Financing the New Jersey Unemployment Insurance Program

Prepared for
New Jersey Department of Labor And Industry

Joseph A. Hoffman,
Commissioner

by
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November 1, 1975

Mr. Joseph A. Hoffman, Commissioner
Department of Labor and Industry
Trenton, New Jersey

Dear Mr. Hoffman:

It is a pleasure to submit herewith our study entitled "Financing the New Jersey Unemployment Insurance Program."

During the course of this study we have carefully analyzed the capability of the present unemployment insurance tax structure to finance future benefit requirements which might reasonably be anticipated. As explained in our study, the yields provided by the present tax structure are not sufficient, and future recessions are likely to cause recurring insolvency.

As a result of our research, we recommend in our study that the Legislature adopt a new unemployment insurance tax structure that will provide higher yields and be more responsive to revenue needs. If adopted, the proposed recommendations will provide the State of New Jersey with a sound basis for financing future unemployment insurance benefits.

Very truly yours,

HALDI ASSOCIATES, INC.

John Haldi

John Haldi
President

Enclosure

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Department of Labor and Industry
State of New Jersey

By

Haldi Associates, Inc.
666 Fifth Avenue
New York

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A number of people have read interim drafts of this report, and we are grateful to all of them for their helpful comments and constructive criticisms. We wish especially to thank Dr. Donald Scarry, Mr. John Doyle and Mr. Don Diefenbach of the Division of Planning and Research, New Jersey Department of Labor and Industry, for their continuing assistance and cooperation throughout the project.

Staff members of Haldi Associates who assisted in this project were Dr. Dr. Thomas Vietorisz, Mr. Bahk Sang and Mr. Robert Stewart. Mr. John Romagna programmed the first version of the computer simulator.

John Haldi
President

New York, New York
November, 1975

SUMMARY

Purpose. The purpose of this study is to investigate the adequacy of New Jersey's unemployment insurance tax structure and to recommend those changes or improvements which appear desirable. The analysis is exclusively concerned with permanent, long-term solutions. The basic objective throughout has been to develop recommendations capable of assuring the trust fund will remain solvent in the event insured unemployment rises to levels as high as any previously experienced within New Jersey.

Findings and conclusions. At the beginning of 1970 the trust fund had a comfortable balance of $483 million. Over the ensuing five years the trust fund declined by $453 million, although insured unemployment averaged only 5.0 percent. Some improvements in the tax structure have been enacted in recent years, but a fundamental shortcoming still persists: namely, the yields provided by the rates contained in the tax table are too low. These yields are not sufficient to rebuild the trust fund to an adequate level nor will they prevent recurring insolvency in the event that the state again encounters periods of insured unemployment as high as those which have occurred several time in the past.

Recommendations. It is recommended that New Jersey retain the recently enacted flexible wage base, which represents a major long-term improvement over a fixed wage base. It is also recommended that New Jersey continue to use employers' reserve ratios as the basis for experience rating.

In assigning experience rates to individual employers, however, it is recommended that New Jersey adopt a new method, known as the "Array System."

Under this system, the taxable wages of all employers subject to experience rating are first listed according to the value of each employer's reserve ratio (those employers with the highest reserve ratios typically appear first, followed by employers with successively lower reserve ratios). Using this list -- or "array" -- tax rates are then assigned to specified percentages of total taxable wages. Employers with the highest reserve ratio pay the lowest rates, and employers with the lowest (i.e., most negative) reserve ratios pay the highest rates. Under the Array System, the rate paid by an individual employer depends upon the value of his reserve ratio relative to other employers, rather than the absolute amount of his reserve ratio. Adoption the the Array System will give most employers an added incentive to try and improve their reserve ratios.

Finally, there is recommended a tax table of specific rates based on the Array System. The yields provided by the rates contained in the recommended tax table will be sufficient to rebuild the trust fund and then maintain it at a level which is adequate for contingencies as severe as any previously encountered by New Jersey. These rates thus overcome the major shortcoming of the existing tax structure. Barring future recessions whose severity sharply transcends historical experience, further legislation concerning the unemployment insurance tax structure should not be necessary for some time. Details on how the proposed Array System works, the adequacy of the yields from the proposed tax structure, and the complete rationale for all other recommendations will be found in the text and the accompanying appendix.

I. Introduction

The purpose of this study is to investigate the adequacy of New Jersey's unemployment insurance tax structure and to recommend changes or improvements which appear desirable.

A major reason for undertaking this study is the fact that over the period 1970-1974 the New Jersey Unemployment Insurance Trust Fund declined by $453 million, from $483 million at the beginning of 1970 to only $30 million at the end of 1974. During these five years the insured unemployment rate in New Jersey averaged 5.0 percent, which was barely above the state's long-term average rate of 4.7 percent. Had New Jersey's insured unemployment rate risen to the all-time high level recorded in 1958 -- 7.9 percent -- the Trust Fund would have declined even more. At the end of April, 1975 the Trust Fund was insolvent in the amount of $235 million (requiring borrowing from the federal government). After regaining solvency during May, the Trust Fund again became insolvent during September, 1975. It is estimated that the Trust Fund will have to continue borrowing money from the federal government at least until May, 1976.

New Jersey needs an unemployment insurance tax structure that is more adequate and more responsive than the existing tax structure. Requirements for an adequate and responsive tax structure are developed in Chapter III and the Appendix. Briefly, such a tax structure provides built-in flexibility for financing future benefit payments at whatever level they materialize, within reasonable

bounds. It also maintains a trust fund reserve sufficient to finance benefit payments that exceed tax revenues during periods of high unemployment, but without building up excessive and unnecessary reserves during periods of sustained economic growth.

Uncertainty about the extent and timing of future benefit payments represents a major problem that must be dealt with when designing an adequate and responsive tax structure. The major sources of uncertainty arise from (1) the extent of future insured unemployment, which is unknown at any time, and (2) the cumulative effect of new benefit provisions which may be written into the law, including possible federal legislation which Congress may adopt.

The uncertainty about future benefit payments poses two different types of problems. The first is a forecasting problem: What range of benefit costs would it be reaonable to anticipate or plan for when designing or appraising a tax structure? This problem is discussed in Chapter II, where prior experience in New Jersey is examined and a set of explicit planning assumptions are proposed. The second problem is: Given any set of planning assumptions, how do we assess whether the tax structure is sufficiently adequate and responsive?

To help answer the second of these two questions, a computer-based simulation model of the New Jersey unemployment insurance system was developed. This simulator enables one to examine the adequacy of the tax structure and the effect of proposed policy changes when several variables are changing concurrently. to illustrate, in the simulator the number of persons in the covered work force and the average weekly wage grow continuously. Concurrent with the growth in these two variables, the user depicts a future economic scenario by designating the

insured unemployment rate for each year to be simulated. The user also selects values for several policy variables, such as the tax structure, or the taxable wage base.. The simulator then shows the outcome (up to 10 years) of simulataneous interaction among all these variables. The simulator was used in the testing and design of the tax structure recommended in Chapter VI.

* * * * * *

The analysis and approach in this study are exclusively concerned with permanent, long-term solutions. Emphasis throughout has been to devise a tax structure which, in addition to meeting current benefit needs, will help rebuild the Trust Fund and then maintain it at a level which is adequate for foreseeable contingencies. Barring recessions whose severity sharply transcends historical experience, the tax structure will be capable of achieving this end.

II. Past and Future Cost of the Unemployment Insurance Program in New Jersey

The outlook regarding future benefit payments is fundamental to considerations about the adequacy and responsiveness of the state's unemployment insurance tax structure. The purpose of this chapter, therefore, is to establish a set of explicit planning assumptions regarding the future cost of unemployment in New Jersey, along with the rationale underlying these assumptions.

Historical benefit payment experience can, within limits, provide a useful basis for projecting the possible extent of future benefit payments. In order to use historical data in a future perspective, however, benefit payments of prior years need to be adjusted and put into a perspective that reflects the growth in coverage, wages and benefits that has occurred.

The most common and perhaps best way of measuring the relative cost of benefit payments is to use the benefit cost rate (BCR), which is defined as a percent of total wages in covered employment for the same time period. The advantage of viewing unemployment insurance expenditures in terms of the benefit cost rate is evident. For example, the increase in benefit disbursements from $14.9 million in 1939 to $450 million in 1974 is mind-boggling, but when we observe that $1.18 was paid out in 1939 for each $100 in wages compared with $1.55 for each $100 of wages in 1973, and $1.97 in 1974, the distorting effects of program growth are largely eliminated. We also have a basis for comparing program climates in 1939 and 1974. The BCR thus summarizes in a useful way the effect of the many factors which, collectively, determine aggregate benefit payments.

Insured Unemployment Experience

By far the most important factor affecting the BCR has been the insured unemployment rate (IUR).[1] Hence the most crucial factor underlying assumptions concerning future benefit cost rates is the outlook for the IUR. The scatter diagram of Figure 1 shows the extent to which changes in the BCR have been related to changes in the IUR.[2] The correlation coefficient (R^2) is .97. For the years covered, this means that ninety-seven percent of the observed fluctuations in the BCR can be statistically accounted for -- i.e., correlated with -- by fluctuations in the IUR, with the remaining three percent of the variation in the BCR presumably correlated with other changes in benefit provisions (e.g., changes in benefit levels, disqualification rules, etc.).

The IUR in New Jersey reflects both general economic conditions as reflected in unemployment and the structure of the New Jersey economy. A study and forecast of future economic conditions is beyond the scope of this study, but certain long-term developments and changes in the unemployment insurance picture in New Jersey are relevant to projections of the future IUR.

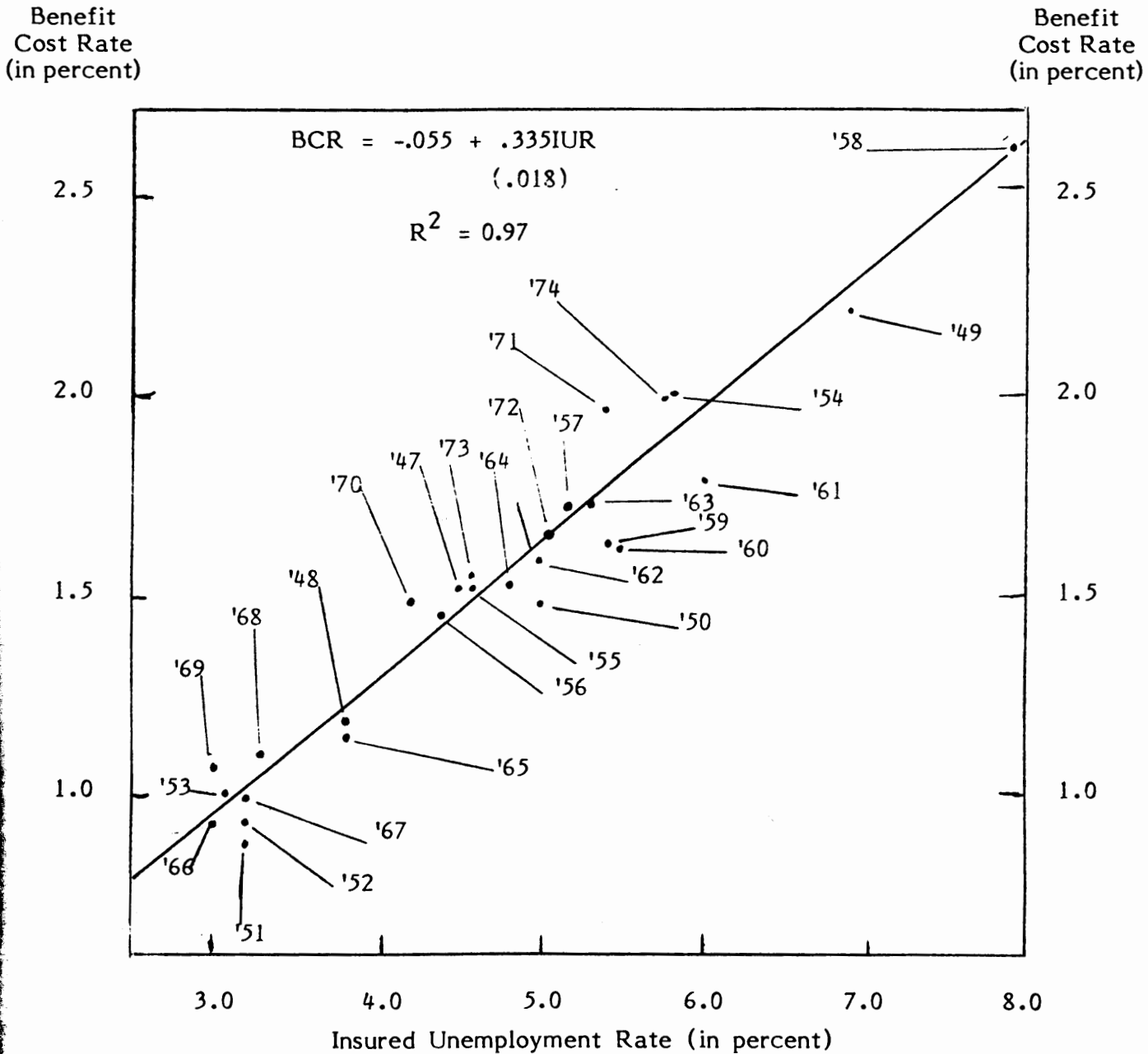
Outlook for the Benefit Cost Rate in New Jersey

Over the history of the unemployment insurance program, the BCR in New Jersey has fluctuated from a low of .12 in 1944 to a high of 2.62 in 1958.[3] Over good years and bad, however, from 1939 through 1974 the BCR has averaged just over 1.4 percent.

New Jersey's IUR, while persistently higher than the national average, has shown no tendency to worsen relative to the national average over the period 1947-

FIGURE 1

Scatter Diagram Showing the Relationship Between the Benefit Cost Rate (BCR) and the Insured Unemployment Rate (IUR), State of New Jersey 1947 - 1974



* Standard error of estimate in parenthesis

Source: Handbook of Unemployment Insurance Financial Data, 1938-1970, and Supplements, 1971-1973, U. S. Department of Labor, Manpower Administration.

1974 (see Figure 2). Thus New Jersey's future insured unemployment rates can be expected to fluctuate more or less in tune with the national economy. Management of the national economy is of course a function of the federal government. Assuming that the federal government provides a sound fiscal and monetary basis for economic growth, New Jersey's IUR can be expected to fluctuate within the range experienced in the past, which means that future benefit cost rates will generally be within the range of past experience. However, two other important factors must also be considered in any long-term projection of future benefit cost rates:

* A New Jersey law that became effective in 1968 establishing the maximum weekly benefit amount at fifty percent of weekly wages in covered employment.

* The extended benefits program

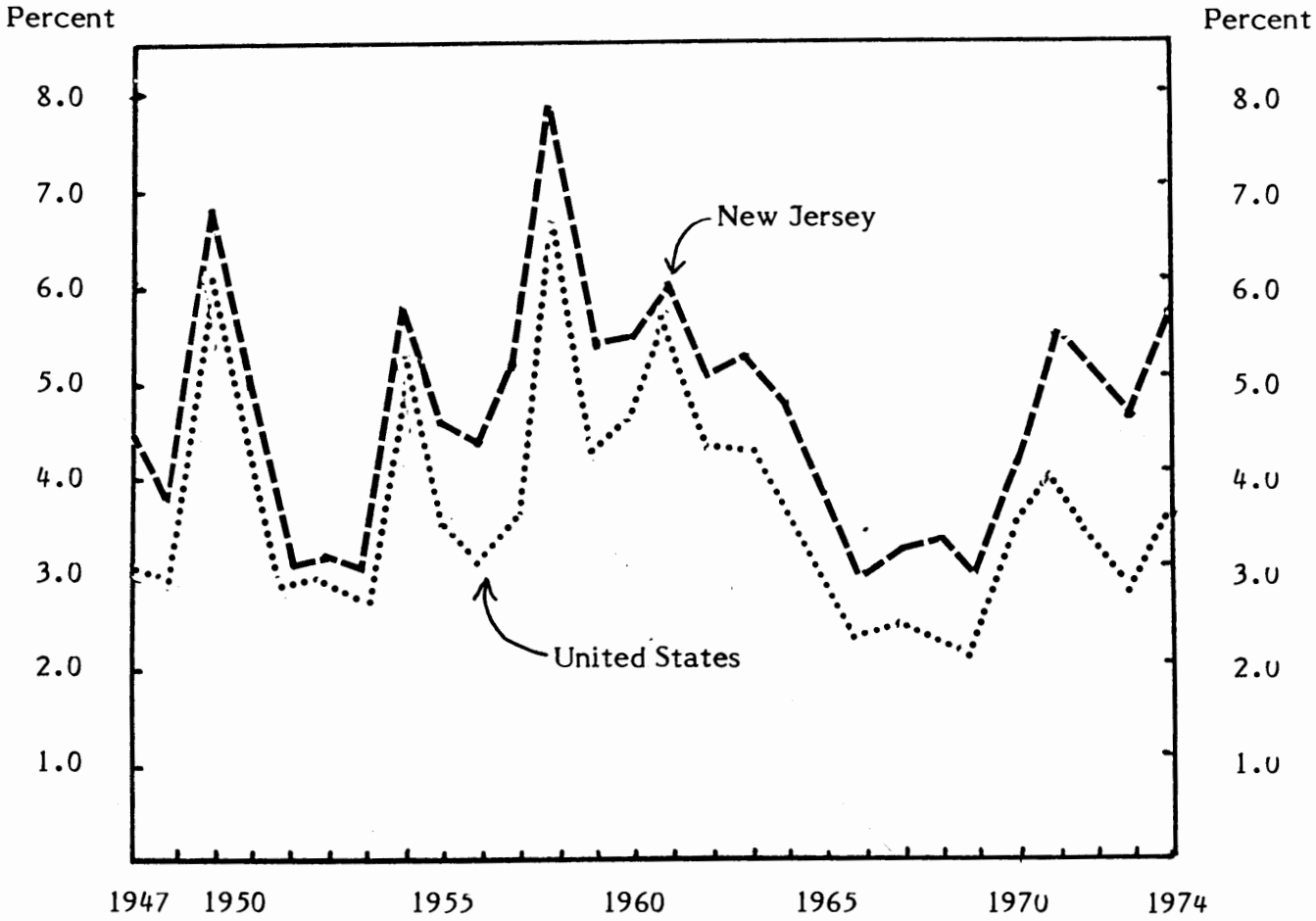
Maximum weekly benefit. The first important factor to consider when projecting the BCR over the next ten to fifteen years is the formula which became effective in January, 1968 for determining each year the maximum weekly benefit amount that covered claimants are entitled to receive. Prior to this, the legislature stipulated the maximum weekly benefit as a fixed dollar amount, and after the maximum had become eroded over a period of time (usually over several years), the legislature would then increase the maximum, thereby temporarily restoring the maximum benefit in relation to the increased wages that had caused the erosion.

Under the current 1968 formula, the maximum weekly benefit is automatically readjusted annually, as a percentage of the average weekly wage in covered employment. The purpose of the 1968 formula is to prevent erosion of the

FIGURE 2

The Insured Unemployment Rate in New Jersey and the United States

1947 -- 1974



Source: Handbook of Unemployment Insurance Financial Data, 1938-1970, and Supplements 1971-1974, U. S. Department of Labor, Manpower Administration.

maximum weekly benefit from occuring, and the net effect will be to increase future benefit cost rates in comparison to those prior years in which the maximum benefit was allowed to erode. Because of the 1968 formula, future BCRs will on average tend to be slightly higher than past BCRs for the same insured unemployment rate.

Extended benefits. In 1970 the federal government adopted a permanent program for extending the potential duration of benefits from 26 to 39 weeks when local or national economic conditions are sufficiently adverse. Federal legislation requires that the state bear one-half the cost of all extended benefits paid under this program. Since 1970 extended benefits have been in effect in New Jersey almost continuously.

In the context of this new program, it is significant to note that even in years when insured unemployment was quite low, about twenty percent of all claimants exhausted their benefits; and in years when insured unemployment was relatively high, as many as forty percent of all claimants exhausted their benefits. Since 1970 this program has added about 10 to 12 percent to the total cost of New Jersey's unemployment insurance program.[4] Had this extended benefits program been in effect during the 1950's and 1960's, it clearly would have increased benefit payments over what they actually were. Hence, from 1970 on, whenever unemployment is sufficiently high to trigger extended benefits into effect, total benefit payments will be higher than they would otherwise have been -- which means that any estimate of the BCR using historical data from the 1950's and 1960's must be adjusted upwards to take account of the existence of this permanent extended benefits program.

Conclusions

Taking the outlook for insured unemployment and all other important factors discussed above into account, Haldi Associates recommendation concerning the average benefit cost rate is:

* The State of New Jersey base its unemployment insurance tax structure on the assumption that over the next 10-15 years the benefit cost rate will average about 1.6 percent.

Although it is reasonable to expect that the IUR may not be as high as in the peak years of 1958-1961, the cost of such unemployment as does occur will, for reasons indicated, almost surely be greater than was experienced with the same IUR in the past. Over the five-year period, 1970-1974, the extended benefits program alone has added 10 to 12 percent to the total cost of the unemployment insurance program. We therefore recommend that for purposes of planning and designing an adequate tax structure the historic benefit cost rate of 1.4 percent should be increased by approximately fifteen percent, to 1.6 percent.

With regard to future uncertainty concerning the extent of fluctuations in the IUR and the BCR, it also seems prudent to adopt a planning assumption consistent with past experience. In order to provide for continued solvency of the trust fund, it is therefore recommended that:

* The tax structure be capable of weathering three consecutive years with benefit cost rates as high as any three prior consecutive years.

At this writing, the three highest consecutive years in New Jersey were 1957-1959, when the benefit cost rates were 1.7, 2.6 and 1.6 percent, respectively.

Notes to Chapter II

[1]The insured unemployment rate (IUR) is defined as:

$$IUR = \frac{\text{Average number of insured unemployed}}{\text{Average monthly covered employment.}}$$

[2]Data for the IUR since 1947 can be found in the Handbook of Unemployment Insurance Financial Data, 1938-1970 and annual supplements.

[3]Even if we exclude from consideration the extremely low rates which occured during the years 1941-1944, the BCR is still seen to have fluctuated widely from a low of .86 in 1951 to a high of 2.62 in 1958. Figure A-2 in the appendix shows the BCR from 1939 - 1974.

[4]"Improving the Condition of the New Jersey Unemployment Compensation Fund," State of New Jersey, Department of Labor and Industry, Division of Planning and Research, April, 1973, p. 9 (mimeo).

III. Requirements for An Adequate Tax Structure

This chapter summarizes a more technical discussion contained in the Appendix. Readers desiring elaboration on this subject are referred there.

The term "adequate" is fundamental to any benefit-financing study such as this. At the same time, it is clearly a relative term. A Trust Fund that is adequate at one time may be inadequate or more than adequate at some other time. Moreover, since adequacy cannot be measured in absolute terms, a Trust Fund will usually be more adequate or less adequate, not simply "inadequate."

In order to specify in clear and unambiguous terms what constitutes an adequate unemployment insurance tax structure, it is first necessary to state one's objectives regarding the tax structure. This chapter therefore begins by setting forth the objectives adopted for this study. The minimum requirements which Haldi Associates have developed for satisfying the stated objectives are then summarized.

Financial Objectives

A minimal objective for an unemployment insurance tax structure is continued solvency of the trust fund for benefit-cost rates falling within the range previously experienced by the state. Beyond this minimum objective, it would clearly be possible for the state to seek other objectives, such as (1) extra margins of safety, (2) counter-cyclical financing, or (3) provision for benefit cost rates higher than any such rates previously experienced by the state. This last objective generally appeals to those who would like to see unemployment insurance benefit

provisions liberalized. The decision to adopt any of these alternate objectives rests on value judgments which are the prerogative, ultimately, of the political decision makers -- i.e., the New Jersey Legislature.

In order to provide the Legislature with the widest possible range of acceptable choices, recommendations contained in this study are based solely on achieving the minimum objective: continued solvency of the trust fund over the range of benefit cost rates previously experienced. The tax structure recommended in Chapter VI is designed to be a benchmark or minimum framework for assuring continued solvency of the trust fund. If the Legislature desires to liberalize benefits or provide an extra margin of safety, it should increase the rates and the yield above those recommended in Chapter VI.

Minimal Requirements to Achieve the Desired Objective

In order for the tax structure to assure continued solvency of the unemployment insurance trust fund over the range of benefit cost rates previously experienced, three basic criteria need to be satisfied:

* The rates that are in effect when the Trust Fund is in a satisfactory range must provide an adequate yield.[1]

* Rate adjustments triggered into effect when the Trust Fund declines below predetermined levels must be sufficiently responsive.

* The Trust Fund must contain a level of reserves adequate to supplement tax revenues during periods of high benefit payments.

Adequate yield. To satisfy the first requirement, the average yield from the rates that are in effect when the Trust Fund is in a "satisfactory range" (this term is defined in the section below on Adequate Trust Fund Reserves) should at least equal the expected long-term benefit cost rate. As discussed in the previous chapter, it is reasonable and prudent to expect that over the next ten to fifteen years the benefit cost rate in New Jersey will average around 1.6 percent. Thus the unemployment insurance tax structure in New Jersey should, when the Trust Fund is in a satisfactory range, yield an average of 1.6 percent on total wages in covered employment.

Responsive rate adjustments. In order for rate adjustments specified in the tax structure to be adequately responsive, they must generate enough additional revenues to keep the Trust Fund solvent over any three consecutive years of benefit cost rates as high as previously recorded in New Jersey. Two criteria which Haldi Associates have established as necessary to meet this general standard are:

* Rate adjustments should insure adequate replenishment of the Trust Fund.

* The yield from the highest rates contained in the tax structure should be at least equal to ninety percent of the highest expected benefit cost rate.

This second requirement is a "fail-safe" provision intended to prevent long-term erosion of the Trust Fund, as occurred in New Jersey during the period 1970-1974.

Trust fund reserves. A certain amount of time elapses before rate adjustments can be imposed and additional revenues realized. Because of this time lag, benefit payments will exceed revenues during periods of increasing

unemployment. In order for the Trust Fund to sustain deficits without becoming insolvent, it is necessary to maintain a reserve which will provide a sufficient cushion, over and above expected income, until the scheduled rate adjustments can take effect.

It is extremely important to recognize that no given level of trust fund reserves can be defined as adequate without taking explicit account of the adequacy and responsiveness of the tax structure. To attempt such a definition is faulty in theory, and in practice may give indications of false security, thereby inviting fund insolvency during periods of high unemployment.

In achieving the minimal objective of fund solvency, for the range of benefit cost rates stated in Chapter II, tradeoffs are permitted -- within limits -- between (1) the degree of responsiveness built into the tax structure, and (2) the level of trust fund reserves. If a relatively low level of trust fund reserves is desired, then one must be prepared to see fairly large rate adjustments triggered into effect immediately following a rise in the BCR.[2] Conversely, one can maintain a more stable tax rate (i.e., trigger in fewer and smaller rate adjustments) by maintaining a higher level of trust fund reserves. Within the limits of safety, the choice is essentially a political decision. Tradeoffs which fail to meet this minimal objective are not discussed further here or in the Appendix. The next chapter analyzes New Jersey's existing tax structure. As will be shown there, the existing tax structure fails to meet the requirements described above as minimally necessary for adequacy.

In conclusion, it is stressed that the tradeoff between (1) lower reserves and more frequent and more severe changes in the tax rate, versus (2) higher reserves

and less frequent and less severe changes in the tax rate are entirely feasible, but such tradeoffs need to occur within certain limits if solvency of the trust fund is to be assured.

Notes to Chapter III

[1]"Yield" is defined here and throughout the remainder of this report as "tax revenues divided by total wages." Tax revenues divided by taxable wages will be referred to throughout as the "return on taxable wages."

[2]Keeping a relatively low but safe level of trust fund reserves means that year-to-year changes in the tax rate are likely to be greater than would be the case if a relatively large trust fund were maintained.

Chapter IV

Analysis of the Existing Tax Structure

In this chapter the adequacy and responsiveness of the existing tax structure will be assessed against (1) the outlook for the future cost of unemployment as developed in Chapter II, and (2) the objectives and criteria for adequacy described in Chapter III. To anticipate, the existing tax structure does not meet our criteria of adequacy. As a result, the existing tax structure can not be expected to restore solvency of the trust fund or avoid recurring insolvency in the event of moderately high unemployment like that experienced in New Jersey on several prior occasions. Events have already born witness to the inability of the tax structure to prevent insolvency. During 1975 the level of trust fund reserves in New Jersey reached an all-time low when, for the first time in the history of the state's unemployment insurance program, the trust fund became insolvent and the state had to borrow money from the federal government in order to continue paying benefits.

In order to discuss the dollar amount of the trust fund in a perspective which reflects the historic growth in coverage, wages, and benefits, it is useful to state reserves as a percentage of total wages in covered employment for the year preceding the date of the reserve. This percentage will be referred to here as the "reserve ratio," and it should be noted that the reserve ratio has the same denominator as the all-important benefit cost rate.[1]

At the end of 1970 the value of New Jersey's reserve ratio was 2.76, which at that time represented an historic low for the year-end reserve ratio. Prior to

1970 the year-end reserve ratio had never been less than 2.95, and in the vast majority of years it was above 3.00

Since 1970, however, both the trust fund and the reserve ratio have gradually declined as two "inflationary recessions" drove benefits up while simultaneously eroding the tax base of the unemployment insurance program. The low reserve ratios which have prevailed since 1970 are symptomatic of two critical shortcomings in the tax structure: namely (1) yields that are neither adequate nor timely; and (2) a taxable wage base that was gradually being eroded by inflation and becoming increasingly inadequate each year.

The latter of these two problems has already been addressed by the Legislature. In 1974 legislation was enacted passed that in future years will have the effect of raising the taxable wage base in step with the average wage in covered employment. When this law becomes fully effective, taxable wages are expected to equal about fifty percent of total wages in covered employment. This legislation will be extremely beneficial in shoring up one of the more serious inadequacies that has contributed to the insolvency of the trust fund.

Maintaining the present parity between taxable and total wages will not, however, solve the problem of inadequate yields. The rates contained in the present structure no longer provide a sufficient yield, hence scant improvement in the condition of the fund can be expected so long as the present structure remains in effect. Comprehending the inadequacies of the present tax structure helps provide an understanding of and an appreciation for the subsequent recommendations which are designed to overcome these shortcomings and restore financing of the unemployment insurance system to a sound basis.

The Problem of Inadequate Yields

The New Jersey tax structure uses a "reserve ratio" formula to determine the tax rate of all covered employers eligible for experience rating.[2] Under this formula the cumulative amount of all contributions paid by an employer minus the cumulative amount of all benefits charged to his account are divided by the employer's taxable wages for the prior calendar year. This quotient is defined as the employer's reserve ratio. The actual rate paid by an employer in any given year depends on both his reserve ratio and the particular rates that are in effect.[3]

The 1975-76 tax structure, shown in Table 1, is designed so that as an employer's reserve ratio declines, his tax rate increases. Employers with negative reserve ratios (i.e., deficit accounts) pay the highest rates of all. In theory, the goal is for every employer to build up a positive reserve in his individual account. If every employer had a positive reserve, then clearly the state's trust fund would also have a surplus.

In actual practice, many employers have so many benefits charged to their account that they are not able to build up any reserves whatsoever; i.e., they have negative reserves, or "deficit accounts." These deficits act as offset to the positive accounts. So long as employers with negative reserve ratios continue in business, they pay the highest rates of any employer. If the experience of these firms improves, they may in time make sufficient contributions to build up a positive reserve ratio. However, whenever firms with negative accounts move out of the state or go out of business, there is of course no further hope that they will some day build up their account to a positive reserve ratio.

TABLE 1

EMPLOYER EXPERIENCE RATING SCHEDULE
JULY 1, 1975

	FUND RESERVE RATIO 1/					
	12.5% & over	10% to 12.49%	7% to 9.99%	4% to 6.99%	2.5% to 3.99%	2.49% & under
EMPLOYER RESERVE RATIO: 2/						
Positive Reserve Ratio:						
.00% to 2.99%	2.5%	2.5%	2.8%	3.1%	3.4%	4.1%
3.00% to 3.99%	2.2	2.5	2.8	3.1	3.4	4.1
4.00% to 4.99%	1.9	2.2	2.5	2.8	3.1	3.7
5.00% to 5.99%	1.6	1.9	2.2	2.5	2.8	3.4
6.00% to 6.99%	1.3	1.6	1.9	2.2	2.5	3.0
7.00% to 7.99%	1.0	1.3	1.6	1.9	2.2	2.6
8.00% to 8.99%	0.7	1.0	1.3	1.6	1.9	2.3
9.00% to 9.99%	0.4	0.7	1.0	1.3	1.6	1.9
10.00% to 10.99%	0.4	0.4	0.7	1.0	1.3	1.6
11.00% and over	0.4	0.4	0.4	0.7	1.0	1.2
Deficit Reserve Ratio:						
.00% to - 9.99%	3.1	3.4	4.0	4.3	4.6	5.5
-10.00% to -19.99%	3.4	3.7	4.3	4.6	4.9	5.9
-20.00% and over	3.7	4.0	4.6	4.9	5.2	6.2
Basic Rate 3/	2.8	2.8	2.8	2.8	2.8	3.4

1/ Fund as a percentage of taxable wages.

2/ Employer's reserve balance (contributions minus benefits) as a percentage of employer's taxable wages.

3/ Basic rate assigned to employers with less than three years of coverage under the law.

The estimated yield from the current tax structure is shown on the bottom line of Table 2. Comparing these yields with the projected benefit cost rate of 1.6 percent, we see that the yield from four of the six individual rate schedules contained in Table 1 are less than 1.6 percent. The only rates that provide a substantially higher yield than 1.6 percent are those that become effective when the Fund Reserve Ratio drops below 2.49% of taxable wages (or, alternatively, when the reserve ratio drops below 1.25% of total wages), and the yield from these highest rates is only 1.9 percent of total wages. Thus even the highest rates are nonsustaining whenever the benefit cost rate exceeds 1.9 percent -- an event that has occurred in six out of the past 36 years. This means that whenever the Fund Reserve Ratio is greater than four percent, yields from the present tax structure will be inadequate even for the average projected BCR. and for any level of unemployment worse than average the rates and their corresponding yields will be even more inadequate.[4] Thus, like a self-fulfilling prophecy, the present rate structure is almost certain to reduce the trust fund to a low level and keep it there. What New Jersey needs is a tax structure that will provide adequate yields before the trust fund declines to such low levels.

The Level of Trust Fund Reserves

A major function of the trust fund is to provide a margin of safety for deficits incurred during recessions until an adequate level of reserves can be rebuilt. The size of the reserve must be sufficient to allow for the 15 to 21 month lag between the time benefits are paid, higher rates are imposed and tax revenues from such rates actually received.

TABLE 2

Estimated Income Rates Under the
1975 - 1976 Tax Structure

	Fund Reserve Ratio[1]					
	12.5% and over	10.% to 12.49%	7% to 9.99%	4% to 6.99%	2.5% to 3.99%	2.49% and under
Rate of Return on Taxable Wages						
Average employer contributions	1.78%	1.98%	2.26%	2.52%	2.78%	3.34%
Average worker contributions	.50	.50	.50	.50	.50	.50
Total contributions	2.28	2.48	2.76	3.02	3.25	3.84
Yield on Total Wages						
Total contributions[1] (employers & workers)	1.14	1.24	1.38	1.51	1.64	1.92

[1]Fund as a percentage of taxable wages.

[2]Assumes that taxable wages will equal fifty percent of total wages.

As indicated in Chapter III, within limits there can be tradeoffs between the level of trust fund reserves and the responsiveness of the tax structure. At present, however, New Jersey has a combination of inadequate yields and too low a trust fund reserve. The trust fund will almost surely remain in or close to insolvency so long as the existing tax structure continues in effect. Meaningful tradeoffs are not possible under these conditions.

Notes to Chapter IV

[1]The ratio of trust fund reserves to taxable wages, which is used to trigger changes in tax rates, will be referred to as the "Fund Reserve Ratio."

[2]Newly established employers with less than three years experience are taxed at a specified "Basic Rate" that is not related to their experience.

[3]When the trust fund drops below certain specified levels, higher rate schedules are triggered into effect. These higher rates increase tax revenues and, hopefully, raise the level of trust fund reserves to a point where the rates are no longer required.

[4]It should be noted that the yields shown at the bottom of Table 2 assume that the flexible taxable wage base adopted by the Legislature will prevent the taxable wage base from declining any further.

V. Basic Considerations in Design of a Recommended Tax Structure

Design of a recommended tax structure can be thought of as a two-stage process. The first stage involves choices and decisions concerning what the fundamental design ought to be, and the second stage involves construction and testing of specific, detailed rate structures which fall within the framework of the basic design.

The criteria of adequacy developed for this study and presented in Chapter III provide part of the ground work for this basic design. Shortcomings of the existing tax structure, as discussed in Chapter IV, also point to the direction in which the basic design ought to move.

The remaining sections of this chapter present explicit recommendations in three basic areas, along with the rationale underlying these recommendations. These recommendations involve principles which precede and transcend the details of any specific tax schedule. Details on a recommended rate structure are given in the next chapter.

Choice of Taxable Wage Base

As indicated in Chapter IV, the relatively inflexible taxable wage base which New Jersey had for many years has tended to undermine the tax structure and erode yields. The problem was not so much that the taxable wage base was low or high, but its relative inflexibility. Any fixed wage base will steadily undermine a tax structure. This erosion is especially pernicious during inflationary periods. Thus an extremely important decision concerns the determination of that portion of wages which will be taxed.

The state has two basic options. It can specify a fixed dollar amount, or the taxable wage base can be determined by a formula which makes taxable wages some percentage of the average wage in covered employment. This latter option, which New has recently adopted, is referred to as a "flexible" wage base.

Recommendation: New Jersey should retain the flexible wage base as currently enacted.

Retention of a flexible wage base will prevent continued erosion and will thereby provide a meaningful basis for design of a tax structure that will be adequate for an indefinite future. If the state adopts any fixed wage base, even $8000 or $10,000, then -- just as sea water gradually melts an iceberg from beneath, until it finally tips over -- the yield from the tax structure will decline gradually but steadily until it again becomes totally inadequate.[1]

Choice of Experience Rating System

Several other experience rating systems have been approved as meeting the requirements of federal law. The state's choice of an experience rating system is not constrained by the minimum requirements for an adequate tax structure stated in Chapter III. If the State of New Jersey desired, it could adopt any of these other experience rating systems in lieu of the reserve ratio system.

Recommendation: New Jersey should retain its reserve ratio systsem of experience rating.

Other experience rating systems do not offer any clear-cut advantages over a reserve ratio system which meets all the previously specified criteria of adequacy. New Jersey's problem lies in the inadequate rates incorporated in the present tax structure, not in the reserve ratio system itself.

Retention of the reserve ratio system has at least two obvious and practical advantages. First, the existing system is generally understood by those employers who take an interest in knowing how the system works. Adoption of a different system would require an extensive and costly effort to explain the new system to legislators, businessmen and other interested parties. Second, the administrative cost of changing to a new system would be high, as well as time-consuming. A number of forms would have to be redesigned and the computer system would need to be reprogrammed. There is no need to incur the additional expense and confusion which a changeover to a new experience rating system would entail

Assuming that the state continues to employ the reserve ratio system for experience rating, it can use employers' reserve ratios to assign tax rates in either of two ways. In the present tax structure each employer's reserve ratio is translated directly into a specific rate. For convenience, we will refer to this system as a "fixed experience rating schedule."

An interesting alternative to the fixed experience rating schedule is provided by the "array" system. Under the array system the reserve ratio of each employer is calculated just as it is now. Before assigning rates to employers, however, all employers are first ranked in the order of their reserve ratios (from highest to lowest), along with the amount of their taxable wages for the preceding year. The lowest tax rate is then assigned to those employers with the highest reserve ratios to the point where their cumulative taxable wages equal some specified percentage (four or five percent, for example) of total taxable wages. The next lowest rate is then assigned to those employers with the next lowest

benefit ratios, up to the point where cumulative taxable wages equal another specified percentage of total taxable wages. The process of assigning rates continues in this way until all employers have been assigned a tax rate. Under the array system an employer's rate depends upon the relative position of his reserve ratio compared to all other employers in New Jersey, rather than upon the absolute amount of his reserve ratio.

With the array system, employers with the highest reserve ratios will pay the lowest tax rate and employers with the lowest -- i.e., most negative -- reserve ratios will pay the highest tax rate. Between these two extremes the array system will have the effect of spreading out taxable wages evenly across the tax table. Under the present fixed experience rating system over one-half of all taxable wages are being taxed at a rate in the lowest thirty percent of the rate schedule. In the array system, by contrast, when all taxable wages have been ranked according to their reserve ratios, the fiftieth percentile will pay the median rate.

From a financial viewpoint the array system has one distinct advantage over a fixed experience rating schedule. Each year it provides a predictable return on taxable wages, whereas with a fixed experience rating schedule the return on taxable wages can fluctuate somewhat. After two or three years with lower unemployment and a lower benefit cost rate, many employers will build up high reserve ratios. Conversely, after two or three years with higher unemployment and higher BCR's, the reserve ratio of many employers will decline somewhat. Thus under a fixed rate schedule the distribution of taxable wages shifts from year to year, and this changing distribution of taxable wages causes the yield to vary somewhat. For this reason, we make the following

* Recommendation: The array system should be used to assign experience rates to employers.

With the array system, a target yield can be selected, and rates can be then computed which will provide exactly that yield. A schedule of rates based on the array system will be found in Table 4 in the next chapter.[2]

Choice of Triggering Formula for Changing Tax Rates

As indicated previously, rate adjustments should provide adequate replenishment of the trust fund in a timely manner. Changes in tax rates are currently triggered into effect by the "Fund Reserve Ratio." New Jersey law defines this ratio as the level of trust fund reserves as of March 31st divided by taxable wages in covered employment during the preceding year. The value of this ratio then determines the specific tax rates that are applicable for the fiscal year beginning on the following July 1st.

Within this basic approach of using a fund reserve ratio to trigger new tax rates into effect, the state has two options. Reserves can be stated as a percentage of either taxable or total wages in covered employment. Both statistics are equally and readily available from the unemployment insurance data system. So long as the state retains a flexible wage base, the trigger points in a ratio based on taxable wages can easily be made equivalent to those in a ratio based on total wages.[3] Hence there is no need to change the present formula at this time. However, should the legislature for any reason abandon the flexible wage base and revert to some fixed wage base, it is recommended that at that time the trust fund reserve ratio be calculated as a percentage of total wages in covered employment.[4]

Notes to Chapter V

[1]Adoption of a flexible wage base will also preserve the relationship between wages which entitle workers to benefits, the formula for determining the maximum benefit amount and wages which are subject to tax. Since the 1950's Congress has had before it legislation that would increase substantially the maximum weekly benefit amount. Between 35-50 percent of all eligible claimants in New Jersey have historically been entitled to receive the maximum weekly benefit, and it has been estimated that enactment of this legislation would increase total benefit payments by nearly twenty percent (see "Improving the Condition of the New Jersey Unemployment Compensation Fund," op. cit., p. 53). In the event Congress does some day adopt this legislation, New Jersey might at that time find it propitious to change the formula for computing the taxable wage base. No change is recommended at this time because there is no need to attempt to anticipate such federal legislation.

[2]It is also worth noting that the present U. I. data system has all the information needed to implement an array system, and with little additional effort it can readily array the taxable wages of employers, and assign tax rates under this proposed system.

[3]With a flexible wage base, the ratio between taxable and total wages will remain almost constant so long as the formula governing determination of the wage base does not change.

[4]The maximum weekly benefit and, therefore, exposure of the trust fund are tied to total wages. With a fixed wage base, total wages will tend to increase somewhat faster than taxable wages, especially during inflationary periods. Thus exposure of the fund will be increasing but trust fund reserves will not increase commensurately, because a trust fund ratio based on taxable wages will not trigger higher rates into effect in a timely manner.

VI. The Recommended Tax Structure

Detailed provisions of a recommended tax structure are presented in this chapter. These provisions have been developed within the basic design proposed in the preceding chapter.

For ease of exposition, specific recommendations concerning the proposed distribution of taxable wages under the array system, the rates themselves (along with the yield from these rates) and the level of trust fund reserves are presented in individual sections. The format of these sections is to present each recommendation, followed by an elaboration on how the recommendation is expected to work along with a rationale for selection of these specific provisions.

There is also a rationale which applies to all the provisions collectively. This arises from the interrelationships between the various recommendations, which together constitute the proposed tax system. In brief, the collective rationale is that the proposed tax structure is adequate to achieve the objective of fund solvency as stated in Chapter III. This is discussed at greater length in a separate section following the recommendations.

The Array Distribution

Recommendation. Each year, before assigning a tax rate to eligible employers on the basis of their individual experience (as reflected by each employer's reserve ratio), it is proposed that the taxable wages of all employers in the state first be ranked and distributed according to the value of employers' reserve ratios, as evenly as possible over 25 separate rate classes. Each rate class will contain

approximately four percent of the taxable wages of all employers qualified for experience rating. These 25 rate classes and the cumulative percentages corresponding to each rate class are shown in Table 3.

The recommendation states that taxable wages should be distributed "as evenly as possible," with each rate class containing "approximately" four percent of total taxable wages. These qualifications are necessary because, to be more specific, the way the proposed system will work is that: (a) an employer shall pay the same rate on all of his taxable wages, and this rate shall be the lowest rate for which any of his taxable wages qualify; and (b) if two employers have the same reserve ratio, both shall pay the same rate, which will be the lowest rate for which the wages of either employer qualify. Because of these provisions, some rate classes may contain slightly more than four percent of taxable wages, with other rate classes then containing slightly less than four percent.

Effect. As indicated previously, under the array system employers will continue reporting to the unemployment insurance system exactly as they do now, and each employer's account and reserve ratio will be maintained and calculated exactly as it is now.[1] Hence the reporting requirements will have no effect whatsoever on employers. The workload of the state agency will not change appreciably either, because the state already tabulates the number of employers and the amount of taxable wages that fall into various reserve ratio categories.

Rationale. The most important rationale for an array system is that each year it will provide the state with a yield that is predictable within a few one-hundredths of one percent, thereby eliminating the vagaries that arise from year-to-year changes in the distribution of taxable wages over reserve ratio classes.

TABLE 3

Recommended Distribution of Employer Rate Classes Using the Array System[1]

Employer's Rate Class[2]	Minimum[3] Cumulative Percent of Eligible Taxable Wages to be Assessed the Rates Assigned to the Corresponding Class
1	4
2	8
3	12
4	16
5	20
6	24
7	28
8	32
9	36
10	40
11	44
12	48
13	52
14	56
15	60
16	64
17	68
18	72
19	76
20	80
21	84
22	88
23	92
24	96
25	100

[1]Excludes new employers with less than three years experience. It is recommended that new employers not eligible for experience rating pay the basic rate shown in Table 4.

[2]Employer's with the highest reserve ratios will qualify for Rate Class No. 1, employer's with the next highest reserve ratios will qualify for Rate Class No. 2, and so on; Rate Class No. 25 will consist of those employers with the lowest reserve ratios.

[3]An employer shall pay the same rate on all wages subject to the unemployment insurance tax, and this rate shall be the lowest rate for which any wages of the employer qualify. Whenever two or more employers have equal reserve ratios, they shall all pay the same tax rate, which shall be the lowest rate for which any such wages qualify.

The array system may also have a side effect of providing many employers with an added incentive to try and improve their reserve ratio. Under the current fixed-rate system many employers in the lowest rate category can do little to affect their individual rate by improving their reserve ratio. At the other extreme, many employers have reserve ratios so low (i.e., negative) that there is little likelihood that they can do anything which would significantly reduce their individual rate. Under the proposed array system only four percent of all taxable wages would be eligible for the lowest rates, and only four percent would pay the highest rates. The remaining ninety-two percent of taxable wages would be spread between the lowest and highest rates, and these employers could reduce their rate by improving their reserve ratio relative to other employers in the state.

The present tax table contains 13 separate rate classes for experience-rated employers. An array system based on 25 rate classes thus doubles the number of rate classes and the size of the tax table. The rationale for adding more rate classes to the tax table is that more steps in the table will permit smaller increments in the tax rate between classes. This way, if the increase or decrease in an employer's reserve ratio during a year causes him to shift from one rate class to the next, his tax rate will change by only a small amount (usually two-tenth's of one percent).[2]

Tax Rates

Recommendation. It is recommended that the tax rates shown in Table 4 be adopted, along with the array system and rate classes shown in Table 3.

Effect. The yield from the rates in Table 4 are shown in Table 5. The tax table has been designed so that the rates in Column 5 provide a 1.6 percent yield on

TABLE 4

Recommended Experience Rating Schedule

Employer's Rate Class[2]	Fund Reserve Ratio[1] Over 9%	8.01 to 9%	7.01 to 8%	6.01 to 7%	5.01 to 6%	4.01 to 5%	3.01 to 4%	2.01 to 3%	2% or less
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	0.1	0.1	0.2	0.2	0.4	0.8	1.1	1.4	1.7
2	0.2	0.2	0.3	0.3	0.6	1.0	1.3	1.6	1.9
3	0.3	0.3	0.4	0.4	0.8	1.2	1.5	1.8	2.1
4	0.4	0.4	0.5	0.6	1.0	1.4	1.7	2.0	2.3
5	0.5	0.5	0.6	0.8	1.2	1.6	1.9	2.2	2.5
6	0.6	0.6	0.7	1.0	1.4	1.8	2.2	2.5	2.8
7	0.7	0.7	0.8	1.2	1.6	2.0	2.4	2.8	3.1
8	0.8	0.8	1.0	1.4	1.8	2.2	2.6	3.0	3.4
9	0.9	0.9	1.2	1.6	2.0	2.4	2.8	3.2	3.6
10	1.0	1.0	1.4	1.8	2.2	2.6	3.0	3.4	3.8
11	1.1	1.2	1.6	2.0	2.4	2.8	3.2	3.6	4.0
12	1.2	1.4	1.8	2.2	2.6	3.0	3.4	3.8	4.2
13	1.3	1.6	2.0	2.4	2.8	3.2	3.6	4.0	4.4
14	1.4	1.8	2.2	2.6	3.0	3.4	3.8	4.2	4.6
15	1.6	2.0	2.4	2.8	3.2	3.6	4.0	4.4	4.8
16	1.8	2.2	2.6	3.0	3.4	3.8	4.2	4.6	5.0
17	2.0	2.4	2.8	3.2	3.6	4.0	4.4	4.8	5.2
18	2.2	2.6	3.0	3.4	3.8	4.2	4.6	5.0	5.4
19	2.4	2.8	3.2	3.6	4.0	4.4	4.8	5.2	5.7
20	2.6	3.0	3.4	3.8	4.2	4.6	5.0	5.5	6.0
21	2.8	3.2	3.6	4.0	4.4	4.8	5.3	5.8	6.3
22	3.0	3.4	3.8	4.2	4.6	5.0	5.5	6.0	6.5
23	3.2	3.6	4.0	4.4	4.8	5.2	5.7	6.2	6.7
24	3.4	3.8	4.2	4.6	5.0	5.4	5.9	6.4	6.9
25	3.6	4.0	4.4	4.8	5.2	5.6	6.1	6.6	6.9
Basic Rate[3]	3.2	3.2	3.2	3.2	3.2	3.2	3.6	4.0	4.4

[1] Fund as a percentage of taxable wages

[2] See Table 3

[3] Basic rate assigned to employers with less than three years of coverage under the law

total wages. The rates in Columns 6-9 provide higher yields, and the rates in Columns 1-4 produce lower yields. Having nine separate steps in the tax table -- corresponding to the indicated levels of the Fund Reserve Ratio -- with the yields shown, will give the state a tax structure which is sufficiently responsive to prevent future insolvency for benefit cost rates as high as any heretofore encountered by the state.

Rationale. The most important aspect of the proposed rates is the yield (shown in Table 5) which they will provide. The rate paid by any particular experience-rated class of employers is of less consequence to solvency of the Trust Fund, so long as the entire rate structure produces the necessary yield.

The rates in Column 5 increase by increments of two-tenths of one percent, from a minimum of 0.4 to a maximum of 5.2 percent. These rates span a slightly wider range than the rates contained in Column 4 of Table 1 (i.e., the current tax table), where the minimum rate is 0.7 percent and the highest is 4.9 percent. The array system makes it possible to spread out the rates in this way while maintaining the yield.

If the Fund Reserve Ratio on March 31st should fall between four and five percent, the rates in Column 6 would take effect on the following July 1st. These rates are four-tenths of one percent higher than the rates in Column 5. The rates in Columns 7-9 represent average increments of four-tenths of one percent over the rates in each preceding column. However, rates in these columns were calculated on the following basis: employers in the lower rate classes pay only an additional three-tenths of one percent; those in the middle pay an additional four-tenths; and those in the highest classes pay an additional five-tenths of one percent.

TABLE 5

Estimated Yield from the Recommended Tax Structure

	Fund Reserve Ratio[1]								
	Over 9%	8.01 to 9%	7.01 to 8%	6.01 to 7%	5.01 to 6%	4.01 to 5%	3.01 to 4%	2.01 to 3%	2% or less
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Rate of Return on Taxable Wages									
1. Employer Contributions	1.50	1.70	2.00	2.30	2.70	3.10	3.50	3.90	4.30
2. Worker Contributions	.50	.50	.50	.50	.50	.50	.50	.50	.50
3. Total Contributions	2.00	2.20	2.50	2.80	3.20	3.60	4.00	4.40	4.80
Yield on Total Wages									
4. Total Contributions	1.00	1.10	1.25	1.40	1.60	1.80	2.00	2.20	2.40

[1]Fund as a percentage of taxable wages.

In the event the Trust Fund should build up to a point where the Fund Reserve Ratio exceeds six percent, then rates are gradually reduced on all employers down to a minimum of one-tenth of one percent (the lowest amount permitted under federal law). These are the rates shown in Columns 1 - 4.

Looked at on an overall basis, the tax table has been designed to reduce the increments in rates that arise from either changes in an employer's rate class or changes in the Fund Reserve Ratio, while at the same time producing a yield which is adequate to maintain the Trust Fund in a solvent condition. An attempt has been made to reduce the undesirable "shock effect" that arises when an employer receives a major change in his tax rate from one year to the next.

Rate Adjustments and the Level of Reserves

Recommendation. It is recommended that the indicated levels of the Fund Reserve Ratio shown in Table 4 be used to determine which particular rates are to be in effect during any particular fiscal year. The Fund Reserve Ratio shown in Table 4 is defined as "trust fund reserves on March 31st divided by total wages in covered employment during the preceding calendar year." This is the same definition of the Fund Reserve Ratio used in the current law as shown in Table 2.

Effect. The tax structure is designed so that when the benefit cost rate is in the range 1.50 to 1.70, the Fund Reserve Ratio will fluctuate in the range of 5.0 to 6.0 percent of taxable wages, or 2.5 to 3.0 percent of total wages. In terms of previous trust fund reserves held by the State of New Jersey, this range does not represent a high level of reserves. The year-end reserve has exceeded 2.5 percent of total wages every year prior to 1971, and in 33 out of the last 37 years.[3]

A comparison of the yield from the present tax structure and the proposed tax structure -- i.e., a comparison of the last lines of Tables 2 and 5 -- shows that yields in the present tax structure range from 1.14 to 1.92 percent, whereas yields in the proposed tax structure range from 1.00 to 2.40 percent. The yield from the current and proposed tax structures are shown in Figure 3.

Rationale. In conjunction with the yield produced by the rates shown in Columns 6-9 of Table 4, the recommended trigger points provide a margin of safety which is sufficient for the trust fund to remain solvent throughout three consecutive years with benefit cost rates as high as any previously experienced in the State of New Jersey, and indefinitely thereafter.[4]

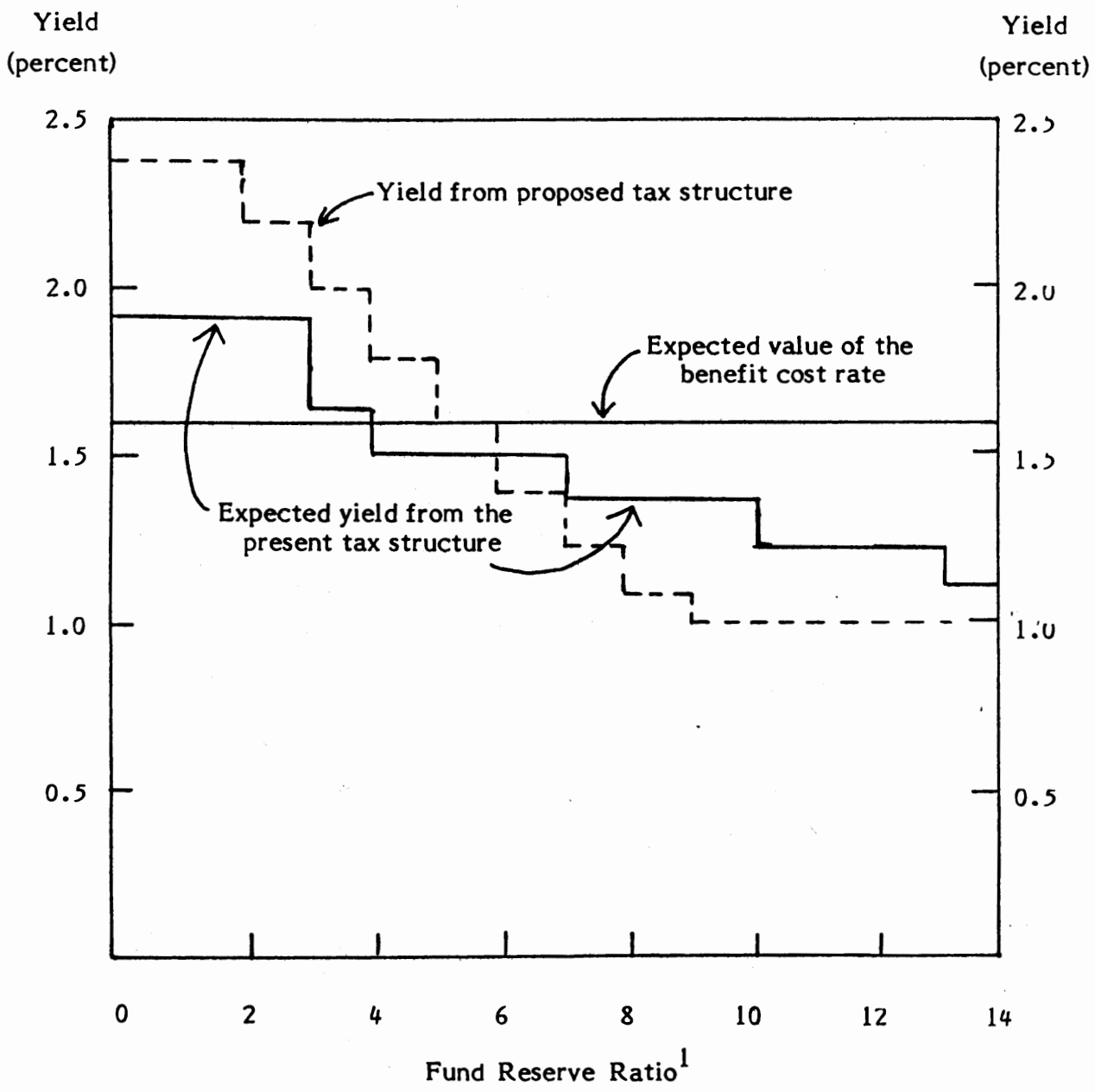
While the proposed tax structure will have no difficulty keeping the trust fund solvent throughout three high-cost years similar to 1957-1959, it is important to realize that should such a sequence of high cost years recur, the fund will remain solvent by a fairly small margin. At their low point, reserves in the trust fund may represent only five to seven months of benefits.

If New Jersey were to encounter a series of unprecedently high cost years the maximum rates might have to become effective. These rates provide an estimated yield of about 2.4 percent on total wages. With this yield the state could, if it had to, sustain on a pay-as-you-go a number of years with cost rates higher than any previously encountered.

The recommended system of rate adjustments has been calculated so as to protect solvency of the trust fund while avoiding unnecessarily large reserves. The following section elaborates on the adequacy of this system of rate adjustments and the trust fund, along with the tradeoffs implicit in this recommendation.

FIGURE 3

Comparison of the Estimated Yield from the Current and Recommended Tax Structures



[1]Trust fund as a percent of taxable wages.

Source: Tables 2 and 5.

Adequacy of the Recommended Tax Structure

The recommended tax structure is designed to be adequate for and responsive to the needs of the State of New Jersey, over both the short and long term. If the recommendations proposed here are adopted, further legislation concerning the unemployment insurance tax structure should not be necessary for some time.

The most important keys to long-term responsiveness are: (1) the retention of a flexible wage base, which will prevent further erosion of the wage base; (2) a tax structure which produces a yield equal to the expected value of the benefit cost rate (1.6 percent) when the trust fund is in an adequate range; and (3) a series of rates over and above these "normal" rates which produce sufficient and adequate yields. New Jersey has already enacted a flexible wage base, and the proposed tax structure will satisfy the other two requirements.

As was indicated in Chapter III, tradeoffs are possible between responsiveness of the surcharge system and the level of trust fund reserves. Such tradeoffs have been made here. It should be clearly understood that the recommended tax structure represents a minimally adequate combination of trust fund reserves and responsive rates. If either greater margins of safety or fewer and smaller year-to-year changes in the tax rates are desired, the Legislature should provide for a higher level of reserves than is recommended here. Finally, if in the future the basic economic structure and unemployment situation in New Jersey undergo a long-term change for the worse, the Legislature might then want to reconsider the financial structure.

Notes to Chapter VI

[1]One implication of this is that if the state should adopt the array system and subsequently, for any reason whatsoever, decide that it wants to abandon the array system and revert to a fixed-rate system, it could do so with no difficulty whatsoever.

[2]If the array system is adopted, but a smaller tax table is preferred, the rate classes proposed in Table 3 can easily be reduced to 20, 13, 10 or any desired number of rate classes.

[3]If the state were to follow the Reserve Multiple Concept as advocated by the Interstate Conference of Employment Security Administrators and the U.S. Unemployment Insurance Service, the level of trust fund reserves under normal conditions would fluctuate between 3.9 and 7.8 percent of total wages, or approximately 8-15 percent of taxable wages. However, this multiple is considered excessive for New Jersey, which on the one hand has a high average cost state and on the other has less variation above this average than many other states. See the Appendix for more details on this subject

[4]See the Appendix for a technical discussion and demonstration of this.

APPENDIX

Adequacy of a State Unemployment Insurance Trust Fund and the Tax Structure Used to Finance the State Unemployment Insurance Program

One of the more important questions concerning financing of an unemployment insurance system is what constitutes an adequate tax structure and trust fund. The major purpose of this technical appendix is to explain the methodology used in this study to determine adequacy of the tax structure and trust fund.

In order to define "adequacy," objectives first need to be stated. The adequacy of any particular tax structure and trust fund can then be measured by the extent to which desired objectives are realized. There exist a number of feasible and reasonable objectives regarding financing of the unemployment insurance system which political decision makers might want to see achieved. To illustrate this point we begin by stating explicitly three alternatives which political decision makers might select.

Each of the following objectives has distinctly different implications for adequacy of the tax structure and trust fund. These threee objectives are intended to be illustrative only, and by no means constitute an exhaustive listing of possible financial objectives. They are selected from a continuum of possible objectives.

A first objective. The combination of contributions and reserves should enable the state to pay all benefits -- i.e., meet all statutory obligations -- that might arise from the highest expected level of insured unemployment and still remain solvent.

This objective encompasses the minimal requirement for fund solvency.[1] It can be achieved by various combinations of a highly responsive tax structure and correspondingly lower reserves, or by a less responsive tax structure and higher reserves. This objective gives the legislature the broadest possible range of options, within the limits imposed by the requirement that solvency be maintained. In other words, this objective places minimal restrictions on combinations of responsiveness of the tax structure and the level of reserves, while maintaining fund solvency. Any combination of tax structure and reserves which will satisfy

this objective will be said to achieve first degree adequacy. In contrast to second and third degree adequacy, which will be defined shortly, first degree adequacy can be satisfied by the lowest level of fund reserves -- provided the tax structure is sufficiently responsive

A different objective. The combination of contributions and trust fund reserves should enable the state to pay all benefits that might arise from the highest expected level of insured unemployment, and remain solvent without having to impose higher unemployment insurance tax rates during a recession or during early stages of the subsequent economic recovery period.[2]

As defined here this objective goes beyond first degree adequacy. Stating that large or rapid changes in the tax rate are undesirable makes it necessary, ceteris paribus, for the state to have higher reserves in order to satisfy this objective. We define a tax structure and reserve level which satisfy this objective as achieving second degree adequacy.

A third possible objective The level of trust fund reserves should enable the state not only to remain solvent while paying all benefits that might arise from the highest expected level of insured unemployment, but also to engage in countercyclical financing. That is, the state would actually lower the unemployment insurance tax during periods of economic recession and high unemployment so that the unemployment insurance financing system will be economically stabilizing, and not act as a financial offset to benefit payments.

To achieve this third possible objective, during recessions (when benefit payments increase automatically) the unemployment insurance tax would actually be lowered in order to ease the impact on employers and stimulate economic expansion. During periods of economic recovery and expansion a correspondingly higher tax rate would be triggered into effect.

Any tax structure and level of reserves which satisfies this objective is defined as achieving third degree adequacy. Clearly third degree adequacy, which would permit tax rates to actually be lowered during recessions while avoiding insolvency, would require the highest reserve levels of all.

The highest expected level of insured unemployment benefits In order to make operational any of the preceding definitions of adequacy, it is first necessary to define what is meant by "the highest expected level of insured unemployment." This subject was discussed at length in Chapter II. On net balance, it would seem

prudent to provide for benefit-cost rates as high as those experienced in the past. More specifically, we propose to adopt as working dicta the following:

* Tax revenues and trust fund reserves together should enable the state to pay all benefits that would arise if the state experienced ten consecutive years of insured unemployment rates as high as previously experienced in any ten consecutive years (for New Jersey this would be the period 1954-1963, when the IUR averaged 5.5 per cent).

* In addition to sustaining a high average benefit cost rate, the tax structure and trust fund should be able to avoid insolvency with as much variation in the benefit cost rate as has been experienced previously in New Jersey.

The objective used in this study. The primary objective used as the basis for the recommendations contained in this study is what was previously defined as first degree adequacy. To be more specific, the recommended tax structure has been designed to avoid insolvency of the trust fund under the most adverse conditions experienced by the state in any ten consecutive years since 1947. Within this restriction, the recommended tax structure has been designed around a relatively low level of reserves and a highly responsive tax structure.[3]

In order for an unemployment insurance system to have reserves adequate for a depression like that experienced during the nineteen thirties -- i.e., general unemployment rates as high as 15 to 20 percent -- extremely large reserves would be necessary. Reserves adequate for such a severe recession are not recommended here.

Third-degree adequacy was rejected as an appropriate objective for state government because measures to stabilize economic activity are primarily the responsibility of the federal government and the Federal Reserve System. Definitions of adequacy which require countercyclical economically stabilizing behavior are appropriate only for federal legislation -- which was beyond the purview of this study.

Second-degree adequacy, while more feasible for state government, was also not adopted for this study. As indicated previously, it is distinctly possible to trade-off a higher level of reserves in return for a more responsive tax structure. We feel that this is a political choice which should be made by the state legislature, not by us. To limit the alternatives and recommendations to those which achieve

second degree adequacy would withhold from the New Jersey Legislature viable choices which it may wish to consider.[4]

Adequacy of the Tax Structure

This section discusses adequacy of the tax structure in terms of yield and responsiveness.

Yield. Our first concern is with the tax rates -- and the yield which these tax rates produce -- when the trust fund is in a range considered adequate. In our view these rates should produce a yield on total wages which is equal to the expected value of the benefit cost rate.

A key part of this definition of adequate yields turns on the "expected value of the benefit cost rate." If the benefit cost rate is viewed as a stochastic variable, then the expected value of the benefit cost rate can be estimated by an unbiased estimator of the true mean of the distribution. However, if the benefit cost rate is viewed as a stochastic time series, then an unbiased estimate of the expected benefit cost rate must reflect any possible trend, as well as the mean value. The expected value of the benefit cost rate plays an important role in assessing adequacy of the tax structure. It is not possible to settle here the many theoretical problems associated with deciding what constitutes the best unbiased estimator of the expected benefit cost rate.[5]

New Jersey's average benefit cost rate for the years 1938-1974 can be calculated either as 1.47 or 1.38. The first figure (1.47) is the sum of total benefits divided by total wages, which is equivalent to a weighted average. A simple arithmetic (i.e., unweighted) average of benefit cost rates gives a long term average of 1.38; from a statistical point of view it is appropriate to use this latter average if each year's benefit cost rate is treated as one observation of an independent random variable. In the case of New Jersey, however, neither a weighted nor an unweighted average represents the best Bayesian estimate of future benefit cost rates. As indicated in Chapter II, New Jersey enacted in 1968 a new benefit law which in practice has the effect of mandating an annual increase in the maximum weekly benefits. The benefits actually in effect prior to 1968 were almost always below what they would have been under the formula adopted in 1968. For this reason, any average incorporating 1937-1967 data will tend to understate

the expected value of the benefit cost rate; i.e. , an upward adjustment of the historical average is indicated. For purposes of this appendix it will be assumed that the expected value of the benefit cost rate is equal to 1.60. Thus, according to the above definition, when the trust fund is in an adequate range an adequate yield will be approximately 1.60 percent of total wages.

In order to complete this definition, one additional operational question must be faced. Namely, in order to estimate the yield from a tax structure, it is necessary to make some assumption about the distribution of taxable wages according to experience rating.[6] The question is: What distribution should be assumed? Since experience rating in New Jersey is based upon each employer's reserve ratio (i.e., each employer's tax rate is directly related to his reserve ratio), the distribution of taxable wages will vary from year to year, based upon experience in prior years. After several years of relatively low insured unemployment and correspondingly low benefit cost rates, many employers will build up the reserves credited to their account and a large percentage of taxable wages will be taxed at the relatively low rates contained in the rate schedule. Conversely, after several years of relatively high insured unemployment and correspondingly high benefit cost rates, the distribution of taxable wages will have shifted towards higher rates. It is recommended that the expected yield be estimated using an "average" distribution of taxable wages.[7]

Responsiveness of the tax structure. In order to prevent insolvency of the Trust Fund, reserves must be replenished in a timely and adequate manner. The rate at which the fund is replenished following depletion due to high benefit payments is defined here as the "responsiveness" of the system. A tax structure which is more responsive to changes in the fund balance will be able to maintain fund solvency with lower reserves than would otherwise be necessary.

Responsiveness is a function of (1) the time lags contained in the tax law and (2) the extent to which increases in the tax rate are triggered into being after a new outflow from the Unemployment Insurance Trust Fund has occurred.

The timing of changes in the tax rate have been taken as given for this study (i.e., it is assumed that the condition of the Trust Fund on any March 31st determines the tax rates applicable to the fiscal year which begins on the

subsequent July 1st) as well as the fact that tax changes, once effected, will continue in effect for the entire fiscal year. Responsiveness thus depends upon the tax structure and the yield from rate adjustments specified in the law.

In order to make the concept of responsiveness more precise, we define here two different measures or indices of responsiveness:

* Maximum responsiveness
* Average responsiveness

Both indices are useful and important in assessing the responsiveness and adequacy of a state's unemployment insurance tax structure.

A maximum responsiveness index. The maximum responsiveness incorporated into a tax structure is defined here as the expected value of the yield from the highest rates contained in the tax structure[8] divided by the highest benefit cost rate experienced by the state since 1947.[9] The maximum responsiveness index of the present and recommended tax structures are as follows:

	E(Yield from highest rate)	Maximum BCR since 1945	Maximum Responsiveness Index
Present tax structure[10]	1.92	2.62	.73
Recommended tax structure	2.40	2.62	.93

To develop a criterion for maximum responsiveness, we posit that the expected value of the yield from the highest schedule of tax rates specified in the law should equal or exceed ninety percent of the highest 12-month benefit cost rate experienced since 1945, which means that the maximum responsiveness index should equal or exceed .90. In the case of New Jersey this means that the expected value of the yield from the highest tax rates should equal or exceed ninety percent of the 1958 benefit cost rate of 2.62; i.e., the yield should equal or exceed 2.36. The practical implications of this criterion is that in the event the state should again encounter such a high-benefit cost rate, continued long-term erosion of the trust fund could set in only if unemployment and benefits continued at that rate for several years.

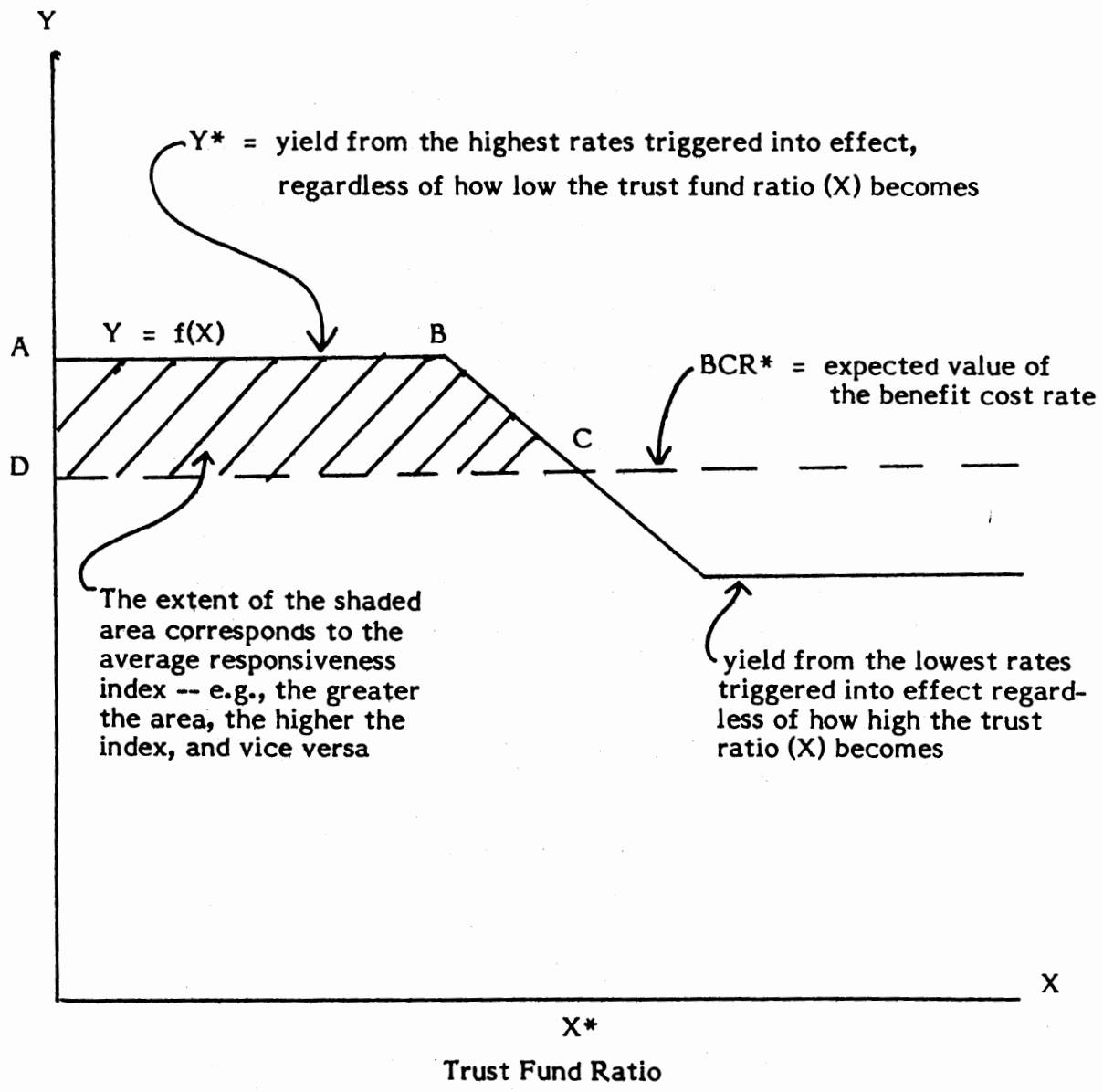
Average responsiveness index. The average responsiveness index is related to the yield from rate adjustments and the value of the trust fund ratio (defined here as the ratio of trust fund to total wages) which is used to trigger in higher rate adjustments. We will first define the average responsiveness index geometrically. In Figure A-1 the expected value of the yield (Y) from various rates contained in the tax structure[11] is plotted against the trust fund ratio (X). In other words, Y is a function of X. In actual practice, Y is a step function of discrete rate adjustments between the maximum and minimum rates. However, to simplify the presentation and definition here, Y has been smoothed and is shown as a continuous single-valued function between the maximum and minimum rates. Superimposed on this is the expected value of the benefit cost rate (line CD). In terms of Figure A-1, the average responsiveness index (ARI) is defined as the area bounded by ABCD[12]. The average responsiveness indices for the present and recommended tax structure are as follows.

	ARI
Present tax structure	.57
Recommended tax structure	1.23

The ARI of the recommended tax structure (1.23)plus the value of the trust fund ratio (X* = 2.5%) when the expected value of the yield is equal to the expected value of the benefit cost rate[13] is equal to 3.73. The recommended tax structure has been designed to maintain first degree adequacy so long as the high benefit cost rate does not exceed 2.62. The sum of the ARI and trust fund ratio divided by 2.62is equal to approximately 1.4. Experience with the New Jersey simulator, as well as the model presented subsequently in thes appendix, indicates that the recommended tax structure will have no trouble achieving first degree adequacy at this multiple. This combined multiple includes, but goes-beyond, the reserve multiple concept. It thus provides a basis for calculating the range within which feasible tradeoffs between responsiveness and the level of reserves (as indicated by the trust fund ratio) can take place. For example, under this approach a tax structure with an ARI of .73 and X* of 3.0 would be about as capable of achieving first degree adequacy as the recommended tax structure.

FIGURE 1

The Expected Value of the Yield (Y) from the Tax Structure as a Function of the Trust Fund Ratio (X)



This combined multiple is lower than the single multiple of 1.5 advocated in the Reserve Multiple Concept. That such a low multiple is adequate for New Jersey is attributable to two important facts: (a) New Jersey has perennially been a high-cost state, and it needs (and historically has had) a relatively high cash flow each year; and (b) New Jersey's high BCRs (2.6, 2.4 and 2.2 percent in 1958, 1946, and 1949, respectively) as a percentage of the expected value of the BCR (i.e., as a percent of 1.6 percent) are not high in comparison to other states. Hence, while the general approach and model used here are applicable to all other states, what constitutes an approrriate combined multiple for a state must be tailored to that state's particular circumstances.

A Model for Determining First Degree Adequacy

This section presents a simplified model for determining whether the unemployment insurance tax structure will meet the objective of first degree adequacy. The model also permits one to make good forecasts of the results of full scale simulation. Finally, this model helps illustrate those all-important tradeoffs which exist between the responsiveness of a tax structure and the level of reserves in the Trust Fund.

The model will first be stated in general terms, after which it will be simplified, quantified and illustrated. The essence of the model is that on every March 31st (or at any other starting point one might care to select) there is an initial fund balance, and that during the course of each year the fund can expect to receive a certain amount of income while statutory benefits are concurrently paid to qualified recipients. Initial reserves plus income equals money available during the period, and the total money available minus benefits paid equals ending fund balance. The essence of the model is thus straightforward. However, because of the number of different variables and time lags in the unemployment insurance financial system, the generalized statement of the model given in the next subsection makes it appear somewhat more complex than it really is.

A general statement of the model. The model is developed in terms of ratios to total wages so as to illustrate the adequacy -- or the inadequacy -- of the crucial points in the trust fund ratio which triggers in higher rate adjustments.[14] Under current New Jersey law rate adjustments are triggered into effect by the

ratio of the trust fund to taxable wages (rather than total wages). However, since the taxable wage base is a specified percentage of the average wage in covered employment, the relationship between total taxable wages and total wages will be more or less constant -- unless or until the state changes the law determining the taxable wage base.

Before presenting the model, we define the following variables:

B = Benefits

C = Contributions

I = Interest income

F = Level of trust fund reserves

M = Total money available to pay benefits

To = Total wages

$A = \frac{M}{To}$ = Availability rate

$G = \frac{F}{To}$ = Trust fund ratio

$BCR = \frac{B}{To}$ = Benefit cost rate

$CR = \frac{C}{To}$ = Contribution rate

In order to achieve first degree adequacy the money available during each month of each year must exceed benefit payments during that month; i.e., the following inequality must be satisfied at all times:

(1) $M > B$

Restating this inequality as a percentage of total wages gives

(2) $A > BCR$

The money available during the course of year t + 1 is given by

(3) $M_{t+1} = F_t + C_{t+1} + I_{t+1}$

where

(4) F_t = Trust fund reserves at the end of t (or the beginning of t+1)

To assess first degree adequacy of a proposed tax structure, we will write out the availability rate in terms of its components. Specifically,

$$(5a) \qquad \frac{M_{t+1}}{To_{t+1}} = \frac{F_t}{To_{t+1}} + \frac{C_{t+1}}{To_{t+1}} + \frac{I_{t+1}}{To_{t+1}}$$

or

$$(5b) \qquad A_{t+1} = \frac{To_t}{To_{t+1}} G_t + \frac{C_{t+1}}{To_{t+1}} + \frac{I_{t+1}}{To_{t+1}}$$

Quantification of the model. For convenience, contributions will be estimated as the sum of four components:

$$(6a) \qquad C = W + X + S \pm E$$

where

- W = Worker contributions
- X = Employer contributions from the rates in effect when the trust fund ratio is in an adequate range (and when the distribution of taxable wages over the experience rating scale is approximately average)
- S = Incremental contributions (in excess of 1.6 percent) triggered into effect by changes in the trust fund ratio
- E = Contributions in excess of or less than X attributable to experience rating -- i.e., changes in the distribution of taxable wages according to reserve ratio classes

or, dividing all terms in (6a) by total wages,

$$(6b) \qquad CR = WR + XR + SR + ER$$

where

$$WR = \frac{W}{To}$$

$$XR = \frac{X}{To}$$

$$SR = \frac{S}{To}$$

$$ER = \frac{E}{To}$$

Each one-year period will be assumed to run from April 1st of one year to March 31st of the next. Under New Jersey law determination of whether a new rate is to be imposed depends upon the value of the trust fund ratio as of March 31st. However, there is a time lag between the date of determination (March 31st), the date of imposition (July 1st), and the first collections attributable to the new rate (October). Consequently, during a 12-month period running from April 1st of one year to March 31st of the next, contributions attributable to rate adjustments will be a function of the rates that were in effect during the previous year as well as any change in rates called for by the trust fund ratio on March 31st and triggered into effect on the following July 1st.

In terms of New Jersey experience, the quarterly distribution of tax receipts during calendar years 1973 and 1974 was 10 percent in the first quarter, 47 percent in the second, 28 percent in the third and 15 percent in the fourth. Because of the aforementioned lag, receipts during the second and third quarters of the calendar year reflect the tax rates in effect during the first two quarters of the year. Thus the contribution rate during t+1 can be estimated as follows:[15]

$$(7) \qquad CR_{t+1} = WR_{t+1} + XR_{t+1} + .75SR_{t} + .25SR_{t+1} + ER_{t+1}$$

The contribution rate attributable to employees and to the normal rates on employers will by definition be constant, with any variations attributable to experience rating distributions reflected in the last term of (7).

Any rate adjustment that is triggered into effect depends upon the previous trust fund ratio; hence the third and fourth items on the right-hand side of (7) can be stated as:

$$(8) \qquad SR_{t} = f_1(G_{t-1})$$

$$(9) \qquad SR_{t+1} = f_2(G_{t})$$

If the tax structure incorporates the array system, the last term in (7), ER, can be assumed to equal zero. Otherwise, since New Jersey uses a reserve ratio formula, it will be a function of the cumulative experience of the state's employers.

Interest income, I, the last item in (3) and (5), depends upon the average daily trust fund balance throughout the period -- which will be related to the initial

trust fund balance -- and the prevailing rate of interst (r). If we use the initial fund balance as a proxy variable for the average daily trust fund balance, then

$$(10) \qquad I_{t+1} = (F_t)r_{t+1}$$

and

$$(11) \qquad \frac{I_{t+1}}{To_{t+1}} = \frac{To_t}{To_{t+1}}(G_t)r_{t+1}$$

Substituting (8) and (9) into (7), and (7) and (11) into (5b) gives the following expression for the availability rate:

$$(12) \qquad A_{t+1} = \frac{To_t}{To_{t+1}} G_t + WR_{t+1} + XR_{t+1} + .75f_1(G_{t-1}) + .25f_2(G_t) + \frac{To_t}{To_{t+1}}(G_t)(r_{t+1}) + ER_{t+1}$$

We now turn to simplifying this rather lengthy equation. Combining the first and sixth terms on the right-hand side of (12) gives the following expression as the coefficient of G_t.

$$(13) \qquad \frac{To_t}{To_{t+1}}(1 + r_{t+1})$$

We can estimate total wages in $t + 1$ as a function of total wages in the preceding period; i.e.,

$$(14) \qquad To_{t+1} = (1 + \alpha)To_t$$

where α is the long term growth rate of total wages. Substituting (14) into (13) then gives the following expression as the coefficient of G_t in equation (12):

$$\frac{1 + r_{t+1}}{1 + \alpha}$$

In the past the long term growth rate of total wages has been about six to eight percent, depending on the base period chosen. Thus α would normally normally range between 1.06 and 1.08.

During the 1950's the rate of interest earned on trust reserves was only two or three percent per year. Recently, however, interest income has climbed to

around five percent and with short term Treasury notes at times yielding as high as nine percent, it appears that interest income over the foreseeable future will equal or exceed five percent. Thus as an approximation and simplification, the coefficient of G_t in (12) can be treated as equal to one. Using this approximation simplifies (12) to:

$$(15) \qquad A_{t+1} = G_t + WR_{t+1} + XR_{t+1} + .75f_1(G_{t-1}) + .25f_2(G_t) + ER_{t+1}$$

We will assume that the sum of employee contributions plus the normal rates on employers yield a fixed 1.6 percent of total wages -- that is: WR + XR = 1.6 -- and we will ignore fluctuations in the yield from the normal rate attributable to the experience rating factor, ER. Equation (15) then simplifies further to

$$(16) \qquad A_{t+1} = G_t + 1.6 + .75_1(G_{t-1}) + .25_2(G_t)$$

Equation (16) now states that the availability rate during year t + 1 is equal to (1) the trust fund ratio at the end of period t or the beginning of t+1 plus (2) the 1.6 percent that can be anticipated from workers and the normal rates imposed on employers, plus or minus (3) the change in contributions attributable to any rate adjustments triggered into effect by the trust fund ratio during t or t+1.

We estimate the last term in (16) -- $f_2(G)_t$ -- as follows. New Jersey's tax structure incorporates a flexible wage base equal to approximately fifty-four percent of the average annual wage in covered employment two years prior to the current year. This will result in taxable wages which are approximately fifty percent of current total wages in covered employment.

Hence an across-the-board tax increase of four-tenths of one percent on taxable wages will yield approximately two-tenths of one percent on total wages (it will be recalled that under existing New Jersey law and the recommended tax structure all employers pay the full amount of any rate adjustment). For the recommended tax structure the function $f_2(G_t)$ is calculated in Table A-1, where the contributions attributable to rate adjustments triggered into effect during t + 1 is only 25 percent of the amount which will be collected over the entire twelve month period during which the rates are in effect.

TABLE A-1

Relationship Between the Initial Trust Fund Ratio (G_t) and the Yield from Rate Adjustments Triggered by G_t

(1) If G_t is	(2) The effective incremental yield over 1.6 percent will equal	(3)* and one-fourth of this will equal $.25\ f_2(G_t)$
2.51 - 3.00	-0-	-0-
2.01 - 2.50	.20	.05
1.51 - 2.00	.40	.10
1.01 - 1.50	.60	.15
1.0 or less	.80	.20

*Column (3) is the fourth term in the right-hand side of equation (16).

In order to finish quantifying (16), we need to determine what can be said about the term

$$(17) \qquad f_1(G_{t-1}) = SR_t$$

It can be shown that

$$(18) \qquad G_{t-1} = G_t + BCR_t - CR_t$$

which means that SR_t is a function of G_t and the net drawdown rate.[16] Quantifying SR_t as a function of G_t will enable us to state the availability rate in t+1 (A_{t+1}) as a function of G_t, which in turn will allow us to assess the adequacy of the crucial trigger points in the trust fund ratio.

If one is given only the value of the trust fund ratio as of March 31st of one year, it is not possible to state with certainty what rate adjustment -- if any -- was in effect during the preceding period. At the same time, it is possible to make some meaningful inferences about S_t given G_t. It is clear, for example, that for low values of G_t the term S_t is greater than zero -- and it could be substantially higher than zero.

To illustrate, suppose that as of March 31st the trust fund ratio has declined to the rather low level of 0.4. New Jersey's benefit cost rate in 1958 was 2.6, and if the recommended tax structure had been in effect at that time, then, since the rates in effect during the prior year would have provided at least a 1.6 percent yield, the net drawdown rate that year would have been 1.0. Thus the maximum expected net drawdown rate under the recommended tax structure is 1.0 percent.[17] More specifically, a trust fund ratio of 0.4 in one year implies that the trust fund ratio during the preceding year was not more than 1.4. Referring to the recommended tax structure shown in the text, this in turn means that the rates shown in column 8 must have been in effect. These rates provide a total yield (including worker contributions) of 2.2 percent.

Using this approach, we can estimate the <u>minimum</u> rate adjustment which would have been in effect during the preceding period if the fund balance on March 31st is below 1.1. These calculations are shown in Table A-2.

For any given initial fund balance we can now estimate the <u>minimum</u> availability rate as stated in (16). This calculation is shown in Table A-3. The dynamics of the recommended tax structure will be illustrated in the following section.

TABLE A-2

Estimation of $f_1(G_{t-1})$: the Minimum
Yield from Prior Rates Given an Initial Trust Fund Ratio (G_t)*

(1)	(2)	(3)	(4)**
If G_t is	Then the highest rates in effect during t are those shown in the following column of Table 4	And the minimum additional yield from the rates in effect during t was	And three-fourths of this equals
1.01 - 1.50	5	0.2	.15
.51 - 1.00	6	0.4	.30
.00 - 0.50	7	0.6	.45

*Calculation of this minimum yield assumes that the maximum net drawdown rate will be 1.0 percent.

**This column gives the minimum value of the third term in the right-hand side of equation (16).

TABLE A-3

Minimum Availability Rate Given the Initial Trust Fund Ratio (G_t)

G_t	WR + XR	Minimum[1] $.75f_1(G_{t-1})$	$.25f_2(G_t)^2$	Minimum[3] A_{t+1}
(1)	(2)	(3)	(4)	(5)
2.51 - 3.00	1.60	-0-	-0-	4.11
2.01 - 2.50	1.60	-0-	.05	3.66
1.51 - 2.00	1.60	-0-	.10	3.21
1.01 - 1.50	1.60	.15	.15	2.98
0.51 - 1.00	1.60	.30	.20	2.61
0 - 0.50	1.60	.45	.20	2.25

[1]See Table A-2.

[2]See Table A-1.

[3]This column is the sum of the lowest vaule of G_t shown in column (1), plus columns (2), (3) and (4), which are all the terms shown in the right-hand side of equation (16).

We emphasize that this is the minimum availability rate. It is important to recognize that if the trust fund ratio of March 31st is in a low range then there exists a rather high probability that rates with a higher yield than that indicated in Table A-2 would have been in effect in the preceding period. We are dealing essentially with a case of conditional probabilities -- namely, the probability that one high cost year will be followed by a second high cost year.[1] Historic benefit cost rates for New Jersey are shown in Figure A-2. It can be observed from this figure that in four different years the benefit cost rate exceeded 2.0 percent, but at no time did the benefit cost rate remain on a relatively high plateau for more than one year. Thus the probability of two consecutive high cost years appears low.

Testing the Model for the Period 1957-1959

As indicated previously, we will illustrate use of the model and test the recommended tax structure by inquiring what would happen if there were a recurrence of the three highest consecutive benefit-cost years ever experienced by the State of New Jersey. The three consecutive years exhibiting the highest benefit cost rates were 1957-1959. In those years the benefit cost rates were 1.6, 2.6, and 1.7 percent, respectively. We will assume that the BCR in 1957 was slightly higher: namely 1.7 percent. The consequences of this sequence of benefit cost rates are worked out in the first column of Table A-4.

The second and third columns of Table A-4 go through a similar exercise using the other possible permutations of these benefit cost rates. In column two the sequence of benefit cost rates is assumed to be 2.6, 1.7, and 1.7; and in column three the sequence of benefit cost rates is 1.7, 1.7 and 2.6. Table A-4 thus displays the experience of 1957-1959 in all possible sequences, including the one which actually occurred.

These three examples all begin by assuming that on March 31st the rates shown in column 4 of Table A-4 are currently in effect and the ratio of reserves to total wages, (G_{t-1}) is just equal to 2.51 (line 1). Under the recommended tax structure this level of reserves will be just sufficient to prevent any higher tax rate from taking effect during the subsequent tax year which begins on July 1st.

Because it is assumed that the rates shown in Column 5 of Table 4 are in effect during the first year (4/1/t to 3/31/t+1), the yield or total contribution rate

FIGURE A-2

Benefit Cost Rates in New Jersey

(Benefits to Total Wages)

1939 -- 1974

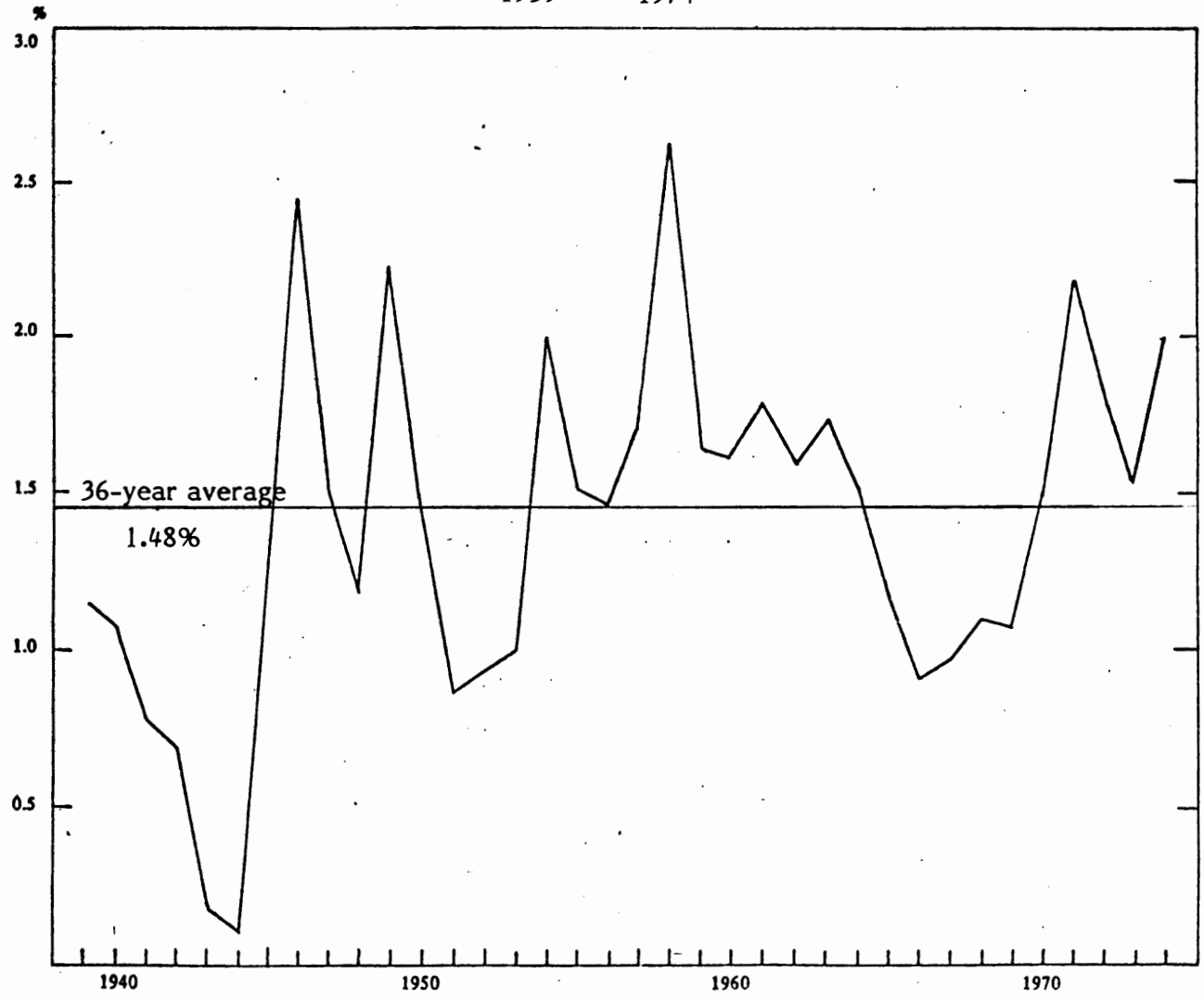


TABLE A-4

Adequacy of the Recommended Tax Structure When Subjected to Three Consecutive High Benefit Cost Years

Time Period	Step		(1)	(2)	(3)
t	1.	G_{t-1}	2.51	2.51	2.51
	2.	$WR_t + XR_t$	+ 1.60	+ 1.60	+ 1.60
	3.	A_t	4.11	4.11	4.11
	4.	BCR_t	- 1.70	- 2.60	- 1.70
	5.	G_t	2.41	1.51	2.41
t+1	6.	$WR_{t+1} + XR_{t+1}$	+ 1.60	+ 1.60	+ 1.60
	7.	$.75SR_t$	--	--	--
	8.	$.25SR_{t+1}$	+ .05	+ .10	+ .05
	9.	A_{t+1}	4.06	3.21	4.06
	10.	BCR_{t+1}	- 2.60	- 1.70	- 1.70
	11.	G_{t+1}	1.46	1.51	2.36
t+2	12.	$WR_{t+2} + XR_{t+2}$	+ 1.60	+ 1.60	+ 1.60
	13.	$.75SR_{t+1}$	+ .15	+ .30	+ .15
	14.	$.25SR_{t+2}$	+ .15	+ .10	+ .05
	15.	A_{t+2}	3.36	3.51	4.16
	16.	BCR_{t+2}	- 1.70	- 1.70	- 2.60
	17.	G_{t+2}	1.66	1.81	1.56
t+3	18.	$WR_{t+3} + XR_{t+3}$	+ 1.60	+ 1.60	+ 1.60
	19.	$.75SR_{t+2}$	+ .45	+ .30	+ .15
	20.	$.25SR_{t+3}$	+ .10	+ .10	+ .10
	21.	A_{t+3}	3.81	3.81	3.41

(WR + XR) is equal to 1.6 percent of total wages in covered employment (line 2).

The initial reserve ratio (G_{t+1}) plus the contribution rate ($WR + XR_t$) is equal to the availability rate (A_t), shown on line 3. In time period t the availability rate is equal to 4.11 percent for all three cases.

The benefit cost rate (BCR_t) shown on line 4 is then subtracted from the availability rate (A_t) to give the ending reserve ratio (G_t), shown on line 5.

This sequence of calculations is then repeated for period (t+1), except that the next iteration takes account of the rates which are triggered into effect by the reserve ratio G_t. The incremental yield from the higher rates (SR), is shown on lines 7 and 8. Receipts during the second and third quarters (line 7) reflect the fact that the normal rates were in effect at the time G_{t+1} was calculated. In calculating the yield, it has been assumed throughout that a flexible wage base of fifty-five percent of the average weekly wage in covered employment would result in taxable wages which are equal to fifty percent of total wages in covered employment.

The condition of the trust fund at the end of the second period, t+1, as reflected by the trust fund ratio (G_{t+1}), is shown on line 11.

This entire sequence of calculations is then repeated for period t+2 (on lines 12-16), and the condition of the trust fund at the end of the third year (t+2) is shown on line 17.

Analysis. In the example depicting the sequence of benefit cost rates which actually occurred (column 1), the lowest trust fund ratio is $G_{t+1} = 1.46$. This means that on March 31st of t+1, looking back over the immediately preceding 12 months, the fund has paid benefits equal to 2.6 percent of total wages, and it still has 1.46 percent of total wages remaining in the trust fund. This means that on March 31st the fund has slightly over six months of reserves at the high payout rate just experienced during the preceding twelve months.

More importantly, during the succeeding 12 months the trust fund can in fact look forward to contributions which will amount to 1.0 percent of total wages. With reserves of 1.46 percent, the fund will have enough money available to weather, if it had to, still another year like 1958. In other words, if during the third year the benefit cost rate remained at 2.6 percent (which did not occur in 1959), all benefits could be paid with no fear whatsoever that the fund might

become insolvent. With a 1.7 percent benefit cost rate during the third year, the level of trust fund reserves will actually rise slightly while paying all benefits.

To conclude, the recommended tax structure is highly responsive, but with a lag. The calculations on lines 18-21, which show the availability rate during t+3, illustrate the effect of this lagged responsiveness. Under the actual case shown in column (1), for example, the availability rate is actually almost as high -- after the three highest cost years on record -- than it was assumed to be at the very beginning. If the benefit cost rate were to drop to its expected long-term average of 1.6 percent, the fund would quickly be restored and normal or less than normal rates would prevail.

Under the variations shown in columns (2) and (3), we observe that at its low point the trust fund goes no lower than in the "actual" sequence. Thus for these two variations in the sequence of high benefit cost rates, it is seen that the recommended tax structure also meets the solvency criterion which we established for first degree adequacy.

These examples illustrate the tradeoffs which exist between (i) initial fund balance, (ii) yield from the basic rates, and (iii) responsiveness of the tax structure. Had the yield from the rates been less, then clearly a higher initial fund balance would have been necessary in order to prevent insolvency of the trust fund. Conversely, had the initial fund balance been higher, lower rates could have been triggered into effect without subjecting the trust fund to the immediate threat of insolvency.

Notes to Appendix

[1]Maintenance of fund solvency is explicitly assumed as the minimum desirable objective throughout this appendix.

[2]In practice this objective can be further refined alone the following lines; e.g., avoid imposition of higher taxes during a recession that lasts not more than 12 months and in which the insured unemployment rate (IUR) does not exceed, say, the average IUR during the last three recessions. As stated above, these objectives are illustrative only.

[3]If the Legisture desires, it can of course opt for higher reserves and correspondingly higher margins of safety than these recommended here.

[4]The present tax structure and trust fund do not even meet the test of first degree adequacy; see Chapter IV, and the last section of this appendix for more details.

[5]One could also view the benefit cost rate as a dependent function of several independent variables, such as the insured unemployment rate, maximum weekly benefit amount, average duration, qualifying period, dependency allowances, etc. (i.e., a single equation model consisting of a multiple regression analysis). In this case the expected value of the dependent variable would depend upon the expected value of the independent variables. Alternatively, since the benefit cost rate is defined as the ratio of benefits divided by total wages in covered employment, one could set up a multiple equation model for predicting separately the expected value of benefits and covered wages (i.e., one equation for each dependent variable), and from such model derive the expected value of the benefit cost rate.

[6]If the tax structure were to be based upon an array system, then in each year the expected value of the yield could be calibrated to be almost exactly equal to any specified target amount, and it would not be necessary to worry about the distribution of taxable wages.

[7]In New Jersey the average IUR for the years 1947-1974 is 4.7 percent. An average distribution of taxable wages could be expected in the year following three to five years during which the IUR averaged 4.7 percent.

[8]This is the expected value of the yield for the full twelve months during which the higher rates are in effect.

[9] When the taxable wage base is fixed (as it is in some states, but not in New Jersey) the maximum responsiveness index falls with a decline in the ratio of taxable to total wages.

[10]See Table 3 in Chapter IV.

[11]This is the expected value of the yield for the full twelve months during which the rates are in effect.

[12]If the expected value of the benefit cost rate is defined as BCR*, and the maximum yield from the highest rates in the tax table is Y*, then

$$ARI = \int_{BCR^*}^{Y^*} Y \, dY$$

Alternatively, if X* is the value of the trust fund ratio when BCR* = Y, then

$$ARI = \int_{0}^{X^*} f(X) \, dX - (BCR^*)(X^*)$$

[13]In the recommended tax structure the expected value of the yield from the normal rates is set equal to the expected value of the benefit cost rate. Hence in the recommended tax structure the trigger point in the trust fund ratio at which the first positive rate adjustment becomes effective is the value of f(BCR*).

[14]By way of comparison, the ARI of the resent tax structure is .57, and X* is 2.00. The sum of these two is 2.57, and this sum divided by the high BCR (2.6 Percent) gives a combined multiple of only 1.0.