New Ways of Evaluating State Unemployment Insurance

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In a previous article in this *Review*, the authors evaluated the unemployment insurance systems of the New England states according to several criteria (Tannenwald and O'Leary 1997). The article focused on the degree to which these systems force some industries to subsidize others, thereby distorting the interindustry allocation of resources. The systems were also evaluated in terms of the generosity of their benefits, the burden of their taxes, and the adequacy of their trust fund reserves.

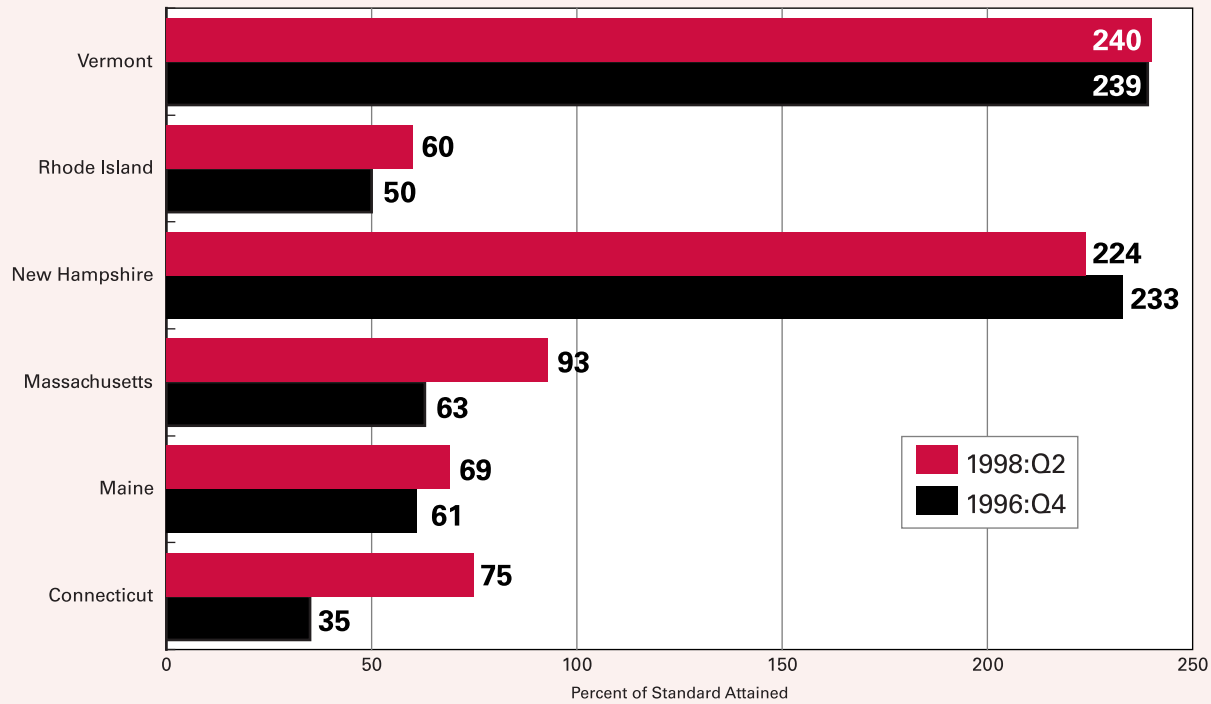
The authors noted that frequently quoted indicators of generosity, tax burden, and interindustry allocative neutrality can be misleading. This article attempts to improve on these indicators by comparing the simulated experiences of representative workers and firms located in different states. It also updates evaluations of the solvency of each New England state's unemployment insurance trust fund. The article is divided into five sections. Section I evaluates New England's UI systems according to commonly cited indicators of trust fund adequacy, generosity, tax competitiveness, and allocative neutrality. In the process, it clarifies the meaning of these normative criteria. Section II critiques these indicators. Section III explains the methodology used to develop the simulation-based alternatives. Section IV uses the new methodology to compare 28 states and contrast the results with those obtained from more conventional indicators. Section V summarizes the article, draws policy conclusions, and makes suggestions for further research.

I. Conventional Views of UI Systems

Over the past decade, several New England states, as well as many others around the country, have been especially concerned about the adequacy of the reserves in their UI trust funds. During the 1990–92 recession, both Connecticut and Massachusetts completely exhausted their reserves and were forced to borrow from the U.S. Treasury to

Figure 1

Adequacy of New England's UI Trust Fund Reserves According to the Average Cost High Multiple Standard[a], 1996:Q4 and 1998:Q2



[a] According to this standard, a state should have sufficient reserves in its UI Trust Fund to finance 12 months of benefits paid out at the Average High Cost Rate. The Average High Cost Rate is the average of the three highest calendar year benefit cost rates in the last 20 years. Benefit cost rates are benefits paid (excluding reimbursable benefits) as a percent of total wages in taxable employment. The average high cost multiple is equal to 100 * (trust fund balances as a percentage of total wages)/(the average high cost rate). According to the average high cost multiple standard, a state's average high cost multiple should equal at least 100 percent.

Source: U.S. Department of Labor, *UI Data Summary,* October 1998 and April 1997, and authors' calculations.

finance UI benefits. Among the seven states using federal UI loans during this period, only Connecticut and Massachusetts had serious funding problems (Vroman 1998, p. 1). Since 1991, Maine's reserves, although never completely exhausted, have averaged only 1 percent of the wages of covered employees, compared to 1.4 percent for the nation as a whole (U.S. Department of Labor 1993 and *UI Data Summary*).

What level of reserves is "adequate?" The Advisory Council on Unemployment Compensation (1995) recommended the "average high cost" standard.[1] According to this guideline, a state should have enough reserves to finance at least 12 months of benefits paid out at the average of its three highest "cost rates" over the previous 20 years. The cost rate is the statewide ratio of benefits paid out to the total wages of UI-eligible employees in any calendar year. As noted in the previous article, at the end of 1996 the trust fund reserves of only two New England states, New Hampshire and Vermont, met or exceeded this standard (both exceeded it by more than twofold). While this was still true by the end of the second quarter of 1998, the other four states in the region had augmented their reserves to the point where they had attained at least 60 percent of the standard (Figure 1). Massachusetts had achieved 93 percent of the standard and may now exceed it.

Concerns about economic competitiveness have slowed the replenishment of trust fund reserves. Ac-

[1] While the Council recommended this standard, a standard has not been officially adopted by the federal government. The issue of how to evaluate trust fund adequacy remains controversial. Some have supported standards more lenient than the average high cost multiple, while others have advocated more stringent standards.

cording to some employers in New England, high UI taxes have discouraged businesses from locating within the region. As evidence, several business groups have noted that, with the exception of New Hampshire, all New England states collect a relatively high amount of taxes per UI-covered employee and have high ratios of UI taxes to total wages paid to UI-covered workers. Rhode Island has by far the highest ratio in the nation, Connecticut, Maine and Massachusetts all rank in the top 10, and Vermont ranks 13th (Table 1).

In general, the New England states have been taxing their employers heavily in order to replenish or to deepen reserves rather than to finance relatively generous benefits.

Although states in the region may impose high UI taxes, as a whole they do not provide especially generous benefits according to the wage replacement ratio, the most commonly cited measure of benefit generosity (although the simulation results reported in Section IV suggest otherwise). This ratio is the average weekly UI benefit as a percentage of the average weekly wage in UI covered employment. As of the second quarter of 1998, two states in the region, Massachusetts and Rhode Island, had high replacement ratios, ranking 17th and 13th in the nation, respectively. The other four states had replacement ratios in the bottom half of the national distribution (Table 2). In general, the region's states have been taxing their employers heavily in order to replenish or to deepen reserves rather than to finance relatively generous benefits.

As alluded to in the introduction and discussed at length in Tannenwald and O'Leary (1997), allocative neutrality requires that UI systems be neutral with respect to the interindustry allocation of resources within a state. This criterion is met when each employer's UI contributions equal the sum of the benefits it derives from the UI system and the social costs of the unemployment that the employer creates. Benefits redounding to the employer are equal to the UI compensation paid to the workers that it has laid off. Public provision of such compensation benefits employers as much as the unemployed workers who receive it. UI allowances relieve temporarily laid-off workers from the need to pursue an entirely different line of work in order to provide for themselves and their families while they are unemployed. As a result, they are available for reemployment when demand for their services revives. Were they not available, labor costs would be higher because the supply of suitably skilled workers would be diminished.

If allocative neutrality is to be attained, employers should take into account the social costs they impose on society when they contemplate adjustments to their work forces. Suppose that the social costs generated by the unemployment of one worker are roughly equal to the total amount of publicly funded UI benefits that the worker receives. Then allocative neutrality is satisfied to the extent that the ratios of UI contributions to paid-out benefits are similar across industries. Dissimilar ratios indicate cross-industry subsidization and, therefore, allocative distortions.

Unfortunately, state-by-state data on UI benefits and contributions broken out by industry are not generally available. Using data received from the Massachusetts Division of Employment and Training, Tannenwald and O'Leary (1997) analyzed the degree of cross-industry subsidization attributable to the Commonwealth's UI system during the mid 1990s. Following the methodology of Munts and Asher (1980), they subtracted the benefits paid out to the unemployed workers of each industry from the industry's UI contributions and divided the difference by the total wages paid by the industry to UI-covered employees. Tannenwald and O'Leary found considerable variation in this ratio, with construction and selected manufacturing industries enjoying the heaviest subsidization.

The ideal UI system promotes the attainment of both the optimal interindustry allocation of resources and the optimal level of employment. Achievement of one goal does not necessarily imply achievement of the other. An allocatively neutral system may nonetheless fail to induce employers to take the social costs of employment fully into account in determining how much labor to employ. One can imagine a state that imposes the same UI tax rate on firms regardless of their propensity to lay off workers. The uniformly imposed rate is so high that, when the economy is strong and unemployment low, employers' UI contributions far exceed the benefits paid out to the workers whom they have laid off. Under such conditions, the

state amasses a surplus in its trust fund sufficient to finance the surge in payouts when the economy weakens and unemployment rises. Over the long run, each employer makes contributions that are roughly equivalent to the benefits received by the workers it has laid off. However, at any given time the employer pays the same tax rate whether it doubles its work force or halves it. The employer has no incentive to moderate swings in the incidence of its layoffs in the interests of society at large.

A UI system is more likely to promote both allocative neutrality and optimal employment levels if it adheres to the "experience rating" principle. According to the principle, an employer's UI tax rate should vary closely with its demonstrated propensity to lay off workers. Small increases in this propensity should trigger concomitant rises in the employer's tax rate, compelling it to factor in the social consequences of changing its lay-off behavior. Allocative neutrality is enhanced because an employer's tax burden depends on the value of the benefits paid to its laid-off workers. Up to a point, employment is stabilized because firms are discouraged from laying off workers and encouraged to expand their employment cautiously, since they will be penalized if they must eventually lay off hired workers (Brechling and Laurence 1995).[2] However, rigid adherence to the experience-rating principle can be destabilizing if toward the end of a recession it causes UI taxes on struggling firms to rise too sharply, inducing them to postpone rehiring or to close their doors. Finally, taxing a firm in proportion to its propensity to lay off workers encourages it to monitor UI claims closely, thereby enhancing the enforcement of eligibility rules.

In order to evaluate the degree to which each state adheres to the experience-rating principle, the U.S. Department of Labor annually publishes an "Experience Rating Index" (ERI). The index equals the percentage of total UI benefits paid by a state that is "effectively charged," that is,

Table 1
Two Measures of "UI Tax Competitiveness"

State	UI Taxes per Covered Worker, 1998:Q2		UI Taxes as Percent of Wages in Covered Employment, 1997:Q3–1998:Q2	
	Amount ($)	Rank	Amount ($)	Rank
Alabama	93.88	40	.4	42
Alaska	492.43	1	1.5	2
Arizona	112.42	35	.8	16
Arkansas	168.06	22	.8	16
California	235.62	13	.8	16
Colorado	102.65	39	.4	42
Connecticut	**386.04**	**4**	**1.1**	**7**
Delaware	178.16	20	.7	21
District of Columbia	250.84	11	.6	27
Florida	83.70	46	.3	46
Georgia	89.42	44	.3	46
Hawaii	301.24	8	1.3	4
Idaho	164.99	23	.8	16
Illinois	211.86	16	.7	21
Indiana	88.07	45	.4	42
Iowa	103.48	38	.5	33
Kansas	34.46	53	.5	33
Kentucky	163.00	24	.6	27
Louisiana	111.77	36	.5	33
Maine	**232.23**	**14**	**1.1**	**7**
Maryland	146.45	27	.5	33
Massachusetts	**362.13**	**5**	**1.0**	**10**
Michigan	254.84	10	.9	13
Minnesota	162.64	25	.6	27
Mississippi	93.60	41	.5	33
Missouri	138.00	28	.5	33
Montana	135.25	29	.9	13
Nebraska	52.66	49	.1	52
Nevada	213.79	15	.8	16
New Hampshire	**48.51**	**51**	**.1**	**52**
New Jersey	387.80	3	1.0	10
New Mexico	148.57	26	.7	21
New York	236.21	12	.6	27
North Carolina	80.27	47	.3	46
North Dakota	92.84	42	.6	27
Ohio	132.83	30	.6	27
Oklahoma	48.63	50	.3	46
Oregon	313.27	7	1.3	4
Pennsylvania	285.84	9	1.1	7
Puerto Rico	180.47	19	.7	21
Rhode Island	**436.79**	**2**	**1.9**	**1**
South Carolina	109.67	37	.5	33
South Dakota	38.50	52	.2	50
Tennessee	112.59	34	.5	33
Texas	118.03	33	.4	42
Utah	90.42	43	.5	33
Vermont	**185.14**	**18**	**.9**	**13**
Virgin Islands	132.29	31	1.3	4
Virginia	53.35	48	.2	50
Washington	337.37	6	1.4	3
West Virginia	203.02	17	1.0	10
Wisconsin	170.25	21	.7	21
Wyoming	126.38	32	.7	21

Source: U.S. Department of Labor, Unemployment Insurance Service, Division of Fiscal and Actuarial Services, *UI Data Summary*, October 1998.

[2] According to Topel (1984), this effect is weakened when experience rating is imperfect.

Table 2
Wage Replacement Ratio, by State, 1998:Q2

State	Average Weekly Benefit Amount as Percent of Average Weekly Wage in Covered Employment: Value (%)	Rank	State	Average Weekly Benefit Amount as Percent of Average Weekly Wage in Covered Employment: Value (%)	Rank
Alabama	31.2	44	Nebraska	34.5	36
Alaska	27.7	51	Nevada	38.5	22
Arizona	27.8	50	**New Hampshire**	**31.6**	**43**
Arkansas	41.7	11	New Jersey	37.5	25
California	24.3	53	New Mexico	36.0	31
Colorado	38.8	21	New York	27.0	52
Connecticut	**28.4**	**48**	North Carolina	40.2	15
Delaware	32.0	42	North Dakota	44.4	2
District of Columbia	28.3	49	Ohio	38.2	23
Florida	42.4	8	Oklahoma	40.0	16
Georgia	32.4	40	Oregon	39.5	18
Hawaii	50.8	1	Pennsylvania	41.3	12
Idaho	43.0	6	Puerto Rico	32.3	41
Illinois	35.8	33	**Rhode Island**	**41.1**	**13**
Indiana	37.4	26	South Carolina	36.4	30
Iowa	44.3	3	South Dakota	39.2	20
Kansas	44.2	4	Tennessee	33.4	38
Kentucky	37.7	24	Texas	36.4	29
Louisiana	29.7	47	Utah	40.7	14
Maine	**30.8**	**46**	**Vermont**	**35.2**	**34**
Maryland	34.9	35	Virgin Islands	36.0	32
Massachusetts	**39.6**	**17**	Virginia	33.3	38
Michigan	36.7	28	Washington	44.2	5
Minnesota	42.8	7	West Virginia	39.3	19
Mississippi	33.6	37	Wisconsin	36.8	27
Missouri	30.9	45	Wyoming	42.0	10
Montana	42.4	9			

Source: U.S. Department of Labor, Unemployment Insurance Service, *UI Data Summary*, October 1998, and authors' calculations.

charged to specific employers for the purpose of determining their experience-rated tax rate. Although a large fraction of a firm's UI tax bill is determined by its experience rating, in most states much of it also includes assessments levied on all firms at a uniform rate. These assessments finance benefits to workers laid off by insolvent firms, benefits charged to firms already at the state's maximum tax rate, benefits whose costs the state feels should be socialized (such as dependents' allowances), and supplementary infusions into UI trust fund reserves when experience-rated taxes fail to replenish them adequately. According to the 1997 ERIs (the latest available), reported in Table 3, the New England states varied sharply in their adherence to the experience-rating principle. New Hampshire's ERI was the second highest in the nation, Connecticut's and Rhode Island's tied for 15th, Maine's and Massachusetts' tied for 28th, and Vermont's ranked 38th.

II. Critique of Commonly Used Measures

With the exception of the average high-cost standard of trust fund adequacy, the indicators cited in Section I are misleading. In particular, comparisons of their values across states partially depend on temporary interstate differences in economic conditions. At another time, similar comparisons might produce very different results.

Given that all states practice experience rating to some degree, UI tax contributions as a percentage of wages paid to covered workers depend in part on prior rates of insured unemployment (IUR). A sharp spike in IUR usually pushes employers into higher UI tax brackets, where they remain for several years. If tax rates rise faster than taxable payrolls, or if taxable payrolls decline, then the ratio of revenue to wages rises. As a result, an increase in a state's ratio relative to those of competing states may reflect a temporary deterioration in its relative economic strength rather than in its long-run competitive standing.

The positive, lagged relationship between earlier rises in insured unemployment and UI tax contributions can be seen in Figure 2 and in the six panels of Figure 3. Note in Figure 3 that in 1989, at the end of a long regional economic boom, two New England states, Connecticut and Massachusetts, posted their

Table 3
Experience-Rating Index (ERI), by State, 1997

State	ERI 1997	Rank	State	ERI 1997	Rank
Alabama	51	36	Nebraska	48	38
Alaska	n.a.	n.a.	Nevada	76	5
Arizona	77	3	**New Hampshire**	**82**	**2**
Arkansas	61	22	New Jersey	59	24
California	59	24	New Mexico	63	20
Colorado	56	27	New York	85	1
Connecticut	**66**	**15**	North Carolina	44	42
Delaware	n.a.	n.a.	North Dakota	52	35
District of Columbia	77	3	Ohio	62	21
Florida	71	9	Oklahoma	50	37
Georgia	67	13	Oregon	54	31
Hawaii	45	41	Pennsylvania	55	28
Idaho	53	32	Puerto Rico	n.a.	n.a.
Illinois	75	6	**Rhode Island**	**66**	**15**
Indiana	60	23	South Carolina	57	26
Iowa	64	19	South Dakota	47	40
Kansas	68	11	Tennessee	65	17
Kentucky	67	13	Texas	53	32
Louisiana	70	10	Utah	n.a.	n.a.
Maine	**55**	**28**	**Vermont**	**48**	**38**
Maryland	n.a.	n.a.	Virgin Islands	n.a.	n.a.
Massachusetts	**55**	**28**	Virginia	74	7
Michigan	n.a.	n.a.	Washington	[a]	[a]
Minnesota	74	7	West Virginia	53	32
Mississippi	42	44	Wisconsin	65	17
Missouri	68	11	Wyoming	43	43
Montana	n.a.	n.a.			

n.a. = not available.
[a]Washington data from 1991 to 1997 are under review.
Source: U.S. Department of Labor and authors' calculations.

lowest insured unemployment rate (IUR) in the postwar era. In that year, their UI tax burdens ranked 43rd and 34th, respectively (U.S. Department of Labor 1993). After the onset of the recession in the early 1990s, employers accelerated their rate of layoffs, raising their experience ratings and, therefore, increasing their tax rates. By 1994 the UI tax burdens of Connecticut and Massachusetts were the tenth and third highest, respectively, in the nation (U.S. Department of Labor, *UI Data Summary*). These increases in relative tax burdens were caused by cyclical rather than structural influences. In comparing states in terms of their unemployment insurance tax burden, Tannenwald and O'Leary (1997) attempted to control for cyclical influences by taking the average burden for the years 1988 (a boom year for New England), 1991 (a year of sharp contraction within the region), and 1995 (a year of economic recovery). The principal drawback of this approach is that over the 1988–95 period some states changed the structure of their UI taxes. Consequently, one cannot draw firm conclusions from these three-year averages about the competitiveness of a particular state's current UI tax system.

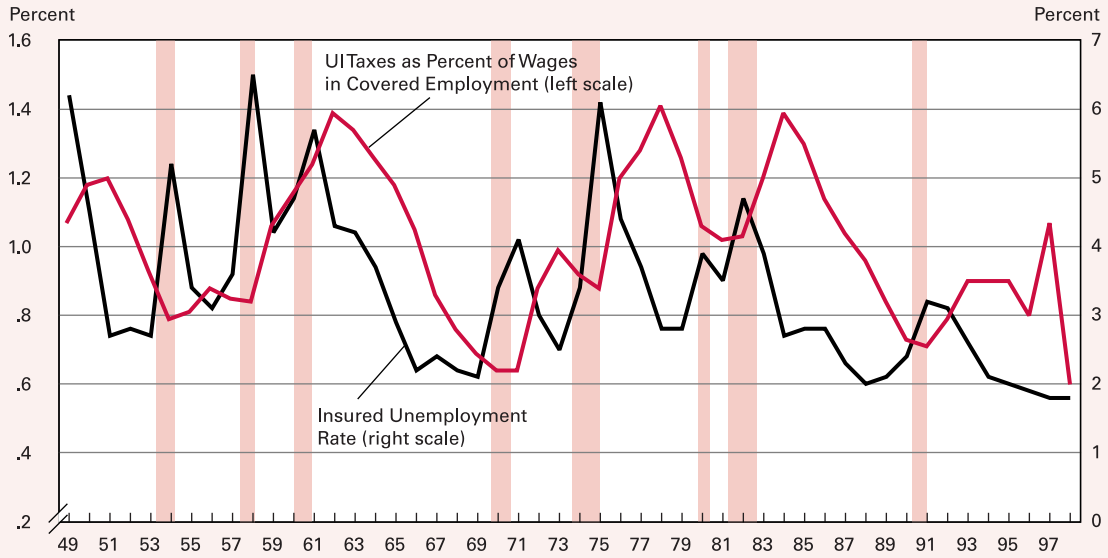
Cyclical influences similarly complicate interpretation of interstate comparisons of benefit-to-wage ratios. In general, the average former wage of UI benefit recipients is lower than that of covered employed workers (Vroman 1980, p. 170). However, when a state's economy contracts, the percentage of layoffs occurring in cyclically sensitive sectors, such as manufacturing and construction, tends to rise. These sectors offer higher-than-average wages. Since a worker's weekly UI benefit varies with his or her most recent wage rate (up to a state-specific maximum), a state's average weekly UI benefit tends to rise more rapidly during a contraction than during a recovery or expansion. At the same time, the percentage of employment accounted for by relatively stable industries, which generally pay lower wages than either manufacturing or construction, tends to rise. Furthermore, the demand for labor is weak. Consequently, the average weekly wage of employees generally increases less rapidly than it does in better economic times.[3] With

[3] It does not necessarily follow that the average wage received by unemployed workers prior to losing their jobs is higher than that received by those who remain employed. In fact, several studies have found that the opposite is true (see Vroman 1980 and Advisory Council on Unemployment Compensation 1995). The cyclicality of the benefit-wage ratio reflects a *narrowing* of the gap between the prior wages of the unemployed and the wages of the employed during economic contractions. As a result, the average weekly benefit rises relative to the average weekly wage.

Evidence that the average wage of unemployed workers prior to being laid off is lower than that of workers who remain employed has led some economists to argue that the benefit-wage ratio, apart from its cyclical biases, is an invalid measure of benefit generosity. A more appropriate measure, not currently reported by the U.S. Department of Labor, would be the ratio of the average benefit to the average wage earned by the unemployed before losing their job (see O'Leary and Rubin 1997, pp. 172–76 and Advisory Council on Unemployment Compensation 1995, pp. 21, 126, 138).

Figure 2

Cyclicality of UI Taxes as a Percent of Total Wages in Covered Employment in the United States



Note: Data are for four quarters ending 1949:Q4 through four quarters ending 1998:Q2. Shaded areas are periods of recession.

Source: U.S. Department of Labor, *UI Data Summary,* various issues, and *ET Handbook 394,* 1938-1993.

benefits accelerating and wages decelerating, the benefit-wage ratio rises. Thus, in any given year, a state's relative ratio reflects its relative economic strength as well as the relative generosity of its UI benefits.

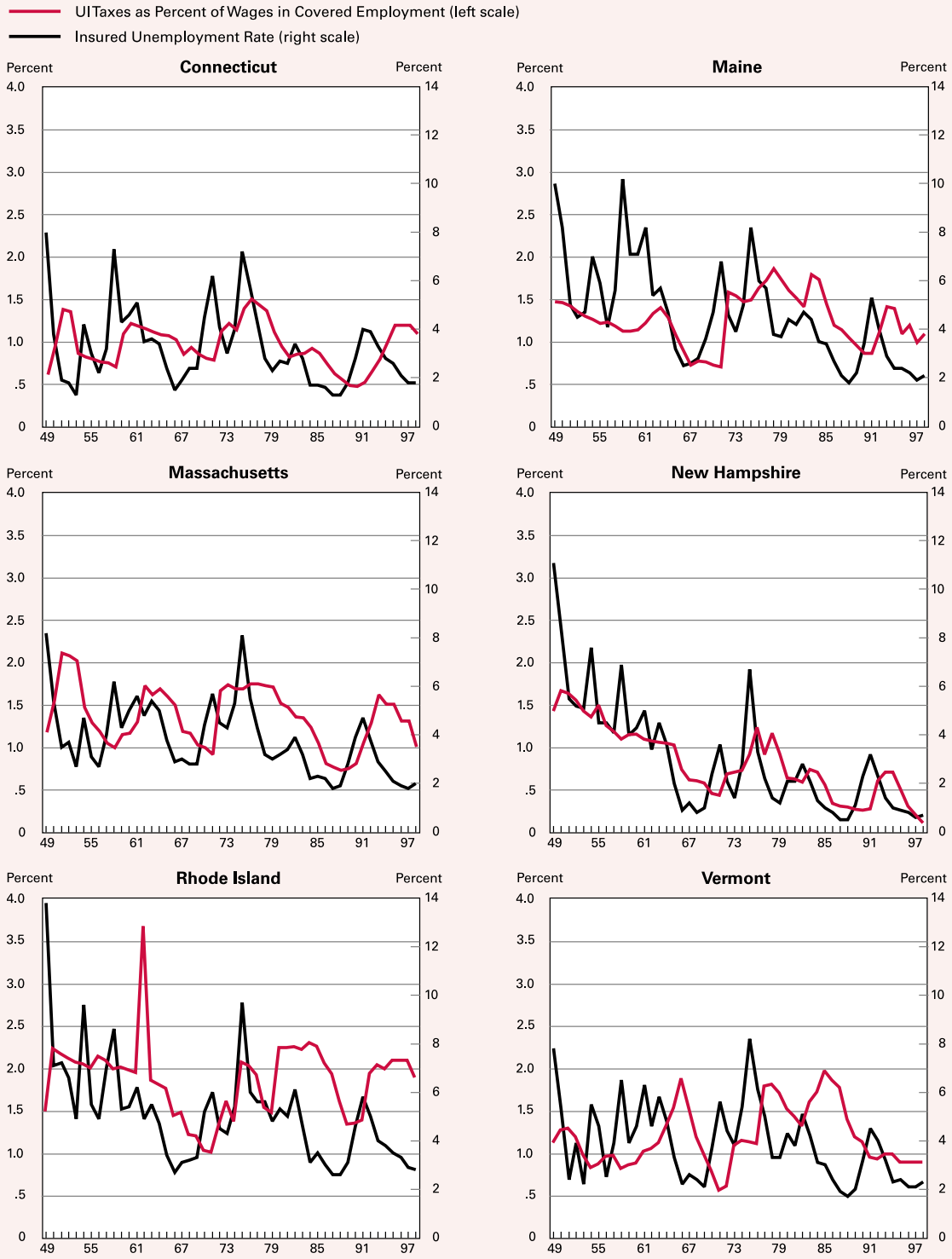
The cyclical pattern of the benefit-to-wage ratio for the nation as a whole is evident in Figure 4. This figure also reveals a rising secular trend in this ratio until the mid 1970s, after which it reversed direction. The inadequacy of many state trust funds during the recession of the mid 1970s, and the concomitant need to borrow from the federal government, led states to curb growth in UI benefits. In 1982, state trust funds collectively registered a deficit for the first time in the UI program's history. In order to promote the accumulation of adequate trust fund reserves, in that year the federal government began to charge interest on its UI loans, inducing further cuts in benefits and increases in taxes.

The ratio of UI benefits to wages in three New England states—Connecticut, New Hampshire, and Vermont—have exhibited postwar secular trends similar to those of the nation. In all three states the reversal in trend began in the early 1970s, a few years earlier than in the nation as a whole. By contrast, the ratio has trended upward in Massachusetts and Rhode Island. In Maine, an upward trend began in 1965 and continued through the early 1990s. Recently enacted sharp cuts in UI benefits have caused the ratio to drop precipitously in the state since 1995 (Figure 5).

Cyclical swings around these trends are generally visible in each New England state, more pronounced in Massachusetts and Rhode Island, less so in the other four states. These fluctuations limit the generalizations about the region that can be drawn from cross-sectional interstate comparisons of benefit-to-wage ratios, just as cyclical fluctuations limit the validity of conclusions drawn from cross-sectional comparisons of UI tax burdens. For example, in 1982, Massachusetts' average weekly benefit was 36.5 percent of its average weekly wage and ranked 38th among the states. Based on this ratio, one might conclude that the Commonwealth's UI program was relatively stingy. However, its relatively low ratio reflected its low insured unemployment rate (ranked 36th) in that year. Eight years later, in 1990, the Commonwealth's ratio, at 42.5 percent, ranked seventh in the nation, largely because its insured unemployment rate ranked fourth (U.S. Department of Labor 1993). Currently, the Common-

Figure 3

Cyclicality of UI Taxes as a Percent of Total Wages in Covered Employment in the New England States

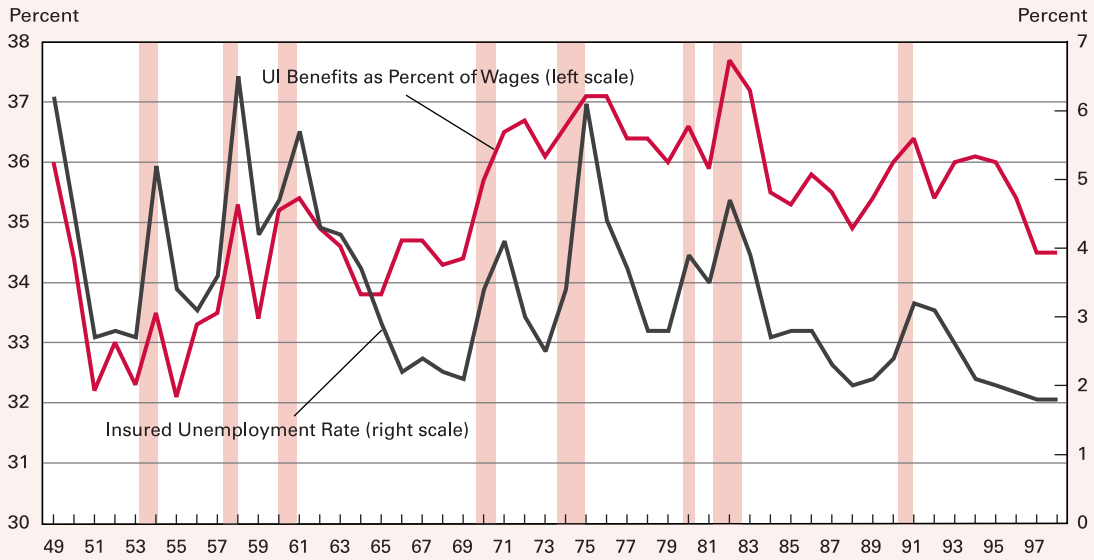


Note: Data are for four quarters ending 1949:Q4 through four quarters ending 1998:Q2.

Source: U.S. Department of Labor, *UI Data Summary,* various issues, and *ET Handbook 394,* 1938-1993.

Figure 4

Cyclicality of Wage Replacement Ratio in the United States



Note: Data are for four quarters ending 1949:Q4 through four quarters ending 1998:Q2. Shaded areas are periods of recession.

Source: U.S. Department of Labor, *UI Data Summary,* various issues, and *ET Handbook 394,* 1938-1993.

wealth's benefit-to-wage ratio ranks 17th, about the same as the rank of its insured unemployment rate (18th). With these cyclical influences removed, are the Commonwealth's benefits relatively generous or stingy? One cannot tell from these simple comparisons.[4]

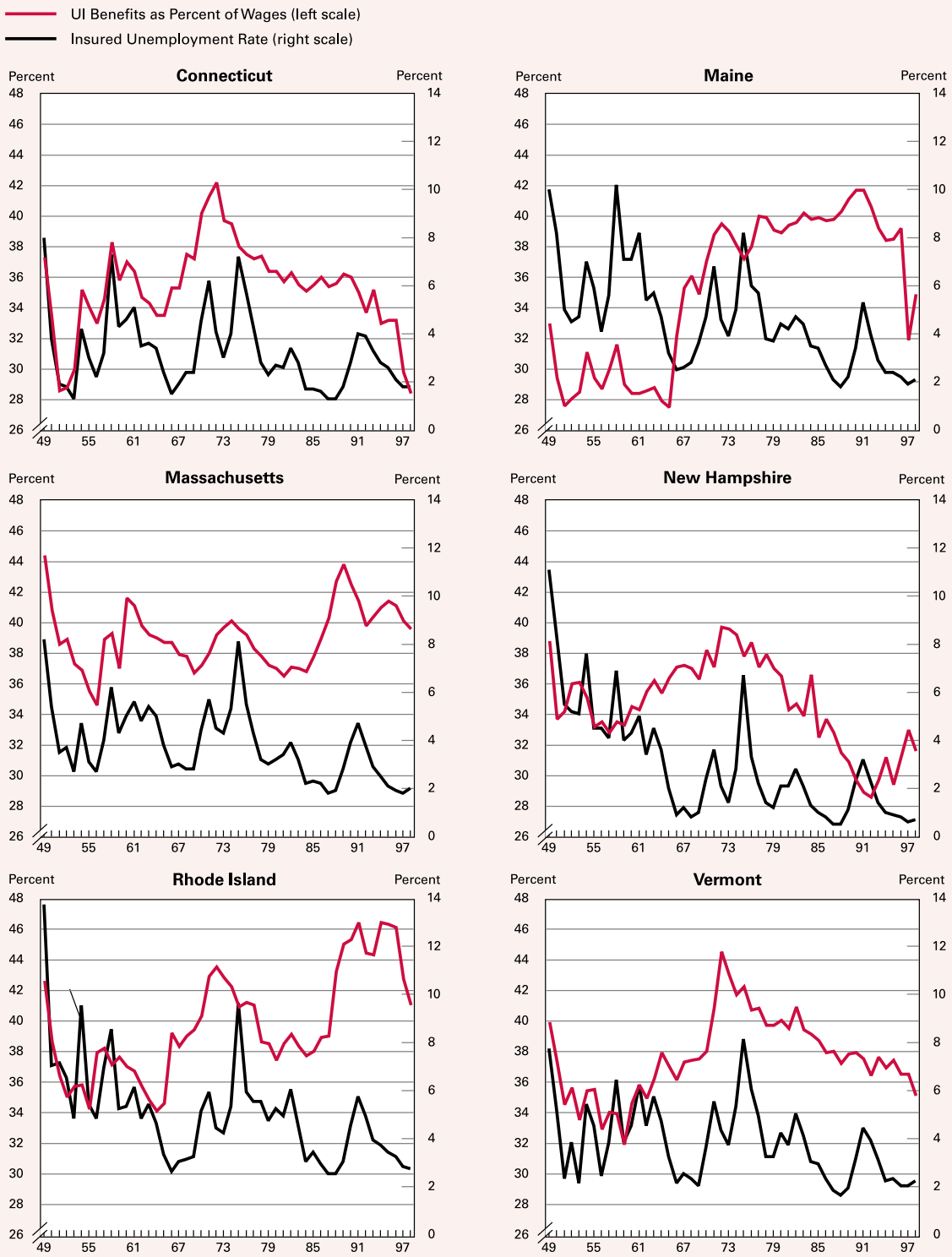
States' experience-rating indices also exhibit cyclical variation. When a state's economy contracts, bankruptcy becomes more widespread. An increasing fraction of employers already at the state's maximum tax rate continue to lay off workers, thereby creating additional costs that cannot be recouped from the firms responsible for them. UI trust fund reserves become depleted, triggering solvency assessments that are rarely imposed in proportion to a firm's experience rating. For all these reasons, a state's experience rating as measured by the ERI is inversely related to its insured unemployment rate. This inverse relationship has been exhibited in the New England states over the past decade (Figure 6). The index values of five of the six states in the region reached their lowest recorded value in either 1991 or 1992, when regional unemployment last peaked. The only exception, Vermont, has a UI tax structure fundamentally different from those of the other states in the region and the rest of the nation (Tannenwald and O'Leary 1997).

The cyclicality of the ERI has caused state rankings to fluctuate dramatically since the index was first reported, in 1988. For example, in 1991, when New England's economy was relatively weak, Massachusetts' ERI was 40, the lowest of the 49 states assigned an index value in that year. Connecticut's ERI was 47, ranked 46th. By 1997, the Commonwealth's ERI had climbed to 55 and ranked 32nd among 44 reporting states. At 66, Connecticut's ERI ranked 14th of 44 (U.S. Department of Labor, unpublished data). Was the increase in each state's ERI attributable to its relatively rapid decline in unemployment or to policy changes

[4] In theory, a cross-sectional regression in which the wage replacement ratio is regressed on the insured unemployment rate would control for these cyclical influences. Each state's residual would be a cyclically adjusted indicator of its benefit generosity. In practice, however, the relationship between the wage replacement rate and the insured unemployment rate is too complex to reduce to a linear equation. Hence the need for the simulations presented in Section IV.

Figure 5

Cyclicality of Wage Replacement Ratio in the New England States



Note: Data are for four quarters ending 1949:Q4 through four quarters ending 1998:Q2.

Source: U.S. Department of Labor, *UI Data Summary,* various issues, and *ET Handbook 394,* 1938-1993.

that increased the degree to which the UI tax systems are experience rated? The answer is unclear.

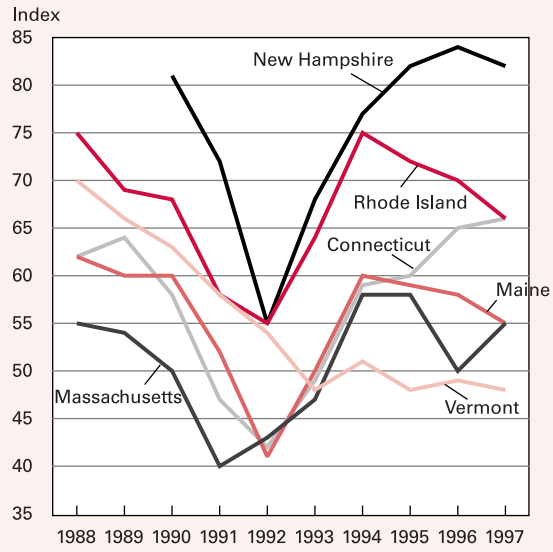
The patterns and extent of interindustry subsidization found by Tannenwald and O'Leary (1997) in Massachusetts in the mid 1990s were also influenced by economic conditions prevailing in the Commonwealth at that time. For example, the large degree of subsidization enjoyed by manufacturers of electrical and nonelectrical machinery reflected in part the decline in demand for minicomputers during the late

Comparisons of the values of UI measures across states partially depend on temporary interstate differences in economic conditions, and for this reason they can be misleading.

1980s and early 1990s. In the future, the industries most heavily subsidized in the Commonwealth and the extent of interindustry subsidization could change, even in the absence of modifications to the structure of its UI system.

Figure 6

Experience Rating Index
New England States, 1988 to 1997



Note: The experience rating index is calculated by first computing "effective benefit charges" by taking the total benefits paid during the reporting period and subtracting from them the ineffective charges, inactive charges, and noncharges. The remainder is then divided by the total benefits. Data are unavailable for New Hampshire for 1988 and 1989.

Source: U.S. Department of Labor, unpublished data.

III. An Alternative Approach to Evaluating State UI Systems

In this study, we employ a "hypothetical firm" approach to develop an alternative set of indicators free of biases attributable to temporary interstate differences in economic conditions. In implementing this approach, we use the Unemployment Insurance Micro Simulation Model (UIMSM), a structural simulation model of state UI systems originally developed during the 1980s at the W.E. Upjohn Institute for Employment Research under the direction of Timothy Hunt (Hunt and O'Leary 1989).[5]

The Basic Strategy

UIMSM is capable of simulating the UI tax liabilities paid by a hypothetical firm and the UI benefits given to the workers it has laid off under a variety of scenarios. In each scenario, the model holds certain characteristics of the firm constant regardless of the state in which it is located. For example, the firm's workers are assumed to have uniform annual wages. In the absence of a recession, the percentage of the firm's work force receiving UI insurance is assumed to be constant. The onset of a recession is assumed to result in a uniform increase in this percentage, that is, to induce an increase in propensity to lay off workers that is invariant across firms. By holding these and other firm characteristics constant, the model is capable of isolating and estimating interstate differences in tax liabilities and benefit levels attributable solely to differences in state UI laws and regulations.

The usefulness of these indicators to policymakers depends on the representativeness of the hypothetical firms used in the simulations. Employers are so diverse that no single prototype can adequately represent them all. In addition, it is difficult to evaluate the allocative neutrality of a state's UI system

[5] Technical details about UIMSM are given in Hunt, O'Leary, and Huang (1990).

without analyzing the extent to which certain types of firms subsidize others. Consequently, we have performed several sets of simulations, each based on one of six different hypothetical firms. The firms differ in the average annual wages of their employees, the percentage of their work force unemployed during non-recessionary years (the firm's initial "insured unemployment rate" or IUR), and the response of the firm's IUR to the onset of a recession (the "spike" in the firm's IUR).[6]

The first prototype was styled as a representative manufacturer, since state and local governments vie most intensely for manufacturing jobs. The prototype's employees all earn annual wages close to the national average for manufacturing production workers in 1998 ($28,000).[7] Like a typical manufacturer, its initial IUR is low (1.15 percent), while the spike in its IUR is large (3.45 percentage points). However, since manufacturers offer widely differing wages, the authors created "low-wage" and "high-wage" variants of the initial prototype, paying an annual wage of $16,000 and $40,000, respectively. Three other prototypes were designed. One, characterized by an average wage level, low initial IUR, and small IUR spike (1.15 percentage points), might be considered representative of a services firm, such as a bank or insurance company. Another—low wage level, average initial IUR (2.3 percent), and average spike (2.3 percentage points)—resembles a prototypical retailer. The third—high wage, high initial IUR, and large spike (4.6 percentage points)—fits the profile of a construction firm. Of the 28 states represented, two, Connecticut and Massachusetts, are in New England.[8]

Key Tax Features Captured in the Micro Simulation Model

A few features of state UI tax systems determine most of the interstate differences uncovered by the simulations: 1) the method for determining an employer's experience rating; 2) the state taxable wage base; 3) the range of statutory tax rates applied to this base as determined by a firm's experience rating; and 4) solvency assessment rates, that is, the supplementary tax rates imposed on employers to finance ineffectively charged benefits or to deepen trust fund reserves. These features, especially those determining a firm's experience rating, are complex and vary considerably across states. Table 4 summarizes differences in these four key features across the 28 states in the study sample.

A few key features of state UI tax systems determine most of the interstate differences: the experience-rating method, the taxable wage base, the range of tax rates, and solvency assessment rates.

Almost all 28 states use either the "reserve ratio" or the "benefit ratio" approach to compute a firm's experience rating. Under the former approach the state keeps track of each firm's cumulative UI tax payments (those made since the firm's creation) and the cumulative benefits effectively charged to the firm. Periodically, the state divides the difference between the firm's cumulative tax payments and benefit charges (the balance in the firm's "reserve account") by the firm's payroll paid to covered employees. This "reserve ratio" determines the firm's tax rate, according to a stipulated tax rate schedule. In general, the lower the reserve ratio, the higher the tax rate, subject to a minimum and maximum.

Under the benefit ratio approach, a firm's experience rating depends solely on the benefits charged to it relative to its payroll, or "benefit ratio," during a specified period (typically three to five years). Its history of UI tax payments is irrelevant. In some benefit ratio states, a firm's benefit ratio is the firm's experience-rated tax rate. For example, in Connecticut, firms with benefit ratios of 0.005 and 0.010 are subject to experience-rated tax rates of 0.5 percent and 1.0 percent, respectively. Other benefit ratio states have schedules stipulating how a firm's tax rate varies with

[6] In effect, each firm is assumed to have a work force attached to it. Although it employs most of this work force, over the course of the year a certain percentage of the force is not working because it has been laid off. That percentage is the firm's IUR.

[7] The average hourly wage for production workers of U.S. manufacturers in September 1998 was $13.60, and their average workweek was 41.6 hours. $13.60 per hour × 41.6 hours × 50 working weeks in a year equals $28,288 per year. Source: Federal Reserve Bank of Boston, *New England Economic Indicators*, November 1998, p. 15.

[8] The 28 states are identical to those comprising the sample in Hunt, O'Leary, and Huang (1990). They were included in that sample because in 1990 they accounted for most of the nation's manufacturing employment. Hunt, O'Leary, and Huang were primarily concerned with the manufacturing sector.

Table 4
Characteristics of 1998 State Experience-Rating Systems

State	Type of Experience Rating[a]	State Taxable Wage Base (Dollars)	Range of Experience Rates (Percent)	Solvency Assessment Rate (Percent)
Alabama	BR	8,000	.29–5.4	−.06
Arkansas	RR	9,000	.1–6.0	.4
California	RR	7,000	.9–5.4	.10[b]
Connecticut	**BR**	**13,000**	**.5–5.4**	**1.50[c]**
Florida	BR	7,000	.0–5.4	VAF + FAF[d,e]
Georgia	RR	8,500	.02–5.4	none
Illinois	BR	9,000	.2–6.4	.4
Indiana	RR	7,000	.2–5.4	none
Iowa[f]	BR	15,700	.0–7.0	.1
Kentucky	RR	8,000	.3–9.0	none
Maryland	BR	8,500	.3–7.5	none
Massachusetts	**RR**	**10,800**	**1.8–7.7**	**.76**
Michigan[g]	BR	9,500	.1–8.1	.2
Minnesota	BR	17,200	.2–9.1	.20[b]
Mississipppi	BR	7,000	.5–5.4	.5
Missouri	RR	8,500	.0–6.0	20% of basic tax rate
New Jersey	RR	19,300	.4–5.4	none
New York	RR	7,000	.0–5.4	1.00
North Carolina	RR	12,600	.0–5.7	20% of basic tax rate
Ohio	RR	9,000	.1–6.5	none
Oregon[f]	BR	21,000	1.0–5.4	none
Pennsylvania[g]	BR	8,000	.0–7.7	1.50
South Carolina	RR	7,000	.54–5.4	.06[e]
Tennessee	RR	7,000	.0–10.0	none
Texas	BR	9,000	.0–6.0	.27
Virginia	BR	8,000	.0–5.4	none
Washington[f]	BR	22,500	.48–5.4	.17
Wisconsin	RR	10,500	.0–8.9	.05–.85[h]

[a]BR = Benefit Ratio, RR = Reserve Ratio.
[b]The rate additions apply only to positive balance employers in California and Minnesota.
[c]Besides 1.5 percent Fund Balance Tax, Connecticut has a special bond assessment of 51.3 percent of the basic tax rate.
[d]Variable Adjustment Factor (VAF) = 0.4526 ∗ (benefit ratio)
Final Adjustment Factor (FAF) = 0.01 or (5.4 − BR − VAF), whichever is smaller.
[e]The rate additions cannot increase the maximum experience tax rates in Florida and South Carolina.
[f]Iowa, Oregon, and Washington use a Benefit Ratio Ranking System. See the text.
[g]Michigan and Pennsylvania also include a reserve ratio in computing a portion of the tax rate.
[h]The additional tax rate in Wisconsin depends on the employer's basic experience tax rate, and is set by a predetermined schedule.
Source: Commerce Clearing House (1998) and data from employment security agencies of the individual states.

its benefit ratio. For example, in Alabama a firm with a benefit ratio between 0 and 0.39 is subject to an experience-rated tax rate of 0.29 percent, while one with a benefit ratio between 0.40 and 0.59 pays a tax rate of 0.44 percent. Two states in the sample, Michigan and Pennsylvania, employ a hybrid method of experience rating that combines both the reserve ratio and benefit ratio approaches (Commerce Clearing House 1998).

In a few benefit ratio states (Iowa, Oregon, and Washington in the 28-state sample), a firm's experience-rated tax rate depends on its *relative* benefit ratio rather than its absolute one.[9] These states rank all firms participating in their UI system from lowest to highest benefit ratio and note each firm's taxable payroll. The state then goes down its list until it has a group of firms whose aggregate taxable payroll equals a stipulated percentage of statewide taxable payroll. The state imposes the highest experience-rated tax rate on these firms. The state then proceeds down the list until it has another group of firms whose aggregate taxable payroll equals the stipulated percentage of the statewide total. The state imposes either the maximum experience-rated tax rate on this group or one slightly lower. The state proceeds to create UI tax brackets in this fashion until every firm in its UI system is assigned an experience-rated tax rate. For example, in 1998, Iowa went down its list until it had a group of firms whose aggregate taxable payroll accounted for 4.76 percent of the statewide total. The state imposed an experience-rated tax rate of 7 percent on these firms. The state continued down the list until it had a second group, also representing 4.76 percent of aggregate payroll. Firms in this group were subject to a rate of only 2.8 percent. Proceeding in this manner, Iowa divided its

[9] Vermont, not in this sample, is the sole New England state employing the relative benefit ratio approach.

ranked firms into 21 tax brackets, each accounting for 4.76 percent of statewide taxable payroll ($21 \times 4.76 = 100$). Firms in the three groups with the lowest benefit ratios were subject to a tax rate of 0 percent (Commerce Clearing House 1998).

Estimating the impact of an economic shock on a given firm's tax rate is difficult in a state employing the relative benefit ratio approach because the impacts on all firms within the state are interdependent. On the one hand, a recession could in theory cause every firm's benefit charges to rise and taxable payroll to fall by equal percentages, leaving its experience-rated tax rate unchanged. On the other hand, a firm suffering an isolated setback in a generally prosperous economic environment could experience a significant rise in its tax rate. We assumed the latter scenario for the three states in the sample employing this method of experience rating.

States have considerable leeway in designing their UI tax systems. Consequently, UI tax rate schedules and taxable wage bases differ sharply across states.

An important difference between the reserve ratio and benefit ratio approaches is the speed with which the state recovers the costs of an increase in benefits charged to a firm. Under the reserve ratio approach a firm's tax liability rises gradually after a surge in charged benefits, remains at an elevated level for several years, and then falls slowly with improving economic conditions. By contrast, under the benefit ratio approach, surges in charged benefits are paid for relatively rapidly and tax rates fall quickly once costs have been recovered. These differences are evident in a comparison of two UIMSM simulations, one involving a firm located in Massachusetts, a reserve ratio state, and the other involving a firm located in Connecticut, a benefit ratio state (Figure 7). In both simulations the firm experiences an unemployment shock in year 11. In both states the firm's UI tax bill rises slightly in that period and continues to rise in year 12. While the tax bill of the Massachusetts firm peaks in year 12, one year earlier than that of its Connecticut counterpart, the difference between its peak-year tax bill and its pre-shock tax bill is smaller. Moreover, this difference does not disappear in the Massachusetts scenario until year 18. By contrast, the shock-induced increase in the Connecticut firm's tax bill vanishes by year 16.

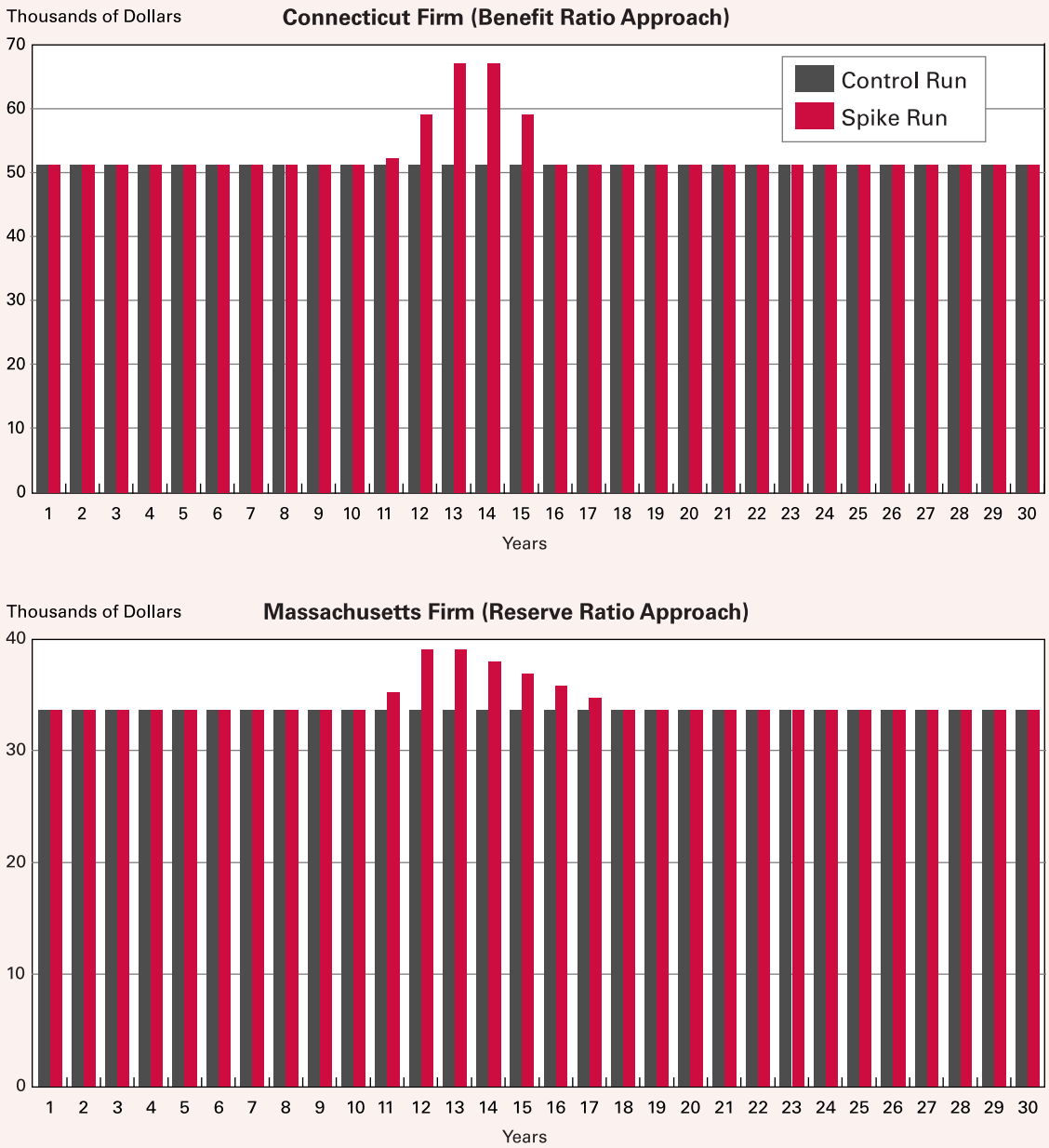
The federal government imposes few restrictions on state UI tax structures. State taxable wage bases must be at least as large as the first $7,000 of each employee's annual wages. The maximum payroll tax rate imposed under any experience-rated tax schedule must be at least 5.4 percent. Otherwise, states have considerable leeway in designing their UI tax systems.[10] Consequently, as shown in Table 4, UI tax rate schedules and taxable wage bases differ sharply across states. Most states have minimum tax rates greater than 0 in order to get firms with low propensities to lay off workers to help cover the costs of ineffectively charged benefits. States also differ sharply in their solvency assessment rates. In only five of the 28 states—Connecticut, Florida, Missouri, North Carolina, and Wisconsin—does an employer's solvency assessments rate reflect its experience rating. In the other 23, assessments are imposed at a uniform rate.

UIMSM incorporates other UI features in addition to those presented in Table 4. One such feature is the time lag between the date on which firms' tax rates are set and the date on which they become effective. For example, in Massachusetts, each employer's experience-rated tax rate that became effective on January 1, 1999 of this year was determined by its cumulative tax payments and benefit charges as of September 30, 1998. Rounding provisions (whether a state rounds "up" instead of "down" in computing reserve ratios and benefit ratios) are another tax detail that can exert a surprisingly large effect on a firm's UI tax rate (Hunt and O'Leary 1989). Yet another set of important UI

[10] The federal government also gives the states a powerful financial incentive to incorporate the experience-rating principle into their UI tax regimes. It imposes its own UI tax on employers, on top of the state tax, equal nominally to 6 percent of the first $7,000 of annual wages paid to each covered employee. The federal tax finances the administrative costs of the whole federal/state UI system and loans to states that have exhausted their own reserves. The federal government provides a credit against 90 percent of its tax, leaving an effective federal tax rate of 0.6 percent, provided that certain conditions are met. The employer must not be delinquent on its state UI taxes. Furthermore, the state in which the employer is located must not have any outstanding debt to the federal unemployment account and its UI laws must conform to federal laws. A state must have experience-rated UI tax structures for its employers to qualify for the 90 percent credit. Currently, the federal government levies an additional 0.2 percentage-point surtax, making the effective federal UI tax rate equal to 0.8 percent.

Figure 7

Simulated Response of UI Taxes of a Hypothetical Firm in Connecticut and Massachusetts to a Spike in Insured Unemployment



Note: Hypothetical firm's initial insured unemployment rate (IUR) is assumed to equal 1.15 percent. Spike in IUR is assumed to equal 2.3 percentage points. Average annual wages of firm's employees are assumed to equal $28,000.

Source: Authors' calculations using the Unemployment Insurance Micro Simulation Model.

tax characteristics concerns arbitrary lower and upper boundaries placed on employers' reserve ratios and benefit ratios which constrain them regardless of a firm's propensity to lay off workers (Tannenwald and O'Leary 1997). UIMSM also takes into account the impact on employers' benefit charges of the one-week

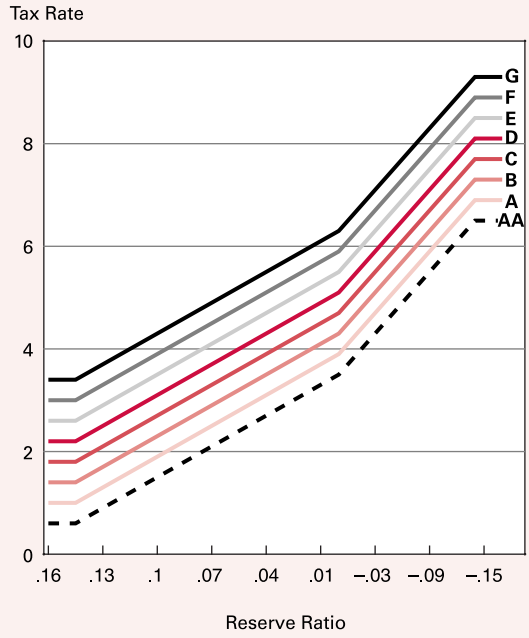
lag between the termination of employment and benefit eligibility.[11]

While UIMSM captures considerable detail, it fails to take into account some important realities. It does not incorporate the special tax rate provisions that some states apply to firms in certain industries or in certain size groups. For example, some states apply a unique tax rate structure to construction firms in recognition of their inherent volatility and resulting tendency to exert a net drain on UI systems. Moreover, UIMSM's hypothetical firms are assumed to have been in operation for many years. Consequently, the model does not take into account unique tax provisions applicable to new firms.[12] Special extended benefit programs are not incorporated either.

Finally, UIMSM does not—indeed, cannot—anticipate how tax rate schedules and solvency assessments might change in response to a particular spike in unemployment. A widespread economic shock inducing a rise in layoff rates throughout many economic sectors will shrink UI trust fund reserves. Under such conditions, many states automatically shift their UI tax rate schedules upward to restore solvency. For example, Massachusetts employs one of eight different rate schedules, depending on the depth of reserves in its UI trust fund (Figure 8). In addition to or in lieu of these shifts, some states increase their solvency assessment rates on an ad hoc basis to replenish their funds.

Figure 8

UI Tax Schedules in Massachusetts



Source: Massachusetts Department of Employment and Training.

Derivation of Indicators from Micro Simulations

As illustrated in Figure 7 for Connecticut and Massachusetts, the tax liabilities paid by each firm and the benefits given to its laid-off workers were simulated for a 30-year period under each state's UI laws and regulations. Two different simulations were performed using each of the six protoypical firms. In the first, the "control run," the firm's IUR remains unchanged throughout the entire period. In the second, the "spike run," the firm confronts an adverse economic shock that causes its IUR to jump in period 11 by its pre-designated amount, leading to a surge in paid-out benefits. Benefit payments fall to their "pre-spike" level in period 12 and stay there for the remainder of the simulation. In every simulation each firm faces the same macroeconomic environment regardless of the state in which it is located. Biases attributable to temporary interstate differences in economic conditions are assumed away.

In order to evaluate the competitiveness of each state's UI tax system, we computed the present value of each firm's total UI tax liabilities in the spike run over the entire 30-year simulation period, discounted back to period 11, the year the firm experiences the unemployment shock:

$$(Tax\ Burden)_s^{i,x} = \frac{\sum_{t=1}^{30} [T_s^{i,x}/(1-r)^{t-11}]}{\sum_{t=1}^{30} [T_s^{i,\bar{x}}/(1-r)^{t-11}]}$$

where:

T = UI taxes paid

[11] The effect of this one-week wait on an employer's benefit charges depends on its average duration of unemployment and its average exhaustion rate (the percentage of its laid-off workers who exhaust the UI benefits for which they are eligible). For the simulations reported in this article, a uniform duration of unemployment of 16.1 weeks and a uniform exhaustion rate of 32.3 percent were assumed. These values equal their actual national averages in 1998:Q1 (U.S. Department of Labor, *UI Data Summary*).

[12] Most states assign a predetermined tax rate to a new firm for a year or so and then phase in experience rating. Note, however, that the total impact of the UI system on new employers asymptotically approaches that for permanent ongoing firms, the type represented in the model.

B = UI benefits paid to laid-off workers
t = year
s = spike run
c = control run
i = the ith firm
x = the xth state
r = discount rate[13]
$\bar{x}$ = Massachusetts, the reference state against which others are compared.

While free of cyclical biases plaguing more commonly cited indicators of competitiveness, this alternative might be biased by the macroeconomic scenario assumed. Firms rarely, if ever, experience a 30-year period of stable employment punctuated only by a one-year spike in layoffs. States' relative tax burdens might differ significantly under an alternative set of macro assumptions, given that states vary in terms of their adherence to the experience-rating principle. Firms whose tax systems are more aggressively experience-rated might be less competitive in a scenario embodying more prolonged or more frequent unemployment shocks. In order to gauge the severity of this problem, we calculated tax burdens under a variety of scenarios differing in the duration and frequency of shocks. We found that relative tax burdens differed very little across scenarios.

We evaluated the generosity of each state's UI allowances by comparing the total UI compensation paid to workers laid off by firms during the spike run under each state's benefit provisions. For a hypothetical firm i the relative generosity of each state's allowances was estimated according to the following formula:

$$(\textit{Benefit Generosity})_s^{i,x} = \frac{\sum_{t=1}^{30} [B_s^{i,x}/(1-r)^{t-11}]}{\sum_{t=1}^{30} [B_s^{i,\bar{x}}/(1-r)^{r-11}]}.$$

In evaluating the allocative neutrality of states' UI systems, still using the spike run scenario, we divided the present value of each firm's total UI tax liabilities by the present value of the total benefits paid to its laid-off workers. Within a given state, the narrower the dispersion in this ratio across the six firm types, the less the degree of interindustry subsidization and, therefore, the more allocatively neutral the state's UI system.

[13] A discount rate of 5 percent was used.

In evaluating the degree to which each state's UI system adheres to the experience-rating principle, we estimated the responsiveness of each firm's UI tax bill to the surge in paid-out benefits attributable to the spike in unemployment, or the "marginal tax cost" to the firm of an additional benefit dollar. Specifically, we computed the present value of the total taxes charged to the firm in the control run over the entire 30-year period, discounted to year 11. In a similar fashion, we computed the present value of the firm's total taxes in the spike run and the total benefits paid to its laid-off workers in both runs. We divided the difference between the present values of the two tax streams by the difference between the present values of the two benefit streams to arrive at an estimate of the firm's marginal tax cost (MC):

$$(MC)^{i,x} = \frac{\sum_{t=1}^{30} [(T_s^{i,x} - T_c^{i,x})/(1+r)^{r-11}]}{\sum_{t=1}^{30} [(B_s^{i,x} - B_c^{i,x})/(1+r)^{t-11}]}.$$

IV. Results

For the six hypothetical firms, indicators of tax competitiveness, benefit generosity, allocative neutrality, and adherence to the experience rating principle are provided in Tables 5 through 8.

Indicators of Relative Tax Competitiveness

Simulated UI tax burdens borne by each prototype, indexed to the values for Massachusetts, are presented and ranked by state in Table 5, columns 1 through 6. For purposes of comparison, column 7 presents UI taxes collected per covered employee, also indexed to Massachusetts.

The table reveals several relationships of potential interest to state policymakers in general and to those of Connecticut and Massachusetts in particular. The tax burdens of both these New England states are high in all seven columns. However, their tax competitiveness varies by type of employer. For example, the high-wage manufacturer (column 4) and the construction firm (column 6) bear a higher tax burden in New Jersey than in Massachusetts, but the other four firms bear a higher tax burden in the Commonwealth. While the low-wage manufacturer's tax burden in North Carolina is 32 percent of that in Massachusetts (column 2), tax burdens on the other prototypical firms

Table 5
Indexes of Present Value of UI Taxes (PVTAX) by State, Hypothetical Firms, 1998 Law
Massachusetts' Value = 100

	(1)		(2)		(3)		(4)		(5)		(6)		(7)	
Initial IUR[a]	1.15%		1.15%		1.15%		1.15%		2.30%		3.45%		Index of	
IUR Spike	+1.15%		+3.45%		+3.45%		+3.45%		+2.30%		+4.60%		UI Taxes Per	
AAW[b]	$28,000		$16,000		$28,000		$40,000		$16,000		$40,000		Covered	
State	PVTAX	Rank	PVTAX	Rank	PVTAX	Rank	PVTAX	Rank	PVTAX	Rank	PVTAX	Rank	Employee[c] Index	Rank
Alabama	47.0	23	49.6	11	48.6	22	40.0	21	73.3	16	45.5	20	25.9	22
Arkansas	54.4	17	44.9	15	55.1	18	45.7	18	68.0	20	48.2	19	46.4	12
California	54.9	16	27.8	27	55.6	17	39.4	23	46.6	27	44.5	23	65.1	9
Connecticut	**155.6**	**2**	**123.8**	**1**	**157.7**	**3**	**155.0**	**2**	**156.2**	**1**	**139.6**	**2**	**106.6**	**2**
(w/o bond assessment)	**(106.2)**	**(3)**	**(124.6)**	**(1)**	**(118.8)**	**(3)**	**(124.9)**	**(3)**	**(123.5)**	**(2)**	**(100.0)**	**(2)**	**(106.6)**	**(2)**
Florida	77.4	9	46.5	12	78.4	9	66.8	11	80.8	10	44.5	23	23.1	26
Georgia	46.0	25	35.6	23	46.6	25	38.4	25	61.1	22	45.4	21	24.7	24
Illinois	95.7	5	62.3	7	97.0	5	82.6	6	100.0	4	72.1	9	58.5	10
Indiana	47.0	23	37.0	21	47.6	24	39.2	24	69.6	17	44.5	23	24.3	25
Iowa	53.7	18	46.5	12	58.2	16	51.8	16	82.0	9	54.3	16	28.6	21
Kentucky	53.5	19	41.6	17	54.2	19	44.9	19	76.8	13	56.1	15	45.0	13
Maryland	74.8	11	55.9	8	75.8	11	62.8	14	91.8	7	69.0	11	40.4	15
Massachusetts	**100.0**	**4**	**100.0**	**4**	**100.0**	**4**	**100.0**	**4**	**100.0**	**4**	**100.0**	**3**	**100.0**	**3**
Michigan	61.1	15	41.2	18	61.9	15	54.2	15	68.1	19	60.4	13	70.4	7
Minnesota	78.1	8	50.5	10	79.1	8	77.3	7	80.4	11	89.6	4	44.9	14
Mississippi	39.9	27	35.8	22	40.4	27	33.5	27	59.8	23	38.4	27	25.8	23
Missouri	43.0	26	39.0	19	43.5	26	36.1	26	68.8	18	44.9	22	38.1	16
New Jersey	73.3	13	42.4	16	74.3	13	69.3	10	74.7	15	87.6	5	107.1	1
New York	76.7	10	72.9	6	77.7	10	70.4	9	78.4	12	52.8	17	65.2	8
North Carolina	64.4	14	38.1	20	65.3	14	64.8	12	67.8	21	79.6	6	22.2	27
Ohio	52.2	20	30.6	26	52.9	20	48.3	17	55.4	26	56.8	14	36.7	17
Oregon	157.8	1	108.2	3	166.2	1	136.7	3	127.6	3	75.8	7	86.5	5
Pennsylvania	94.5	6	74.7	5	95.8	6	97.1	5	96.0	6	73.4	8	78.9	6
South Carolina	47.6	22	33.7	24	48.2	23	40.0	21	57.4	25	44.3	26	30.3	20
Tennessee	50.9	21	31.8	25	51.5	21	42.7	20	59.7	23	52.4	18	31.1	19
Texas	85.1	7	54.4	9	86.2	7	71.5	8	87.4	8	66.5	12	32.6	18
Virginia	34.1	28	22.5	28	34.6	28	28.7	28	41.4	28	37.4	28	14.7	28
Washington	149.6	3	116.6	2	164.3	2	171.7	1	143.4	2	150.0	1	93.2	4
Wisconsin	73.9	12	46.0	14	74.9	12	63.8	13	76.5	14	72.1	9	47.0	11

[a]IUR—Insured Unemployment Rate
[b]AAW—Average Annual Wage
[c]Average for 1997:Q3 through 1998:Q2
Source: U.S. Department of Labor, *UI Data Summary*, October 1998, and authors' calculations using UIMSM.

range from 64 percent to 80 percent of those imposed by the Commonwealth. These results imply that, in evaluating the attractiveness of their state's UI tax environment to a particular company, state officials should take into account the company's characteristics.

Each of the first six columns in Table 5 is highly correlated with column 7, the index of UI taxes per covered employee, suggesting the traditional indicator has some validity. Nevertheless, some states' ranking in column 7 differs significantly from their rankings according to the six simulation-based indicators. These differences are generally consistent with the hypothesis that, as an indicator of tax competitiveness, UI taxes per covered worker is cyclically biased. States whose ranking according to this traditional indicator is significantly lower than their rankings according to the simulation-based indicators have experienced relatively low rates of insured unemployment over the past several quarters. Examples of such states include Florida, North Carolina, and Texas. Con-

versely, states whose ranking according to UI taxes per worker is noticeably higher than their rankings according to the indexes produced by the six simulations (for example, California, Michigan, and New Jersey) have had relatively high rates of insured unemployment in recent quarters (U.S. Department of Labor, *UI Data Summary*).[14]

A comparison of Connecticut's seven index values reveals another problem with UI taxes per covered employee—it fails to take into account some special assessments levied to pay off federal debt. Connecticut currently imposes such an assessment to help pay off bonds it issued to repay federal UI loans incurred during the recession of the early 1990s. Because taxes per employee does not include revenues from this assessment, Connecticut's value for this indicator is only 7 percent above Massachusetts'. By contrast, the present values of the Connecticut firms' simulated UI tax bills, which include the bond assessment, are between 24 percent and 58 percent higher than the Commonwealth's.

Interstate Comparisons of Benefit Generosity

Total benefits paid by representative firms in each of the 28 states, indexed to Massachusetts values, are presented and ranked in Table 6, columns 1 through 6. For purposes of comparison, wage replacement ratios, also indexed to Massachusetts' ratio, are reported and ranked in column 7. Massachusetts ranks high in all six UIMSM scenarios, along with Illinois, Michigan, New Jersey, Oregon, and Washington. Connecticut is relatively generous to the workers of all firms paying average or high wages (represented by firms in columns 1, 3, 4, and 6), but ranks near the median in its generosity toward low-wage employees (represented by firms in columns 2 and 5).

Connecticut exemplifies several states in the sample that rank lower in their generosity toward low-wage workers than toward medium- and high-wage workers. Other states in this group include California, Florida, Minnesota, North Carolina, Pennsylvania, and Washington. Such states replace a relatively small percentage of wages lost through unemployment but set a high maximum benefit level. By contrast, states that rank higher in their generosity toward low-wage workers replace a higher percentage of previous wages but cap benefits at a relatively low level. Examples include Georgia, Indiana, Iowa, Kentucky, and Maryland.

The wage replacement ratio (column 7) is positively correlated with each of its six UIMSM-based counterparts. However, this correlation is not as strong as that between UI taxes per covered employee and the simulation-generated indicators of tax burden. The relative weakness of the correlation among indicators of generosity reveals more problems with the simulations than with the wage replacement rate. In particular, unrealistic assumptions embedded in UIMSM concerning the number of dependents per worker may bias the simulation results. The simulations assume that the average worker of each firm has one dependent.[15] The ratio of workers to dependents nationwide is probably considerably higher than one.[16] Consequently, states with low or nonexistent dependents' allowances generally look less generous in the simulations than they do according to the wage replacement ratio. Examples include Arkansas, Florida, Minnesota, Iowa, and North Carolina.[17] Conversely, Massachusetts, a state with an ample dependents' allowance, looks more generous in the simulations than according to the traditional indicator.

The findings suggest that as an indicator of tax competitiveness, UI taxes per covered worker is significantly cyclically biased.

[14] We averaged each state's tax burden index over the six simulations and divided this average by its index of UI taxes per covered employee. The resulting ratios were regressed on the states' average insured unemployment rate for 1998:Q2, 1998:Q1, and 1997:Q4. The estimated coefficient on the average unemployment rate is −0.55, significant at the .0001 level.

[15] Specifically, the simulations assume that half the workers of each employer are single with no dependents and half are married with two dependents.

[16] In 1997 the United States had 122.7 million employees. In that year 84.2 million Americans were between the ages of 0 and 21. Many of them were not dependents. Most dependents fall within this age bracket. In 1994 total establishment payroll in the U.S. was 114.1 million, while in that year, the 107.3 million tax filing units filing for the U.S. personal income tax (86 percent of whom reported wage income) claimed a total of 70.0 million exemptions for dependents. Of these, 64.6 million were claimed for children living at home. Thus, most elderly Americans are independent. Sources: U.S. Bureau of Labor Statistics web site (*http://stats.bls.gov*), U.S. Bureau of the Census web site (*http://census.gov/population/estimates/state/stats/ag9797.txt)*, and Keenan and Curry (1995).

[17] Florida's relative replacement ratio was also bolstered by a one-time increase in UI benefits disbursed in 1998 that, given its temporary nature, was not incorporated into UIMSM.

Table 6
Indexes of Total UI Benefit Paid (BEN) to Employees of Hypothetical Firms, by State, 1998 Law
Massachusetts' Value = 100

	(1)		(2)		(3)		(4)		(5)		(6)		(7)	
Initial IUR[a]	1.15%		1.15%		1.15%		1.15%		2.30%		3.45%		Wage	
IUR Spike	+1.15%		+3.45%		+3.45%		+3.45%		+2.30%		+4.60%		Replacement	
AAW[b]	$28,000		$16,000		$28,000		$40,000		$16,000		$40,000		Ratio (%)	
State	BEN	Rank	BEN	Rank	BEN	Rank	BEN	Rank	BEN	Rank	BEN	Rank	Rate[c]	Rank
Alabama	63.5	27	92.1	11	63.4	27	45.9	27	91.5	11	45.4	27	78.7	24
Arkansas	66.4	26	80.2	21	66.3	26	47.9	26	80.3	21	47.9	26	105.2	5
California	86.0	10	65.0	28	86.0	10	52.7	23	65.1	28	52.7	23	61.4	28
Connecticut	**93.5**	**7**	**90.5**	**14**	**93.5**	**7**	**89.8**	**4**	**89.8**	**14**	**88.9**	**4**	**71.8**	**26**
Florida	85.4	14	80.2	21	85.4	14	63.1	15	80.3	21	63.1	15	107.2	4
Georgia	74.8	23	91.6	13	74.8	23	54.1	21	90.9	13	53.5	21	81.7	23
Illinois	98.4	4	93.1	10	98.4	4	71.6	10	93.1	10	71.5	10	90.4	18
Indiana	74.9	22	94.4	9	74.9	22	54.1	21	94.4	9	54.1	21	94.4	13
Iowa	84.8	18	102.5	4	84.0	18	61.2	17	99.4	4	60.6	17	111.9	1
Kentucky	85.5	13	104.8	3	85.4	13	61.8	16	104.1	3	61.2	16	95.4	11
Maryland	83.5	19	96.6	7	83.4	19	60.3	18	95.9	7	59.8	18	88.3	19
Massachusetts	**100.0**	**3**	**100.0**	**5**	**100.0**	**3**	**100.0**	**1**	**100.0**	**5**	**100.0**	**1**	**100.0**	**8**
Michigan	95.0	6	95.7	8	95.0	6	72.4	9	95.1	8	71.7	9	92.8	15
Minnesota	85.7	12	80.8	20	85.7	12	76.2	7	80.7	20	76.1	7	108.2	3
Mississippi	57.1	28	80.2	21	57.1	12	41.3	28	80.3	21	41.3	28	84.8	20
Missouri	68.5	25	99.3	6	68.4	25	49.5	25	98.6	6	49.0	25	78.1	25
New Jersey	113.8	1	107.0	2	113.6	1	94.1	3	106.3	2	93.2	3	94.7	12
New York	85.4	14	80.8	19	85.4	14	68.8	12	80.8	19	68.8	12	68.2	27
North Carolina	85.4	14	80.2	21	85.4	14	73.8	8	80.3	21	73.8	8	101.5	7
Ohio	85.1	17	80.2	21	85.1	17	67.5	14	80.3	21	67.5	14	96.5	10
Oregon	106.9	2	107.3	1	106.0	2	77.2	6	104.9	1	77.1	6	99.8	9
Pennsylvania	86.0	10	82.3	18	86.0	10	86.9	5	82.4	18	86.9	5	104.2	6
South Carolina	72.7	24	80.2	21	72.7	24	52.5	24	80.3	21	52.5	24	91.8	17
Tennessee	81.0	20	80.2	21	81.0	20	58.5	19	80.3	21	58.5	19	84.3	21
Texas	93.5	7	88.3	16	93.5	7	67.6	13	87.7	16	66.9	13	92.0	16
Virginia	75.5	21	84.4	17	75.4	21	54.5	20	83.8	17	54.0	20	84.0	22
Washington	97.5	5	92.0	12	96.6	5	96.5	2	89.9	12	96.4	2	111.7	2
Wisconsin	93.5	7	88.3	15	93.5	7	70.0	11	87.7	15	69.3	11	92.9	14

[a]IUR—Insured Unemployment Rate
[b]AAW—Average Annual Wage
[c]Average for 1997:Q3 through 1998:Q2
Source: U.S. Department of Labor, *UI Data Summary*, October 1998, and authors' calculations using UIMSM.

Massachusetts' higher ranking according to the simulations also raises questions about the representativeness of the hypothetical firms in states with relatively high wages. Note that Connecticut, whose UI-covered workers enjoy the second highest average weekly wage in the nation (U.S. Department of Labor, *UI Data Summary*), ranks in the top half in all the simulations in Table 6, but its wage replacement ratio ranks 26th out of 28. In addition to Connecticut and Massachusetts, Illinois, New Jersey, and New York are cases in point. The percentage of workers in Connecticut with annual average wages exceeding $40,000, the highest represented in the simulations, is relatively large. These workers, not represented among the hypothetical firms, are mostly likely to feel the constraint of maximum benefit limitations and therefore to have low replacement ratios. To remedy this problem, one could relax the assumption that the annual wages of the prototypical firm in each scenario are uniform. One could vary the assumed annual wage across states to reflect actual interstate differences in wage levels and then compare firms in terms of their ratio of benefits to payroll. For example, in column 4, instead of assuming a uniform annual wage of $40,000

across all states, one could assume a higher wage in high-wage states and a lower wage in low-wage states.

Tax/Benefit Ratios and Interindustry Allocative Neutrality

Analysis of these ratios suggests that most states' UI systems are more or less allocatively neutral. The variation in ratios across firm types is small in most of the 28 states in the sample. In 19 of these states, the inter-firm standard deviation is less than 0.1, while in more than half of them it is less than 0.05 (Table 7, column 8). In those states where such variation is relatively large, the prototypical construction firm (column 6) enjoys far lower tax/benefit ratios than the other five prototypes, indicating a relatively high degree of subsidization. Both Connecticut and Massachusetts fall into this category. On average, the representative financial service provider (column 1) and the representative low-wage manufacturer (column 2) have somewhat higher tax/benefit ratios than the other representative manufacturers (columns 3 and 4) and the representative retailer (column 5) (see bottom line of the table). In Massachusetts, the low-wage manufacturer has by far the highest tax/benefit ratio, while in Connecticut the highest tax/benefit ratio is borne by the financial services firm.

Most states keep their UI trust funds solvent largely by imposing high minimum rates on firms when their employment is stable or expanding. When firms increase their propensity to lay off workers, states tend not to increase the firms' UI tax burdens proportionately.

Most states in the sample have a mean tax/benefit ratio for the six prototypes that exceeds 1 (column 7). The high ratios of many states, including Connecticut and Massachusetts, show that their UI tax systems are currently designed to build up reserves depleted during the recession of the early 1990s. States with the highest average ratios also tend to subsidize the representative construction firm most heavily, suggesting a desire to shield firms suffering the highest incidence of unemployment from the rigors of aggressive reserve-building efforts. States with low ratios, such as Georgia and Virginia, tend to have a high level of reserves in their UI trust funds.

Adherence to Experience Rating—Interstate Comparison of Marginal Tax Costs

Most of the tax/benefit ratios displayed in Table 7 exceed the value of 1. However, 115 of the 168 marginal tax costs shown in Table 8 are below 1, in many instances far below. Thus, while over the long run states may recoup benefits by imposing taxes of equal or greater value, they generally do not match *increases* in benefit payments with comparable *increases* in UI tax liability. Evidently, most states keep their UI trust funds solvent largely by imposing high minimum rates on firms when their employment is stable or expanding. When firms increase their propensity to lay off workers, states tend not to increase the firms' UI tax burdens proportionately and subject those burdens to a maximum. Thus, on the whole state UI systems do not effectively force firms to internalize the social costs generated by unemployment.

The widespread subsidization of employers such as the prototypical construction firm evident in Table 7 results from the firm's low marginal tax cost in most states. Under the laws and regulations of 19 out of the 28 states, the construction firm enjoys a lower marginal tax cost than the other five firms (Table 8). In eight of those states, the construction firm's marginal tax cost is five cents or less (column 6). This type of firm tends to be so heavily subsidized at the margin because it is at or near most states' maximum UI tax rate before experiencing the unemployment shock. The shock, therefore, has little or no effect on its statutory rate.

Massachusetts deviates sharply from the experience-rating principle. The average marginal tax cost of the six prototypical firms under the Commonwealth's UI laws and regulations is $0.59, which ranks 25th among the 28 states (column 8). The marginal tax costs of the prototypical financial services firm and low-wage manufacturer are only $0.46 and $0.25, respectively. Each value is the lowest for its firm type among the 28 represented states (columns 1 and 2). An analysis of why these values are so low provides insights into some of the principal UI features responsible for interstate variation in departures from pure experience rating.

Table 7

Present Value of UI Taxes Paid Divided by Present Value of UI Benefits Received for Hypothetical Firms, Spike Runs, 1998 Law

	(1)		(2)		(3)		(4)		(5)		(6)					
Initial IUR[a]	1.15%		1.15%		1.15%		1.15%		2.30%		3.45%		(7)		(8)	
IUR Spike	+1.15%		+3.45%		+3.45%		+3.45%		+2.30%		+4.60%		Tax-Benefit		Standard	
AAW[b]	$28,000		$16,000		$28,000		$40,000		$16,000		$40,000		Ratio		Deviation	
State	Ratio	Rank	Ratio	Rank	Ratio	Rank	Ratio	Rank	Ratio	Rank	Ratio	Rank	Mean	Rank	Value	Rank
Alabama	1.18	15	1.24	14	1.14	15	1.14	15	1.14	16	1.13	11	1.16	15	.042	18
Arkansas	1.33	12	1.36	12	1.25	12	1.25	12	1.21	13	1.11	12	1.25	12	.089	11
California	1.03	20	1.04	19	.99	22	1.00	21	1.02	21	1.01	16	1.02	18	.019	25
Connecticut	**3.26**	**1**	**2.68**	**1**	**2.63**	**1**	**2.14**	**1**	**2.48**	**1**	**1.84**	**2**	**2.51**	**1**	**.488**	**2**
Florida	1.46	10	1.45	10	1.37	10	1.37	8	1.44	6	.84	27	1.32	11	.239	7
Georgia	1.00	26	.96	25	.93	27	.91	27	.96	27	.99	20	.96	27	.034	19
Illinois	1.57	6	1.65	7	1.51	5	1.54	4	1.53	5	1.20	5	1.50	6	.155	8
Indiana	1.03	20	.97	24	.95	25	.93	26	1.05	19	.98	23	.99	23	.046	16
Iowa	1.08	17	1.04	19	1.04	17	1.04	17	1.18	15	1.07	13	1.08	16	.054	12
Kentucky	1.01	24	.98	22	.94	26	.94	25	1.05	19	1.01	16	.99	23	.044	17
Maryland	1.46	10	1.43	11	1.39	9	1.39	7	1.37	11	1.32	3	1.39	10	.048	14
Massachusetts	**1.68**	**5**	**2.30**	**4**	**1.48**	**6**	**1.30**	**11**	**1.43**	**7**	**1.14**	**9**	**1.56**	**5**	**.407**	**3**
Michigan	1.03	20	1.09	17	1.01	19	1.01	19	1.02	21	.94	25	1.02	18	.048	14
Minnesota	1.49	7	1.55	8	1.40	8	1.34	9	1.42	8	1.30	4	1.42	7	.093	10
Mississippi	1.12	16	1.11	16	1.08	16	1.08	16	1.06	17	1.05	14	1.08	16	.027	21
Missouri	1.01	24	.98	22	.98	23	.98	23	1.00	24	1.00	18	.99	23	.013	27
New Jersey	1.04	19	.95	26	1.00	21	.99	22	1.00	24	1.04	15	1.00	22	.034	19
New York	1.47	8	2.08	6	1.36	11	1.32	10	1.38	10	.92	26	1.42	7	.375	5
North Carolina	1.21	14	1.18	15	1.19	14	1.19	14	1.21	13	1.19	6	1.20	14	.012	28
Ohio	.99	27	.95	26	.97	24	.97	24	.99	26	.99	20	.98	26	.016	26
Oregon	2.52	3	2.48	3	2.17	3	2.18	3	1.74	3	1.17	8	2.04	3	.511	1
Pennsylvania	1.81	4	2.15	5	1.65	4	1.45	5	1.66	4	.96	24	1.61	4	.396	4
South Carolina	1.05	18	1.05	18	1.01	19	1.01	19	1.02	21	.99	20	1.02	18	.024	23
Tennessee	1.02	23	.99	21	1.02	18	1.02	18	1.06	17	1.00	18	1.02	18	.024	23
Texas	1.47	8	1.52	9	1.41	7	1.41	6	1.42	8	1.19	6	1.40	9	.113	9
Virginia	.73	28	.66	28	.70	28	.70	28	.71	28	.73	28	.71	28	.026	22
Washington	2.63	2	2.68	1	2.41	2	2.19	2	2.28	2	1.85	1	2.34	2	.307	6
Wisconsin	1.27	13	1.29	13	1.22	13	1.22	13	1.25	12	1.14	9	1.23	13	.053	13
Mean	1.39		1.42		1.29		1.25		1.29		1.11		1.29		.133	

[a]IUR—Insured Unemployment Rate

[b]AAW—Average Annual Wage

Source: U.S. Department of Labor, *UI Data Summary*, October 1998, and authors' calculations using UIMSM.

Table 8

Marginal Tax Cost (MTCOST) of an Additional Benefit Dollar, Hypothetical Firms, by State, 1998 Law ($)

	(1)		(2)		(3)		(4)		(5)		(6)				(8)		(9)	
Initial IUR[a]	1.15%		1.15%		1.15%		1.15%		2.30%		3.45%		(7)		Mean of		Experience	
IUR Spike	+1.15%		+3.45%		+3.45%		+3.45%		+2.30%		+4.60%		Standard		Marginal		Rating	
AAW[b]	$28,000		$16,000		$28,000		$40,000		$16,000		$40,000		Deviation		Tax Cost		Index 1997	
	MTCOST		MTCOST		MTCOST		MTCOST		MTCOST		MTCOST							
State	($)	Rank	($)	Rank	($)	Rank	($)	Rank	($)	Rank	($)	Rank	Value	Rank	Value	Rank	Index	Rank
Alabama	1.17	6	.76	22	.93	13	.93	12	.71	26	.73	10	.176	17	.872	14	51	22
Arkansas	.94	14	.94	13	.89	15	.89	14	.89	16	.85	6	.035	27	.900	13	61	13
California	.83	18	.67	24	.81	20	.81	20	.83	17	.04	22	.312	9	.664	23	59	15
Connecticut (w/o	**1.31**	**2**	**1.37**	**2**	**1.33**	**2**	**1.33**	**1**	**1.53**	**2**	**.48**	**16**	**.374**	**6**	**1.225**	**2**	**66**	**6**
bond assess.)	**(.87)**	**(16)**	**(.91)**	**(13)**	**(.88)**	**(16)**	**(.88)**	**(16)**	**(1.02)**	**(12)**	**(.32)**	**(16)[c]**	**(.374)**	**(6)**	**(.813)**	**(17)**	**(66)**	**(6)**
Florida	1.31	2	1.29	3	1.00	8	.94	11	1.30	4	.03	26	.493	3	.978	10	71	5
Georgia	.69	25	.69	23	.59	27	.49	27	.74	24	.27	17	.176	17	.577	27	67	6
Illinois	1.29	4	1.26	4	1.23	3	1.22	2	1.28	5	.04	22	.497	2	1.053	3	75	2
Indiana	.58	27	.78	21	.56	28	.44	28	.75	22	.04	22	.269	11	.525	28	60	14
Iowa	.74	23	1.09	7	.87	18	.87	17	1.27	6	.03	26	.427	5	.812	17	64	11
Kentucky	.74	23	.82	20	.61	24	.61	25	1.07	10	.85	6	.175	19	.781	18	67	6
Maryland	1.07	8	1.13	6	1.09	5	1.09	5	1.14	8	.62	13	.199	15	1.022	6	n.a.	n.a.
Massachusetts	**.46**	**28**	**.25**	**28**	**.61**	**24**	**.81**	**20**	**.79**	**20**	**.60**	**14**	**.210**	**14**	**.587**	**25**	**55**	**18**
(with Schedule B)	**(.82)**	**(21)**	**(.39)**	**(28)**	**(.81)**	**(20)**	**(.81)**	**(20)**	**(.79)**	**(20)**	**(.41)**	**(16)**	**(.211)**	**(14)**	**(.672)**	**(23)**	**(55)**	**(18)**
Michigan	.98	12	1.06	8	.95	12	.92	13	1.06	11	.69	11	.137	20	.944	11	n.a.	n.a.
Minnesota	.96	13	1.05	9	.99	10	1.07	6	.80	19	1.05	2	.101	23	.986	9	74	3
Mississippi	.99	11	.89	15	.89	15	.89	14	.93	14	.64	12	.120	22	.871	15	42	24
Missouri	.80	22	.83	19	.82	19	.82	19	.83	17	.90	5	.034	28	.833	16	n.a.	n.a.
New Jersey	.83	19	.60	26	.81	20	.86	18	.78	21	.76	9	.093	24	.772	19	59	15
New York	.89	16	.44	27	.88	17	.80	22	.74	24	.03	26	.336	8	.630	24	85	1
North Carolina	1.03	9	.90	14	1.06	6	1.04	7	1.08	9	.99	3	.065	25	1.016	7	44	23
Ohio	.90	15	.84	18	.92	14	.89	14	.91	15	.14	19	.308	10	.765	20	62	12
Oregon	.81	21	.85	17	.63	23	.64	24	.40	28	.14	19	.268	12	.578	26	54	20
Pennsylvania	1.00	10	1.02	11	.97	11	.97	10	1.02	13	.52	15	.196	16	.917	12	55	18
South Carolina	.86	17	.95	12	.79	22	.79	23	.75	22	.21	18	.262	13	.724	21	57	17
Tennessee	.83	18	.87	16	1.03	7	1.03	8	1.71	1	.78	8	.344	7	1.041	4	65	9
Texas	1.20	5	1.15	5	1.17	4	1.17	4	1.19	7	.04	22	.464	4	.986	8	53	21
Virginia	.64	26	.64	25	.60	26	.60	26	.66	27	.94	4	.129	21	.681	22	74	3
Washington	2.18	1	1.69	1	1.46	1	1.22	2	1.32	3	.05	21	.710	1	1.320	1	[d]	[d]
Wisconsin	1.08	7	1.05	9	1.00	8	.98	9	1.06	11	1.06	1	.039	26	1.039	5	65	9
Mean	.97		.92		.91		.90		.98		.48		.25		.86		61.88	

n.a.—not available.

Note: All rankings assume that Massachusetts uses schedule C unless otherwise noted.

[a]IUR—Insured Unemployment Rate. [b]AAW—Average Annual Wage. [c]CT ranks 17 if MA uses schedule B. [d]Washington data from 1991 to 1997 are under review.

Source: U.S. Department of Labor, unpublished data, and authors' calculations using UIMSM.

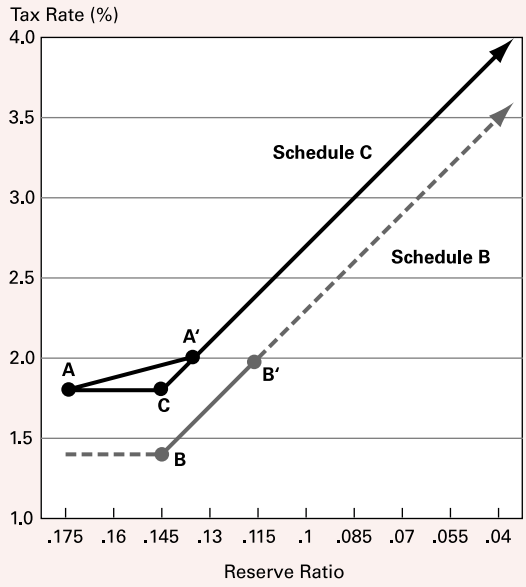
Given the rules governing the Commonwealth's UI taxes and benefits, Massachusetts employers possessing the characteristics of these two firms tend to amass unusually large surpluses in their reserve accounts, driving their reserve ratios well below that qualifying them for the minimum statutory tax rate. Thus, their pre-shock reserve ratios are at a point such as A in Figure 9, and their statutory tax rate is at the minimum, which was 1.8 percent in 1998. After the IUR spike, the increase in the firms' reserve ratios first pushes them along the horizontal segment of the tax schedule (currently Schedule C) and then along the sloped segment to point A'. The change in the firms' tax rate relative to the increase in its reserve ratio, the slope of line AA', is flatter than that of the sloped segment. In states whose tax schedule begins to rise at a lower reserve ratio, such firms are more likely to be closer to the lower boundary of the sloped segment of their tax schedules (at a point such as C) before experiencing the IUR spike.

On January 1, 1999, the Massachusetts UI tax schedule shifted downward to Schedule B (Figure 8), one of many downward shifts that have been implemented by special legislation in recent years. In the past, the issue of whether the Commonwealth's UI tax rates should be cut across the board has been framed as a trade-off between trust fund adequacy and competitiveness. However, Table 8 and Figure 9 both suggest that the shift to Schedule B may also make the Commonwealth's UI system more experience-rated. Under the lower rate schedule, most firms will pay less tax into their reserve accounts. Consequently, their reserve ratios will be smaller during periods of economic stability than under the higher schedule. As a result, in simulations assuming that the lower schedule is in effect, the representative financial services firm, although enjoying a lower tax rate than under Schedule C, is now on the sloped part of the schedule (at point B) prior to the unemployment shock. The shock propels the firm up the schedule to point B'. The slope of segment BB', the firm's marginal tax cost, is now steeper than it was under Schedule C (the slope of segment AA'). In a similar fashion, the representative low-wage and medium-wage manufacturers also experience increases in their marginal tax cost as a result of the schedule shift (Table 8, columns 2 and 3).[18] The mean marginal tax cost under the Commonwealth's system rises from $0.59 to $0.67 (column 8). Thus, under schedule B the system will be more experience-rated.

Analysis of tax benefit ratios suggests that most states' UI systems are more or less allocatively neutral.

Figure 9

How Downward Shift in UI Tax Schedule in Massachusetts Could Increase Marginal Tax Cost of Additional Benefit Dollar for Certain Firms



Under Connecticut's UI tax systems, the marginal tax costs of all the prototypes except the construction firm are well above $1 and rank in the top two. The state's generally high marginal tax costs reflect the strongly experience-rated character of the special assessment earmarked for retirement of the state's debt to the federal UI trust fund. Without this assessment, Connecticut's marginal tax costs are near the median for all firm types (columns 1 through 6).

For purposes of comparison, states' Experience Rating Index (ERI) values for 1997 are presented in Table 8, column 9. These values are uncorrelated with

[18] However, the prototypical construction firm has a lower tax cost under schedule B, because the maximum tax rate is lower.

the marginal tax costs of any of the six hypothetical firms. Given the cyclical influences on ERI discussed in Section II, the correlations between ERI and marginal tax costs should be stronger after one has controlled for lagged values of state insured unemployment rates. In fact, this is not the case. Yet, the ranking of many states' marginal tax cost differs dramatically from their ERI ranking. Some states imposing low marginal tax costs had high ERI values, including Virginia, Kentucky, New York, and Georgia. In other states, such as North Carolina and Texas, the opposite was true.

While the authors cannot account for all such divergent rankings, some expose a weakness in the methodology for computing the ERI index—it fails to take into account the extent to which solvency assessments are experience-rated. For example, North Carolina, which had the second lowest ERI in the sample, is one of only five sample states whose solvency assessment is experience-rated (20 percent of an employer's basic experience-rated tax rate). Because this tax is not part of the state's "regular" experience-rated tax structure, it is not taken into account in computing the state's ERI. As the result of a similar omission, the marginal tax costs of the six prototypical firms under Connecticut's UI system are between 39 percent and 65 percent above that of the median state (columns 1 through 6), while Connecticut's 1997 ERI (66) was only 6 percent above the median (62) (column 9).

V. Summary, Policy Implications, and Suggestions for Further Research

Too often, indicators used to evaluate state and local public policies are those most readily available or easiest to compute rather than the most accurate and insightful. Statistics used to evaluate state unemployment insurance programs are cases in point. Conventional indicators rating these programs in terms of competitiveness, benefit generosity, and adherence to the experience-rating principle are influenced by states' relative economic conditions, thereby obscuring underlying structural differences. Moreover, because they are statewide averages, they obscure important intrastate differences in tax and benefit treatment across types of firms and workers. This article offers alternative indicators based on a simulation approach designed to alleviate these problems.

Like traditional indicators of competitiveness, the simulation-based indicators portray both Connecticut and Massachusetts as states that impose high UI tax burdens on their employers. However, the simulations also show that each state's tax burden relative to that of a particular competitor state varies by type of firm. These differences suggest that, in contemplating adjustments to UI taxes, policymakers should consider how each proposed change would affect their state's relative tax burden on the types of employers they are most interested in attracting. For example, a change in UI tax rate might affect a state's competitiveness in the "market" for medium-wage manufacturers differently than an adjustment to its UI tax base. The simulation approach allows policymakers to evaluate differences in the effects of these two options.

In contemplating adjustments to UI taxes, policymakers should consider how each proposed change would affect their state's relative tax burden on the types of employers they are most interested in attracting.

The simulations also reveal significant differences in generosity across types of workers. While Massachusetts' benefits are relatively generous across the board, some states, such as Connecticut, are relatively generous to medium- and high-wage workers, but less so toward low-wage workers. In other states, the opposite is true. Suppose a state wants to enhance the relative generosity of UI benefits to some types of workers in particular. The simulation approach would permit policymakers to evaluate how policy alternatives might promote such a goal. An aggregate indicator would provide less insight.

The results presented in Table 7 suggest that most states' UI systems achieve a reasonable degree of allocative neutrality. Connecticut and Massachusetts are exceptions to this generalization. The type of firm that all states in the sample tend to subsidize most heavily experiences both high seasonal turnover (initial IUR) and large increases in layoffs during recessions (IUR spike)—the prototypical construction firm. This pattern of subsidization was found in Massachusetts by Tannenwald and O'Leary (1997).

While most states' UI systems do not engage in extensive cross-industry subsidization, few adhere strictly to the experience-rating principle. More often than not, a firm that increases the rate at which it lays off workers is not fully billed for the resulting drain on its state's UI trust fund reserves. Maximum and minimum UI tax rates are largely responsible for significant departures from the experience-rating ideal. In the simulations, the type of firm generally receiving the largest subsidy at the margin is the same type that generally receives the largest subsidy on average—the prototypical construction firm. Massachusetts' divergence from experience rating is relatively large. By contrast, Connecticut, apart from its treatment of the prototypical construction firm, adheres to the principle fairly closely.

Perhaps the most valuable insight that policymakers can glean from the simulations presented in this article is the nature of the trade-offs among policy goals entailed in various UI options. The simulations may even clue policymakers into some "win-win" situations, in which a policy innovation that furthers one goal simultaneously furthers another. The reduction in Massachusetts' rate schedule, shown by the simulations both to enhance competitiveness and to increase conformity to experience rating, is a case in point. Modifications to the model might enhance the simulations' usefulness by making the prototypical firms more representative of real employers. For example, one could allow variation across locations in firms' characteristics in order to make them more representative of particular states. In addition, one could allow different weightings of firm types in computing average simulation results for each state, to recognize interstate differences in industry mix.

The simulations show that the factors governing how a particular firm or worker fares within a given UI system are numerous and complex. Policies designed to improve the treatment of one set of employers or workers often impose costs on other firms and workers. Given such intricacy and harsh trade-offs, it is not surprising that debates concerning state UI policy are so contentious.

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