumption is that retirement plan costs incurred by employers are affected by federal and state taxes imposed on employees. To the extent that this assumption was not appropriate, the conclusions that may be drawn from the results of this study are limited.

The second basic assumption concerned the definition of small employers, the intended beneficiaries of simplified employee plans. The answers
to the research questions may have been affected by which employers were considered small. To the extent that small employers and their employees have characteristics different from those used in the simulation of plan costs, the appropriateness of drawing conclusions about the population of small employers is limited.

CONTRIBUTION OF THE STUDY

The contributions of this study have been alluded to in the discussion above. Knowledge was gained about how federal and state tax policies affect employer costs and whether Congress accomplished its stated objective by establishing simplified employee plans. The results of this study may find application in the evaluation of present federal tax policies and in the development of strategies to affect state labor forces, investment, and employment opportunities.
### TABLE 1-1

**PLAN COST EXAMPLES**

<table>
<thead>
<tr>
<th>Plan Type</th>
<th>Other Income Status</th>
<th>Filing Income Status</th>
<th>Total Annual Pre-tax Plan Distribution</th>
<th>Federal Distribution Tax</th>
<th>After-tax Plan Distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>QP</td>
<td>$5,000 Single</td>
<td>$1,700</td>
<td>$23,906</td>
<td>$1,643</td>
<td>$22,263</td>
</tr>
<tr>
<td>SEP</td>
<td>5,000 Single</td>
<td>1,700</td>
<td>27,094</td>
<td>6,206</td>
<td>20,888</td>
</tr>
<tr>
<td>QP</td>
<td>0 Joint</td>
<td>1,700</td>
<td>23,906</td>
<td>1,643</td>
<td>22,263</td>
</tr>
<tr>
<td>SEP</td>
<td>0 Joint</td>
<td>1,700</td>
<td>27,094</td>
<td>3,876</td>
<td>23,218</td>
</tr>
</tbody>
</table>

The computations above were based on the following assumptions:

- a plan participation period of 10 years and
- a 10 percent annual return on plan assets.
CHAPTER 2

A THEORETICAL FRAMEWORK FOR RETIREMENT ARRANGEMENTS

The purpose of this study was to investigate certain characteristics of employer retirement plan costs. However as mentioned in Chapter 1 a basic premise of this study is that the contributions employers make to retirement arrangements represent an additional cost of doing business. This chapter is a brief review of selected attempts to describe the theoretical foundations of retirement arrangements.\textsuperscript{9}

The evolution of retirement arrangement theory from the early theories, which viewed post-retirement payments by employers as acts of benevolence, to the more complex theories of today, which are often represented by mathematically rigorous explanations of employer and

\textsuperscript{9}Stone (1982) presented an excellent summary of the literature in this area making a brief review sufficient here.
employee behavior, indicates that retirement arrangement payments by employers reasonably can be viewed as a cost incurred by employers. An understanding of some attempts to explain the theoretical basis for retirement plans may aid in the application and interpretation of the results obtained from this study.

THE HISTORY OF PRIVATE PENSIONS

The first well-known United States private pension program was adopted by American Express in 1875, preceding the Social Security Act of 1935 by about 60 years [Jackson, 1977]. A number of railroads, public utilities, and banks followed by adopting mainly noncontributory plans.10 By 1930, 420 plans had been adopted by private industry [Jackson, 1977].

As might be expected, most of the early private pension plans were established by large organizations. The plans usually formalized firm practices with respect to retired or disabled employees and their families. Although length of service has been a common thread in the fabric of private pension programs, other factors have been used to calculate employee benefits over the

10Retirement arrangements can be classified on the basis of their contributory or noncontributory nature. Contributory plans are those plans to which employees contribute. Noncontributory plans are plans to which only employers contribute.
years, and the emphasis placed on such factors has shifted from time to time. 11

During the first half of the twentieth century, organized labor became a major factor in the development of retirement plans, but at first, labor leaders were suspicious of formal plans. Some labor organizers saw pension plans as a way for management to buy employee loyalty and undermine union influence while holding wages at low levels [McGill, 1984]. Ultimately, organized labor played a key role in forcing employers to include retirement benefits in the list of items to be negotiated.

In 1946 a grievance was filed with the National Labor Relations Board alleging that Inland Steel Company had violated the terms of a labor contract by enforcing a policy of mandatory retirement at age 65. The problem arose because Inland Steel refused to negotiate the matter, asserting that the mandatory retirement policy was part of the company's pension plan and not part of any collective bargaining agreement.

The National Labor Relations Board [Inland Steel Company, 1948] did not agree with management and ruled that under the Labor-Management Relations Act of 1947

11 For example, Jackson (1977) pointed out that the compensation used by most employers to determine benefits shifted from final average pay to career pay around 1940 and then back to final average pay around 1975.
the pension plan provisions were subject to negotiation and that management could not take unilateral action in this area. The Seventh Circuit Court of Appeals affirmed the National Labor Board's ruling [Inland Steel Company, 1949]. The court found that a pension plan is a condition of employment, but the court would not go so far as to equate pension plan benefits with wages. Treatment of pension plans as a condition of employment was enough to force pension plans into the mainstream of labor negotiations and to prohibit many employers from altering or terminating pension plans without submitting the matter to collective bargaining units.

The introduction of the current social security system required major changes in the way employers viewed private pension benefits. Whereas private pension plans seemed to discharge a moral obligation of the employer or some earned right of the employee, the social security provisions appeared to address, primarily, the need for income, a social problem.12 Private pension plans assumed a role secondary to the social security system. According to Jackson [1977],

12While the social security system does take into account the amount of taxes paid into the system, the system's primary emphasis is on need. Also, the present social security system is very broad with respect to participation and is, for the most part, a nonvoluntary system.
the most commonly stated reasons for maintaining private pension plans after the introduction of the current social security system were those listed below:

1. Discharge a moral obligation of the employer
2. Permit the retirement of inefficient workers while retaining older skilled workers who are still efficient
3. Attract capable, well trained, new employees
4. Maintain a favorable working climate
5. Develop a good corporate image
6. Develop a more efficient working relationship with a union by putting long-term problems on the bargaining table
7. Reduce the employee's total dependence on government to a more manageable level, and
8. Utilize a tax advantage [Jackson, 1977, p. 18].

Explanations for specific levels of pension benefits requires a more complex theoretical structure. No such structure has been described and tested fully, but the following sections of this chapter summarize attempts to develop a theoretical framework for retirement arrangements.

GRATUITIES AND DEFERRED WAGES

Pension benefits were originally viewed as gratuities from employers [Pesando and Rea, 1977 and
McGill, 1984], but as Stone [1982] pointed out, this view is inconsistent with economic theory and practice. De Roode [1913] offered another theory in which the pension component of compensation was viewed as only one part of a total compensation package. This deferred compensation theory also has proven to be an inadequate explanation of pension payments in practice and has been replaced or supplemented by other theories discussed later in this chapter.

One possible alternative interpretation of pension payments that makes use of the deferred compensation theory is that employers do not pay pension benefits as a result of a gratuitous intent or because of an existing obligation. Instead, pension payments are paid by employers because of the current and future benefits employers, not employees, expect to receive. That is, pension payments can be viewed as creating goodwill that employers hope will result in greater current and future productivity. Employers expect current and future employees to provide services partly because they expect to receive pension benefits, and an employer's history with respect to pension benefits reasonably could be expected to affect employees' subjective assessments of the probability of receiving pension benefits.

If any obligation to make future payments exists, whether the obligation is legal, moral, or just a
commitment on the employer's part because of anticipated goodwill, the deferred part of a compensation package can be viewed as having some current value. As in the case of current wages, deferred wages may be subject to negotiation. Negotiation, or even a desire to negotiate, does not appear to exist in all cases at an individual employee level [See, Johnson and Higgins, 1979], but there is some evidence that tradeoffs occur on an aggregate level [e.g., Pesando and Rea, 1977 and Bernstein, 1964].

The deferred wage theory of pension payments is widely held today\textsuperscript{13} although, as Stone [1982] observed, the deferred wage theory does not appear to provide a satisfactory explanation for at least three empirically observable situations:

1. deferred vesting provisions are present in many plans;
2. many firms integrate pension benefits with social security benefits; and
3. some United States and Canadian firms make unilateral upward adjustments in the pensions of retired employees.

The apparent discrepancies in theory and practice can be reconciled with the aid of concepts borrowed from option pricing theory and agency theory as discussed below.

\textsuperscript{13}For examples of how this view has been used to set policy see U. S. Congress (1973) and FASB (1981).
The use of deferred vesting provisions increases uncertainty for employers and employees because of the method used to compensate employees, but the use of an alternative compensation method does not change the underlying substance of the transaction: employees receive something of value in return for their services. The uncertainty may change the present value of the potential future benefits, but uncertainty does not cause the potential future benefits, as indicated by the first objection in the preceding section, to become worthless. Also, vesting deferral may be part of an employee incentive package offered by employers. However, no inherent conflict exists between deferred vesting and employee compensation.

The second objection raised above to the deferred wage theory as an explanation of empirical observations can be resolved in a similar manner. Social security benefits are themselves uncertain, and private pension plans may be used to reduce the risk that an employee will face retirement with an inadequate amount of income. While integration with social security benefits may reduce the value of future pension payments, integration does not necessarily mean that the conditional payments have no value.
The third objection to the deferred wage theory is more difficult to reconcile with a theory that explains pension payments. Perhaps unilateral adjustment of pensions for retired employees is explained best as an effort by employers to create goodwill and confidence among current and future employees. That is, a reduction in the uncertainty of pension adequacy may increase the value of deferred pension benefits. This explanation seems more plausible than the "implicit contract" theory suggested by Pesando and Rea [1977].

Some commentators have attempted a rigorous explanation of the pension-related behavior discussed above through the use of option pricing theory and agency theory. Treynor, Regan, and Priest [1976] and Logue [1979], for example, argued that pension benefits represent contingent claims. That is, employees receive wages in the form of current payments and future payments that are conditioned upon the occurrence of stipulated events. Using an option pricing approach, employees place a value on the conditional future payments, i.e., the option, taking into account individual utility functions and probability estimates. Then, choices are made by employees in an attempt to optimize total compensation.
PENSIONS AND AGENCY THEORY

Agency theory has been used to examine the costs of monitoring and enforcing relations among groups acting as principals and agents [e.g., Watts, 1977]. A primary feature of agency theory is that agents, not principals, ultimately bear monitoring and supervision costs. Logue [1979] used agency theory to explain why employers, employees, and investors would choose uncertain future payments in exchange for certain current payments. The reasons for such a choice are tied to the savings that may result from long-term employment. Delayed retirement payments provide employees with an incentive to remain with the same employer for an extended period of time. The employee incentive arises from an employee's ability to share in employer savings brought about by reduced training and hiring costs. As evidence of this shared savings, Logue cited the relatively small number of retirement plans among certain industries with low hiring and training costs.

SELECTED STUDIES

Many studies provide support for the theories described above. Perhaps the most widely supported theory is the deferred wage theory [Pesando and Clarke, 1983, p. 733]. The notion of benefit tradeoffs has been
extensively tested, and as indicated at the beginning of
this chapter, a basic premise of this study is that
employer contributions to employee retirement
arrangements are costs incurred by employers. This
section briefly describes the results and conclusions of
selected studies which tend to support one or more of
the theories discussed above.

Ehrenberg [1980] attempted to determine if public
sector employees trade retirement benefits for wages.
Cross-section regression analysis was used to estimate
the effect of a variety of pension plan characteristics
on employee wages. Among the plan characteristics
included in the regression model were the existence of a
compulsory retirement age, a minimum age requirement for
retirement benefit eligibility, the salary percentage
employees received for minimum regular retirement
benefits, and employee contributions as a fraction of
annual salary.

Perhaps the most interesting result of the
Ehrenberg study was that the amount of plan funding is
related to wage level differentials. This indicates
that employee and employer perceptions about the
likelihood of retirement benefit payments are affected
by plan funding. Other plan characteristics affected
wage levels in predictable directions. That is,
generous plan characteristics tended to be associated
with lower wage levels, indicating that pension benefits, indeed, are traded for current wages.

Woodbury [1983] used a transcendental logarithmic indirect utility function to estimate preferences for wage and nonwage benefits. This method of estimation uses a general indirect utility function for the price of wages, the price of fringe benefits, income, and workplace variables to obtain estimates of employee preferences for wage and nonwage compensation.

Estimates of the rate of substitution between wages and fringe benefits indicated that fringe benefits were consistently substituted for wages at a rate exceeding unity. The inclusion of pension benefits in the definition of fringe benefits caused the rate of substitution to increase. Woodbury found that, in general, employee sensitivity to retirement benefit changes is greater than employee sensitivity to other fringe benefits. Also of interest were the discoveries that larger organizations tend to pay proportionately larger shares of fringe benefits and that collective bargaining causes the compensation mix to shift towards fringe benefits and away from current wages.

White [1983] also found evidence of employee substitution of nonwage compensation for current wages. White examined employee preferences for educational, retirement, legal, life insurance, and health insurance
benefits. The experimental task was for subjects to allocate their total salaries among current cash wages and the five noncash benefits. Half of the subjects were told that the noncash benefits were taxable; the other subjects were told that noncash benefits were not taxable.

The results of White's study suggest that employees prefer to be paid, at least in part, in the form of noncash benefits. Employee preferences for the noncash benefits varied widely, however. Tax treatment affected the choice of education, retirement, and legal benefits. Job classification affected the choice of all noncash benefits except life insurance.

Halperin and Tzur [1985] used an approach significantly different from the approaches used in the studies discussed above. In an attempt to explain which factors cause employers to substitute the payment of nontaxable benefits for currently taxable wages, Halperin and Tzur asked employers to choose a compensation package, made up of wages and nontaxable benefits, which would minimize employer expenses but provide a constant level of employee utility.

Not surprisingly, the results of this study indicated that tax favored benefits are substituted more freely for wages in the form of cash as employee income rises. Using the Halperin and Tzur model, health
insurance benefits were substituted even if employee income was relatively low. In addition, Halperin and Tzur found that employees at a compensation level near the minimum wage could benefit by receiving less compensation in the form of cash. A wide range of middle management employees were found to be at the maximum level of fringe benefits under the applicable laws.

SUMMARY

Various theories have been offered to explain the existence of retirement arrangements and the forms these plans have taken in practice. Neither gratuity theory nor deferred wage theory alone appears sufficient to explain current plan practices, but when combined with option pricing theory and agency theory, deferred wage theory has provided a framework for generating hypotheses and empirically testing the effects of retirement arrangements. This chapter concludes with a figure originally presented by Stone [1982, p. 2] which shows the path taken by retirement plan theorists on their journey to a more complete understanding of retirement arrangements.
FIGURE 2-14

THE LINKAGE OF PENSION THEORY DEVELOPMENT, ACCOUNTING, REFORM LEGISLATION, AND EMPIRICAL RESEARCH

Originally presented by Stone (1982).
CHAPTER 3

ECONOMIC EFFECTS OF RETIREMENT PLANS AND INTERJURISDICTIONAL TAX DIFFERENTIALS

Following World War II, governmental control over wages caused employees and employers to focus on fringe benefits as a method of compensation. Employer payments to retirement plans were used to reduce taxes and provided a benefit to employees. Later, employer contributions were allowed as deductions only if the plan did not discriminate in favor of certain groups. This requirement put pressure on employers to include a broader range and a larger number of employees in company retirement plans. Such plans were well received by employees since employer contributions to qualified plans were not taxable to employees at the time employers contributed to the retirement arrangement, and

15 For a general discussion of the history of fringe benefits as a component of compensation see McGill [1984] and Summerfeld et al. [1984].
instead, amounts paid to employees were taxed as the
benefits were received.

Retirement plan abuses accompanied the rise in
pension plan popularity. Inadequately funded plans and
harsh vesting schedules caused the benefits of many
retirement plans to be illusory. In addition, job
mobility was often affected by plan requirements. The
Employee Retirement Income Security Act of 1974 was
enacted to prevent many of these abuses, and subsequent
tax laws giving preferential treatment to certain
retirement arrangements have made retirement plans a
major consideration for both employees and employers
[Cymrot, 1981].

The increase in retirement plan popularity has not
gone unnoticed by critics of the trend. Some have
suggested that tax deferral may be inequitable. In
addition to deferring taxation, certain provisions allow
favorable tax treatment when benefits are eventually
received. Also, benefits may be taxed during an
employee's retirement years when other income and
marginal tax rates are low. Taxpayers who receive
compensation in the form of taxable wages during their
productive years do not receive a comparable benefit.
In fact, employees covered by some form of retirement
plan may be better able to pay a tax on compensation
than those who are not participants in such plans. Some
commentators [e.g., Berle, 1959] have expressed concern about the potential for concentrations of wealth, and corresponding amounts of power, among the relatively small group of individuals responsible for the investment of retirement plan funds. The introduction of individual retirement accounts has substantially reduced the amount of criticism concerning distortions in individual taxpayer equity, but many of the arguments used against qualified retirement arrangements apply to individual retirement accounts as well.

Federal and state tax policies almost certainly have contributed to the current emphasis on retirement arrangements by both employers and employees [See, Lewellen, 1975; Galper and Zimmerman, 1977; Feldstein, 1976; Fredland et al., 1968; Romans and Ganti, 1979; Eaton and Rosen, 1980; Keeley, 1980; Hemming, 1980; and Brannigan, 1985]. Little is known, however, about the effect of tax policies on small employer retirement plan costs and the related effects on state and local economies.

For example, a recent survey [U.S. League Survey, 1984] found that individual retirement account and simplified employee plan assets tend to be invested in in-state banks and thrift institutions, but the implications of such a tendency are far from clear. These institutions usually supply credit to in-state
creditors giving apparent support to local economies [Murrman et al., 1984]. Qualified plans, on the other hand, reasonably could be expected to have a more geographically diverse portfolio of investments.

While this means that states might want to encourage employers to establish simplified employee plans instead of qualified retirement plans, many have argued for indirect investment by qualified retirement plans, instead, as a way of making a social investment as well as an economic investment in state and local economies [e.g., Murrman et al., 1984]. For example, socially desirable goals could be promoted by requiring that a state pension plan invest in low income housing. In this manner, investments might benefit plan participants both directly and indirectly.

The ultimate effect of such investments is sometimes unclear. For example, apparent increases in investment in state economies may merely displace other investments. Increases in investment may occur only when such investments reach parts of a state or local economy that would not otherwise have been funded because of an inefficient market for funds or because of some bias in the economy.

\[16\] New York City public employee pension funds were used in this way when New York City was in financial trouble a few years ago.
Research to date on the effects of state and local taxation has focused on explanations for interjurisdictional differences in economic variables instead of explanations for the aggregate levels of economic variables. This emphasis on differences caused by interjurisdictional tax variability may be due, in part, to the relative difficulty of explaining the aggregate prices of capital, labor, and other economic variables. Wheaton [1986] observed that the ultimate effect of state taxation or taxation within any identifiable jurisdiction is related to several factors:

1. price elasticities of state output demand,
2. local supply elasticities, and
3. technology or substitution between factors.

Wheaton suggested a trichotomous division of the empirical research which has been done on the impact of interjurisdictional differences in business taxes. He stopped short of a detailed description of the literature in each of the three categories above, perhaps because so little can be inferred from these studies. Indeed, Due's [1961] early observations still appear to summarize what is known about interjurisdictional tax differentials.

First, even relatively high state and local tax levels, acting alone, do not appear to have the drastic effects on firm behavior that might be predicted on the
basis of casual observation of taxation differences among jurisdictions. Second, tax considerations may have an effect on firm location decisions if most or all of the other relevant factors are equal. For example, lower property taxes might cause a firm to locate in a particular state if the alternative is a neighboring state with similar levels of other taxes. Finally, certain areas might be excluded from consideration by a firm because of a general perception that the area does not have a healthy business environment. This means that in some cases all available alternatives may not be evaluated because of the initial screening process for suitable business locations.

Due also offered an explanation for the inconclusive results that characterize most of the interjurisdictional research. Adapting Gresham's Law to the firm location decision, Due speculated that firms tend to locate in areas with relatively low taxes, but the evaluation of tax levels is clouded by assessments of the efficiency with which jurisdictions provide public services. That is, the economy of locating in a geographic area must be evaluated in light of the amount and quality of the public services provided in return for the tax dollars paid. In this way, state and local taxes may cause nonoptimal location decisions because of illusory savings.
All of the comments above can be summarized by saying that no comprehensive theoretical framework exists for the effects of interjurisdictional business tax differences. The following sections of this paper summarize selected interjurisdictional tax differential studies using the trichotomy Wheaton suggested. Taken as a whole, these studies do not support any single theory of interjurisdictional tax differentials. That is, they do not appear to support a theory that explains the effects of such differentials. Perhaps continued study of the issues related to interjurisdictional tax differentials will result in such a theory.

CROSS-SECTION STUDIES

The earliest researchers to examine business tax impacts used a cross-section approach to investigate the effects of differences in tax levels. At best, the results of these studies were mixed.

Several early studies examined growth rates in states with differing tax burdens. Bloom [1955] examined manufacturing employment growth and capital outlays of manufacturers to determine the degree of correlation between these variables and per capita state-local tax collections and the growth in these tax collections during the periods 1939 to 1953 and 1947 to 1953. No significant correlations were found. A small
positive correlation was found between the growth in tax collections and the growth in manufacturing employment, however the limitations of this study obscure the meaning of these results.

For example, the taxes examined were not limited to those placed on manufacturers. In addition, there was no attempt to identify other factors that might have influenced manufacturing growth during the period under study. Therefore, the apparent conclusion to be drawn from this study, that is, that high taxes are associated with high rates of growth in manufacturing employment, must be discounted considerably.

Another study by Thompson and Mattila [1959] attempted to correct some of the shortcomings of the Bloom study by looking at taxes on a per employee basis and by using a more sophisticated econometric approach. However, after examining twenty-nine manufacturing industries from 1947 to 1954 no significant correlations were found between employment growth and tax differences between states.

Due [1961] has attacked the results of the above studies and the results of other studies which have used similar approaches. He pointed out three major problems with studies of this ilk:
1. failure to distinguish among firms which have significant discretion as to geographic location,

2. failure to distinguish between types of taxation, and

3. failure to show that the results in rapidly growing states would have been similar if lower taxes had been imposed.

Due argued that, at best, these early studies fail to show a relationship between taxation and economic growth. They hardly prove the absence of a relationship.

Some early researchers used surveys to approach the problem in a different manner. These early surveys attempted to identify general factors or specific taxes that affect location decisions.\textsuperscript{17} An assessment of the degree to which tax factors affect location decisions has not been attempted, but some studies have offered limited insight into this question by determining the ratio of taxes to other amounts, such as specific costs, within a given firm.\textsuperscript{18} Even these studies, however, may have missed the mark because they failed to identify which comparisons are most important in the firm.

\textsuperscript{17}For example, Strasma (1959, p. 14) found that 16 percent of 196 manufacturing firm respondents indicated that local taxes influenced past location decisions and 19 percent indicated that state taxes had influenced location decisions.

\textsuperscript{18}E.g., Yntema, 1959 (comparisons of the relative tax costs of firms in Michigan with those of neighboring states).
location decision. For example, the overall importance of tax factors may be determined by comparing taxes in various jurisdictions with some variable such as firm profit.

Typical of some of the earlier surveys, Wheaton [1983], in a fairly recent survey, tried to determine the magnitude of tax differentials by comparing the total tax burden, that is all taxes for which businesses are liable, for each of the 48 continental states. He found that state and local taxes amount to, on the average, eight percent of business income and that there is wide variation across states. No specific conclusions were reached in this study, but Wheaton suggested that the variation between states, i.e., between four percent and twelve percent, has significantly affected business resource allocation and that the challenge to tax researchers is to describe the nature of these effects.

The research described above focused on the impact of interstate tax differentials. In a review of the cross-section literature on interjurisdictional tax differentials Oakland [1978] described the issues related to interjurisdictional tax differentials in terms of their effects on several major social problems. Oakland argued that resolution of these social problems requires a different approach.
Instead of the interstate approach, Oakland emphasized the intraurban effects of tax differentials. Oakland agreed with Due that little has been learned about industrial location decisions since the early cross-section studies, and he cited three reasons for the lack of understanding:

1. we do not yet fully understand the processes that influence intrametropolitan location;
2. there is a general lack of necessary data; and
3. few researchers have attempted to study the issue [Oakland, 1978 p. 13.].

Indeed, Oakland was able to identify only three serious attempts to address the problem of intraurban industrial location. Oakland cited as evidence of the importance of interjurisdictional tax study the effect that such differences have on the urban poor. That is, as large urban areas become increasingly suburbanized, the urban poor are left stranded because of the fiscal deterioration of many cities.

Lamenting the lack of evidence in prior studies, Oakland stressed the importance of intraurban tax research, to the exclusion of research on any intermetropolitan effects of tax differentials, saying

The significance of [prior] findings . . . is that the supply of industrial firms to a particular metropolitan area can be assumed independent of the fiscal environment in the area and thus the problem reduces to one of determining whether fiscal factors influence the spacial distribution of the stock of firms within the urban area [Oakland, 1978, p. 15].
The three studies which Oakland identified as meritorious used multiple regression to explain the effects of tax rate differentials upon industry locations within a single metropolitan area. These studies appear to have received Oakland's approbation primarily because of their intraurban approach to the problem. Judged on the basis of their information content these studies were as disappointing as the interstate studies mentioned earlier.

Beaton and Joun [1968] examined the effects of various independent variables on the percentage increase in manufacturing employment from 1958 to 1965. The study used 20 cities in Orange County, California. The results of this study indicated that the model may not have been properly specified. For example, high property tax rates were found to actually encourage industry location.

Fox [1973] studied the Cleveland and Cincinnati areas using a cross-section methodology in which the dependent variable was the per capita increase in the industrial property tax base from 1964 to 1969. In the Cleveland area, the tax rate coefficient was found to be negative and statistically significant. The elasticity of investment to the tax rate was found to be 4.4, indicating that industrial investments were sensitive to changes in tax rates. The reasonableness of most of the
coefficient signs in this study inspire more confidence than the earlier Beaton and Joun study.

The Fox model did not work as well for the Cincinnati area, however. As in the Beaton and Joun study, tax rates in the Cincinnati area were found to be positively related to industrial investment. Again, the model appears to have been inappropriately specified.

Schmenner [1974] examined the effects of property tax differentials as well as local income tax differentials using as dependent variables the percentage of standard metropolitan statistical area manufacturing employment from 1967 to 1969 and from 1969 to 1971 and the percentage increase in standard metropolitan statistical area manufacturing employment from 1967 to 1969 and from 1969 to 1971. Four metropolitan areas were used. For the most part, coefficients were not found to be significant, and again, unanticipated signs were attached to the coefficients. There was some weak evidence from the Schmenner study that while property tax differentials are unimportant, income tax differentials are important.

In summary, the studies conducted by Beaton and Joun, Fox, and Schmenner may have been commendable, as suggested by Oakland, for their intraurban approach, but they did not produce much additional evidence as to the importance of tax differentials.
TIME SERIES STUDIES

Another group of studies used a time series approach to investigate the effects of tax differentials. This group of studies differs from the cross-section studies discussed earlier in a number of ways. The time series studies generally have found significant differences, a result which was conspicuous by its absence in most of the cross-section studies.

Grieson et al. [1977] examined a tax change in New York city that occurred in 1966. Data from the period 1962 to 1965 and 1966 to 1971 was used to determine if the tax change significantly affected employment in industries relative to employment in the United States as a whole. The tax change resulted from a switch from a tax which approximated a gross receipts tax to a tax resembling a gross profits tax. In this way, tax rates for some industries were altered as a result of the change in tax structure.

With respect to manufacturing firms in New York City, a significant location elasticity factor of -.35 was found indicating that manufacturing industries were in fact affected by changes in local taxation. No significant elasticity factors were found for nonmanufacturing industries. The authors speculated that the differences in manufacturing and
nonmanufacturing industries resulted because manufacturing industries generally are unable to pass along cost differences brought about by local taxes. Nonmanufacturing industries may be more likely to exploit the unique characteristics of the local environment and may be better equipped to pass along differences in cost caused by local taxes. The authors believed that this could be true especially in their study examining differences in New York City.

Grieson [1980] studied the effects of changes in the rate of the Philadelphia income tax on employment and aggregate city tax revenues using data from the years 1965 to 1975. The model worked very well, and most of the tax coefficients were significant. Grieson's study lends considerable credibility to the argument that state and local tax differentials affect factors of production.

POOLED CROSS-SECTION AND TIME SERIES STUDIES

Any enthusiasm resulting from the promising results of the time series studies above should be tempered by the results of later studies which pooled cross-section and time series data. This later group of studies found little evidence that geographic tax differentials significantly affected the values of economic variables.
For example, Steinnes [1977] examined towns within a single metropolitan area by pooling cross-section and time series data and found little evidence that local tax differences affected the growth of business establishments. Carlton [1979] obtained similar results when he examined the growth of new firms in specific industries across different metropolitan areas.

**SUMMARY**

The above review of the research that has been done on interjurisdictional tax differentials suggests that very little has been learned since Due's observations in 1961. Researchers appear to be unable to completely and consistently specify the relationships, or even to accurately predict, the effects of interjurisdictional tax differentials on important economic variables.
CHAPTER 4

RETIREMENT PLAN TAXATION

The amount of tax paid by an individual as a result of a distribution from a retirement arrangement may vary widely depending upon the facts and circumstances which surround the distribution. The amount and timing of tax liabilities may be affected by such factors as the amount of other taxable income or whether distributions are received in the form of cash or property. In this study, two factors are considered which affect the tax liabilities associated with retirement plan distributions: 1) the type of plan from which distributions are made and 2) the state tax policy under which distributions are taxed. This study took as its population of interest those plan benefits which are paid in a lump sum transfer of cash to plan participants. This population may appear restrictive at first blush, but because of the favorable tax benefits
available to taxpayers who elect to receive plan
benefits in this manner, there exists a strong incentive
to receive plan distributions in a lump sum. Other
factors which affect an employer's cost of providing
after-tax retirement benefits, such as plan
administration cost, will be discussed in Chapter 5.

QUALIFIED PLANS

Qualified plans are those retirement arrangements
which meet certain statutory requirements. For their
trouble, such plans receive favorable tax treatment.
One of the most significant features, from an employee's
point of view, is that employees are not required to
include in taxable income employer contributions to
qualified retirement plans [§§402(a) and 403(a)].19
That is, although employees receive a benefit from
employer contributions to retirement arrangements,
employees are not taxed in the year during which such
contributions are made. In addition, earnings on
contributions are not taxable to employees while the
earnings remain in the plan [§§401(a) and 501(a)].
Employees are taxed when plan benefits are actually

19Unless otherwise indicated, section references are
to the Internal Revenue Code of 1986 or the regulations
thereunder. Citations to Pre-TRA 1986 sections refer to
the Internal Revenue Code of 1954, as amended, and the
regulations thereunder. References to Act sections
refer to the Tax Reform Act of 1986 unless otherwise
indicated.
received by employees. Even then, substantial tax reduction may result from tax computation alternatives which are available under federal and state tax laws.

The requirements for qualification are set forth in §§401 et seq. The requirements are meant to deny preferential tax treatment for plans which are not for the exclusive benefit of plan participants and to preclude the plan abuses mentioned earlier in Chapter 2. In general, plan qualification means that certain minimum standards must be met with respect to plan discrimination, funding, participation, and vesting. Because this study is not directly concerned with these requirements, and because of the complexity of many of the requirements, a detailed discussion of all requirements for plan qualification will not be presented here. The reader should refer to §§ 401 et seq. for specific qualification requirements. The discussion which follows is general and addresses only those requirements which bear most directly on the taxation of distributions from qualified plans at an individual taxpayer level.

**Taxation Of Qualified Plan Distributions**

Assuming no employee contributions to a qualified plan, employees are required to include all plan distributions in gross income in the year distributions are received [§§402(a) and 403(a)]. If no tax relief
provisions apply, the progressive nature of the United States federal income tax causes the federal income tax in the year of distribution to be substantial for many taxpayers. That is, taxpayers who elect to receive retirement benefits in a lump sum could incur a substantially higher tax than taxpayers who elect to receive benefits over a period of time greater than one year.

**Pre-TRA 1986 Rules.** Under prior law, that is, prior to the Tax Reform Act of 1986 (TRA 1986), two provisions offered a great deal of relief to taxpayers who received plan distributions. The first provision allowed any portion of a qualified plan distribution attributable to employee participation prior to 1974 to be treated as long-term capital gain [Pre-TRA 1986 §402(a)(2)]. The second provision allowed any portion of a qualified plan distribution attributable to post 1973 plan participation to be taxed under a special ten year forward averaging computation if the distribution was received as a lump sum. In many cases taxpayers were able to pay less tax by electing, as allowed under Pre-TRA 1986 §402(e)(4)(L), to have the entire distribution, that is even the portion eligible for capital gain treatment, taxed as ordinary income under the ten year forward averaging rules.
The tax on a lump sum distribution was computed under the ten year forward averaging method in the following manner:

1. The lump sum distribution, including any capital gain portion was reduced by a the minimum distribution allowance. The minimum distribution allowance was defined [Pre-TRA 1986 §402(e)(1)(D)] as
   a. the lesser of $10,000 or half of the lump sum distribution, reduced by
   b. 20 percent of the amount by which the lump sum distribution exceeded $20,000.

2. The resulting amount was then divided by 10.

3. After adding the current year's zero bracket amount for single taxpayers to the amount computed in 2 above, a tax was computed using the rate schedule for single taxpayers even if the taxpayer used another filing status to determine the federal income tax on other income.

4. The tax computed in 3 above was multiplied by 10.

5. The tax on the ordinary income portion of the distribution was then computed by taking a portion of the tax computed in 4 above equal to the ratio of the ordinary income component of the distribution to the total distribution.

Example 4-1 shows how the averaging provisions described above can affect a taxpayer's total tax liability. Notice that under the facts shown, the amount of tax which would be due on a $90,000 lump sum distribution without any averaging relief is $21,354 greater than the tax due under the ten year forward averaging rules.
The Effect Of TRA 1986. TRA 1986 altered the rules for plan distributions considerably. The capital gain treatment that was previously available for distributions attributable to pre-1974 plan participation was phased out except in the case of distributions to individuals who were 50 years old on or before January 1, 1986. Capital gain treatment will be completely eliminated for distributions after 1991 [Act §1122].

Perhaps of even greater significance was the change caused by TRA 1986 to the ten year forward averaging rules. A procedure similar to the ten year forward averaging method is available after January 1, 1986, but the averaging period is five years instead of ten years [Act §1122].

Example 4-2 shows how the new five year forward averaging procedure works. Under the same facts as in Example 4-1, a taxpayer would save only $18,204 by electing the five year forward averaging method assuming the five year forward averaging method applied to distributions received in 1986. Note that the tax which resulted from the five year forward averaging method is $3,150 more than the tax computed under the ten year forward averaging method.

A transition rule allows taxpayers who were 50 years old before January 1, 1986 to elect the ten year
forward averaging method or the five year forward averaging method, but if the ten year forward averaging method is used the tax rates in effect during 1986 must be used. Example 4-3 shows that if the lump sum distribution in Example 4-1 were received in 1987, the total tax would be $33,060 without any averaging relief and $9,570 under a five year forward averaging election. Because the taxpayer in Example 4-3 is 63 years old, the transition rules apply and the appropriate comparison for tax planning purposes is between the tax liability computed in Example 4-1, using ten year forward averaging and 1986 rates, and Example 4-3, using five year forward averaging and 1987 rates. Clearly, the better choice would be to elect five year forward averaging.

Qualification As A Lump Sum Distribution. To be eligible for the special averaging treatment, under either the ten year forward averaging provisions or the new five year forward averaging rules, taxpayers must receive within one taxable year the entire interest in a qualified retirement plan. In addition, the payment must be made after the taxpayer has reached age 59 1/2 or as a result of the taxpayer's permanent disability, death, or separation from service [§402(e)(4)(A)]. Both the capital gain and averaging rules are available only once [§402(e)(4)(B)].
SIMPLIFIED EMPLOYEE PLANS

As previously mentioned, simplified employee plans were created in 1978 to give employers a method of providing retirement benefits to employees without having to meet the complex requirements associated with qualified plans. Simplified employee plans are established by employers but are funded by employer contributions to employee individual retirement accounts. If the requirements of §408(k) are met, the annual amount which can be deducted by employers is approximately the same as for a qualified defined contribution plan (i.e., 15 percent of compensation up to $30,000 [§219(b)(2)]. Prior to TRA 1986, contributions were required for each employee who had attained age 25 and who had performed service for the employer in three or more years during the preceding five calendar years [Pre-TRA 1986 §408(k)(2)]. TRA 1986 changed many of the restrictions placed on simplified employee plans, generally bringing simplified employee plans more in line with the tax treatment for qualified plans and with salary reduction arrangements previously available under §401(k).

Under prior law, employer contributions to a simplified employee plan were deductible by employers, within limits, but employees were required to include
such employer contributions in gross income. Employees were then allowed a corresponding deduction. Act §1108(b) and (c), amending Pre-TRA 1986 §§402(h)(1) and 404(h)(1), left employers the right to claim a deduction of simplified employee plan contributions, but employees may now exclude some or all of such contributions from gross income until plan assets are distributed.

The deduction limitations on employers remain 15 percent of compensation, including any salary reduction contributions allowed under §401(k)(6), up to $30,000 [§402(h)(2)]20. However, a $7,000 annual limitation applies to amounts excludable from employee gross income [§402(g)(1)]. The $7,000 limitation applies to both §401(k) plans and §408(k) plans, but note that the limit is not a limitation on simplified employee plan contributions or the amount which can be deducted by employers. Instead, employer contributions in excess of $7,000 must be included in gross income. Participants in §401(k) plans are taxed on any excess and participants in §408(k) plans will be allowed a corresponding deduction for any additional contributions.

20Note that §402(g) and (h) were incorrectly numbered by TRA 1986. The correct citations are §401(i) and (j), respectively.
Participation Requirements

Act §1898(a)(5), amending Pre-TRA 1986 §408(k)(2)(A), requires that employers make simplified employee plan contributions for each employee who has attained age 21, has performed services for the employer during three or more of the preceding five years, and has $300 or more in compensation from the employer during the year. Act §1108(d), adding §408(k)(2), allows the exclusion of certain employees for purposes of the above requirement as allowed for qualified plans under §410(b)(3)(A) and (C).

Simplified Employee Plans Compared To Qualified Plans

The primary advantage of simplified employee plans, when compared to qualified plans, is that substantial savings may result from the lower administration costs associated with simplified employee plans. Employer contributions to a simplified employee plan, and any earnings on employer contributions, escape, for a time, the federal income tax as in the case of qualified plans. The problem, indeed, one of the main points of this study, is that distributions from simplified employee plans are not eligible for the federal averaging computations or capital gain treatment. That is, a lump sum distribution from a simplified employee plan is treated as ordinary income for federal tax purposes. Consider, for example, the effect of plan
type on the taxpayers in Examples 4-1, 4-2, and 4-3. If the distributions in those examples were assumed to come from simplified employee plans, the tax would be the amount computed without any averaging relief.

STATE TAXATION

Most retirement arrangement distributions, whether from qualified plans or from simplified employee plans, are subject to taxation at a state level as well as at the federal level. This study examines employer costs under three types of state tax policies:

1. states which do not tax plan distributions from either qualified plans or simplified employee plans,

2. states which tax plan distributions from both qualified plans and simplified employee plans at ordinary income tax rates, and

3. states which have some other policy for taxing qualified plan and simplified employee plan distributions.

Certainly, this trichotomy is not the only possible state tax policy classification scheme. Table 4-1 summarizes the state tax laws for qualified plan and simplified employee plan distributions in each of the

21For example, Curatola (1986) divided states into six categories on the basis of plan contribution deductibility by employees, in the case of individual retirement accounts, and plan distribution taxation. However, Curatola's classification scheme was based on a broader analysis of qualified plans, individual retirement accounts, and simplified employee plans.
fifty states and the District of Columbia. Based on the information in Table 4-1, Table 4-2 was constructed according to the trichotomy mentioned above. The absence from Table 4-1 of some state tax law exceptions to the general rules which are presented in Table 4-1 means that a state tax computed under the guidelines of Table 4-1 will be only an approximation of the actual tax in some states.

SUMMARY

Qualified retirement plans and simplified employee plans receive similar tax treatment until plan assets are distributed. Upon distribution, qualified plans appear to have a clear advantage over simplified employee plans because of the federal, and in some cases the state, tax relief available to qualified plan participants. Whether the tax advantages available to qualified plan participants is outweighed by increased plan administration costs and by other variables which affect plan cost is the subject of later chapters in this study.

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22 This data was originally presented by Curatola (1986). The author of the present study was a graduate assistant and received financial support from the International Foundation of Employee Benefit Plans during the compilation of this data.
Example 4-1: John is married and filed a joint tax return for 1986. John is 63 years old and received a $90,000 lump sum distribution from a qualified retirement plan during 1986. John had $22,000 of other taxable income during the year. The tax on $112,000 of taxable income, without the benefit of the ten year forward averaging computation is $36,803 including additional taxes of $34,064 on the $90,000 lump sum distribution. John's 1986 tax liability, assuming a ten year forward averaging election is $15,449 including a tax of $12,710 on the $90,000 lump sum distribution. Under these facts, the ten year forward averaging election reduced John's total tax liability by $21,354 as shown below:

Total tax without ten year forward averaging ($112,000 of ordinary income) $36,803

Total tax using ten year forward averaging:

- Total lump sum distribution $90,000
- Less minimum distribution allowance 0
- Amount subject to ten year forward averaging $90,000
- Averagable amount divided by 10 $9,000
- Plus zero bracket amount for single taxpayers 2,480
- Base for tax computation $11,480
- Tax on base using single rates $1,271
- Tax on base multiplied by 10 $12,710
- Tax on other taxable income 2,739

Total tax using ten year forward averaging $15,449

Savings from ten year forward averaging $21,354
Example 4-2: Assume the same facts as in Example 4-1 except that John used five year forward averaging instead of ten year forward averaging. Under these facts, five year forward averaging would reduce John's total tax liability by $18,204 as shown below:

Total tax without five year forward averaging ($112,000 of ordinary income) $36,803

Total tax using five year forward averaging:

Total lump sum distribution $90,000
Less minimum distribution 0
allowance

Amount subject to five year forward averaging $90,000

Averagable amount divided by 5 $18,000

Plus zero bracket amount for single taxpayers 2,480

Base for tax computation $20,480

Tax on base using single rates $ 3,172

Tax on base multiplied by 5 $15,860

Tax on other taxable income 2,739

Total tax using five year forward averaging $18,599

Savings from five year forward averaging $18,204
Example 4-3: Assume the same facts as in Example 4-1 except that John received the $90,000 lump sum distribution in 1987 and elected five year forward averaging. Under these facts, five year forward averaging would reduce John's total tax liability by $23,490 as shown below:

Total tax without five year forward averaging ($112,000 of ordinary income)

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total lump sum distribution</td>
<td>$90,000</td>
</tr>
<tr>
<td>Less minimum distribution allowance</td>
<td>0</td>
</tr>
<tr>
<td>Amount subject to five year forward averaging</td>
<td>$90,000</td>
</tr>
<tr>
<td>Averagable amount divided by 5</td>
<td>$18,000</td>
</tr>
<tr>
<td>Plus zero bracket amount for single taxpayers</td>
<td>N/A</td>
</tr>
<tr>
<td>Base for tax computation</td>
<td>$18,000</td>
</tr>
<tr>
<td>Tax on base using single rates</td>
<td>$1,278</td>
</tr>
<tr>
<td>Tax on base multiplied by 5</td>
<td>$6,390</td>
</tr>
<tr>
<td>Tax on other taxable income</td>
<td>3,180</td>
</tr>
<tr>
<td>Total tax using five year forward averaging</td>
<td>$9,570</td>
</tr>
</tbody>
</table>

Savings from five year forward averaging

$23,490
**TABLE 4-1**

**SUMMARY OF DISTRIBUTION TAXATION**

**BY STATE**

<table>
<thead>
<tr>
<th>State</th>
<th>Simplified Employee Plans</th>
<th>Qualified Plans</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alabama</td>
<td>All ordinary income</td>
<td>All ordinary income</td>
</tr>
<tr>
<td>Alaska</td>
<td>No income tax</td>
<td>No income tax</td>
</tr>
<tr>
<td>Arizona</td>
<td>All ordinary income</td>
<td>All ordinary income</td>
</tr>
<tr>
<td>Arkansas</td>
<td>All ordinary income</td>
<td>Taxable under AR's TYA</td>
</tr>
<tr>
<td>California</td>
<td>All ordinary income</td>
<td>Taxable under CA's 7YA</td>
</tr>
<tr>
<td>Colorado</td>
<td>All ordinary income</td>
<td>All ordinary income</td>
</tr>
<tr>
<td>Connecticut</td>
<td>No income tax</td>
<td>No income tax</td>
</tr>
<tr>
<td>Delaware</td>
<td>All ordinary income</td>
<td>Taxable under DE's TYA</td>
</tr>
<tr>
<td>District of Columbia</td>
<td>All ordinary income</td>
<td>All ordinary income</td>
</tr>
<tr>
<td>Florida</td>
<td>No income tax</td>
<td>No income tax</td>
</tr>
<tr>
<td>State</td>
<td>All ordinary income</td>
<td>Not taxable in the case of retirement</td>
</tr>
<tr>
<td>----------------</td>
<td>---------------------</td>
<td>---------------------------------------</td>
</tr>
<tr>
<td>Georgia</td>
<td>All ordinary income</td>
<td>All ordinary income</td>
</tr>
<tr>
<td>Hawaii</td>
<td>Not taxable in the case of retirement</td>
<td>Not taxable in the case of retirement</td>
</tr>
<tr>
<td>Idaho</td>
<td>All ordinary income</td>
<td>All ordinary income</td>
</tr>
<tr>
<td>Illinois</td>
<td>All ordinary income</td>
<td>Not taxable</td>
</tr>
<tr>
<td>Indiana</td>
<td>All ordinary income</td>
<td>All ordinary income</td>
</tr>
<tr>
<td>Iowa</td>
<td>All ordinary income</td>
<td>25% of TYA tax</td>
</tr>
<tr>
<td>Kansas</td>
<td>All ordinary income</td>
<td>13% of TYA tax</td>
</tr>
<tr>
<td>Kentucky</td>
<td>All ordinary income</td>
<td>Taxable under KY's TYA</td>
</tr>
<tr>
<td>Louisiana</td>
<td>All ordinary income</td>
<td>Not taxable</td>
</tr>
<tr>
<td>Maine</td>
<td>All ordinary income</td>
<td>15% of TYA tax</td>
</tr>
<tr>
<td>Maryland</td>
<td>All ordinary income</td>
<td>All ordinary income</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>All ordinary income</td>
<td>All ordinary income</td>
</tr>
<tr>
<td>Michigan</td>
<td>All ordinary income</td>
<td>Not taxable</td>
</tr>
<tr>
<td>Minnesota</td>
<td>All ordinary income</td>
<td>Taxable under MN's TYA</td>
</tr>
<tr>
<td>Mississippi</td>
<td>All ordinary income</td>
<td>All ordinary income</td>
</tr>
<tr>
<td>Missouri</td>
<td>All ordinary income</td>
<td>Not taxable</td>
</tr>
<tr>
<td>Montana</td>
<td>All ordinary income</td>
<td>10% of TYA tax</td>
</tr>
<tr>
<td>State</td>
<td>Taxable Income</td>
<td>Taxable Income</td>
</tr>
<tr>
<td>---------------------</td>
<td>-----------------------------------------</td>
<td>-----------------------------------------</td>
</tr>
<tr>
<td>Nebraska</td>
<td>20% of federal income tax</td>
<td>20% of federal income tax</td>
</tr>
<tr>
<td>Nevada</td>
<td>No income tax</td>
<td>No income tax</td>
</tr>
<tr>
<td>New Hampshire</td>
<td>No income tax</td>
<td>No income tax</td>
</tr>
<tr>
<td>New Jersey</td>
<td>All ordinary income</td>
<td>All ordinary income</td>
</tr>
<tr>
<td>New Mexico</td>
<td>All ordinary income</td>
<td>All ordinary income</td>
</tr>
<tr>
<td>New York</td>
<td>All ordinary income</td>
<td>Taxable under NY's TYA</td>
</tr>
<tr>
<td>North Carolina</td>
<td>All ordinary income</td>
<td>All ordinary income</td>
</tr>
<tr>
<td>North Dakota</td>
<td>All ordinary income</td>
<td>Taxable under ND's TYA</td>
</tr>
<tr>
<td>Ohio</td>
<td>All ordinary income</td>
<td>All ordinary income</td>
</tr>
<tr>
<td>Oklahoma</td>
<td>All ordinary income</td>
<td>All ordinary income</td>
</tr>
<tr>
<td>Oregon</td>
<td>All ordinary income</td>
<td>All ordinary income</td>
</tr>
<tr>
<td>Pennsylvania</td>
<td>All ordinary income</td>
<td>All ordinary income</td>
</tr>
<tr>
<td>Rhode Island</td>
<td>23.15% of federal income tax</td>
<td>23.15% of federal income tax</td>
</tr>
<tr>
<td>South Carolina</td>
<td>All ordinary income</td>
<td>Taxable under SC's TYA</td>
</tr>
<tr>
<td>South Dakota</td>
<td>No income tax</td>
<td>No income tax</td>
</tr>
<tr>
<td>Tennessee</td>
<td>No income tax</td>
<td>No income tax</td>
</tr>
<tr>
<td>Texas</td>
<td>No income tax</td>
<td>No income tax</td>
</tr>
<tr>
<td>Utah</td>
<td>All ordinary income</td>
<td>All ordinary income</td>
</tr>
<tr>
<td>State</td>
<td>Federal Income Tax Rate</td>
<td>Ordinary Income Taxation</td>
</tr>
<tr>
<td>--------------</td>
<td>-------------------------</td>
<td>--------------------------</td>
</tr>
<tr>
<td>Vermont</td>
<td>26.5% of federal income tax</td>
<td>26.5% of federal income tax</td>
</tr>
<tr>
<td>Virginia</td>
<td>All ordinary income</td>
<td>All ordinary income</td>
</tr>
<tr>
<td>Washington</td>
<td>No income tax</td>
<td>No income tax</td>
</tr>
<tr>
<td>West Virginia</td>
<td>All ordinary income</td>
<td>Not taxable</td>
</tr>
<tr>
<td>Wisconsin</td>
<td>All ordinary income</td>
<td>All ordinary income</td>
</tr>
<tr>
<td>Wyoming</td>
<td>No income tax</td>
<td>No income tax</td>
</tr>
</tbody>
</table>
TABLE 4-2

STATES CLASSIFIED BY DISTRIBUTION TAXATION

<table>
<thead>
<tr>
<th>Level 1 States</th>
<th>Level 2 States</th>
<th>Level 3 States</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alaska</td>
<td>Alabama</td>
<td>Arkansas</td>
</tr>
<tr>
<td>Connecticut</td>
<td>Arizona</td>
<td>California</td>
</tr>
<tr>
<td>Florida</td>
<td>Colorado</td>
<td>Delaware</td>
</tr>
<tr>
<td>Hawaii</td>
<td>District of</td>
<td>Illinois</td>
</tr>
<tr>
<td>Nevada</td>
<td>Columbia</td>
<td>Iowa</td>
</tr>
<tr>
<td>New Hampshire</td>
<td>Georgia</td>
<td>Kansas</td>
</tr>
<tr>
<td>South Dakota</td>
<td>Idaho</td>
<td>Kentucky</td>
</tr>
<tr>
<td>Tennessee</td>
<td>Indiana</td>
<td>Louisiana</td>
</tr>
<tr>
<td>Texas</td>
<td>Maryland</td>
<td>Maine</td>
</tr>
<tr>
<td>Washington</td>
<td>Massachusetts</td>
<td>Michigan</td>
</tr>
<tr>
<td>Wyoming</td>
<td>Mississippi</td>
<td>Minnesota</td>
</tr>
<tr>
<td></td>
<td>New Jersey</td>
<td>Missouri</td>
</tr>
<tr>
<td></td>
<td>New Mexico</td>
<td>Montana</td>
</tr>
<tr>
<td></td>
<td>North Carolina</td>
<td>Nebraska</td>
</tr>
<tr>
<td></td>
<td>Ohio</td>
<td>New York</td>
</tr>
<tr>
<td></td>
<td>Oklahoma</td>
<td>North Dakota</td>
</tr>
<tr>
<td></td>
<td>Oregon</td>
<td>Rhode Island</td>
</tr>
<tr>
<td></td>
<td>Pennsylvania</td>
<td>South Carolina</td>
</tr>
<tr>
<td></td>
<td>Utah</td>
<td>Vermont</td>
</tr>
<tr>
<td></td>
<td>Virginia</td>
<td>West Virginia</td>
</tr>
<tr>
<td></td>
<td>Wisconsin</td>
<td></td>
</tr>
</tbody>
</table>

Note that Level 1 states are those states which do not tax lump sum distributions from qualified plans or simplified employee plans. Level 2 states are those states which tax lump sum distributions from qualified plans and simplified employee plans as ordinary income. Level 3 states are those states which have a tax policy which falls between the extremes of Level 1 and Level 2 states.
CHAPTER 5

METHOD

This chapter describes the method used to answer the research questions presented earlier. Simulation was used to answer the research questions, and although this chapter is not about simulation per se, certain aspects of the simulation process are emphasized throughout the chapter. The list of factors which led to the choice of simulation as the method for answering the research questions includes those factors common to most simulation experiments:
1. the cost of gathering data directly on plan cost would have been excessive;

2. the reliability of data collected directly would have been highly suspect because of problems associated with self-reported data and because of the difficulty of combining data collected from employers with data collected from employees and other sources; and

3. an analytical solution to the research questions was not possible because the input variables lack theoretical bases, and because the combination of inputs, even if a theoretical basis for input combination existed, would be so complex that simulation would have been more convenient.

The simulation approach, although the best approach in this case, is not without problems. Rivett [1972] said, "The history of mankind is a history of model building." If this is true, then this study is an example of history repeating itself. One problem with repetition, in the case of simulation, is that, as Kreutzer [1986, p. 10] pointed out, "Modelling and simulation in general still [sic] lacks satisfactory theoretical and methodological foundations." However, simulation offers advantages over the available alternatives in many situations, and much has been done in recent years to improve the often intuitive nature of the modelling process [See, Zeigler, 1976, 1984; Zeigler et al., 1979; Doyle, 1976; and Kindler, 1979]. Simulation was used here in an attempt to make use of the advantages of simulation while avoiding the problems associated with the available alternatives.
The chapter begins with a restatement of the research questions. A description of the experimental design follows. Next, a section on the system, including a theoretical validation of the model and a description of the system's subsystems, is presented. A sample iteration of the simulation procedure follows. The sources of all frequency distributions used as input for the model are given next, followed by a section on data analysis. The chapter concludes with the assumptions and limitations of the study.

RESEARCH QUESTIONS

The following research questions were addressed by this study:

1. Does retirement plan type affect the cost small employers incur to provide after-tax retirement benefits to employees?

2. Does state tax policy with respect to retirement arrangements affect the cost small employers incur to provide after-tax retirement benefits to employees?

EXPERIMENTAL DESIGN

Because the research questions address two factors which affect plan cost, the research questions were answered by simulating small employer costs in a two-factor design with plan type nested in state tax policy. Simulated subject responses were obtained by
randomly assigning relevant attributes to the simulated subjects.

Each of the design factors, as well as the subsystems that constitute the system, are discussed in more detail in subsequent sections of this chapter. Figure 5-1 shows how observations were obtained using a computer program to simulate plan costs for a sample of employers and employees.

As shown in Figure 5-1, the first step in the simulation process was to select a plan type and state tax policy and, in each iteration of the simulation process, to randomly select values for those employer and employee attributes that affect an employer's cost of providing after-tax plan benefits. The selection of attributes was based on empirical frequency distributions for each of the individual attributes. In each iteration, values of three employer attributes and five employee attributes were selected. In each simulation iteration, the employer and employee attributes provided a description of the subject. The description included the relevant attributes of a small employer and an employee of that employer. This description then was used to calculate the total cost to the employer of making retirement plan contributions over the employee's plan participation period. Based on the accumulated benefit which resulted from the
employer's contributions, i.e., a lump sum distribution, both federal and state income taxes were computed, given the plan type and state. The ratio of employer contributions to after-tax employee benefits was used as an index of the employer's cost of providing after-tax retirement plan benefits.

**Plan Type Factor**

The plan type factor was examined at three levels within each state type factor. The inclusion of three levels allowed an examination of (1) the effect of plan type on employer cost and (2) the sensitivity of employer cost to plan type.

The research question addressed by the plan type factor, obviously, was directed at the difference in small employer cost for simplified employee plans and qualified plans. Qualified plans, however, are so varied that discovering a representative cost for such plans was thought to be impossible. Therefore, two qualified plans were used, one a low cost qualified plan alternative and one a high cost qualified plan alternative. The third level of the plan type factor was a simplified employee plan.

The plan administration costs used for this study were based on discussions with plan administrators and actuaries. This informal approach was required because of a general lack of cost data for small retirement
arrangements. Every effort was made to assure that any errors associated with plan cost were understatement errors in the case of low-cost qualified plans and overstatement errors in the case of high-cost qualified plans. Because one of the \textit{a priori} expectations of this study was that simplified employee plans would be more costly on an after-tax basis than the other retirement arrangements examined, the costs associated with simplified employee plan administration were conservatively estimated. That is, any errors made in estimating simplified employee plan administration costs are likely to have been errors of cost understatement.

The use of a three levels of the plan type factor permitted the possibility of finding that qualified plans are no more costly than simplified employee plans only in the case of low-cost qualified plan alternatives. For example, defined contribution qualified plans are generally believed to be less expensive than defined benefit plans because defined contribution plans do not require the use of actuaries to determine the required employer contributions. Defined benefit plans reasonably could be expected to differ significantly in cost from simplified employee plans even if the difference in cost between defined contribution plans and simplified employee plans is
insignificant. Also, the three-level design allowed statistical inferences about the difference in the cost of the two types of qualified plans. Tax computations, obviously, were affected by the level of the plan type variable because of the differing tax treatment accorded qualified plans and simplified employee plans.

**Low-cost Qualified Plans.** Low-cost qualified plans were assumed to have no initial fixed cost when plan participants enter the system. However, an annual cost of $10 per plan participant was assumed, with a minimum charge of $150 per employer. For example, an employer with 16 plan participants was treated as having incurred an annual cost of $10 for each plan participant. However, an employer with only 10 plan participants was treated as having incurred a cost of $15 per year for each plan participant because the $150 minimum annual cost had to be shared by only 10 plan participants.

**High-cost Qualified Plans.** The initial cost of entering the system was assumed to be $75 per plan participant for high-cost qualified plans. After entering the system, the annual fee for low-cost qualified plans was treated as the starting point for determining the annual fee for high-cost qualified plans. An additional annual charge of $2,500 per employer was used to represent actuarial and other costs.
associated with the more complex and, therefore, more costly qualified plans. These costs were assumed to be evenly allocated among all plan participants.

**Simplified Employee Plans.** Simplified employee plans were assumed to have no plan administration costs. This assumption probably caused underestimation of plan costs, but as described earlier, this assumption allowed the marginal cost of the two qualified plans to be estimated conservatively.

**State Tax Policy Factor**

As discussed in Chapter 4, state policy with respect to the taxation of retirement benefits varies considerably among states. Some states tax plan distributions as ordinary income; that is, plan distributions are treated the same as income from other sources. Other states allow some or all plan distributions to escape taxation. These differences could be significant considerations for employers making firm location decisions or for geographically mobile employees. Also, state tax policies might be used to help explain wage differentials among states. For these reasons, the first research question was posed, and state tax policy was used as a factor in the experimental design.

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23See Chapters 2 and 3 for a more detailed discussion of the theoretical basis and economic impact, respectively, of retirement benefit payments.
Investigation of the possible effects of the income tax statutes in each of the fifty states would have been extremely time consuming and perhaps less informative than a broader approach to the influence of state taxation on employer cost. Therefore, each subject was randomly assigned to a state, but observations were grouped according to a broader, three-level classification system for analysis.

The first state tax policy level included states with no state income tax. Obviously, this policy represented an extreme method of taxing distributions. The second level of the state tax policy factor included states that tax plan distributions at ordinary income rates for state tax purposes. This policy can be viewed as another extreme method of taxing retirement plan benefits. The third level of the state tax policy factor included all of the remaining states. These remaining states fall between the extremes of the first two levels.24

THE SYSTEM

Simulation has long been used to find the effects of changes in variables when analytical solutions are either impossible or difficult to determine [Naylor et

24Chapter 4 contains a detailed discussion of how states were assigned to each of the three levels of the state tax policy factor.
al., 1969]. The research questions in this study presented such a situation because of the large number of variables which combine to produce plan cost. This section validates the model used to simulate employer costs by describing the system and its components and, thereby, demonstrating that the model adequately represents the actual system that produces employer retirement plan costs.

In computer simulation, the variables of interest are called factors or responses depending on how they are used in the model. Naylor et al. [1969] gave a simple, but informative, description of these two types of variables:

If our experiment is designed to answer the question, how does a change in X affect Y, then X is a factor and Y is a response. In an experiment with a computer simulation model a response must of necessity be an endogenous (output) variable, whereas a factor will normally be a parameter or an exogenous (input) variable or some property of its probability distribution.

By defining a system and simulating system responses, conclusions can be drawn as to the effects of system inputs, or factors, upon system output, or responses.

A general model was defined in Chapter 1 that describes the way inputs to the system of employer costs and employee benefits result in system output. The inputs to the system are employer and employee attributes and the system output is employer cost.
Employer cost was defined as the ratio of total employer contributions, stated in terms of future value on the date of plan separation, to total after-tax employee benefits, also stated in terms of future value on the date of plan separation. That is, the response variable in this study is an index of employer cost and can be viewed as the average employer contribution required to pay one after-tax dollar of retirement benefit.

**Model Validation In General**

The initial problem was to determine which attributes, or variables, affect the system output, employer cost. In the model used for this study, inputs were assumed to be of two types:

1. employer attributes and
2. employee attributes.

These two types of variables are represented in the discussion that follows by $\alpha$ and $\beta$, respectively.

The system can be represented, as in Figure 5-2, in terms of (1) employer contributions to retirement arrangements and (2) after-tax benefits received by employees. The system presented in Figure 5-2, while conceptually appealing because of its simplicity, is of limited value in the simulation of actual subject responses. The subsystem descriptions below were used to write the computer program, represented by Figure 5-1, that was used to simulate small employer costs.
The Subsystems

Recall that in Equation 1-1, \( R(\alpha_1, \ldots, \beta_n) \) represented the future value of all employer contributions and \( G(\alpha_1, \ldots, \beta_n) \) represented \( R(\alpha_1, \ldots, \beta_n) \) less plan costs and the total amount of tax on \( R(\alpha_1, \ldots, \beta_n) \). The future value of all employer contributions and the tax paid on the future value of all employer contributions is dependent upon not only employer contributions but also upon certain other employer and employee characteristics. Therefore, the employer and employee characteristics of interest are those which affect the accumulation of assets to be distributed to employees and those which affect the amount of tax employees must pay. The primary determinants of plan cost, using the notation of Equation 1-1, are summarized in Figure 5-3. The reasons these variables were included in the response variable computation will become evident as the components, or subsystems, of the response variable are examined.

Equation 1-1 is restated below:

\[
C = \frac{R(\alpha_1, \alpha_2, \ldots, \alpha_m, \beta_1, \beta_2, \ldots, \beta_n)}{G(\alpha_1, \alpha_2, \ldots, \alpha_m, \beta_1, \beta_2, \ldots, \beta_n)} \quad (1-1)
\]
where

\[ C = \text{an index of the cost of providing after-tax benefits to employees,} \]

\[ R = \text{the function that defines the relationship between the future value of employer contributions and two types of variables: (1) employer attributes } \alpha_1 \text{ to } \alpha_m \text{ and (2) employee attributes } \beta_1 \text{ to } \beta_n, \]

\[ G = \text{the function that defines the relationship between the after-tax amount received by an employee and three types of variables: (1) employer attributes } \alpha_1 \text{ to } \alpha_m \text{ and (2) employee attributes } \beta_1 \text{ to } \beta_n, \]

\[ \alpha_m = \text{employer attribute } m, \]

\[ \beta_n = \text{employee attribute } n, \]

\[ m = \text{the total number of employer attributes,} \]

\[ n = \text{the total number of employee attributes.} \]

Equation 1-1 and Figure 5-2 suggest that the system of interest can be described in terms of at least two subsystems: (1) an employer contribution subsystem and (2) an employee benefit subsystem. The first subsystem is represented by the numerator in Equation 1-1 and the top part of Figure 5-2. The second subsystem is represented by the denominator in Equation 1-1 and the lower part of Figure 5-2.

**Employer Contribution Subsystem.** The employer contribution subsystem begins with an employer contribution to a retirement arrangement and ends with the distribution of plan assets. The variables of
interest, therefore, are those variables which affect this flow.

**Plan costs**—When an employer establishes a retirement arrangement, some initial costs may be incurred, some fixed and some variable. Later, plan maintenance costs are incurred; these too may be fixed or variable. For the purposes of this study, all plan costs were assumed to be related to the type of plan used (an experimental design factor) and the number of plan participants (an employer attribute).

**Plan earnings**—Plan asset accumulation, or the earning process, was treated as a simple process during which assets are contributed annually by employers by applying an employer contribution percentage (an employer attribute) to an employee salary (an employee attribute). These contributions were assumed to earn some rate of return (an employer attribute) during an employee plan participation period (an employee attribute). At the end of the asset accumulation period, plan assets were assumed to be distributed in a lump sum.

The employer contribution subsystem can be represented, as in Figures 5-1 and 5-2, as a series of contributions by an employer, some contributions going to cover plan expenses, followed by a plan earning process. The asset accumulation stage ends with the
distribution of plan assets to a plan participant. The future value of all plan administration costs for a given plan participant plus the amount distributed to the plan participant forms the numerator, R, of the response variable, C.

**Employee Benefit Subsystem.** The employee benefit subsystem can be analyzed in a manner similar to the employer contribution subsystem. The subsystem begins, as shown in Figures 5-1 and 5-2, with a pre-tax distribution from a retirement arrangement, i.e., one of the outputs of the employer contribution subsystem. The pre-tax distribution is then reduced by the federal and state income taxes applicable to the lump sum distribution. The taxes extracted at the federal and state levels is dependent upon the amount of the pre-tax distribution (an output of the previous subsystem), plan type (a design factor), applicable state income tax rules (an employee attribute which is conditioned upon the state tax policy factor), employee filing status (an employee attribute), and taxable income from other sources after plan separation (an employee attribute).

**Programming The System**

The basic elements of the program used to simulate subject responses are discussed below. Figures 5-1 and 5-2 show these elements in flowchart form.
The first step was to select a cell in the experimental design. This determined plan type, with corresponding administration costs, and the list of states for which a state tax could be computed.

The next step was to select values for each of the relevant employer and employee attributes. This was done by randomly sampling from empirical distributions for each of the employer and employee attributes.

Based on the selected values of the employer and employee attributes, in each simulation iteration, the employer contribution amounts were calculated. This calculation was done separately for administration costs and for those contributions which, ultimately, were distributed to employees. Administration costs were assumed to be made up of initial-year plan costs and annual plan costs. Pre-tax distribution amounts paid to employees were computed on the basis of employer contribution percentage, plan rate of return, and employee salary. Contributions were then checked for statutory limitations on employer contributions.\(^\text{25}\) In each case, the future value of plan administration costs was added to pre-tax distributions to form the numerator, \(R(a_1, \ldots, \beta_n)\), of the response variable.

The next step was to compute the after-tax amount, \(G(a_1, \ldots, \beta_n)\), received by the employee based on the

\(^{25}\text{These limitations were discussed in Chapter 4.}\)
pre-tax distribution amount and the employer and employee attributes determined earlier. \( G(\alpha_1, \ldots, \beta_n) \) is merely the pre-tax distribution amount less the federal and state income taxes as shown in Figure 5-1. \( R(\alpha_1, \ldots, \beta_n) \) was then divided by \( G(\alpha_1, \ldots, \beta_n) \) to calculate the cost index, \( C. \) A total of 3000 observations were collected for each cell in the experimental design.

**A SAMPLE ITERATION**

Suppose that the procedure outlined above has been followed. Further, assume that the random selection of values resulted in the following values for a low-cost qualified plan in a state which does not tax plan distributions:

- \( \alpha_1 = 15 \) plan participants,
- \( \alpha_2 = \) a 9 percent rate of return on plan assets,
- \( \alpha_3 = \) a 6 percent employer contribution rate
- \( \beta_1 = 12 \) years of plan participation,
- \( \beta_2 = \) a married, filing jointly filing status,
- \( \beta_3 = \) $22,000 of taxable income from other sources after plan separation,
- \( \beta_4 = \) Texas, and
- \( \beta_5 = \) $74,476 of salary during the years of plan participation.
Employer Contribution Subsystem

The future value of all plan contributions made by the employer can be calculated. The employee's $74,476 salary and the employer's 6 percent contribution rate result in a $4,469 annual employer contribution, not including the employer's contribution for the employee's pro rata share of plan administration costs. Using the 9 percent rate of return on plan assets for 12 years of plan participation, the $4,469 of annual employer contribution would grow to a pre-tax distribution amount of $90,000. If plan administration costs are assumed to be $10 per participant with a $150 minimum annual charge to the employer, and if the number of plan participants is assumed constant, the future value of plan administration costs, on a per employee basis, can be calculated. This amount, $201, increases the employer's cost. In this case, the cost of the pre-tax distribution would be increased to $90,210 by administration costs. That is, employers were assumed to make contributions to cover all plan costs in addition to a contribution based on employee salary. The contributions based on employee salary remain in the plan and earn some rate of return. The amounts accumulated for an employee's benefit are later distributed as shown in Figure 5-2. Total plan cost, i.e., $R(\alpha_1, \ldots, \beta_n)$, then can be compared to the
amount that actually reached the employee, $G(\alpha_1, \ldots, \beta_n)$, after federal and state taxes are paid.

**Employee Benefit Subsystem**

Determining an after-tax distribution requires merely the calculation of any federal and state tax on the plan distribution. Continuing with the above facts, note that filing status, income from other sources, and distribution amount are the same as for Example 4-1. Recall that the total tax in Example 4-1, using ten year forward averaging and 1986 tax rates, was $15,449. This total tax was the sum of a $2,739 tax on income from other sources and a $12,710 tax on the $90,000 lump sum distribution. There would be no state income tax under the facts assumed here.

After subtracting both federal and state income taxes from the pre-tax distribution, the employee in this example would be left with $77,290 of after-tax benefits. That is, $G(\alpha_1, \ldots, \beta_n)$ is $77,290$ (i.e., $90,000 - $12,710) in this example.

**The Index, C**

The cost index, $C$, defined earlier to be the ratio of $R(\alpha_1, \ldots, \beta_n)$ to $G(\alpha_1, \ldots, \beta_n)$, now can be calculated. In this example, $C$ is equal to $1.25$ (i.e., $90,000/77,290$).\(^{26}\) One possible interpretation of this

\(^{26}\)This result was based on the rounded amounts used in this example.
index is that, on average, the employer contributed about $1.25 to pay $1.00 of after-tax benefits to this employee. Figure 5-4 uses the flowchart presented earlier in Figure 5-1 to trace the employer contributions in the above example through the system.

As a quick illustration of how much difference a shift from one cell of the experimental design to another can make, assume that the random number generation process above had resulted in the same values of the model variables during an iteration for a simplified employee plan in a state that does not tax plan distributions.

Following the same procedure as before, the future value of all employer contributions would be $90,000. Assuming no administration costs for simplified employee plans, this value, without further adjustment, is $R(\alpha_1, \ldots, \beta_n)$. The tax on the $90,000 distribution, as determined in Example 4-2, is $34,064$ (i.e., a tax of $36,803$ on all income less a tax of $2,739$ attributable to income other than the plan distribution). This value of $G(\alpha_1, \ldots, \beta_n)$ yields an index of 1.6089817 (i.e., $90,000/55,936$). The cost incurred by the employer to pay $1.00 of after-tax benefit to this employee was, on average, $1.61.$
VARIABLE FREQUENCY DISTRIBUTIONS

Earlier subsections described the theoretical justification for including each of the variables in the model of employer cost by defining the system and subsystems of employer retirement arrangement cost. Also, the general approach to programming the model was described. This section gives the sources of the variable frequency distributions used to randomly select employer and employee attributes for each observation.

Number Of Plan Participants, $a_1$

Simplified employee plans were created specifically to lower the cost to small employers of providing retirement benefits to employees. Therefore, this study was concerned with the population of small employers in the United States. Congress did not describe what was meant by the term "small employers," and this omission complicated the evaluation process considerably. Should size be evaluated in terms of assets, number of employees, profit margins, or some other variable? No guidance was given by the enacting legislation, but some conclusions can be drawn from subsequent legislation.

As described in Chapter 4, TRA 1986 brought simplified employee plans more in line with qualified plan treatment. One type of qualified plan that was directly compared by TRA 1986 to simplified employee plans was the §401(k) plans already available to
employers. Simplified employee plans were brought into almost perfect alignment with §401(k) plans when simplified employee plans have 25 or fewer participants. This treatment appears to provide strong evidence as to current congressional thought.

Based on the evidence of congressional intent mentioned above, this study took as the population of small employers, those United States employers with 25 or fewer employees. The characteristics of interest for these employers, and their employees, were described earlier. The frequency of occurrence for one employee to twenty-five employees, using one-employee increments, was obtained from the United States Bureau of the Census [1986].

Rate Of Return On Plan Assets, \( \alpha_2 \)

The distribution of \( \alpha_2 \) was based on a random sample of mutual funds with long-term growth as a stated objective. Average returns during a recent ten-year period for 30 funds were used to approximate the returns available to retirement arrangements. These returns seemed appropriate because of the common objective of long-term growth. Returns were obtained from Wiesenberger [1986].

\[27\] See Chapter 4 for a more detailed discussion of the federal tax rules for such plans.
**Employer Annual Contribution Percentage, \( a_3 \)**

The frequency distribution of the annual employer contribution percentage variable was based on the annual contributions of a sample of 168 employers with 401(k) plans [Hewitt Associates, 1986]. Employers were assumed to have made the same percentage contribution during the entire plan participation period.

**Length Of Plan Participation, \( \beta_1 \)**

A uniform distribution ranging from 5 to 35 years of plan participation was used for \( \beta_1 \). A uniform distribution was selected because of the difficulty of projecting current plan participation periods into the future. Recent economic, social, and geographic trends make any projections highly suspect [See, General Accounting Office, 1986], and the use of a uniform distribution allowed all participation periods to be equally represented.

The lower limit of this frequency distribution was selected to avoid problems associated with minimum plan participation requirements. The upper limit was intended to be a reasonable approximation of the maximum working life of an employee.

**Employee Filing Status, \( \beta_2 \)**

An empirical distribution based on all United States taxpayers 55 years of age and older was used for \( \beta_2 \) [U. S. Department of Health and Human Services,
The effect of $\beta_2$ on federal tax computations was discussed in Chapter 4. In addition to the effect on the federal tax, many state tax computations are affected by taxpayer filing status.

**Taxable Income From Other Sources, $\beta_3$**

An empirical distribution based on all taxpayers in the United States aged 55 and over was used for $\beta_3$ [U. S. Department of Health and Human Services, 1985]. Income from other sources has an effect, in some cases, on the rate at which plan distributions are taxed.

**State Income Tax, $\beta_4$**

A state was assigned to each observation on the basis of the total number of returns filed in each state. This frequency distribution was chosen to represent the current and future probability that a plan lump sum distribution would be taxed by a given state. The experimental design determined which states were treated as possible occurrences for each observation. That is, the frequency distribution for $\beta_4$ was actually three conditional frequency distributions. After an experimental design cell was selected, only one of the three state frequency distributions was used to determine which state tax rules would be used to determine the state income tax on plan distributions. For example, during a series of iterations in cell C$_{22}$ only states in level 2 of the state tax policy factor
were considered. Figure 4-2 lists the states in each of the three state tax policy categories. The state income tax variable should not be confused with the state tax policy factor used in the experimental design. The two are related, but the state income tax variable may take on any of 50 values, although only a subset of the 50 states was possible in any given experimental design cell. The state tax policy factor was used to group responses into three levels for analysis.

**Employee Salary, $5**

The frequency distribution for the annual employee salary variable was based on the annual salaries of employees in a sample of 51 401(k) plans which included over 400,000 employees [Hewitt Associates, 1986]. Employee salary, in conjunction with the employer contribution percentage was used to determine employer contributions.

**DATA ANALYSIS**

The procedure used in this study to analyze employer cost involved analysis of simulated subject responses that resulted from the combination of empirical and theoretical distributions for employer and employee attributes. Because responses were determined in a random manner, statistical testing was appropriate
Hypotheses

Analysis of variance (ANOVA) is a widely accepted method for testing the equality of group means when certain assumptions are met. This technique was used to test the following null hypotheses:

\[ H_{01} : \text{Plan type has no effect on employer cost, } C; \]
\[ H_{02} : \text{State tax policy has no effect on employer cost, } C; \]

Rejection of any null hypothesis suggests the need for further investigation to determine the nature of any effects. Additional investigation included post hoc comparisons of cell means, e.g., Scheffe [1953].

Interpretation Of Results

The interpretation of null hypothesis rejection is straightforward and follows from earlier chapters. The following subsections summarize these conclusions.

Plan Type. Rejection of the null hypothesis for the plan type factor would indicate that plan type does, in fact, affect plan cost. That is, if the plan type has a significant impact on plan cost, Congress may have achieved its goal of providing an incentive for small employers to offer retirement benefits. Of course, this assumes that the effect of the plan type factor was in the direction Congress intended.
Rejection of the null hypothesis of no plan type effect as a result of higher plan costs for simplified employee plans, instead of lower costs for simplified employee plans, would indicate that Congress did not accomplish its intent; indeed, this result would indicate that Congress created a plan type that was more costly for small employers. A failure to reject the plan type hypothesis would indicate that the creation of simplified employee plans may have been ineffective for achieving Congress's goal.

**State Tax Policy.** Rejection of the null hypothesis of no differences among the levels of the state tax factor may be interpreted as evidence that state taxation has a significant effect on the cost of providing after-tax benefits to employees. Such results would indicate that certain groups of states may have a relative labor cost advantage over other groups of states, at least with respect to the retirement plan costs investigated by this study.

**ASSUMPTIONS AND LIMITATIONS**

This study relied heavily upon two assumptions. The first assumption was that retirement plan costs incurred by employers are affected by the federal and state taxes imposed on employees. The second basic assumption concerns the definition of small employers,
the intended beneficiaries of simplified employee plans. To the extent that these assumptions were not appropriate, the conclusions which can be drawn from the results of this study are limited. For the reasons stated earlier in this chapter, the assumptions and limitations appear appropriate for the purposes of this study.
Inliltze

Select plan type

Select state tax treatment

Start iteration

C_{l,k} = C_{a,a,a}

C_{l,k} = C_{m,k}

C_{l,k} = C_{l,m,k}

C_{l,k} = C_{l,m,n}

A

E

D

C

(Continued ...)

FIGURE 5-1
COMPUTER PROGRAM FLOWCHART
FIGURE 5-1 (... Continued)

Start an iteration

Select attributes

Compute FY of initial year costs

Compute FY of annual costs

Compute annual contribution

Compute lump sum distribution

Compute federal income tax

Compute state income tax

Compute after-tax benefit

Compute sum of plan contributions

R

R/C

Compute average benefit cost

B

(Continued ...)

FIGURE 5-1 (... Continued)
FIGURE 5-3

DETERMINANTS OF PLAN COST

\( \alpha_1 = \) number of plan participants,
\( \alpha_2 = \) rate of return on plan assets,
\( \alpha_3 = \) employer contribution percentage,
\( \beta_1 = \) length of plan participation
\( \beta_2 = \) employee filing status,
\( \beta_3 = \) taxable income from other sources after plan separation,
\( \beta_4 = \) applicable state income tax, and
\( \beta_5 = \) employee salary during plan participation period.
FIGURE 5-4
EXAMPLE ITERATION

See Figure 5-2

Select employer and employee attributes

Compute PV of initial year plan cost

$0

Compute PV of annual plan cost

$201

Compute initial employer contribution

$4,109

Compute lump sum distribution

$60,800

Compute the federal income tax

$1,271.0

Compute the state income tax

$0

Compute the after-tax distribution

C - $77,290

Compute ratio of total employer contributions to after-tax benefit

C - 1.25

See Figure 5-2
CHAPTER 6

RESULTS

This chapter presents data that resulted from simulating after-tax, small employer, retirement arrangement costs and the results of statistical tests on that data. The data indicates that simplified employee plans have not, in general, provided a low-cost retirement arrangement alternative for small employers as Congress intended.

The chapter begins with a description of the data that was generated by the simulation procedures described in earlier chapters. Then, a detailed discussion of the results is presented. Next, the results of some statistical tests are presented. The chapter concludes with a summary of the study.
SUMMARY OF THE COMPUTER SIMULATION AND ITS RESULTS

As described in Chapter 5, the computer simulation procedures produced responses, that is, cost indices, for three plan types in three categories of states. In each simulation iteration, total employer inputs, or plan costs, were compared to the after-tax benefits that an employee would receive as a result of the assumed employer payments.

The employer payments for each iteration of the simulation were assumed to be the result of stochastic processes which yield values for all relevant employer characteristics. Likewise, the tax payments made by employees, and, therefore, the after-tax employee benefits that result from employer contributions, were assumed to result from stochastic processes that yield all relevant employee characteristics.

Output Categories

The plan types considered were low-cost qualified plans (LCQPs), such as defined contribution plans, high-cost qualified plans (HCQPs), such as defined benefit plans, and simplified employee plans (SEPs).

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28 The employer characteristics of interest included the number of plan participants, the rate of return on plan assets, and the employer's annual plan contribution percentage.

29 The employee characteristics of interest included the employee's years of plan participation, filing status, taxable income from other sources, salary, and applicable state tax rules.
The states in each of the three state income tax policy categories differ with respect to policies for taxing retirement plan distributions.

States in the first state income tax policy category (NT) do not tax retirement arrangement distributions. States in the second and third categories (OI and MIX, respectively) tax plan distributions, but OI states treat plan distributions as ordinary income while MIX states allow the tax on certain plan distributions to be computed, under a variety of methods, in such a way that plan distributions may receive more favorable tax treatment, assuming equal tax rates, than distributions in OI states. That is, under certain circumstances, distributions in MIX states are taxed at less than ordinary state income tax rates either because some form of state averaging computation applies to certain plan distributions or because state income tax laws allow some distributions to escape the state income tax entirely. Plan distribution taxation for specific states was presented in Table 4-1.

Number Of Observations

For each combination of state income tax policy and plan type, 3,000 observations were generated by a computer program designed to calculate employer cost indices for the system of employer inputs and after-tax
plan outputs. In all, 27,000 observations were generated.

Given the large number of observations and the standard deviation of these observations, the overall mean index of plan cost, $1.73, could be estimated to within about $0.01 with 99 percent confidence. The number of observations for each combination of plan type and state income tax policy (i.e., 3,000) was selected because of computing time limitations and because preliminary simulation runs of much shorter duration indicated that the overall index mean could be estimated with the high degree of precision indicated above using approximately 27,000 observations.

The efficiency of using 27,000 observations to estimate the overall sample mean was reviewed after all observations were collected. The results of this review indicated that additional observations would not have efficiently reduced the precision of the overall sample mean estimate.

As an example of the efficiency of the sample size used, consider the following 99 percent confidence interval estimates of the sample mean for the overall cost index: 9,000 observations (i.e., 1,000 observations for each combination of plan type and state

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30 The simulated system was described in detail in Chapter 5.
income tax policy) resulted in an estimate of the sample mean accurate to within $0.0198; 24,300 observations (i.e., 2,700 observations for each combination of plan type and state income tax policy) resulted in an estimate of the sample mean accurate to within $0.0122; 26,100 observations (i.e., 2,900 observations for each combination of plan type and state income tax policy) resulted in an estimate of the sample mean accurate to within $0.0118; 27,000 observations (i.e., 3,000 observations for each combination of plan type and state income tax policy) resulted in an estimate of the sample mean accurate to within $0.0116. These results indicate that the sample of 27,000 observations was both efficient and effective for achieving the purposes of this study.

Means And Standard Deviations

The means and standard deviations for all combinations of plan type and state income tax policy are presented in Table 6-1 and are plotted with plan type on the X-axis in Figure 6-1 and state income tax policy on the X-axis in Figure 6-2. The average index of plan cost for all observations was $1.73. The lowest average plan cost index, $1.32, resulted from low-cost qualified plans in states that do not tax plan distributions. The highest average plan cost index,
$2.02, resulted from high-cost qualified plans in states that tax plan distributions as ordinary income.

In general, simplified employee plans were found to be less costly than high-cost qualified plan alternatives but more expensive than low-cost qualified plan alternatives. These results support one of the a priori expectations of this study: simplified employee plans do not, on average, result in plan costs that are lower than those which result from qualified plan alternatives that were available when simplified employee plans were created by Congress.

The ratio of employer inputs, or costs, to after-tax employee benefits was used as an index of the costs small employers incur to provide retirement plan benefits to their employees. This ratio represents the average cost of providing a dollar of after-tax plan benefit. That is, the response variable merely is the ratio of costs to after-tax employee benefits.  

Validation Procedures

To ensure the empirical validity of the computer program used to generate responses, a random sample of responses, i.e., cost indices, was calculated manually for each combination of plan type and state tax policy, and the results were compared to the responses generated.

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31The response variable was described in detail in Chapter 5.
by the computer program. In addition, response aggregates were reviewed for reasonableness.

The statistics presented in Table 6-1, in addition to providing a description of the data that resulted from the computer simulation procedures, serve as a partial check on the conceptual validity of the model and the empirical validity of the computer program used to generate observations. The means in Table 6-1 are presented in Figures 6-1 and 6-2 and the relationships shown are discussed in the following section of this chapter.

DISCUSSION OF THE RESULTS

This section of the chapter serves three purposes: (1) it documents the reasonableness of the data generated and, thereby, serves as a validity check on the theoretical model and computer program; (2) it highlights and explains any nonintuitive relationships; and (3) it gives a more detailed description of the results that, in the following chapter, will serve as a basis for some conclusions and recommendations to federal and state tax policy-makers.

32 A conceptual validation of the model was presented in Chapter 5.

33 The primary empirical validation procedure relied upon, as mentioned earlier, was the manual recalculation of samples of computer generated responses.
The Effect Of State Taxation. A short description of certain differences among state categories may be helpful at this point. Note that, ceteris paribus, plan costs for LCQPs in OI states could be expected to be higher than the costs for similar plans in MIX states because qualified plan distributions in MIX states get some tax relief at the state level while distributions in OI states are taxed at ordinary state income tax rates.  

Focusing for the moment on the LCQPs in Figures 6-1 and 6-2, the expected value of the federal tax reasonably could be expected to be approximately the same for all state categories because all distributions were assumed to have been made from low-cost qualified plans. Therefore, any difference in average plan cost indices across state income tax categories must have been attributable solely to differences in state taxation or random variation. The higher costs for low-cost qualified plans in OI states ($1.42022) and MIX states ($1.42121), then, when compared to the costs of low-cost qualified plans in NT states ($1.31829), is not surprising. However, why would the average plan costs for low-cost qualified plans in OI states and MIX states be approximately equal?  

34See Chapter 4 for a discussion of the state tax relief available to qualified plans in the third state income tax policy category.
One part of the answer to the question posed above is, simply, that state tax rates in MIX states are higher, in general, than state tax rates in OI states. As can be seen from Figures 6-1 and 6-2 and Table 6-1, the preferential treatment accorded qualified plans in MIX states, i.e., when compared to the treatment of qualified plans in OI states, is offset by the higher tax rates imposed by MIX states.

To confirm that this was, indeed, the reason for similar costs in these two state income tax policy categories, the maximum income tax rate for each OI state and each MIX state was weighted by the probability that each state in these two categories would occur for any single iteration of the computer simulation. This value was used to compute an average maximum income tax rate for states in the OI and MIX state income tax categories. As suspected, the average maximum income tax rate for MIX states, approximately 9.3 percent, was significantly higher than the average maximum tax rate for OI states, approximately 5.5 percent.

Another factor that caused higher state taxes in MIX states was that the preferential state income tax treatment that was used to place some states in the MIX state income tax policy category did not apply in all cases because of tax minimization algorithms that were included in the computer simulation program. The
purpose of these algorithms was to simulate actual taxpayer behavior.

For example, some MIX states do not tax lump sum qualified plan distributions if the special federal averaging treatment for such distributions is elected. However, the special federal averaging procedure is not optimal in all cases because, for example, it requires that higher, single taxpayer rates be used to calculate the tax on qualifying distributions even if taxpayers otherwise qualify for the lower rates that apply to married taxpayers. Under certain circumstances, taxpayers reasonably could be expected to have plan benefits taxed as ordinary income instead of under the special federal averaging method.

In the special cases described above, the state tax treatment would resemble the state income tax treatment in OI states, i.e., ordinary state income tax treatment. However, this ordinary state income tax treatment would apply only to specific iterations with, perhaps, unusual facts and circumstances, and such instances of OI-type state income taxation in a MIX state would not require reclassification of a MIX state as an OI state. Indeed,

\[35\] Illinois, Louisiana, Michigan, Missouri, and West Virginia have adopted this approach to taxing qualified plan distributions.

\[36\] See Chapter 4 for a discussion of other possible tax treatments of such plan distributions.
one of the characteristics of MIX taxation is that under some circumstances certain states allow qualifying distributions to receive preferential treatment and under some circumstances these states tax distributions as ordinary income in a manner similar to OI states. The point is that the average state income tax in MIX states is higher than that which might be casually predicted.

This possibility, analytically deduced, was empirically tested during a model validation procedure in which those states that allow qualified lump sum distributions to escape taxation entirely, under certain circumstances, were separated from other MIX states, and costs in these states were analyzed for logical consistency. As expected, this subset of MIX states, i.e., the subset of states that allow qualified lump sum distributions taxed under the special federal averaging computation to escape state income taxation, had a slightly higher average cost index than NT states, a logical point of reference because NT states do not tax plan distributions.

The Effect Of Plan Type. Shifting the focus from state income tax policies, this subsection of the chapter is a discussion of the effect of plan type on employer costs. As mentioned earlier, and as shown in Figures 6-1 and 6-2, low-cost qualified plans in states
that do not tax plan distributions have the lowest average plan cost. Low-cost qualified plan alternatives are more costly in OI and MIX states than in NT states. However, the difference in cost between low-cost qualified plans in OI states and MIX states is not statistically significant.\textsuperscript{37}

Figure 6-1 shows that for high-cost qualified plans the results are similar to the results that were obtained for low-cost qualified plans except that high-cost qualified plan indices were generally higher than low-cost qualified plan indices. Again, the high-cost qualified plan alternative that had the lowest average cost was in the NT state income tax policy category.

The reversal in order of plan cost indices in OI states and MIX states, although the differences were not statistically significant and probably are not significant in any practical sense, is interesting and supports the empirical validity of the computer program used to generate responses as well as the conceptual validity of the model. That is, low-cost qualified plans were slightly more costly in MIX states, a non-intuitive result that was explained above by the

\textsuperscript{37}The results of the statistical analysis are presented later in this chapter.
higher tax rates and certain tax-minimizing behavior of taxpayers in MIX states.

This result is logical because as more employer contributions go toward plan administration costs, i.e., as when employers switch to or initially adopt high-cost qualified plans, smaller distributions are available to employees. The resulting smaller distributions, i.e., smaller than the distributions that would have resulted under a low-cost qualified plan, ceteris paribus, are not as often exposed to the higher maximum tax rates applicable in MIX states.

Thus, the reversal in order of the cost indices for OI states and MIX states as plan type is switched from LCQP to HCQP is a reasonable outcome although, perhaps, not intuitively obvious. Alternatively, the reversal could be solely attributable to random variation since the differences are not, after all, statistically significant.

As was true for qualified plans, simplified employee plans had the lowest average cost index in states that do not tax plan distributions. In OI and MIX states, plan costs reasonably could be expected to be approximately equal except for state tax rate differences and other minor differences in state taxation such as the deductibility of the federal income tax for state income tax purposes.
Figures 6-1 and 6-2 and Table 6-1 show that these expectations were born out in the computer simulation results. That is, simplified employee plans in OI states were found to be more costly, on average, than simplified employee plans in NT states. Simplified employee plans turned out to be even more costly in MIX states because of the higher tax rates in MIX states.

Perhaps the most significant observation that can be made about simplified employee plans is most apparent from Figure 6-1: state income tax policies appear most likely to have some practical significance in the case of simplified employee plans. That is, as was the case for the two qualified plan alternatives examined previously, states that do not tax plan distributions appear to have a substantial cost advantage over OI and MIX states. However, the difference between the average plan cost in OI states and MIX states is much more pronounced for simplified employee plans is statistically significant. Therefore, employers in MIX states, and MIX state economies in general, may pay a big premium for the simplicity of adopting or maintaining simplified employee plans.

STATISTICAL ANALYSIS

The data that resulted from the computer simulation was analyzed using a nested analysis of variance model
with an equal number of replications for each
combination of the levels of the state income tax policy
factor and the plan type factor. This model was
previously defined as
\[
C_{ijk} = U + S_i + P_{j(i)} + e_{k(ij)} \quad (1-2)
\]
where
- \(C_{ijk}\) = the cost index of the kth
  observation for plan type j in
  state tax policy i,
- \(U\) = the overall mean effect,
- \(S_i\) = the effect of the ith level of
  factor S, the state tax policy
effect,
- \(P_{j(i)}\) = the effect of the jth level of
  factor P, the plan type factor
effect, within state tax policy i,
- \(e_{k(ij)}\) = the random error present in the
  kth observation for plan type j
  in state tax policy i.

ANOVA Results

In Chapter 5, two null hypotheses were stated.
Both hypotheses are restated below, and the results of
statistical tests related to these hypotheses then are
reported:

- \(H_{o1}\): Plan type has no effect on employer
cost;
- \(H_{o2}\): State income tax policy has no effect on
employer cost.

As shown in Table 6-2, the effects of plan type and
state income tax policy were found to be significant at
a .01 level of significance. That is, both omnibus null
hypotheses, $H_{o1}$ and $H_{o2}$, were rejected, and further investigation was indicated to determine which of the plan and state factor levels differ.

**Multiple Comparisons**

Scheffe's test [1953] was used for purposes of multiple comparisons. With few exceptions the null hypothesis of equal plan cost indices was rejected for levels of the plan cost factor and the state income tax policy factor. The results of these tests are summarized in Figure 6-3.

These results demonstrate statistically what is visually apparent in Figures 6-1 and 6-2. That is, for qualified plans, both high-cost qualified plans and low-cost qualified plans, there is no significant difference between the costs incurred by employers in OI states and employers in MIX states. Also, there is no significant difference between the costs incurred by employers in MIX states to provide benefits under high-cost qualified plans and under simplified employee plans. In other states, i.e., NT states and OI states, simplified employee plans are significantly less expensive than high-cost qualified plan alternatives. Low-cost qualified plan alternatives are the least expensive alternatives in all state categories.
Sensitivity Of The Results

For reasons mentioned in Chapter 5, small employers were defined as those United States employers with 25 or fewer employees. Because part of the cost of adopting a qualified plan, i.e., part of the administration costs, were assumed fixed, the relative advantage of low-cost qualified plan alternatives over simplified employee plans reasonably could be expected to be highly sensitive to the number of plan participants. To guard against the possibility that the conclusions of this study were unreasonably dependent upon the maximum number of employees used, all of the tests described in this chapter were performed on two subsets of the original data.

The first subset resulted from selecting only those observations that had 15 or fewer plan participants. The second subset resulted from selecting only those observations that had 10 or fewer plan participants. Similar conclusions could have been drawn from the results of statistical tests and visual inspection of the data in both subsets of the original data. That is, plan costs proved to be fairly resilient to changes in the maximum number of plan participants.

Simplified employee plans were assumed to contain no fixed plan administration cost, and therefore, changes in the number of plan participants did not
affect the average costs of this type of plan. High-cost qualified plan alternatives were assumed to have a relatively high fixed cost of plan administration, and the mean cost of these plans could be expected to be affected by lowering the number of plan participants over which plan costs could be spread. Likewise, low-cost qualified plan alternatives were expected to be affected by lowering the maximum number of plan participants, but this group was not expected to be as sensitive to changes in the number of plan participants as the high-cost qualified plan alternatives.

The expected relationships were supported by the analysis of sensitivity of plan cost to the maximum number of plan participants. High-cost and low-cost qualified plan alternatives became more costly as the maximum number of plan participants decreased, but on both subsets of the original data, low-cost qualified plan alternatives remained the lowest plan option in all three state categories.

Assumptions

In the model described above, the random error term, $e_{k(ij)}$, is assumed to be normally distributed with mean zero and variance $\sigma^2$.\(^{38}\) The normality assumption

---

\(^{38}\)For a discussion of the assumptions of the ANOVA model see, for example, Berenson, et al. [1983 pp. 137-173], Tabachnick and Fidell [1983 pp. 77-85], or Hicks
was tested using a Kolmogorov-Smirnov test\textsuperscript{39} and the hypothesis of normally distributed residuals was rejected at a .01 level.

Although no pattern was apparent from an examination of a stem-and-leaf plot of the residuals, five transformations of the dependent variable were used in an attempt to find a more appropriate dependent variable for the ANOVA model. The transformations were the square, square root, natural logarithm, reciprocal root and reciprocal of the original data.

This attempt to transform the data satisfactorily was unsuccessful, and although the ANOVA model is robust against normality and variance assumption violations\textsuperscript{40}, a number of steps were taken to assure that the results of the statistical tests were not misleading. These additional steps are outlined below and produced results that are consistent with the results reported elsewhere in this chapter.

Conover [1980, p. 337] suggested an alternative in situations where the assumptions of parametric tests are not met and no nonparametric test is available. The

\textsuperscript{[1982 pp. 228-232].}

\textsuperscript{39}See Conover [1980, pp. 344-384] for a general description of such tests.

\textsuperscript{40}Berenson [1982] found, for example, that shape, i.e., symmetrical versus nonsymmetrical, has less influence on the ANOVA procedure than does tail density.
alternative suggested is to rank the data and "apply the usual analysis of variance to the ranks." This procedure was followed, and as stated above, the results were consistent with those found using conventional ANOVA procedures.

SUMMARY

State income tax policy and plan type significantly affect plan cost. However, state income tax policy does not significantly affect plan costs when OI states are compared to MIX states, except in the case of simplified employee plans. This result, however, is probably due to the higher tax rates imposed by MIX states. This suggests that the more complex taxing schemes adopted in MIX states, in general, may not have been successful at reducing taxes on plan distributions. In general, plan costs are lowest in those states that do not tax plan distributions.

In all state categories low-cost qualified plan alternatives result in costs significantly lower than those costs that would have resulted from either high-cost qualified plan alternatives or simplified employee plans. High-cost qualified plan costs and simplified employee plan costs are approximately equal in MIX states. Under no state tax policy category are simplified employee plans the inexpensive retirement
plan alternative Congress intended.
### TABLE 6-1

**CELL MEANS AND STANDARD DEVIATIONS**

<table>
<thead>
<tr>
<th>Plan Type</th>
<th>State Type</th>
<th>Mean Cost Per Dollar Of Benefit</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>LCQP</td>
<td>NT</td>
<td>$1.31829</td>
<td>0.24762</td>
</tr>
<tr>
<td>LCQP</td>
<td>OI</td>
<td>$1.42022</td>
<td>0.30242</td>
</tr>
<tr>
<td>LCQP</td>
<td>MIX</td>
<td>$1.42121</td>
<td>0.36392</td>
</tr>
<tr>
<td>HCQP</td>
<td>NT</td>
<td>$1.85068</td>
<td>0.97522</td>
</tr>
<tr>
<td>HCQP</td>
<td>OI</td>
<td>$2.02069</td>
<td>1.25916</td>
</tr>
<tr>
<td>HCQP</td>
<td>MIX</td>
<td>$1.98234</td>
<td>1.06319</td>
</tr>
<tr>
<td>SEP</td>
<td>NT</td>
<td>$1.69644</td>
<td>0.27423</td>
</tr>
<tr>
<td>SEP</td>
<td>OI</td>
<td>$1.84609</td>
<td>0.34234</td>
</tr>
<tr>
<td>SEP</td>
<td>MIX</td>
<td>$1.99077</td>
<td>0.42370</td>
</tr>
</tbody>
</table>

where

- Plan type LCQP is a low-cost qualified plan,
- Plan type HCQP is a high-cost qualified plan,
- Plan type SEP is a simplified employee plan,
- State type NT includes states that do not tax distributions,
- State type OI includes states that tax distributions as ordinary income, and
- State type MIX includes states that have tax policies other than those of state types NT and OI
### TABLE 6-2
ANOVA RESULTS

<table>
<thead>
<tr>
<th>Source</th>
<th>F value</th>
<th>p-value</th>
</tr>
</thead>
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<tr>
<td>State Tax Policy</td>
<td>162.700</td>
<td>&lt; .01</td>
</tr>
<tr>
<td>Plan Type</td>
<td>576.548</td>
<td>&lt; .01</td>
</tr>
</tbody>
</table>
TABLE 6-3

MULTIPLE COMPARISONS

<table>
<thead>
<tr>
<th>Plan State</th>
<th>Plan State</th>
<th>Scheffe p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>LCQP NT</td>
<td>LCQP OI</td>
<td>&lt;.00001 *</td>
</tr>
<tr>
<td>LCQP NT</td>
<td>LCQP MIX</td>
<td>&lt;.00001 *</td>
</tr>
<tr>
<td>LCQP NT</td>
<td>HCQP NT</td>
<td>&lt;.00001 *</td>
</tr>
<tr>
<td>LCQP NT</td>
<td>SEP NT</td>
<td>&lt;.00001 *</td>
</tr>
<tr>
<td>LCQP OI</td>
<td>LCQP MIX</td>
<td>.98986</td>
</tr>
<tr>
<td>LCQP OI</td>
<td>HCQP OI</td>
<td>&lt;.00001 *</td>
</tr>
<tr>
<td>LCQP OI</td>
<td>SEP OI</td>
<td>&lt;.00001 *</td>
</tr>
<tr>
<td>LCQP MIX</td>
<td>HCQP MIX</td>
<td>&lt;.00001 *</td>
</tr>
<tr>
<td>LCQP MIX</td>
<td>SEP MIX</td>
<td>&lt;.00001 *</td>
</tr>
<tr>
<td>HCQP NT</td>
<td>HCQP OI</td>
<td>&lt;.00001 *</td>
</tr>
<tr>
<td>HCQP NT</td>
<td>HCQP MIX</td>
<td>&lt;.00001 *</td>
</tr>
<tr>
<td>HCQP NT</td>
<td>SEP NT</td>
<td>&lt;.00001 *</td>
</tr>
<tr>
<td>HCQP OI</td>
<td>HCQP MIX</td>
<td>.09854</td>
</tr>
<tr>
<td>HCQP OI</td>
<td>SEP OI</td>
<td>&lt;.00001 *</td>
</tr>
<tr>
<td>HCQP MIX</td>
<td>SEP MIX</td>
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</tr>
<tr>
<td>SEP NT</td>
<td>SEP OI</td>
<td>&lt;.00001 *</td>
</tr>
<tr>
<td>SEP NT</td>
<td>SEP MIX</td>
<td>&lt;.00001 *</td>
</tr>
<tr>
<td>SEP OI</td>
<td>SEP MIX</td>
<td>&lt;.00001 *</td>
</tr>
</tbody>
</table>

* indicates a significant difference at a .01 level.
FIGURE 6-1
RESPONSE MEANS BY PLAN TYPE
FIGURE 6-2
RESPONSE MEANS BY STATE INCOME TAX POLICY
In 1978, Congress created a new type of retirement arrangement, the simplified employee plan. Congress's purpose was to encourage small employers to offer their employees retirement benefits. The primary enticement for small employers under a simplified employee plan was to be the administrative ease, at least in comparison to qualified retirement plans, with which simplified employee plans could be created and maintained.

This ease of administration would, Congress believed, result in lower administration costs and, thereby, encourage employers to offer retirement benefits to their employees. However, distributions from simplified employee plans were not allowed all of the tax benefits accorded more complex qualified retirement plans.
Individual states have adopted a variety of policies for taxing distributions to employees from both simplified employee plans and qualified retirement plans. State tax policies that have been adopted range from taxing distributions from both qualified retirement plans and simplified employee plans as ordinary income to allowing all distributions to escape state taxation completely. A substantial number of states have adopted policies that fall between these two extremes.

This chapter summarizes a study reported in previous chapters and draws upon that study to form conclusions about prior legislation and tax policies and to make suggestions for the future. Questions of the type stated below are the subject of this chapter:

Are federal tax policies with respect to retirement arrangements consistent with traditional notions of tax equity?

Have small employers received adequate inducements to offer retirement benefits to their employees?

Have states significantly distorted the effects of federally provided mechanisms for paying retirement benefits to employees?

What are the relative advantages to states of adopting one of the currently available state tax policies with respect to retirement benefits?

While not claiming to conclusively answer such questions, the results obtained in this study help to shed at least some light on the true cost of retirement benefits, the real cost of such benefits being still
hidden among the shadows of legislative intent, interstate competition for factors of production, and a variety of private and public actions with intended and unintended consequences.

The Chapter begins with a summary of the study reported in previous chapters. This section of the chapter is followed by sections on the implications of the study results and the limitations of the study. The chapter concludes with a discussion of areas for future research.

SUMMARY OF THE STUDY

This research reports the results of a computer simulation of the costs small employers incur to provide after-tax retirement benefits to their employees. The purpose of this research was to answer two research questions:

1. Does retirement plan type affect the cost small employers incur to provide after-tax retirement benefits to employees?

2. Does state tax policy with respect to retirement arrangements affect the cost small employers incur to provide after-tax retirement benefits to employees?

The first question is, primarily, a federal tax policy issue concerning the effectiveness of simplified employee plans as a method for reducing small employer costs. The second question addressed federal and state
tax policy issues by examining how state tax policies affect the cost of providing retirement benefits to employees under plan types defined by federal tax policies. Similarly, the second research question addresses the issue of how state tax policies affect the implementation of federal tax policies.

A system of employer costs and employee benefits was defined so that the relationship between employer costs and employee benefits could be described and analyzed. A cost index was defined, equal to the ratio of employer inputs, or costs, to after-tax distributions to employees, with both costs and benefits stated in terms of their values on the date of the distribution of plan assets to employees.

Three categories of retirement arrangements were examined. Of the three categories examined, two included qualified retirement plans and one included simplified employee plans. One of the qualified retirement plan categories included low-cost qualified plan alternatives (LCQPs), for example, defined contribution plans. The other qualified retirement plan category included high-cost qualified plan alternatives (HCQPs), for example, defined benefit plans. The third retirement arrangement category included only simplified employee plans (SEPs).
Three categories of state tax policy with respect to retirement arrangements were examined. The first category (NT) included only those states that impose no income tax on distributions from the plan types examined. The second category (OI) included states at the other extreme, those states that tax all distributions at ordinary income tax rates. The third state tax policy category (MIX) included the remaining states that have some hybrid approach to taxing retirement arrangement distributions.

IMPLICATIONS OF THE STUDY

Perhaps the primary observation that can be made about the effects of plan type and state income tax policy is that both appear to affect the cost of after-tax benefits paid to employees in the form of a lump sum distribution. Figures 6-1 and 6-2 capture the essence of the plan type and state income tax policy effects.

In general, low-cost qualified plan alternatives result in the lowest plan cost. Indeed, at an average cost of $1.95 per dollar of after-tax employee benefit, high-cost qualified plan costs are about 141 percent of low-cost qualified plan costs, which have an average cost of $1.39. At an average cost of $1.84, simplified employee plan costs are about 133 percent of low-cost
qualified plan costs. That is, ignoring state income taxation for the moment, an employer with a low-cost qualified plan could expect to incur substantially lower retirement arrangement costs than an employer with a simplified employee plan or a high-cost qualified plan alternative.

One of the a priori expectations of this study was that simplified employee plans would prove to be more costly than all qualified plan alternatives. Clearly, this is not the case. Ignoring state income taxation, i.e., looking only at NT states, high-cost qualified plan costs are about 109 percent of simplified employee plan costs. If the state income tax policy factor is considered, simplified employee plans are about as costly as high-cost qualified plans in one group of states, MIX states.

In NT and OI states, simplified employee plans follow the overall pattern. Simplified employee plan costs in NT and OI states are a little more than 90 percent of the cost of high-cost qualified plans and about 130 percent of the cost of low-cost qualified plans. That is, under all three state tax policies low-cost qualified plan alternatives are, on average, less costly than simplified employee plans, and in MIX states simplified employee plan costs are about the same as high-cost qualified plan costs.
In some sense, then, Congress was incorrect to have focused on plan administration cost reduction as a method for increasing the benefits paid to the employees of small businesses. That is, at best, simplified employee plans achieve the goal of cost reduction only among the group of small businesses that wish to offer the most complex, and therefore most expensive, schemes for paying retirement benefits.

Given the legislatively imposed requirements for simplicity when a simplified employee plan is adopted, simplified employee plans appear to be an inappropriate substitute for high-cost qualified plan alternatives. In many states, state income tax policies have such a distorting effect on plan cost that simplified employee plans are at least as costly as the qualified plan alternatives examined.

Because simplified employee plans were assumed to have no administration costs, the cost advantage of adopting a simplified employee plan, instead of a high-cost qualified plan, seems doubtful. If the administration costs of simplified employee plans are later found to be greater than zero, perhaps because of hidden costs not contemplated by this study, simplified employee plans may turn out to be more costly than, even, high-cost qualified plan alternatives.
Based on the evidence presented earlier in this chapter, a fair conclusion is that, at best, Congress failed to achieve its purpose in creating simplified employee plans. In fact, such an evaluation may be too generous; arguably, Congress achieved the opposite of what was intended: by creating simplified employee plans, Congress may have provided small employers with a tempting alternative that produces less retirement benefits per dollar of employer contribution than retirement plan alternatives that might otherwise have been adopted by small employers.

Because of the added consideration of competitive advantages among states, proposing sound recommendations or deriving logical conclusions about policy effects at the state level is especially tricky business.41 In general, those states that do not tax plan distributions have the lowest average plan cost. This result was expected and served as a benchmark for the effects of other state tax policies. The tax benefits available to participants in qualified retirement arrangements are so extensive that a simplified employee plan is the most costly method of providing retirement benefits in a large number of states. In other states, simplified employee plans offer only limited cost

41Such factors could, conceivably, have consequences at the federal level as well.
reduction over the most complex, and most costly in terms of administration cost, qualified plan alternatives. When compared to less complex qualified plans, for example, defined contribution plans, simplified employee plans offer no cost advantage in any state category.

The implications for Congress are that, first, the administration cost reduction available from simplified employee plans is not adequate to overcome the tax benefits available to qualified plans. If Congress's purpose is to put more retirement benefits into the hands of employees, simplified employee plan distributions should receive at least some of the tax relief given to qualified plan alternatives. Second, states significantly distort the relative cost of paying after-tax dollars to employees in all of the retirement arrangements examined, although determining the practical effects of this distortion is a very difficult task.42

If simplified employee plans are to be used as a vehicle for encouraging retirement benefit payments, the federal incentive, that is, cost reduction by means of plan administration simplification, is insufficient to overcome, completely, the effects of state income

42See Chapters 2 and 3 for a general discussion of selected studies and possible effects of interstate tax differentials.
taxation. Again, the apparent solution is to extend at least some of the tax relief currently available to qualified plans to simplified employee plans.

The implications of this study to individual states, and groups of states, is less clear than the implications at the national level. Rather than indicating a shortcoming of this study, the preceding statement reflects the complexity of state tax policy issues and the difficulty of predicting the effects of changes in state income tax policies.

Assuming that the current federal rules for retirement arrangement taxation continue, states that currently do not tax qualified plan distributions, may wish to consider taxing such distributions if state revenue is a primary consideration. Because these states now offer the lowest cost alternative, there might be little lost, in the way of a competitive edge over other states, if a state income tax were imposed on all, or some, plan distributions. State tax revenue considerations would, of course, have to be balanced against social goals such as providing an adequate standard of living for retired residents and, in states that do not tax other sources of income, problems of horizontal tax equity.

States that currently tax all distributions as ordinary income do not appear to be at the competitive
disadvantage that might be expected. As an additional benefit, they achieve a degree of horizontal tax equity, among simplified employee plans, qualified plans, and other sources of income, not present at the federal level.

Through a combination of higher, more progressive tax rates and more complex taxing schemes, MIX states, in general, cause benefits to be more heavily taxed than similar benefits in NT and OI states. This suggests that states, especially MIX states, may want to reevaluate their policies for taxing retirement arrangement distributions. By adopting a hybrid method of taxing plan distributions, MIX states may have attempted to give preferential treatment to certain types of distributions, but the effect, when compared to other states, may be to tax these distributions more heavily. Again, policy changes in these states would require close examination of the effects of a change on other state goals.

LIMITATIONS OF THE STUDY

This study relied heavily upon two assumptions about lump sum distributions paid to the employees of small businesses. The first assumption was that retirement plan costs incurred by employers are affected by the federal and state taxes imposed on employees.
The second assumption concerns the definition of small employers, the intended beneficiaries of simplified employee plans.

To the extent that the assumptions employed were not appropriate, the conclusions which can be drawn from the results of this study are limited. For the reasons stated in earlier chapters, the assumptions and limitations appear appropriate for the purposes of this study.

FUTURE RESEARCH

Recent federal legislative trends have run counter to the proposals in this chapter. Instead of attempting to make simplified employee plans more efficient as a means of putting after-tax benefits into the hands of employees, qualified plans have been made less efficient. For example, some qualified plan participants are no longer eligible to use the federal ten year averaging method to compute the tax on a lump sum plan distribution and, instead, are required to use a less advantageous five year averaging method. The group to which this restriction applies will grow in coming years, and the effect of this shift certainly will be of interest to federal and state policy-makers.

Individual states may find that they are able to benefit from a closer examination of plan costs in their
own state and in neighboring states. Many of the assumptions of this study were based on data collected at the national level. Using regional or state data may allow more precise cost calculations for specific regions or states.
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Strasma, J. D., State And Local Taxation Of Industry (Federal Reserve Bank of Boston, 1959).


VITA

W. Robert Smith

855 Beacon Street, #4 Home: 617-267-7464
Boston, Massachusetts 02215 Office: 617-353-2035

EDUCATION

B.S. degree in Accounting from Louisiana State University, 1978

M.B.A. degree from Louisiana State University, 1981

TEACHING AND RESEARCH PREFERENCES

Taxation and financial accounting

PUBLICATIONS


GRANTS

"A Study To Investigate The Effects Of State Taxation And Plan Type On Small Employer Retirement Plan Costs" (Brookfield, Wisconsin: International Foundation Of Employee Benefit Plans, 1987).


Exxon Company Grant (1985) to an outstanding graduate student intending to make college teaching a career.

Exxon Company Grant (1984) to an outstanding graduate student intending to make college teaching a career.

WORK EXPERIENCE

Teaching

LSU Accounting Department. Taught courses in Introductory Financial Accounting, Intermediate Accounting, and Fundamental Tax Problems and Tax Planning for Individuals while taking courses for Ph.D. degree.

Boston University. Taught Managerial Accounting from the spring semester of 1987 to the present.
Accounting


LSU Accounting Department. Worked as a graduate research assistant while taking courses for M.B.A. degree.

LSU Accounting Department. Employed as a grader for accounting courses while pursuing B.S. degree.

S & S Cash Register Company, Baton Rouge, Louisiana. Converted the accounting systems of small companies to computerized systems during the summer of 1980.

Other


ACTIVITIES, HONORS, AND MEMBERSHIPS

Certified Public Accountant (1979), Louisiana.

Lloyd F. Morrison Award (1985) presented to the LSU graduate assistant who has excelled in teaching.

President of the LSU Accounting Graduate Student Association.

Editor and author for The Graduate Outlook, a newsletter published by the LSU Accounting Graduate Student Association.

National Association of Accountants.

American Accounting Association.
DOCTORAL EXAMINATION AND DISSERTATION REPORT

Candidate: W. Robert Smith

Major Field: Accounting

Title of Dissertation: A Study To Investigate The Effects of State Taxation and Plan Type On Small Employer Retirement Plan Cost

Approved:

[Signatures]

Major Professor and Chairman

Dean of the Graduate School

EXAMINING COMMITTEE:

[Signatures]

Date of Examination:

May 12, 1988