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ABSTRACT

Legislated and administrative changes in the unemployment insurance system during the 1980s probably reduced the program's detrimental effects on labor market efficiency. They did so without changing the nature of the federal-state relationship that makes the program so unusual. Regrettably, though, they hurt the labor market status of low-wage workers by greatly increasing the negative impact of unemployment insurance taxes on the demand for their labor. This inequitable and socially dangerous side effect of an otherwise desirable idea can be reversed if the following policy changes are adopted: (1) increase the Federal Unemployment Tax Act tax base in any year to equal the national average annual wage 2 years earlier; (2) increase maximum state unemployment insurance tax rates if the preceding proposed change is adopted; (3) require that minimum state unemployment insurance tax rates be zero; (4) require interest charges and payments on employers' accounts; (5) require states to limit noncharged benefits to a small fraction of total benefits; and (6) provide more federal assistance to states that institute short-time compensation and otherwise encourage such programs through the Federal Unemployment Tax Act in order to induce employers to rely more on work-sharing and less on layoffs. The adoptions of these policy changes would, in addition, provide employers with increased incentives to spread work around rather than lay off employees, resulting in smaller employment fluctuations and a lower unemployment rate. (The document contains 8 tables and 49 references.) (CML)

17. UNEMPLOYMENT INSURANCE FINANCING, SHORT-TIME COMPENSATION, AND LABOR DEMAND

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The fifty-four year-old U.S. unemployment insurance (UI) program is a set of 53 separate programs loosely linked by Federal requirements imposed through the tax structure that finances benefits and their administration. Unlike UI programs in nearly all other industrialized countries, benefits in the U.S. are almost entirely financed by taxes on employers, and those taxes are partly experience rated --- taxes paid increase as benefits received by the employer's workers increase (see Edebalk-Wadensjö, 1986, and Chinloy, 1980). Since the mid-1970s knowledge of the likely impacts of those taxes on labor markets has burgeoned. It is thus especially timely to consider the effects of recent subtle, but sometimes major changes in the structure of UI taxes. This study presents a capsule summary of how UI is financed; demonstrates how UI financing can affect the structure of employment, employment fluctuations and the demand for workers and hours; and discusses various policy proposals.

I. The Unemployment Insurance Tax System

The general outline of UI financing in the United States is simple. Almost all UI benefits are financed by taxes on employers. Employers pay a small amount to the federal government to cover administrative and other costs. Employers' state UI tax liabilities can increase as more benefits have been paid to their laid-off workers and

more benefits have been paid statewide compared to the state UI system's tax revenues.

An employer's state UI account can be thought of as a bathtub, with benefits running out of the tub and taxes pouring in. The rate of flow into the tub depends on how fast the water (benefit payments) flows out of the tub and on the water (tax) pressure statewide, which is higher when all tubs are low on water (funds). In some employers' tubs the benefits flow out so fast, and the spigot of taxes they must pay is relatively narrow, that the tub is always empty. At the opposite extreme, some other companies find that benefits flow out so slowly that the spigot of their taxes allows a sufficient inflow of taxes to keep the tub always full.

The details of financing are as follows. Under the Federal Unemployment Tax Act (FUTA) employers are liable to a tax of 6.2 percent on the wages of each employee, up to a ceiling (tax base) of $7000 per worker. Wages above this amount are not subject to federal tax. So long as the state UI tax system that finances benefits is constructed so that it is possible for an employer to pay at least a 5.4 percent tax rate, 5.4 percentage points of the FUTA tax is credited to that state's employers. The remaining 0.8 percentage points of the tax are retained by the federal government for use as grants to states for program administration, payment of long-term benefits, and loans to state UI systems.

Total FUTA tax collections (the 0.8 percentage points) in 1987 were $6.1 billion; but total state UI taxes in that year were $19.1 billion. While the FUTA tax is small, its impact on total UI taxes need

not be. The reason is that the FUTA tax is the main lever used in federal legislation to influence state UI tax policy.

To qualify for the 5.4 percentage-point credit on the FUTA tax, all states have adopted systems of at least partial experience rating. Over half of all employees are in states where experience rating is based on the reserve ratio, the excess of the employer's prior taxes minus prior benefits relative to the company's taxable wages (Topel, 1985). One-fourth are in states where experience rating is based on recent, usually three-year averages of the benefit ratio, benefits paid relative to taxable wages. These ratios essentially measure how well funded the employer's UI account is.

In the reserve-ratio system the typical tax structure can be described by Schedule A in Figure 1 (based on Brechling, 1981). (In a benefit-ratio state the benefit ratio would be on the horizontal axis.) The tax rate cannot drop below a legislated minimum t_{min}, which is often zero in some states, even if reserves rise above some maximum reserve ratio, R^*. As the company's reserve-ratio drops, its tax rate rises in steps until it hits t_{max}, the highest tax rate on employers with positive reserves (positive balances). In some states an extra tax on negative-balance employers --- those whose reserve accounts are in deficit --- makes the highest tax rate t_{neg}.

Schedule A in Figure 1 is not permanent. An employer's tax rate also depends on the experience of the entire state UI fund. If the state fund is low --- it has been paying out more than it has recently taken in --- a higher tax schedule is imposed statewide. There is some least favorable schedule, Schedule B in Figure 1, that relates a firm's

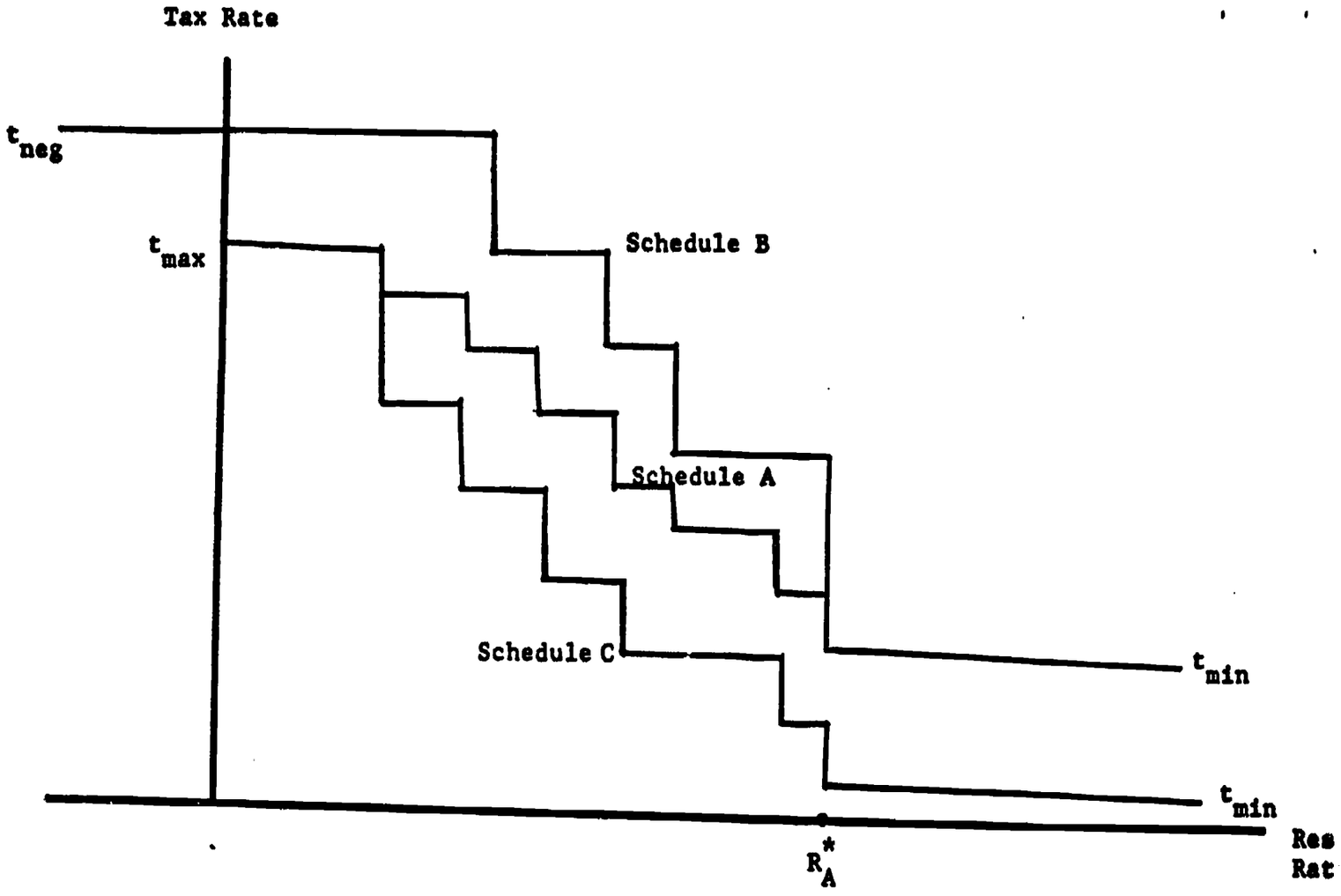

Figure 1. UI Tax Schedules, Tax Rates and the Company's Reserve Ratio

NOTE: t_{neg} = Tax rate on negative-balance employers.

t_{max} = Maximum tax rate on positive-balance employers

t_{min} = Minimum tax rate

tax rate to its reserve ratio when the state fund is weakest. Obversely, if the state fund has been bringing in more taxes than have been paid out in benefits, lower schedules are imposed. There is some most favorable schedule, Schedule C, that employers face if the state fund is very flush. Notice that t_{min}, t_{max} and t_{neg} can differ along the various schedules (though few states have both different minimum and maximum tax rates on their most and least favorable schedules).

A company whose reserve ratio is above R^* when the state is on Schedule A cannot reduce its tax rate below the t_{min} now paid; and if the state were already on its most favorable schedule, the tax rate could never be reduced. Unless $t_{min} = 0$, these bounds on taxes mean that additional benefit payments will not raise the employer's tax bill; and lower benefit payments may not lower the tax bill. Additional benefits paid by an employer with a negative balance cannot raise the tax on a given schedule; and if the state is already on its least favorable schedule, those benefits cannot raise taxes in the future if the employer continues to pay very high UI benefits. Also, negative-balance employers do not accrue any interest charges; and positive-balance employers are not credited with interest. The absence of interest charges means that other employers essentially provide interest-free loans out of their tax payments to finance benefits for employees of negative-balance firms.

State governments have made decisions that some noncharged benefits --- those paid to voluntary quitters and selected other categories of recipients --- will not be financed by taxes on the employer from whose company the worker was separated. The limits on tax

rates, the absence of interest credits to employers with positive balances and interest charges on those with negative balances, and the noncharging of some benefits mean that for some UI benefit payments the experience rating of taxes is ineffective. All of these considerations imply that experience rating is incomplete --- a firm's annual tax liability does not fully reflect the actuarial present value of the benefits paid to its employees. The UI tax is only partly experience rated.

Over a period of time taxes statewide must equal total payments of regular benefits; state UI systems must be self-financing. This consideration and the existence of noncharged and ineffectively charged benefits mean that the typical employer's UI tax liability is partly fixed per worker, partly increasing with past benefit payments. The typical employer's UI tax bill is:

$$eB + T ,$$

where B is total benefits paid to the firm's workers, T is a fixed amount that is large enough to keep the state fund in balance over a period of years, and e measures the effectiveness of experience rating --- how many cents each extra dollar of benefits costs the typical employer (Feldstein, 1976). The measure e is crucial in analyzing many of the effects of UI on labor markets. If e were one, experience rating would be complete; if it were zero, the UI tax would be independent of the firm's experience.

Table 1 presents information on the tax-rate structures of the ten largest states for which comparable data are available for 1978 and 1988.[1] For each of the two years the table presents t_{max} and t_{min} on the

most favorable schedule (the lowest range of tax rates facing each employer) and on the least favorable schedule (the highest range of tax rates). The tremendous diversity in the states' tax structures is made clear by these data and those in Appendix Table 1. Interstate differences in the structure of tax rates can cause the effectiveness of experience rating to differ sharply among states.

Even more noticeable in Table 1 are the sharp increases in each state in the range of rates between 1978 and 1988. The reason for the changes is clear: The Tax Equity and Fiscal Responsibility Act of 1982 (TEFRA) raised the creditable part of the FUTA tax rate from 2.7 percent to its current 5.4 percent effective in 1985. This federally-imposed change meant that the potential for more complete experience rating has been much greater since 1985. Indeed, 8 states now have t_{max} above 7 percent on their most favorable (lowest) schedules, and 16 have this on their least favorable (highest) schedules. Moreover, many states have chosen to lower t_{min}; 12 states now have a t_{min} of zero on their most favorable schedule.

Along with the major changes in tax-rate policy in the 1980s have come important though less obvious changes in policy regarding the tax base. The tax base under FUTA was raised from $4200 to $6000 in 1978, and to $7000 in 1983. As Table 2 and Appendix Table 2 show, an increasing number of states set the tax base above the federal minimum. State UI taxes are now applied to a tax base that exceeds $7000 in 37 of the 51 major jurisdictions (states and the District of Columbia). This has not prevented increases in taxable wages from driving the ratio of the base to the average annual wage (AAW) to the lowest it has been

TABLE 1

State UI Tax Schedules, 1978 and 1988

	YEAR							
	1978				1988			
	Most Favorable		Least Favorable		Most Favorable		Least Favorable	
STATE	T_{min}	T_{max}	T_{min}	T_{max}	T_{min}	T_{max}	T_{min}	T_{max}
California	0.00	3.30	0.40	3.90	0.30	5.40	1.30	5.40
Illinois	0.10	4.00	0.10	4.00	0.20	6.70	0.20	6.70
Indiana	0.02	2.80	2.70	3.30	0.02	5.40	1.30	5.40
Massachusetts	0.40	4.20	2.20	6.00	1.20	5.40	3.00	7.20
Michigan	0.30	6.90	0.30	6.90	0.00	8.00	1.00	10.00
New Jersey	0.40	4.30	1.20	6.20	0.30	5.40	1.20	7.00
New York	0.30	3.00	4.30	5.20	0.00	5.40	2.10	6.40
North Carolina	0.10	5.70	0.10	5.70	0.01	5.70	0.01	5.70
Ohio	0.00	3.60	0.60	4.30	0.00	5.20	0.30	7.30
Texas	0.10	4.00	0.10	4.80	0.00	6.00	0.00	6.00

SOURCE: Comparison of State UI Laws, August 1978, September 1988.

TABLE 2

The UI Tax Base, 1978 and 1988

STATE	Base 1978	Base AAW 1978	Base 1988	Base AAW 1988
California	$6,000	.475	$7,000	.312
Florida	6,000	.579	7,000	.393
Illinois	6,000	.445	9,000	.403
Massachusetts	6,000	.515	7,000	.331
Michigan	6,000	.399	9,500	.394
New Jersey	6,200	.476	12,000	.525
New York	6,000	.445	7,000	.292
Ohio	6,000	.451	8,000	.377
Pennsylvania	6,000	.493	8,000	.401
Texas	6,000	.500	8,000	.377
ALL STATES	6,190	.513	8,535	.417

NOTE: AAW = Average annual wage.

since the program's inception.[2] Federal policy has consciously widened the range of experience-rated tax rates; it has unconsciously reduced the fraction of wages to which those rates apply.

II. Effects of UI Taxes on the Labor Market

The labor-market impact of UI taxes stems from two sources: 1) The incompleteness of experience rating --- that is, $\underline{e} < 1$; and 2) The limit on the tax base to an amount far less than the wage earned by most workers. The effects are felt in three broad areas: 1) The kinds and sizes of different industries; 2) The extent of employment fluctuations in an industry; and 3) The types of workers, their wages and the length of their workweeks.

A. Effects on Employment Structure

The incompleteness of experience rating causes taxes to exceed benefit payments in some firms and fall short in others. These differences are not random. In 1978, for example, agriculture-forestry-fisheries generated far more benefit payments than taxes in the 11 states examined by Becker (1981, Table 8). Construction generated more benefits than taxes in 10 of the 11 states, and mining did so in 9 of the 11. Incomplete experience rating produced the opposite result in several other major industries. In all 11 states typical employers in finance-insurance-real estate paid taxes that exceeded the benefits received by their workers. This was true in 10 of the 11 states in the transportation-communications-utilities industries, and in 9 of 11 in services and wholesale-retail trade. These systematic differences exist both within particular states and in the entire nation (see Munts-Asher,

1980). They were present in data covering a variety of states in the 1960s. Data for New Jersey in the mid-1970s show that a company paying t_{max} in one year is very likely to be paying that highest tax in succeeding years: The same employers consistently take more from the UI system than they put in (Marks, 1984). All these phenomena probably still exist, though the widening of tax rates in the mid-1980s almost certainly reduced the extent of the differences among industries. They represent a cross-subsidy from those industries that pay taxes that exceed benefits to those where benefits paid fall short of taxes.

This subsidy lowers the cost of doing business in the subsidized industry. Because of it, employers could hire workers on more favorable terms, as workers are attracted to an industry that can offer them UI benefits financed by other employers; they could sell their products more cheaply, and/or they could make higher profits. Unless the entire impact comes in the form of higher profits, the subsidy raises output and employment in the subsidized industries above they would otherwise be, and reduces them in the industries that are paying the subsidy.

Consider the typical firm in a subsidized industry. Its demand for labor is shown by the downward-sloping demand curve D_0 in Figure 2. If the entire effect of the subsidy is on wages, so that the wage falls from W_0 to W_1, Figure 2 shows that employment in good times in the subsidized industry would expand from N_0 to N'_0, as employers move down their demand curve D_0. (If the effect were instead wholly on product prices, the same increase in employment would have occurred. The lower price would have caused D_0 to shift out, increasing the amount of labor demanded at the wage W_0.) Since the subsidized industries generate

above-average unemployment, this means that the UI system subsidizes the expansion of high-unemployment industries through a net tax on more stable industries. By causing an expansion of the demand for goods whose production creates more unemployment, incomplete experience rating makes the economy more prone to unemployment. Total employment economy-wide does not expand, though; the increase in the subsidized industries is offset by a drop in employment in industries that pay more in taxes than their workers receive in benefits.

Research on UI has pointed out the steady and continuing flow of subsidies toward certain industries, but has spent little time analyzing the size of their effects. There is substantial agreement that the cross-subsidies do not affect profits, given the fairly competitive nature of American industry (McLure, 1977). Most of the impact is either on wages, and hence indirectly on product prices, or on prices directly. In either case the effect is to change the sizes of industries as customers switch to subsidized goods.

The few studies of this effect yield vastly different implications. The one study (Deere, 1988) that examines the impact of the subsidy on the relative sizes of industries across states finds that, in states where the subsidy is bigger, the least stable industries are relatively larger. The implied effects are, indeed, huge. The only examination of the costs of the encouragement to excess production in the subsidized industries suggests that in construction, an industry that is heavily subsidized by the UI system, an amount equivalent to 0.25 percent of output is wasted (Topel, 1986). The directions of the likely impacts of the subsidy are clear, and we know that the result is

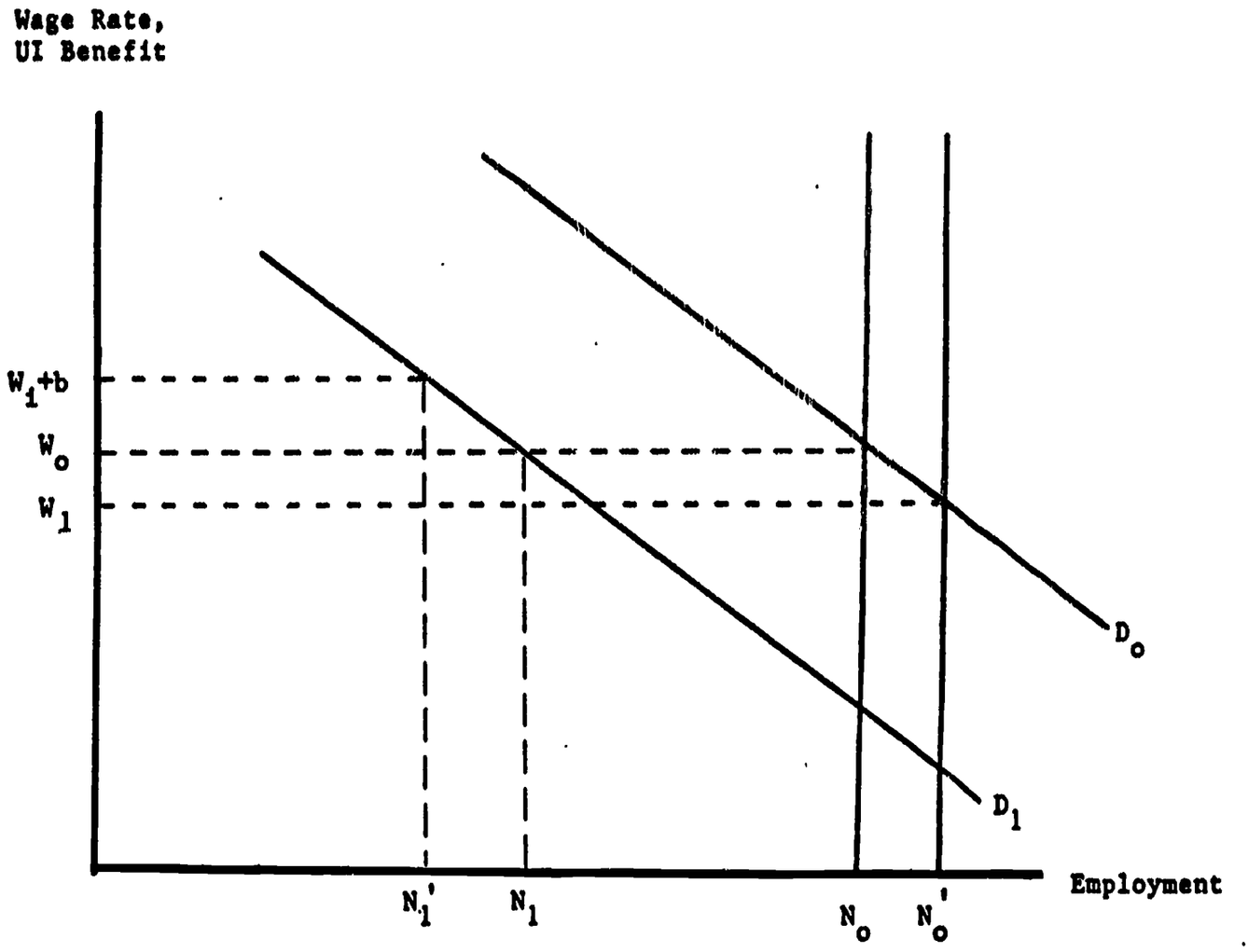

Figure 2. The Effect of UI on Employment

the expansion of unstable industries and the contraction of stable industries. We just have very little evidence on the magnitudes of these effects.

B. Effects on Employment Fluctuations

Remember that for the typical firm $g < 1$ --- an extra dollar of benefits paid out to its employees raises its taxes by less than one dollar. Part of the cost of benefits is shared among all companies in the state UI system. How large is g? A study of 9 states during 1971-78 showed that benefits charged to employers with negative balances averaged around 20 percent of all benefit payments (Wandner-Crosslin, 1980). That study also found that noncharged benefits amounted to around 15 percent of the total, a result corroborated (Hibbard, 1980) by data for 8 other states in the years 1971-75. Yet another study (Becker, 1981, Table 8) demonstrated about the same extent of noncharging and a similar importance of benefits paid to employees of negative-balance employers for 9 states in 1978. Data for 1983 for 12 states show that benefits charged to positive-balance employers and to negative-balance employers up to their tax contributions equalled 52 percent of all benefit payments (Office of the Inspector General, 1985). Finally, ignoring noncharged benefits, data for 19 reserve- and benefit-ratio states (Topel, 1984, Table 1) suggest that the cost to the typical employer of an extra dollar of UI benefits is only around 80 cents.

Taking all the evidence together, it seems fairly clear that g was between one-half and two-thirds during the 1960s and 1970s. Other data (Office of the Inspector General, 1985) suggest that g fell during the

early 1970s. The substantial widening of the range of tax rates in 1985 has probably raised $\underline{s}$ in the late 1980s. However, the continued existence of noncharged benefits, and the many firms whose benefit payments far exceed even 10 percent of their taxable payroll, mean that the average extent of experience rating is today probably no more than 75 percent.

Incompletely experience-rated unemployment insurance not only shifts resources to the subsidized, unstable industries, as Section A showed; it also provides incentives for many companies to choose to lay off workers rather than spread work by reducing hours when product demand declines. This point has been well-known since the advent of UI:

> Though a compensation system might tend to cause employers to lay off or discharge workmen [sic] because provision had been made for their maintenance, rather than to permit them to share in the work available, this tendency can be checked by merit [experience] rating....(Millis-Montgomery, 1938, p. 176)

Recent theoretical work has formalized this observation and examined some of its ramifications (for example, Feldstein, 1976; Baily, 1977; Burdett-Hool, 1983; and Burdett-Wright, 1988). To understand why it occurs, consider the company shown in Figure 2. In the absence of unemployment insurance it employs N_0 workers in good times, and only N_1 workers in bad times. Because of the drop in demand for its product, its demand for labor shifts from D_0 to D_1. The number of workers it wishes to employ at the going wage W_0 is reduced to N_1. What if the company can pay UI benefits that are only incompletely experience rated? In addition to the expansion of the industry in good times to N'_0, the employer now has an incentive to reduce employment in bad times to N'_1,

below N_1. This raises workers' incomes on average over the cycle, because more of them can collect b dollars of benefits during bad times. By offering a wage-employment package that provides UI benefits during bad times, the employer can attract workers for a wage below W_0, say W_1. (If it kept the wage at W_0, it would have a surplus of potential employees seeking jobs in the company.) The employer is willing to offer this deal because its taxes do not rise one-for-one with each dollar of benefits paid --- precisely because the degree of experience rating e is less than one.

This discussion suggests that: 1) Employers with substantial noncharged benefits; 2) Negative-balance employers; 3) Companies that are at t_{max}, and 4) Firms whose reserve-ratio exceeds R^* in states where $t_{min} > 0$, will all have an incentive to increase layoffs above what they would be if experience rating were complete or if there were no UI system. The incentive is greater where the product-demand cycle that produces the layoffs is easily predicted, for employees are then more easily attracted to a company offering a slightly lower wage but the chance to receive substantial benefits during "UI vacations." This implies that seasonal and other temporary layoffs will be especially strongly affected by incomplete experience rating, as will permanent layoffs where business cycles are predictable. Other permanent layoffs, such as those stemming from increased foreign competition and other demand shocks, are not likely to be affected as much.

To some extent the heightened incentives to lay off workers are reduced by the existence of multiple tax schedules: Even though the benefits may not raise taxes this year, they may do so in future years

as the state system shifts to a higher schedule (Brown, 1986; Wolcowitz, 1984). As Table 1 and Appendix Table 1 show, though, even today, and even on the least favorable schedule, the range of tax rates is often not very wide. There still exist incentives to expand layoffs, and thus to increase layoff unemployment.

Before 1987, when the Tax Reform Act of 1986 became effective, the incentive to lay off workers in bad times was even greater, because UI income was untaxed or only partly taxed. A dollar of benefits was worth more to the recipient than a dollar of (taxed) wages. This gave workers a still greater incentive to accept layoffs and gave their employers still lower costs, in the form of employees willing to work at lower wages than otherwise. Many of the recent studies of experience rating account for the differential taxation of UI benefits before 1987.

In the last 12 years substantial work has been done relating incomplete experience rating to employment fluctuations. We now know a fair amount about the size of its impacts on unemployment. More important, we know which characteristics of the UI tax structure produce most of these effects.

Table 3 summarizes the 10 available studies on this effect. (Only one study was published before 1977; it and the state of knowledge about UI taxes generally up to that time are summarized by Hamermesh (1977).) The various studies have mainly attempted to discover the effects of the tax structure on the layoff rate or the rate of unemployment resulting from layoffs. They have tried to distinguish between effects on permanent and temporary layoffs, and to look for special effects on seasonal variation in employment. Both efforts are based on the

observation that the largest effects of incomplete experience rating will be on those flows into unemployment that are most expected, and among those workers who are likely to retain an attachment to the employer who lays them off.

The studies differ greatly in method, type of data and the structuring of the problem. In all studies, examining differences in the parameters of the states' UI tax systems allows the researcher to determine the impact of differences in experience rating. In some, though, the impact of state tax systems on individual experience may be muddied by the use of industry-level data on turnover measures. In many studies the parameters of the tax systems are considered separately rather than as contributory factors to the degree of incompleteness of experience rating, which in turn can directly affect turnover. While all the studies advance our knowledge, these considerations suggest that Saffer's second study and, especially, Topel's work are the most reliable.

While more research would be desirable, at this point it seems fairly safe to conclude that: 1) A higher t_{neg} or t_{max} reduces the layoff rate and the rate of layoff unemployment. This is so mainly for temporary layoffs and seasonal unemployment; the evidence for effects on permanent layoffs is more mixed. The effects are quite large. Indeed, Topel (1986), the only study to attempt an overall evaluation of the effect of incomplete experience rating, suggests that imposing complete experience rating would reduce unemployment by roughly 20 percent. This effect is probably too large to be believable: It is difficult to imagine that a program that taxes less than 1-1/2 percent of payroll can

TABLE 3
Studies of Experience Rating and Unemployment

Study	Data	Results
Brechling (1981)	Reserve-ratio states, 1962-69, manufacturing industries	Higher t_{neg} sharply reduces layoff rate; smaller effect of lower t_{min}
Edebalk-Wadensjö (1986)	Sweden 1954-69	Sharp decline in temporary layoffs after introduction of partial experience rating
Halpin (1979)	Three small manufacturing industries, 1960-74, 36 to 50 states	Reduced seasonal variability of employment where high tax base compared to wages; no consistent effects of other tax parameters
Halpin (1980)	41,000 individuals, 1976	Lesser chance of being on temporary layoff where: High tax base compared to wages; smaller gap between t_{max} and tax rate needed to fund negative balances
Kaiser (1987)	Reserve-ratio states, 1964-69, manufacturing industries	Higher t_{neg} sharply reduces layoff rate; high tax base reduces layoff rate
Saffer (1982)	States, 1967-75, data on industries	Larger gap between t_{neg} (or t_{max}) and t_{min} reduces layoff rate
Saffer (1983)	15,000 individuals, 1975	Lesser chance of being on temporary or permanent layoff if worker is in a state with a larger gap between t_{neg} (or t_{max}) and t_{min}
Topel (1983)	8000 individuals from 29 industries, 19 states, 1975	Lesser chance of temporary lay off, greater chance of returning to work with more complete experience rating; imperfect rating and not taxing benefits produced 30% of temporary layoff unemployment
Topel (1984)	34,000 individuals, from 29 industries, reserve- and benefit-ratio states, 1973-76	Lesser chance of being on temporary layoff in states and industries where UI subsidy is smaller; smaller effect on permanent layoff unemployment
Topel (1985)	76,000 men, 1977-81, reserve- and benefit-ratio states	Lesser chance of being on temporary layoff in states and industries where UI subsidy is smaller; smaller effect on permanent layoff and quit unemployment. Perfect experience rating would reduce unemployment rate by 1.5 percentage points.

account for 1.5 percentage points of unemployment in the entire labor force. The result indicates, though, how important the impact of some aspects of incomplete experience rating can be. 2) Beyond this effect, little else can be concluded from the available research about the effects of tax-rate policy. In particular, there is at best only sparse evidence that reducing t_{min} to zero has a discernable impact on layoff unemployment.

As Table 3 shows, empirical research has demonstrated that a higher tax base relative to taxable wages also reduces layoffs and seasonal unemployment. The reason to expect this is simple: For a particular set of tax rates, raising the tax base raises the tax liability of a negative-balance employer, or one at t_{max}, who lays off another worker. Raising the tax base is another way of increasing experience rating (see Brechling, 1977). Indeed, even though European UI systems are not experience rated, European employers rely less on temporary layoffs to meet drops in product demand. The reason may well be that in Europe UI taxes are essentially on a per-hour basis (because the ceilings are very high relative to wages) (Fitzroy-Hart, 1985).

C. Effects on the Employment Mix and on Worker-Hours Substitution

Because it is not applied in equal proportions to all workers, the UI tax will induce firms to substitute workers whose labor is taxed less heavily for workers whose labor is taxed more heavily. A highly cyclical business in Pennsylvania that employs a worker earning $8000 can pay a tax of $736 on that worker's wages (a tax rate of 9.2 percent applied to the $8000 tax base.) The same tax, $736, would be paid on the wages of a worker earning $40,000. In this case the low ceiling on the tax base raises the cost of employing the high-wage worker by 1.8

percent, so that the relative cost of employing the low-wage worker is increased by 7.4 percent (9.2 - 1.8). Assuming the workers' market wages reflect their skills and their value to the employer, the ceiling creates a powerful incentive to shift toward hiring higher-wage, more skilled employees.

These incentives can create two effects. First, if the wages of low-skilled workers do not fall when the demand for their services is reduced, fewer of them will be employed. Second, if their wages can fall, they will. In either case the net income of the population of low-skilled workers in the state will be reduced.

Say all 100 workers in a Pennsylvania company earn $12,000 per annum working a forty-hour week, and the employer is already rated at t_{max} on the highest state tax schedule. On September 1 the employer realizes that product demand is booming and decides to expand output by 25 percent. Many factors will affect the choice between hiring 25 more workers and asking current employees to work overtime. An additional, potentially substantial one is that the employer must pay UI taxes of 9.2 percent of wages on each new worker, but would incur no extra UI tax liability on overtime hours of current workers (because the $8000 ceiling means the tax liability on them vanished on August 31 for the remainder of the calendar year). The limit on the tax base thus creates an incentive to use more hours and fewer workers.

No one has studied the effects of the UI tax itself on the mix of workers. The huge body of research on the impact of changes in relative labor costs on the skill mix of workers, and the somewhat smaller set of research results on employers' ability to substitute hours for workers (Hamermesh, 1986; Hart, 1984), allow us to infer the probable impacts of

the tax. Also, Hamermesh (1978) shows that greater UI coverage leads to greater reliance on employment reductions for a given drop in product demand. The evidence leads to the conclusions that: 1) Because the UI tax base is so close to the minimum wage (on an annual basis), it is unlikely that overtaxing low-wage employment can reduce the wage rates of low-skilled workers. Instead, it reduces the number employed. This effect is substantial, with each 1-percent increase in the relative cost of low-skilled workers lowering their employment by at least 1 percent. The low limit on the tax base relative to taxable wages has reduced the number of jobs for low-skilled workers. 2) We know that a rise in taxes that are assessed per worker leads employers to substitute extra hours per worker for employees, especially low-wage employees (Hart-Kawasaki, 1988; Wright-Loberg, 1987). We can conclude that to some unknown extent the low tax base has increased employers' reliance on overtime and reduced employment, especially of low-skilled workers.

III. Optimal Experience Rating and Tax Base

There are two fundamentally different views of the appropriate extent of experience rating. Most public-finance economists would argue that experience rating should be structured to ensure that the UI system as a whole produces the same employment, unemployment and industrial structure as would be produced in the absence of publicly-provided UI. From this viewpoint incomplete experience rating should be used to offset other taxes that produce distortions, such as other payroll taxes and income taxes (Boadway-Oswald, 1983). Under this view the UI tax should be used to increase the neutrality of the tax system, i.e., to

minimize the distortions to the labor and other markets that taxes produce.

The alternative view, held by many specialists in UI and by some economists, is based on the nature of the employees' separation that generated the benefits that must be financed. Under this view one should attempt to distinguish between UI benefits that are due to the employer's actions and those that are beyond the employer's control, with only the former being charged to the employer. The latter, including perhaps benefits to voluntary quitters, long-duration claims and cyclical increases in benefits, should be spread across the state (or even the national) UI system (Halpin, 1978; NCUC, 1980). This view does not necessarily conflict with the other; rather, its intellectual basis is entirely different. The evidence in Section II.B shows that complete experience rating would essentially eliminate temporary layoff unemployment, and other evidence shows that most temporary layoffs return to their jobs. Proponents of this view should thus argue that taxes to finance all unemployment spells resulting from temporary layoffs should be fully experience rated.

UI tax policy should avoid increasing unemployment beyond what would occur in its absence if there were no social desire for publicly-provided benefits. Yet the existence of that desire means that financing an optimal level of benefits may require an incompletely-rated tax that increases unemployment and shifts resources toward certain industries. UI tax policy should not penalize employers for long-duration unemployment that is beyond their control. Yet long-duration unemployment can be lowered by reducing the number of workers becoming unemployed, and that can often be accomplished by

increasing the extent of experience rating. These two considerations alone suggest there is no easy philosophical basis for choosing which implications of the two views to choose. As was recognized very early in the program:

> The degree of preference should be decided upon with due regard to the desire to further stabilization of employment on the one hand, and the safety of the fund and the desire to distribute the burden involved in carrying the cost with proper reference to ability to pay on the other. (Millis-Montgomery, 1938, p. 167)

The choice of goals has implicitly been made for more than fifty years by the political process at the federal and state levels. Temporary benefit programs enacted by the federal government to provide for workers who have exhausted regular benefits have generally not been financed by experience-rated taxes. (They have been financed out of general revenues or shared with state UI funds.) At the state level the philosophy underlying financing decisions is much less clear. Nonetheless, one can draw some inferences about the process that generates the tax structures by comparing interstate differences in taxes to differences in industrial and demographic characteristics. Experience rating is less complete where: 1) The distribution of employment is spread among more different industries; 2) Unemployment is concentrated especially heavily in a few industries; and 3) The largest industry accounts for an unusually large share of unemployment (Adams, 1985; Maloney-McGregor, 1938).

All three results support the conclusion that the financing of state UI benefits is largely a matter of attempts by powerful, high-unemployment industries to use legislation to gain subsidies from other industries. This suggests that neither viewpoint is dominant in

state UI policy, and that one must instead argue that the efficiency and equity considerations under either viewpoint should prevail over the outcomes currently generated by the political process at the state level. Such a choice in favor of increased experience rating was made, at least implicitly, in 1982 when the federal government effectively mandated the imposition of a minimum t_{max} of 5.4 percent for state systems starting in 1985.

There has been less discussion of the optimal tax base. The only full-blown argument is for setting the base at 50 percent of the average wage, in the belief that this will minimize voluntary turnover (Brechling, 1977). Given that most voluntary turnover takes place within a few jobs, since most workers are long-term employees, and given the importance of objectives other than minimizing voluntary turnover, this argument seems quite minor. Instead, optimal policy on the tax base should take into account its role in the experience rating of UI taxes and its effect on the types of workers hired and employers' choices between workers and hours. From this viewpoint we have, by allowing the tax base to fall in relative terms, implicitly chosen to limit the effect on experience rating of the increased range of state tax UI rates; and we have increased the incentive the UI system provides employers to hire higher-wage workers, and to use more overtime rather than additional workers.

IV. Short-Time Compensation, Partial Benefits and UI Financing

Short-time compensation (STC) is in general an adjunct to UI programs that allows the payment of benefits to workers who are only partly unemployed. In some programs in various industrialized

countries, and in those in the United States, benefits are paid on a pro rata basis. Thus, for example, workers whose employer relies on a 20-percent hours reduction for all workers rather than laying off 20 percent of the work force will receive wages for 80 percent of the workweek and short-time compensation equal to 20 percent of their regular weekly benefit amount. One can view STC as an attempt to make UI neutral with respect to employers' decisions about meeting declining product demand by layoffs instead of reductions in hours.

Since the inception of the UI program most state systems have provided partial UI benefits to be paid when a worker is unemployed for at least several days per week. In most states payments are structured so that the worker and employer are severely discouraged from using them (Munts, 1970). Eleven states, compared to only 6 in 1978, have now made their partial benefits provisions more conducive to worksharing by specifying that benefits are reduced by only a fraction of each dollar of earnings. In most of them, though, the rates of reduction are quite high: With the exceptions of Alaska and Montana, the other states that structure partial benefits this way decrease them by at least 66 cents for each additional dollar earned.

Feeling a need to encourage work-sharing, California in 1978 instituted its own STC program as part of the state UI system. Arizona and Oregon implemented STC programs in 1982, and in that year TEFRA required the Secretary of Labor to assist states in setting up STC programs. As of 1987 9 other states had implemented STC programs. Financial arrangements under the STC legislation differ sharply among the states. Arizona, California and Oregon charge surtaxes to negative-balance or other high-unemployment companies whose workers

receive STC, as do three other states. In six other state systems, though, STC payments are treated the same as regular UI benefits that are charged to the employer (Johnson, 1987).

Part of the legislation implementing federal assistance to states in setting up STC programs required that an evaluation of these programs be carried out. This was met by Kerachsky et al. (1986), who did a thorough evaluation of all aspects of STC programs in Arizona, California and Oregon, based on a comparison of employers that used STC and otherwise similar employers that did not. In all states total payments under STC were tiny fractions of all UI benefits. Thus in 1982, the biggest year of the Arizona program, STC was $2.4 million, only 1.4 percent of all benefits; in the same year in California, the corresponding figures were $18.6 million and 0.8 percent (Johnson, 1987). Clearly, STC could not have had much impact even in the states that implemented the program.

The results of Kerachsky et al. relevant to this discussion are:

1. Workers in companies that used STC had more total hours of compensated time (by STC and regular benefits together) than did employees in otherwise identical firms.

2. Higher-wage employers were more likely to use STC, as shown by the higher benefit entitlements of their workers.

3. The administrative cost per hour compensated was higher for STC than for regular benefits.

The first and third conclusions corroborated a detailed study of STC in California (unfortunately done without a control group).

The experience documented by Kerachsky et al. (1986) in Arizona, California and Oregon is probably unusually favorable compared to STC in the other 9 states that adopted it. In all three states STC payments were more likely to be experience rated than regular UI benefits; in

most other states that is not so. Also, seasonal work is probably more important in most other states than in these three; and seasonal employers (construction, agriculture) are relatively poorly experience rated. These considerations suggest that the potential for the STC program to generate more compensated hours than would otherwise occur is greater even than that found in these three states. As I have argued (Hamermesh, 1978), and as Kerachsky et al.'s findings suggest, STC not only leads to a greater reliance on worksharing relative to layoffs; it also produces a larger reduction in the total number of hours worked.

A wider application of STC would probably reduce layoff unemployment and spread work among more people during slack times. However, it demonstrably reduces the total amount of work available too, though there is not sufficient evidence on how large this effect is. Also, because STC is not completely experience rated, it increases the extent of cross-subsidization implicit in the UI system. If no other characteristics of the UI system, including the tax structure, the tax base and partial benefit formulae, can be altered, STC is a potentially effective tool if the only concern is worksharing. It is a costly one, though; and there are other means within the UI system of accomplishing the same goal with a less adverse impact on the labor market and lower administrative costs.

V. Policy Alternatives

Any policy for ameliorating the effects of UI on employment and wage outcomes must confront the necessity of maintaining fund solvency. UI has as its basic purpose maintaining living standards for unemployed workers, not improving labor-market efficiency (Hamermesh, 1982). This

means that, while some proposals might appeal to one's desire to reduce unemployment, the need to maintain confidence in the widely-accepted UI program requires that desirable policies both reduce unemployment/ increase labor-market efficiency and improve funding of the program without raising its budgetary cost. Most of the proposals are not new. However, the confluence of growth in the available evidence on the effects of UI financing and major changes in financing during the 1980s mean that the discussion can be more confident and can take account of the changed conditions of the UI system.

PROPOSAL 1: INCREASE THE FUTA TAX BASE

The National Commission on Unemployment Compensation (1980, pp. 85-86) recommended raising the tax base to 65 percent of average annual taxable wages (AAW) over a period of time. The FUTA base was originally the same as the tax base under Old Age and Survivors' Insurance; in 1989 that base is $48,000, while the FUTA base is $7000. Following the NCUC recommendation by increasing the FUTA base to 65 percent of AAW would, as columns (1) and (3) of Table 4 show, have raised the average tax base nationwide in 1988 by over 50 percent. A still more radical proposal, requiring that the base equal twice the average benefit (in light of the notion that UI replaces 50 percent of pre-tax earnings), would, as Table 4 shows, have resulted in much a larger increase, as would a uniform doubling of the FUTA base to $14,000. The simplest policy change, and the one I shall discuss, is that the FUTA tax base in any year shall equal 65 percent of the national AAW two years earlier, with the policy phased in over a two-year period.

Based on the theory and evidence presented here, the arguments for this policy are:

1. The current low tax base means that we are using a tax on the employment of low-wage workers to finance the operation of state employment services (since the major use of FUTA revenues is as grants for administration of these services). Using a highly regressive tax to fund an institution that benefits the entire economy is unusual, and perhaps unique.

2. Forcing states to tax a larger share of total earnings would make experience rating more complete. It would clearly widen the fraction of charged benefits that are effectively experience rated. It would, as the evidence shows, lessen the incentives for employers to rely on temporary layoffs to meet reduced product demand, and would increase their reliance on worksharing instead.

3. In the short run increasing the base would lead to a build-up of state UI reserves (see the Appendix). This would occur when the reserves are nowhere nearly sufficient to meet requirements of a recession like that of 1974-75 or 1981-82. The short-term increase in state UI taxes would occur at a time when the economy is booming.

4. The proposal would make the state UI systems more flexible, as fewer firms' tax liabilities would be limited by maximum tax rates. It would probably not result in higher taxes on employers after the initial period of phase-in. There is only weak evidence (see the Appendix) that benefit amounts, which are the main proximate cause of higher state UI taxes, tend to increase when the base is raised.

The arguments against the proposal are:

1. It might result in larger state programs, as legislators use the increased base to vote higher benefit formulae. At the least, it would mean a vast enlargement of FUTA revenues, as the higher base is combined with the currently very high FUTA tax rate of .8 percent.

2. If the imposition of this policy is delayed, it could produce a tax increase just at the time the economy is sliding into a recession.

The sharp increase in state maximum UI tax rates required by TEFRA has probably gone part way toward making experience rating more complete. The effects have, though, been partly offset by the continuing decline in the tax base relative to AAW. The higher tax

TABLE 4

The Impact of Tax Base Policies

STATE	1988 Actual	Base - Average Benefit Times 2	Base - AAW Times .65	Uniform $14,000
California	$7,000	$17,264	$14,562	$14,000
Florida	7,000	20,800	11,583	14,000
Illinois	9,000	18,304	14,533	14,000
Massachusetts	7,000	24,544	13,758	14,000
Michigan	9,500	25,168	15,666	14,000
New Jersey	12,000	25,064	14,851	14,000
New York	7,000	18,720	15,605	14,000
Ohio	8,000	16,328	13,809	14,000
Pennsylvania	8,000	26,208	12,962	14,000
Texas	8,000	21,840	13,785	14,000
ALL STATES	$8,535	$19,443	$13,504	$14,000

rates on the smaller base have increased the regressivity of the tax and hurt labor-market outcomes for low-skilled workers. To increase fund solvency and its ability to handle cyclical demands, and to reduce detrimental side-effects on the labor market, this proposal should be adopted. However, to prevent a substantial enlargement of state bureaucracies and the build-up of very large loan funds, the 0.8 percent FUTA tax rate should be cut as the base rises. A policy like the following would index FUTA revenues without raising the share of FUTA taxes in employment costs, and would meet the goals outlined above:

Year	1990	1991	1992 and thereafter
Base as Percent of AAW	50	57.5	65
FUTA Tax Rate	.65	.6	.5

PROPOSAL 2: INCREASE MAXIMUM STATE UI TAX RATES

The National Commission on Unemployment Compensation (1980, pp. 93) recommended raising state tax maxima so that, "the vast majority of benefit payments are effectively charged...." Presumably this implies an increase in the creditable component of the FUTA tax rate even beyond the 5.4 percent that became effective in 1985. Other than indicating that the maximum tax should increase if we wish to make experience rating more effective, no specific increase is implied by the evidence. The arguments for an increase are:

1. Even with the increases in tax maxima documented in Table 1, there still are many negative-balance employers. This means that all the potentially detrimental effects on the labor market induced by incomplete experience rating still exist, though perhaps not to the same degree as before 1985.

2. The studies summarized in Table 3 show the especially strong impact of low state tax maxima on rates of temporary layoffs and the unemployment rate. Raising the creditable part of the FUTA tax still further would force states to raise their tax maxima still further, thus reducing incentives for layoffs and the cyclical instability of employment.

3. Increases in state tax maxima would in the short run increase UI tax revenues and help replenish depleted state UI reserves.

The arguments against the proposal are:

1. The evidence on the effects of state tax maxima is based on the pre-1985 environment. It is not clear that the beneficial impacts of raising maxima still further will be so large, now that the system is probably more completely experience rated.

2. Raising tax maxima in vacuo, as was effectively done under TEFRA, makes UI taxes more regressive and increases employers' biases in favor of substituting hours for workers. By itself the proposal would reduce job opportunities and/or earnings for low-wage workers.

There is substantial evidence that some employers generate cost rates in excess of 10 percent year after year. The proposal would reduce cross-subsidies to these employers; and the evidence clearly shows its impact in reducing layoffs. However, today's very low tax base relative to AAW means that by itself it would harm low-wage workers' labor-market prospects. This proposal should be adopted, but only along with Proposal 1.

PROPOSAL 3: REQUIRE THAT MINIMUM STATE UI TAX RATES BE ZERO

This has been proposed by many economists in the last 12 years, including this author and most of those cited in Table 3. The National Commission on Unemployment Compensation (1980, p. 93) recommended against it. The argument for it is:

1. It would improve experience rating and reduce the detrimental effects of UI on the structure of employment and on employment fluctuations.

The arguments against it are:

1. The evidence suggests that lower tax minima have small impacts on layoff rates. While the incentives exist, the responses are small.

2. In all states the cost of noncharged benefits is socialized. A zero minimum tax rate allows some employers to escape their share of these social costs.

3. There have never been even implicit federal standards for state tax minima. It is not worth creating this new area of federal interference in state programs.

Tax minima are already very close to zero: Even on the least favorable tax schedules, 21 states had minimum rates below 1 percent in 1988; nearly all states had minimum rates below 1 percent on their most favorable schedules. Given the apparently small changes in incentives that this proposal would produce and the evidence that these incentives have little impact on employment fluctuations, the only argument in its favor seems minor compared to the arguments against it. This proposal should not be adopted.

PROPOSAL 4: REQUIRE INTEREST CHARGES AND PAYMENTS ON EMPLOYERS' ACCOUNTS

Paying and charging interest on employers' accounts is another way to increase the experience rating of state systems. Interest at current short-term rates could be credited on positive balances and charged on negative balances. This would be similar to the crediting and charging of interest on states' balances with the federal UI trust funds.

Arguments in favor are:

1. The increase in experience rating would have all the desirable effects noted in Section II and discussed under Proposals 1-3.

2. Several studies (Bronars, 1985; Cottle-Macaulay, 1985) have demonstrated how this proposal could generate additional revenue for state systems.

3. The proposal is in accord with recommendations that most benefits be effectively charged to the employer.

4. The proposal accords with past practice that federal intervention in state programs operate through the tax system. It mirrors practices in existence since 1983 in the federal trust funds.

The negative arguments are:

1. At a time of fairly low interest rates, the size of the incentives created is likely to be small, especially relative to the extra administrative costs imposed.

2. There have never been federal standards for how states handle employers' reserves in state funds. It is not worth creating a new area of federal interference in state programs.

Despite the administrative costs, this proposal has merit. If short-term interest rates were 15 percent, as they were in 1980, it would provide powerful incentives to employers to avoid layoffs. The proposal is hardly a major extension of federal interference, since it does work through the tax system (although not through the FUTA tax rate itself). It should be adopted.

PROPOSAL 5: REQUIRE STATES TO LIMIT NONCHARGED BENEFITS TO A SMALL FRACTION OF TOTAL BENEFITS

In some states noncharged benefits can account for 50 percent of all regular benefits. This implies that, no matter how wide the range of tax rates may be, half the benefits cannot be effectively experience rated. The arguments in favor of this proposal are:

1. The standard arguments regarding the necessity for increased experience rating. It accords with calls for greater effectiveness of rating.

2. Discussion of this proposal would further a needed debate on the appropriate extent of experience rating in the UI system.

The counterarguments are:

1. This is a federal benefit standard and represents a substantial expansion of federal interference in state programs.

2. The interference is in an area on which there is no general agreement (see Section III). Why expand the federal role greatly if we do not know what the appropriate amount of noncharging is?

The lack of common agreement on the proper fraction of benefits to be charged, and the criteria for charging, suggest that this proposal should not be adopted. That conclusion is underscored by the implied change in the federal-state relationship that the proposal represents.

PROPOSAL 6: MORE WIDESPREAD ENCOURAGEMENT TO SHORT-TIME COMPENSATION

Providing more federal technical assistance to states that institute STC programs, or even encouraging such programs through the FUTA tax, could induce employers to rely more on worksharing and less on layoffs. The arguments in favor of such assistance/encouragement are:

1. Studies have demonstrated that STC does tilt employers' decisions toward hours reductions and away from layoffs. An expanded program would produce effects in the desired direction.

2. Other countries, particularly in Western Europe, have used expanded STC programs with apparent success.

The arguments against the program are:

1. The major evaluation study demonstrates that STC is expensive to administer and that it raises total benefit costs.

2. Both in state programs here and in STC in other countries the utilization rate is tiny. It has not had a perceptible effect on unemployment rates.

3. By increasing benefit payments for incompletely experienced-rated employers, STC increases the extent of cross-subsidization in the UI system.

4. Adopting Proposal 1 would produce a much greater increase in worksharing and a much larger decline in layoff unemployment without creating more federal interference in state programs and without generating new state bureaucracies.

Short-time compensation has not been target-efficient in the U.S.; and it probably generates negative side-effects. Its goals can be attained more readily with less radical changes.

VI. Conclusion

Legislated and administrative changes in the UI system during the 1980s probably reduced the program's detrimental effects on labor-market efficiency. They did so without changing the nature of the federal-state relationship that makes the program so unusual. Regrettably, though, they hurt the labor-market status of low-wage workers by greatly increasing the negative impact of UI taxes on the demand for their labor. This inequitable and socially dangerous side-effect of an otherwise desirable idea can be reversed if the policy changes proposed here are adopted. Their adoption would in addition provide employers with increased incentives to spread work rather than lay off employees, resulting in smaller employment fluctuations and a lower unemployment rate.

NOTES

1. The data used in this table, Tables 2, 4 and Appendix Tables 1 and 2 are from Comparison of State Unemployment Insurance Laws, revisions of August 1978 and September 1988. Additional data are from Employment and Training Administration, ET Handbook No. 394 and the supplements to it.

2. Vroman (1987, Table 1.6). The weighted averages in Table 2 are based on covered employment in 1978 and 1985 respectively; the AAW for 1988 are based on extrapolations from 1985. For these reasons, and because the national averages are apparently not weighted averages, the data differ slightly from those used in the Appendix.

A1. The data are all taken from Employment and Training Administration, ET Handbook No. 394 and the supplements to it.

APPENDIX TABLE 1

State UI Tax Schedules, 1978 and 1988, Smaller States

	YEAR			
	1978		1988	
	Most Favorable	Least Favorable	Most Favorable	Least Favorable
STATE	T_{min} T_{max}	T_{min} T_{max}	T_{min} T_{max}	T_{min} T_{max}
Alabama	0.50 3.60	0.50 4.00	0.50 5.40	0.50 5.40
Alaska	0.60 3.10	3.00 5.50	1.00 6.50	1.00 6.50
Arkansas	0.00 4.00	0.10 4.00	0.00 5.90	0.10 6.00
Colorado	0.00 3.60	0.70 3.60	0.00 5.40	1.00 5.40
Connecticut	0.10 4.60	1.50 6.00	0.50 5.40	1.50 6.40
Delaware	0.10 3.00	0.50 4.50	0.10 8.00	0.10 8.00
District of Columbia	0.10 2.70	2.70 2.70	0.10 5.40	0.80 5.40
Georgia	.028 3.20	0.01 3.52	0.01 5.40	0.06 8.64
Hawaii	0.20 3.00	3.00 3.00	0.00 5.40	2.60 5.40
Idaho	0.20 3.20	2.70 4.40	0.10 5.40	2.90 6.80
Iowa	0.00 4.00	0.80 6.00	0.00 5.40	0.00 9.00
Kansas	0.00 3.60	0.00 3.60	.025 5.40	.025 5.40
Kentucky	0.10 3.20	2.70 4.20	0.30 9.00	1.00 10
Louisiana	0.10 2.70	2.70 3.90	0.30 6.00	0.30 6.00
Maine	0.50 3.10	2.40 5.00	0.50 5.40	2.40 6.50
Maryland	0.10 2.90	3.00 4.20	0.10 5.40	2.80 6.00
Minnesota	0.10 7.50	1.00 7.50	0.10 8.00	0.80 8.00
Mississippi	0.00 2.70	2.70 2.70	0.10 5.40	0.10 6.40
Missouri	0.00 3.60	0.50 4.10	0.00 5.40	0.00 7.80
Montana	0.50 3.10	3.10 3.10	0.00 6.40	1.70 6.40
Nevada	0.60 3.00	1.10 3.50	0.30 5.40	0.30 5.40
New Hampshire	0.01 2.10	2.80 6.50	0.01 6.50	2.80 6.50
New Mexico	0.10 4.20	2.70 5.10	0.10 5.40	2.70 5.40
North Dakota	0.20 4.20	2.70 4.20	0.10 5.40	0.10 5.40
Oklahoma	0.10 3.10	0.40 3.70	0.10 5.50	0.50 6.20
Oregon	1.20 2.70	2.60 4.00	0.90 5.40	2.20 5.40
Rhode Island	1.00 2.80	2.20 4.00	0.80 5.40	2.30 8.40
South Carolina	0.25 4.10	1.30 4.10	0.19 5.40	1.24 5.40
South Dakota	0.00 4.50	4.10 4.10	0.00 8.00	1.55 9.75
Tennessee	0.30 4.00	0.75 4.00	0.15 10	0.50 10
Vermont	0.20 2.70	1.20 5.50	0.40 5.40	1.30 8.40
West Virginia	0.00 3.30	2.70 3.30	0.00 7.50	1.50 7.50

APPENDIX TABLE 2

The UI Tax Base, 1978 and 1988, and Selected Alternatives

STATE	Base 1978	Base AAW 1978	Base 1988	Base AAW 1988	Base if Equals 2*Bens 1988	Base if Equals .65*AAW 1988
Alabama	$ 6,600	.610	$ 8,000	.444	$12,480	$11,702
Alaska	10,000	.483	21,100	.705	19,552	19,448
Arizona	6,000	.528	7,000	.369	15,080	12,340
Arkansas	6,000	.619	7,500	.455	21,528	10,708
Colorado	6,000	.508	10,000	.479	22,256	13,568
Connecticut	6,000	.474	7,100	.306	22,464	15,065
District of Columbia	6,000	.436	8,000	.324	27,872	16,032
Delaware	6,000	.447	8,500	.401	21,320	13,769
Georgia	6,000	.551	7,500	.388	17,160	12,566
Hawaii	9,800	.906	8,700	.503	23,192	11,242
Idaho	9,600	.895	16,200	.926	20,072	11,376
Indiana	6,000	.476	7,000	.346	10,192	13,159
Iowa	6,500	.579	11,000	.633	18,096	11,301
Kansas	6,000	.546	8,000	.432	21,840	12,032
Kentucky	6,000	.525	8,000	.438	17,264	11,873
Louisiana	6,000	.502	8,500	.423	19,864	13,075
Maine	6,000	.620	7,000	.423	17,784	10,746
Maryland	6,000	.515	7,000	.352	21,320	12,925
Minnesota	7,500	.635	11,700	.579	26,416	13,129
Mississippi	6,000	.631	7,000	.436	15,080	10,444
Missouri	6,000	.510	7,500	.377	14,560	12,923
Montana	6,000	.572	12,600	.748	19,240	10,952
Nebraska	6,000	.578	7,000	.421	13,936	10,796
Nevada	6,900	.584	12,000	.631	19,136	12,367
New Hampshire	6,000	.588	10,800	.581	16,224	12,077
New Mexico	6,100	.580	10,800	.612	16,536	11,474
North Carolina	6,000	.600	10,100	.582	23,712	11,278
North Dakota	6,000	.575	11,000	.657	19,032	10,880
Oklahoma	6,000	.526	9,100	.461	20,488	12,818
Oregon	8,000	.661	14,000	.741	23,816	12,288
Rhode Island	6,000	.593	12,000	.684	24,960	11,396
South Carolina	6,000	.601	7,000	.413	15,288	11,011
South Dakota	6,000	.656	7,000	.479	14,560	9,492
Tennessee	6,000	.573	7,000	.389	16,120	11,705
Utah	9,600	.871	13,200	.715	21,008	12,001
Vermont	6,000	.601	8,000	.466	17,576	11,164
Virginia	6,000	.561	7,000	.373	18,304	12,203
West Virginia	6,000	.473	8,000	.406	23,400	12,796
Washington	8,400	.642	15,100	.763	21,736	12,871
Wisconsin	6,000	.505	10,500	.557	20,800	12,251
Wyoming	6,000	.478	10,200	.503	20,800	13,186

APPENDIX: A Model of Benefits, Taxes and the Tax Base

To examine whether a higher tax base automatically leads to higher taxes and/or higher benefits as UI administrators and legislators try to spend an apparent revenue windfall, I estimated two models of taxes and benefits. The first consists of:

$$(1)\quad TAXRAT_t = a_0 + \sum_0^4 a_{1i} BASTOT_{t-i} + \sum_1^4 a_{2i} BENTOT_{t-i} + \sum_1^4 a_{3i} TAXRAT_{t-i} + \epsilon_{1t} ,$$

and:

$$(2)\quad BENTOT_t = b_0 + \sum_0^4 b_{1i} IUR_{t-i} + \sum_1^4 b_{2i} BENTOT_{t-i} + \sum_1^4 b_{3i} TAXRAT_{t-i} + \epsilon_{2t} ,$$

where TAXRAT is the ratio of state UI taxes to total payroll; BASTOT is the ratio of taxable to total payroll; BENTOT is the ratio of regular benefits paid to total payroll; and IUR is the covered unemployment rate. All variables are measured as percentages. Through equation (1) this model allows for a direct effect of a higher tax base on taxes. It allows for indirect effects through (2), as a higher base can raise taxes through the lagged effects of the higher TAXRAT feeding back through higher benefits onto future taxes. The model allows us to test for causality, in particular, to answer the crucial question whether the $b_{3i} = 0$, i.e., whether higher taxes lead to higher benefits.

The model does not allow for the possibility of a direct effect of a higher taxable base on benefit payments <u>independent of the effect of the base on benefits through its possible effect on the ratio of taxes to total payroll</u>. To do so respecify (2) as:

$$(2')\quad BENTOT_t = b_0' + \sum_0^4 b_{1i}' IUR_{t-i} + \sum_1^4 b_{2i}' BENTOT_{t-i} + \sum_1^4 b_{3i}' TAXRAT_{t-i} + \sum_0^4 b_{4i}' BASTOT_{t-i} + \epsilon_{2t}' .$$

The VAR models (1) and (2), and (1) and (2′), are estimated on annual data for the entire United States, with t = 1950,...,1986.[A1]

The results of the estimation are shown in Appendix Table 3. The first thing to note is that benefits "Granger-cause" taxes, as should not be surprising. Taxes do not Granger-cause benefits: The F-statistics on the vectors of coefficients b_{3i} and b'_{3i} are not significantly different from zero even at the 90-percent level.

A test of the joint significance of b'_{3i} and b'_{4i} yields F(9,17) = 1.91, also not significantly different from zero at the 90-percent level. However, a test of the joint significance of the b'_{4i} alone yields F(5,17) = 2.80, different from zero at the 90-percent level of confidence (though not at the 95-percent level). There is only weak evidence that a higher base affects benefits. A higher base does, though, affect the ratio of taxes to total payroll, at least in the short run: The vector of coefficients a_{1i} is significantly different from zero (F(5,23) = 6.92) at all conventional levels. Interestingly, while the immediate direct effect of an increase in the base is huge (a_{10} = 1.57), the long-run effect must be minute, for $\Sigma\hat{a}_{1i}$ = -.018). This implies that the steady-state impact of raising the tax base in model (1)-(2) will be essentially zero.

Reestimates of the models including time trends added little. None of the trend terms was signficantly different from zero, and the changes in the a_{ji} and b_{ji} and in their sums were qualitatively unimportant. This and the very high values of the $\bar{R}^2$ for the equations suggest that the two models can be useful for simulating the effects of policy changes involving the tax base.

A number of simulations of such policies were carried out using the models. I concentrate here on policies that would have: 1) Raised the tax base to 65 percent of taxable wages in 1978; and 2) Raised it to 65 percent

in equal increments over a three-year period. The year 1978 is chosen because the base was raised substantially then, and because choosing it allows sufficient time to infer the long-run effects of the policy change. Appendix Table 4 shows the actual values of BASTOT from 1978-86 and their values under the two simulations. The first half of the table shows the results of simulating changes in the system (1)-(2); the second half shows simulation results based on (1)-(2').

If we use (1)-(2), implicitly assuming, as standard statistical tests suggest is not unreasonable, that a higher base has no direct long-run effects on benefits, the results suggest that there are no indirect effects either. Moreover, while raising the tax base does raise TAXRAT in the short run, there is no long-run effect of a higher base on the rate of taxation. Unless something happens to raise benefit payments (in this model, higher insured unemployment), state funds reap a temporary windfall when the base is raised, but tax rates adjust downward within five years. At that point total taxes are unchanged from what they would have been if the base had not been altered, given the same rules on benefit payments and the same number of weeks claimed. The results are similar for the two simulations. The main difference is unsurprisingly that the phased increase in the base produces smaller effects each year but takes longer before the steady state is reached.

The conclusions change sharply if one simulates the effects in the system (1)-(2'). The direct effects of BASTOT in (2') are not significant, and their sum is -.0369. But because the higher tax base has a large direct initial effect (b'_{40} = 1.39), the continuing substitution of 65 percent for the actual, lower values of BASTOT raises benefits, and hence the taxes that finance them (since the system is self-financing).

What can one conclude from this? The strongest evidence is that taxes are independent of the base in the long-run, so that a higher base is eventually met by offsetting reductions in tax rates as employers move down experience-rated schedules. In the short run a higher base does, though, raise taxes that finance regular state UI benefits. This suggests that an increase in the base should be imposed at a time when the effects of the short-run tax increase on business will be least onerous. The estimates indicate that a long-run increase in benefits is a possibility, though the results are only marginally significant. Even if they were significant, though, they ignore the decline in the insured unemployment rate that would occur as a higher base produces more complete experience rating and thus reduces total benefit costs by reducing employment fluctuations. We may conclude that on net it is not apparent that increasing the base produces long-term increases in total UI taxes.

APPENDIX TABLE 3

Estimates of a Model of UI Tax Rates and the UI Tax Base, 1950-86

	Dependent Variable		
	Taxes/ Total Payroll	Benefits/ Total Payroll	Benefits/ Total Payroll
Base/AAW (Current value and 4 lags)	1.5699		1.3936
	0.3226		-1.4336
	-1.4203		1.5467
	-0.1520		-0.4051
	-0.3377		-1.1385
Insured unemployment rate (Current value and 4 lags)		0.3463	0.3499
		-0.2712	-0.2761
		0.0605	0.1000
		-0.1221	-0.0918
		-0.0099	-0.0101
Benefits/ Total Payroll (4 lags)	0.2120	0.7582	0.7755
	0.1860	-0.1523	-0.2667
	0.1078	0.3863	0.3280
	0.0963	0.0066	0.0299
Taxes/ Total Payroll (4 lags)	0.3330	-0.0129	0.0235
	-0.0289	-0.1232	-0.4203
	0.0602	0.2259	0.4351
	-0.0177	-0.1015	-0.0702
Adjusted R-squared	0.968	0.981	0.987
F-Statistics on Vectors of Lagged Endogenous Variables			
	35.05** F(4,23)	0.56 F(4,22)	2.02 F(4,17)

**Significant at the 99-percent level of confidence

APPENDIX TABLE 4

Simulations of the Effects of Increasing the Tax Base

Model (1)-(2)

	Actual Values			Simulation 1			Simulation 2		
	BASTOT	TAXRAT	BENTOT	BASTOT	TAXRAT	BENTOT	BASTOT	TAXRAT	BENTOT
Year									
1978	.496	1.37	0.93	.65	1.65	0.93	.50	1.41	0.93
1979	.474	1.42	0.94	.65	1.77	0.94	.55	1.49	0.93
1980	.447	1.06	1.34	.65	1.39	1.28	.60	1.41	1.31
1981	.423	1.02	1.17	.65	1.27	1.15	.65	1.43	1.16
1982	.405	1.02	1.72	.65	1.18	1.64	.65	1.37	1.60
1983	.431	1.20	1.43	.65	1.25	1.33	.65	1.35	1.32
1984	.428	1.39	0.92	.65	1.32	0.90	.65	1.37	0.91
1985	.415	1.29	0.95	.65	1.23	0.97	.65	1.25	0.97
1986	.407	1.14	0.98	.65	1.15	0.97	.65	1.16	0.96

Model (1)-(2')

	Actual Values			Simulation 1			Simulation 2		
	BASTOT	TAXRAT	BENTOT	BASTOT	TAXRAT	BENTOT	BASTOT	TAXRAT	BENTOT
Year									
1978	.496	1.37	0.93	.65	1.63	1.17	.50	1.40	0.96
1979	.474	1.42	0.94	.65	1.81	1.13	.55	1.49	1.04
1980	.447	1.06	1.34	.65	1.49	1.60	.60	1.43	1.51
1981	.423	1.02	1.17	.65	1.43	1.58	.65	1.50	1.48
1982	.405	1.02	1.72	.65	1.43	2.04	.65	1.51	1.99
1983	.431	1.20	1.43	.65	1.55	1.68	.65	1.57	1.73
1984	.428	1.39	0.92	.65	1.65	1.22	.65	1.66	1.30
1985	.415	1.29	0.95	.65	1.56	1.25	.65	1.58	1.30
1986	.407	1.14	0.98	.65	1.46	1.22	.65	1.50	1.25

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