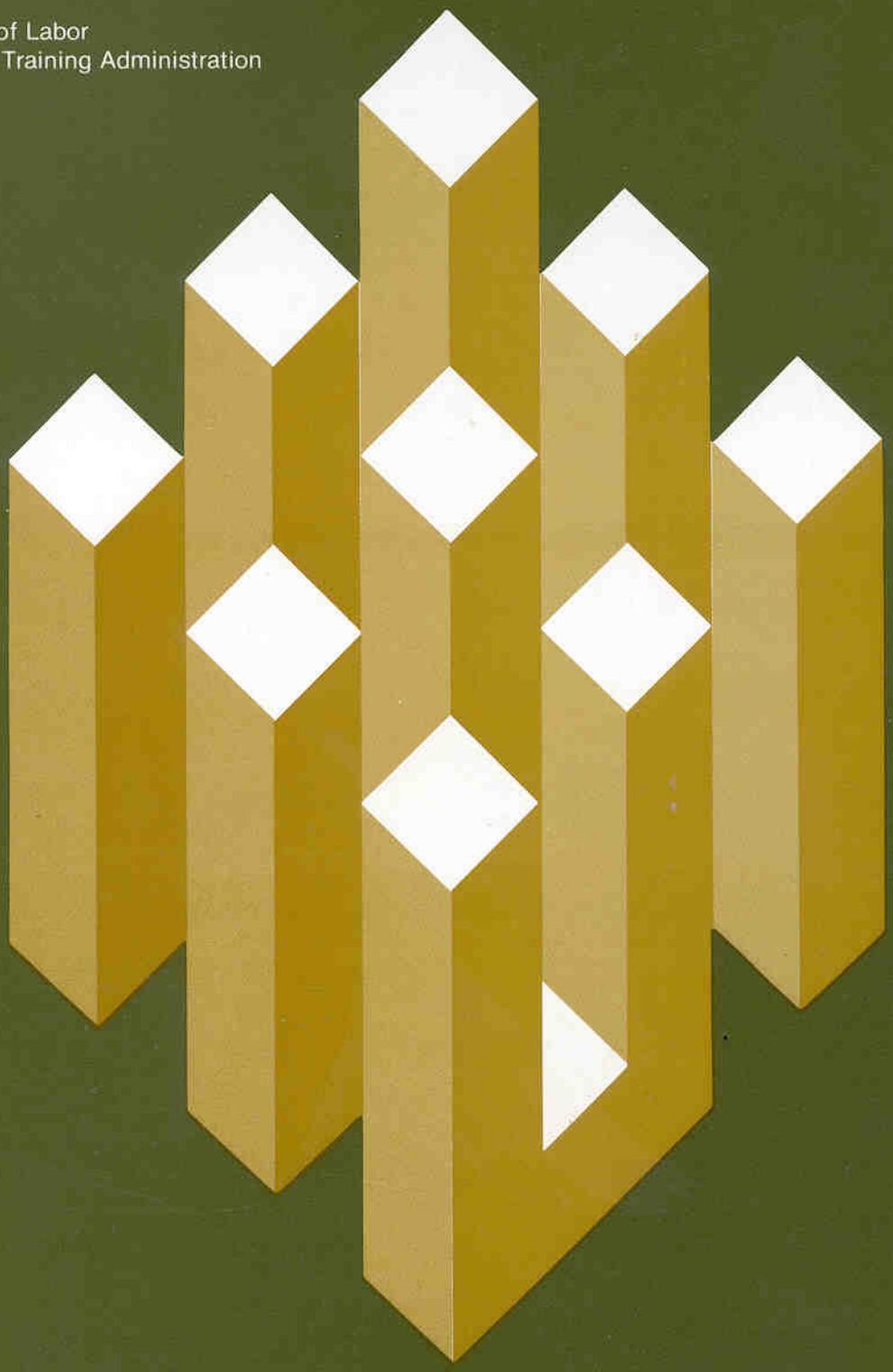
The Effects of Increasing the Federal Taxable Wage Base for Unemployment Insurance

Unemployment Insurance
Occasional Paper 95-1

U.S. Department of Labor
Employment and Training Administration



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U.S. Department of Labor
Robert B. Reich, Secretary

Employment and Training Administration
Doug Ross, Assistant Secretary

Unemployment Insurance Service
Mary Ann Wyrsch, Director

1995

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Submitted to:

Unemployment Insurance Service
Department of Labor

Contract No. 3965-2-00-80-30

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Acknowledgements

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Abstract

The objective of this study was to examine the effects of an increase in the Unemployment Insurance (UI) Federal Taxable Wage Base. To accomplish this objective, universe wage record data were obtained from four States (Colorado, Maryland, Missouri, and Texas) for calendar years 1990 and 1991. The weighted average wage in these States in 1991 was very close (98.7 percent) to the weighted average wage of all the States. A State-by-State simulation model was also developed based on historical relationships between the taxable wage base and the taxable wage proportion of total wages. Combined with estimates of the elasticities of demand and factor substitution obtained from a review of the theoretical literature, the model can be used to provide estimates of the employment effects of raising the Federal taxable wage base to various levels using different assumptions of model parameters.

The universe data from the four States were used to estimate the revenue effects on the Federal and State trust funds of raising the Federal taxable maximum and assuming conformity by the States. A sample of firms stratified by industry and size was used to estimate payroll tax increases and changes in effective tax rates for different sizes of firms, firms in different industries, firms with different experience rated State tax rates, average wage levels, and for firms at the minimum and maximum tax rates for the State. Similar results were also estimated assuming revenue neutral offsetting tax rate changes by the States.

The State-by-State macromodel of employment and revenue effects was prepared in Lotus format and accompanies the report. It allows employment and trust fund revenue effects to be estimated for the effects of increases in State, Federal, and total UI taxes. Results may be estimated for different values of: (1) the wage share of labor costs; (2) labor's share of total production costs; (3) the elasticity of substitution between labor and capital; and, (4) the degree of experience rating cost offset.

Executive Summary

The objective of this study was to examine the effects of an increase in the Unemployment Insurance (UI) Federal Taxable Wage Base. To accomplish this objective, universe wage record data were obtained from four States (Colorado, Maryland, Missouri, and Texas) for calendar years 1990 and 1991. The weighted average wage in these States in 1991 was very close (98.7 percent) to the weighted average wage of all the States. A State-by-State simulation model was also developed based on historical relationships between the taxable wage base and the taxable wage proportion of total wages. Combined with estimates of the elasticities of demand and factor substitution obtained from a review of the theoretical literature, the model can be used to provide estimates of the employment effects of raising the Federal taxable wage base to various levels using different assumptions of model parameters.

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Historical Review

A review of events surrounding previous increases in the taxable wage base suggests that States have not passed offsetting decreases in the average tax rate when the Federal Taxable Wage Base has been increased, even when the increase in the taxable base has been substantial (e.g., 50 percent in 1978). This suggests that an increase in the taxable wage base would have a positive effect on State trust fund solvency.

Macromodel Estimates

Increasing the Federal tax base to $28,000 would raise Federal tax contributions by $7.2 billion per year and, assuming conformity and no change in State tax rates or experience rating, raise State tax contributions by $15.4 billion. Complete elimination of the cap on Federal taxable wages would raise Federal tax contributions by $11.2 billion and State revenues by $25.4 billion. This would represent an increase of 120 percent for Federal and 75 percent for State taxes. The difference, of course, results from the fact that most States already have taxable maxima higher than the Federally required base.

The main qualitative conclusion to emerge from the simulations conducted is the comparatively small size of the estimated employment effects. With a modest elasticity of labor demand and a low labor supply elasticity, raising the taxable wage base to $14,000 would reduce employment by slightly less than 100,000. This is slightly more than 0.1 percent of UI-covered employment. Assuming full backward shifting, the employment reduction is even smaller, at about 55,000.

Increased Federal UI taxes account for a measurable share of the total employment effect. Just over one-third of the reduction associated with increasing the Federal tax base to $14,000 is due to higher Federal taxes, the remainder is due to higher State tax bases.

Eliminating the taxable wage base (i.e., making all UI-covered wages taxable) would only reduce employment by 381,000, less than 0.5 percent of covered employment.

Universe Data

Based on universe data from the sample States, doubling the taxable wage base to $14,000 would increase Federal trust fund contributions by more than 50 percent. Tripling the Federal taxable wage base to $21,000 would roughly double the contributions to the Federal trust fund. The same is true for State trust fund contributions; however, the analysis here ignores that State taxable wages bases are, in most cases, already higher than the Federal and that State tax rates may be changed to offset the change in the taxable maximum.

The current Federal wage base covers roughly one-third of total wages in the States. Raising this to $14,000 would raise that percentage to roughly 55 percent of total wages. Raising the Federal wage base to $65,000 would translate into more than 90 percent of wages in the sample States being covered.

Sample Data

The taxable wage proportion increases the most for the largest firm sizes as the taxable wage base increases from $7,000 to $65,000. As the wage base increases, relative differences in the effective tax rate tend to diminish, reducing the relative disadvantage of the smaller firm sizes.

Raising the taxable wage base would cause all industries to pay more and result in some convergence of the effective tax rates. It would also increase the effective tax rate for high-wage industries more than for low-wage industries.

The taxable wage proportion increases within each experience-rated tax rate category as the taxable wage increases. However, there seems to be no discernable relationship between the taxable wage proportion and the experience-rated tax rate. Apparently, absent any control for industry, there is no systematic relationship between the wage distribution and layoff experience.

As might be expected, raising the taxable wage base would increase the taxable wage proportion. This would result in a significant convergence of effective tax rates among firms with differing average wages.

Minimum tax rate firms, with the exception of Missouri (with a zero minimum tax rate), are paying more than their benefit charges. This only increases as the taxable wage base increases. Among firms with maximum rates on wages, raising the taxable wage base to $14,000 would, essentially, remove the ineffective charges in all the States examined. The exception would be Missouri, where ineffective charges would still be 1 percent of UI taxes for maximum tax rate firms.

If each State reduced its average tax rate to raise the same amount of revenue with a higher tax base as it does currently, the difference in the effect by firm size would be negligible, as would be the effect on firms with different experience-rated tax rates. However, the revenue effect on industries with high and low wages would be substantial, as would the effect on firms with higher and lower average wages. With the exception of the highest wage category (average wages near or in excess of $65,000), this revenue effect would be substantial.

* * * *

Chapter 1

Introduction to the Study

This report examines the effects of an increase in the Federal taxable wage base for the Unemployment Insurance (UI) system. Chapter 1 presents an overview of the UI system and how it is financed. It also discusses possible rationales for increasing the Federal taxable wage base and the various effects such an increase will have on employers, UI trust funds, and labor. In addition, the possible long-term effects of a taxable wage base increase are examined.

1.1 Unemployment Compensation: A History and Overview

In order to understand the issues surrounding an increase in the Federal taxable wage base, it is necessary to understand the background of the U.S. UI system and the methods used to plan, budget, and allocate resources in the UI system.

1.1.1 The Federal-State Unemployment System

The concept of a UI program was debated at both the State and Federal levels for several years prior to the enactment of the Federal law. At that time, many industrialized countries in Western Europe had instituted social insurance programs that provided unemployment benefits, and several States had considered enacting their own independent unemployment insurance programs. The State of Wisconsin had also passed a program that served as something of a model for the eventual Federal law.

A key problem in the debate was how a single national system of unemployment compensation could take into account the large differences in State economies and each State's right to control its own affairs. After much study (by the Senate Select Committee on Unemployment Insurance and the President's Committee on Social Security) and with the pressure generated by the Great Depression, a resolution was found that created a national system of unemployment insurance but gave States the flexibility to set many of the program's parameters.

The U.S. UI system was created by the Social Security Act of 1935 (the Act). The Act created a unique Federal-State system to administer UI benefits. The UI system is responsible for two main objectives:

- To replace wages temporarily to recently employed workers who became involuntarily unemployed
- To provide economic stability for the economy during recessions

Under the legislation, each State is allowed to administer its own UI program, but the U.S. Department of Labor is responsible for overseeing the overall system.

Consequently, there are 53 State UI programs. Each of the 50 States, as well as the District of Columbia, the Virgin Islands, and Puerto Rico has its own set of Federally approved UI laws. The result is substantial diversity among the States in taxable wage limits, tax rates, benefit eligibility, and benefit amounts.[1]

1.1.2 Program Administration

The Act provides the administrative framework for the UI system. Responsibility for overseeing the administration of the UI system nationally rests with the Secretary of Labor. The agency within the Department of Labor responsible for carrying out the Secretary's UI responsibilities on a day-to-day basis is the Unemployment Insurance Service (UIS), an agency within the Employment and Training Administration (ETA). The role of the UIS focuses on the following activities:

- Ensuring proper and efficient administration of the UI program
- Preparing national budgets at both the Federal and State levels of detail
- Allocating authorized administrative funds to the State UI agencies
- Reviewing and assisting in developing Federal legislation
- Establishing performance standards (Secretary's Standards) and Desired Levels of Achievement (DLA) for State operations and evaluating State operations
- Providing training and technical assistance to State Employment Security Agencies (SESAs)

The Federal Unemployment Tax Act (FUTA) of 1939 (P.L. 76-379) determines program coverage and imposes certain requirements on the State programs. In order to qualify for UI benefits, an unemployed worker must have recently worked for a covered employer for a given period of time and earned a certain amount in wages. The particular qualification requirements are set by each State. The State generally determines individual qualification requirements, disqualification provisions, eligibility, weekly benefit amounts, potential weeks of benefits, and the State tax structure used to finance all of the regular State benefits and half of the Extended Benefits (EB). Approximately 98 percent of all wage and salary employees are covered by UI. However, in 1992, only 52 percent of unemployed individuals actually received UI.[2]

[1] *Comparison of State Unemployment Insurance Laws*, U.S. Department of Labor, August 1993.

[2] *Ibid.*, p. 492.

1.2 Financing the UI System

Currently, FUTA imposes a 6.2 percent gross tax rate on the first $7,000 paid annually in wages to each employee by covered employers. The amount of wages that is subject to tax is called the Federal taxable wage base. Employers in States with programs approved by the Federal Government and with no delinquent Federal loans may credit 5.4 percentage points against the 6.2 percent tax rate. To obtain Federal approval, a State UI system collects employer payroll taxes, provides unemployment benefits, and meets certain other requirements.[3] States must also levy UI payroll taxes on State wage bases that are equal to the Federal taxable wage base. However, States are granted the discretion to set their own wage bases above the Federal minimum.

Because all 53 States currently have State tax bases that are greater than or equal to the Federal maximum, employers pay both State and Federal UI taxes on covered employees. State tax revenues are used to finance regular UI benefits and half of the Federal-State EB program. Tax rates and taxable wage bases are allowed to vary across States, subject only to minimum Federal requirements. Average State tax rates are below 5.4 percent and can range from zero in 15 States to a maximum as high as 10 percent in 3 States.[4] State tax rates are "experience rated," that is, firms that have a greater propensity to lay off employees (and thus draw more benefits) pay higher tax rates.

State UI tax rates are set on specific computation dates on an annual basis and become effective on a specified date. In all but four States, the effective date of the new tax rate is January 1; for the other four States,[5] the effective date of the new tax rate is July 1. The dates of computation vary significantly among States, and there are differences between the specific formulas used for the computation of the new tax rates, even among States with similar experience-rating systems. Firm contributions to the State UI trust fund are calculated on a quarterly basis by multiplying taxable wages by the firm's tax rate.

The Federal UI tax minus the credit is used to finance UI program administration in all States, as well as Federal administration and several specialized Federal benefit programs. The current 0.8 percent FUTA tax rate has two components: a permanent tax rate of 0.6 percent and a temporary surtax rate of 0.2 percent. The temporary surtax was first added to the permanent FUTA tax rate in 1976 (P.L. 94-566). Since 1976, authorization for the surtax has been extended repeatedly. The Omnibus Budget Reconciliation Act of 1987 (P.L. 101-203) extended the 0.2 percent surtax through 1990 (P.L. 101-508). In 1990, the surtax was extended again through 1995. Most recently, the surtax was continued through 1996 under the Emergency Unemployment Compensation Act of 1991 (P.L. 102-164).

State and Federal UI tax revenues are deposited into one of the 59 separate accounts that make up the Federal Unemployment Trust Fund. Funds are managed by the U.S. Treasury. These accounts handle all funds related to the UI system, including Federal-State UI outlays

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[3] *Federal Register*, Vol. 51, No. 146, July 30, 1986, Notices, p. 27271.

[4] *Ibid.*, p. 485.

[5] The four States in question are New Hampshire, New Jersey, Tennessee, and Vermont.

and taxes and Unemployment funds for both Federal employees and railroad employees. The 59 accounts in the Unemployment Trust Fund are as follows:

- Fifty-three state UI trust funds, which fund regular UI benefits in the 53 States
- The Employment Security Administration Account, which funds administration
- The Extended Unemployment Compensation Account, which funds the Federal half of the Federal-State EB program
- The Federal Unemployment Account, which funds loans to insolvent State UI programs
- The Federal Employee Compensation Account, which funds benefits for Federal civilian and military personnel authorized under 5 U.S.C. 85
- The Railroad Unemployment Insurance Account, which funds benefits for railroad employees
- The Railroad Administration Account, which funds the costs of administering the UI program for railroad employees

The accounts are funded through a variety of mechanisms. The State trust funds are funded with State UI taxes as described above. The Employment Security Administration Account, the Extended Unemployment Compensation Account, and the Federal Unemployment Account are financed with Federal tax revenues. The Federal Employee Compensation Account is financed with general revenues.

1.2.1 The Federal Taxable Wage Base

Since the inception of Unemployment Insurance in the 1930s, the Federal taxable wage base has changed four times. Between 1937 and 1939, there was no Federal wage base. Between 1940 and 1971, the Federal wage base was set at $3,000. It was increased to $4,200 in 1972 and to $6,000 in 1978. It has been at $7,000 since 1983.

Originally, the Social Security Act did not provide for a taxable wage base for the UI program, and, excepting three States, both the Federal and State contribution rates applied to total wages. Michigan, New York, and South Carolina were the exceptions and taxed only the first $3,000 of wages in 1939. As a result of an amendment in the UI laws passed in 1939, however, a Federal taxable wage base equal to the Social Security tax base, $3,000, became effective January 1, 1940.[6]

There was little pressure to change the Federal wage base until financing concerns became an issue. By that time, in the early 1970s, the ratio of taxable payrolls to

[6] *Unemployment Insurance in the United States, The First Half Century*, Saul Blaustein, 1993.

total payrolls had declined from 0.93 in 1940 to 0.45 in 1971. Subsequently, the tax base was increased to $4,200. With the stagflation of the mid-1970s, the UI program found itself facing financing problems again and by 1978 had increased the tax base to $6,000.[7] The taxable wage base was increased to $7,000 in 1983 and has remained at that level since.

In 1990, average earnings in taxable covered employment were slightly above $23,000. The gap between average annual earnings of covered workers and the Federal taxable wage base has since increased. The growing gap means that the taxable share of covered wages is declining. In 1990, only 37.6 percent of covered wages were taxable compared to 92.8 percent in 1940. It has also meant that even though the statutory Federal tax rate doubled between the late 1960s and the late 1980s from 0.4 percent to 0.8 percent, the effective tax rate, or the amount of FUTA revenue collected as a percent of the total covered wages, only fluctuated between 0.2 and 0.3 percent of total wages during this period.

1.2.2 State Taxable Wage Bases

For reasons of solvency and tax equity, most State UI programs now have taxable wage bases that exceed $7,000. Exhibit 1-1 provides a summary of developments in State UI tax bases since 1974. States are arrayed in descending order by the size of their tax bases as of 1994. State wage bases range from $7,000 to $25,000 in Hawaii. The Federal taxable wage base is shown at the bottom of the Exhibit for comparison purposes.

States tax bases can be separated into roughly four separate groups: tax bases equal to the Federal tax base, those above $7,000 but below $10,000, those equal to $10,000 but below $14,000, and those equal to or greater than $14,000. In 1994, 12 States had taxable wage bases that were equal to the level mandated by Federal law. Thus, 41 States had tax bases above the Federal level; more States than at any other point in the history of the Federal-State UI system. However, most of these 41 jurisdictions had tax bases that exceeded $7,000 by rather modest amounts. Twenty State tax bases were between $7,100 and $9,900, and another nine fell between $10,000 and $13,900. Twelve State tax bases exceeded $14,000 or more than twice the current Federal tax base.

There have not been any major changes in the grouping of States with substantially above-average tax bases over the last several years.[8] This stability is due to the fact that the States with the highest tax bases generally have indexed wage bases. In addition, indexation provisions have tended to be stable from one year to the next in States that have adopted indexation. The data for 1985, 1988, and 1993 illustrate this point. In the States where comparisons between 1985 and 1993 can be made,

[7] *Ibid.*

[8] Montana's tax base increased from $8,600 in 1985 to $12,200 in 1986 when it implemented indexation at 80 percent of average covered earnings.

indexation rates are unchanged.[9] The only recent change in the grouping of high-tax-base States occurred when Massachusetts, a nonindexed State, raised its tax base from $7,000 to $10,800 in 1992.

1.2.2.1 States With Fixed Taxable Wage Bases Above the Federal Minimum

Many States have increased their taxable wage bases through periodic legislation. Legislative increases in State tax bases have not resulted in State tax bases that deviate significantly from the Federal tax base. Although it is certainly conceivable for a State to achieve a high tax base through periodic legislative changes to its tax base, this has not occurred during the last two decades. Three States currently have discretionary wage bases that equal or exceed $10,000. Massachusetts' tax base is set at $10,800 (it was enacted in 1992 due to a severe financing problem). Wisconsin's tax base is set at $10,500, and Colorado has a State tax base of $10,000. Connecticut increased its tax base to $9,000 in 1994 and plans to increase it to $10,000 in 1995.

Five nonindexing States increased their taxable wage bases between 1992 and 1993. They were: Missouri (from $7,000 to $7,500); Maryland (from $7,000 to $8,500); the District of Columbia (from $8,000 to $9,000); Arkansas (from $8,000 to $8,500); and Ohio (from $8,250 to $8,500). The changes in State taxable wage bases in Missouri and Maryland reduced the number of States with State taxable maxima of $7,000 to 12 States.

1.2.2.2 States With Indexed Wage Bases

Eighteen States have tax bases that are indexed to rise automatically with the average level of earnings of covered workers within the State. These tax bases are indexed to set percentages of Statewide average earning levels. Indexation rates range from 50 percent to 100 percent. Indexed wage bases are present in the 12 States with 1994 tax bases of $14,000 or higher and in 6 of 9 States with tax bases between $10,000 and $14,000.

Wages are indexed to 100 percent of average wages in three States: Hawaii, Idaho, and the Virgin Islands. States typically index the taxable wage base using the State's average earnings over a 12-month period that ends 1 to 2 full years before the current tax year.

The taxable wage bases in these States reflect not only the indexation percentage and the length of the lag in the calculation of average Statewide earnings but also the average level of earnings in the State. In 1993, for example, the tax bases in New Jersey and Rhode Island were $16,100 and $15,600, respectively, and their respective

[9] Major changes in indexation percentages were Utah's reduction from 100 percent in 1984 to 75 percent in 1985, Hawaii's increase from 90 percent in 1976 to 100 percent in 1977, and Alaska's increase from 60 percent in 1982 to 75 percent in 1983.

Exhibit 1-1

State Taxable Wage Bases

State	1994 Tax Base ($)	1994 Index Pct. (%)	1994 Index Lag (months)	First Year	1988 Tax Base ($)	1988 Index Pct. (%)	1985 Tax Base ($)	1985 Index Pct. (%)	1980 Tax Base ($)	1974 Tax Base ($)
Hawaii	25,000	100	18	1972	17,400	100	15,100	100	11,200	6,800
Alaska	23,800	75	18	1982	21,100	75	21,800	75	10,000	10,000
Virgin Islands	22,500	100	18	1986	14,000	100	8,000		6,000	N/A
Idaho	20,400	100	24	1976	16,200	100	15,000	100	10,800	4,200
Washington	19,900	80	24	1989	15,100		10,000		9,600	5,400
Oregon	19,000	80	24	1976	14,000	80	13,000	80	10,000	5,000
New Jersey	17,200	54	12	1977	12,000	54	10,100	54	6,900	4,200
Rhode Island	16,400	70	12	1980	12,000	70	10,600	70	7,200	4,200
Utah	16,200	75	18	1977	13,200	75	12,100	75	11,000	4,200
Nevada	15,900	67	12	1975	12,100	67	11,100	67	7,900	4,200
Minnesota	15,100	60	12	1982	11,700	60	10,300	60	8,000	4,800
Montana	15,100	80	12	1986	12,600		8,600		7,600	4,200
Iowa	13,900	67	12	1978	11,000	67	11,200	67	7,400	4,200
North Carolina	13,200	60	12	1984	10,100	60	8,700	60	6,000	4,200
New Mexico	13,100	65	18	1978	10,800	65	10,000	65	7,200	4,200
North Dakota	13,000	70	18	1980	11,000	70	10,700	70	7,600	4,200
Wyoming	11,400	55	12	1985	10,200	55	9,600	55	6,000	4,200
Massachusetts	10,800				7,000		7,000		6,000	4,200
Oklahoma	10,700	50	12	1986	9,100	60	7,000		6,000	4,200
Wisconsin	10,500				10,500		9,500		6,000	4,200
Colorado	10,000				10,000		8,000		6,000	4,200
District of Columbia	9,500				8,000		8,000		6,000	4,200
Michigan	9,500				9,500		9,000		6,000	4,200
Arkansas	9,000				7,500		7,600		6,000	4,200
Connecticut	9,000				7,100		7,100		6,000	4,200
Illinois	9,000				9,000		8,500		6,500	4,200
Texas	9,000				8,000		7,000		6,000	4,200
Ohio	8,750				8,000		8,000		6,000	4,200
Delaware	8,500				8,500		8,000		6,000	4,200
Georgia	8,500				7,500		7,000		6,000	4,200
Louisiana	8,500				8,500		7,000		6,000	4,200
Maryland	8,500				7,000		7,000		6,000	4,200
Missouri	8,500				7,000		8,000		6,000	4,200
Alabama	8,000				8,000		8,000		6,000	4,200
Kansas	8,000				8,000		8,000		6,000	4,200
Kentucky	8,000				8,000		8,000		6,000	4,200
New Hampshire	8,000				7,000		7,000		6,000	4,200
Pennsylvania	8,000				8,000		8,000		6,000	4,200
Vermont	8,000				8,000		8,000		6,000	4,200
Virginia	8,000				7,000		7,000		6,000	4,200
West Virginia	8,000				8,000		8,000		6,000	4,200
Arizona	7,000				7,000		7,000		6,000	4,200
California	7,000				7,000		7,000		6,000	4,200
Florida	7,000				7,000		7,000		6,000	4,200
Indiana	7,000				7,000		7,000		6,000	4,200
Maine	7,000				7,000		7,000		6,000	4,200
Mississippi	7,000				7,000		7,000		6,000	4,200
Nebraska	7,000				7,000		7,000		6,000	4,200
New York	7,000				7,000		7,000		6,000	4,200
Puerto Rico	7,000				7,000		7,000		6,000	4,200
South Carolina	7,000				7,000		7,000		6,000	4,200
South Dakota	7,000				7,000		7,000		6,000	4,200
Tennessee	7,000				7,000		7,000		6,000	4,200

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indexation percentages were 54 percent and 70 percent of Statewide average wages. Thus, even though the taxable wage base is indexed to a much lower percentage of the State's average earnings, the taxable wage base is slightly higher in New Jersey than in Rhode Island because New Jersey's average earnings are higher.

Exhibit 1-1 also lists the years when indexation became fully automatic in each State with indexation. The first State to index its wage base to average wages was Hawaii, which began indexation in 1972. Since then, no more than three States have indexed their wage bases during a given year. The initial years of State indexation are distributed fairly evenly since 1972. In the 4 years leading up to and including the 1978 change in the Federal tax base, a total of seven States indexed their wages bases. Since the last increase in the wage base in 1983, a total of six States have indexed their wages bases.

The dates that States began indexation may understate the length of time that many States with indexation actually have had tax bases consistently above the Federal tax base. In the State of Washington, for example, the high State tax base extends back to 1973, even though the State UI tax base was only linked to the State's annual average wage in 1989. Washington's tax base increased automatically by $600 each year during the 1970s and then by 15 percent per year in the 5 years prior to 1989. The 1992 to 1993 increase was 5 percent.

1.3 Rationale for Raising the Federal Taxable Wage Base

The real value of the taxable wage base has decreased substantially since the program's inception. This decrease has had several effects. First, the UI tax burden has become unevenly distributed across low- and high-wage firms. As the real value of the taxable wage base has declined, low-wage employers have had to pay taxes on a higher proportion of their employees' wages, thus paying a higher effective tax rate than their high-wage counterparts. This existing tax inequity is the primary motivation for increasing the taxable wage base.

Second, trust fund contributions have been adversely affected. In most States, benefit formulation is tied to a higher and ever-increasing portion of wages, but contributions are not tied to a similar base. As a result, there has been a decline in State trust fund balances, and it has become more difficult for States to provide adequate benefits during recessionary periods. The high-cost multiple (HCM), which measures how long recession-level benefits could be paid from State trust funds, has declined for the overall UI system from an average of 2.1 between 1954 and 1969 to 0.6 in 1992,[10] below the lowest proposed standard of 1.0. Further, only 18 of the 53 State UI systems met the least conservative standard for the HCM in 1992.[11] The HCM figures indicate that trust fund adequacy should be a legitimate

[10] The HCM is calculated using two ratios: (1) the ratio of current net trust fund reserves to current year total wages earned in insured employment divided by (2) the ratio of the largest amount of total state benefit payments experienced in any 12 consecutive months to the total wages in insured employment during those 12 months.

[11] For a more complete discussion of the HCM, see *Report and Recommendations: February 1994*, Advisory Council on Unemployment Compensation, February, 1994, pp. 93-94.

concern, and simulation models conducted by the GAO and Vroman[12] concluded likewise. A number of States became insolvent during the last recession, making it necessary for States to borrow funds from the Federal Government and demonstrating the inadequacy of the State trust fund balances during times of recession.

Third, the use of trust fund surcharges is inversely related to the level of the trust fund. This relationship has encouraged increases in the average UI tax rate structure contemporary with cyclical downturns. Increasing taxes during recessionary periods may be undesirable from a macroeconomic perspective because this may delay economic recovery and prolong periods of high unemployment.

Fourth, the gap between total covered wages and the Federal taxable wage base has widened considerably since the inception of the UI program in 1939. At the start of the program, the Federal taxable wage base represented 100 percent of total wages; by 1992, the taxable wage base represented only 36 percent of total wages. Furthermore, average annual wages are currently more than three times the taxable wage base.[13] If the taxable wage base had been indexed for wage growth since 1940, the taxable wage base in 1991 would have been over $50,000 instead of $7,000.[14]

To remedy these situations, many researchers and policymakers have advocated raising the Federal taxable wage base. Assuming the States also raised the State wage bases to the new Federal level and enacted no subsequent change in the tax rate, an increase in the taxable wage base would reduce the tax inequity between low- and high-wage firms and industries, improve trust fund balances, and eliminate part of the difference between average covered wages and the wage base. Proposals to raise the Federal taxable wage base have ranged from modest increases (for example, raising the tax base to $10,000) to substantial increases (for example, raising the tax base to the level of the Social Security wage base, which is currently set at $60,600).

1.4 The Effects of Increasing the Federal Taxable Wage Base

This study estimates the various effects of raising the Federal taxable wage base. In particular, it examines the effects of different increases in the Federal taxable wage base on employers, UI tax revenues, and labor. This section discusses the potential effects of an increase in the taxable wage base on these groups, as well as the long-term effects of any increase.

1.4.1 Effects on Employers

An increase in the Federal taxable wage base would affect both Federal UI taxes and State UI taxes. Under current statutes, States must set their tax bases at or above the Federal maximum to be eligible for the 5.4 percent FUTA tax credit offset. Because many States have legislation requiring the State tax base to be changed

[12] *Unemployment Insurance: Trust Fund Reserves Inadequate*, U.S. General Accounting Office, 1988, and *Unemployment Insurance Trust Fund Adequacy in the 1990s*, Wayne Vroman, 1990.

[13] *Report and Recommendations: February 1994*, Advisory Council on Unemployment Compensation, p. 107.

[14] *1993 Green Book*, Committee on Ways and Means, U.S. House of Representatives, p. 482.

when the Federal tax base changes and strong lobbies exist to maintain experience-rated tax rates, it is likely that all States with tax bases at the current Federal level would match any increase in the Federal tax base. To analyze the consequences of raising the Federal taxable wage base, it is convenient to separate the analysis into the three effects that such an increase would have. They are as follows:

- An immediate increase in Federal payroll taxes (unless the Federal tax rate is reduced by an amount that offsets the increase in the tax base)
- Higher State UI payroll taxes in States where the taxable wage base falls below the new (higher) Federal tax base
- Subsequent reductions in State UI tax rates as UI trust fund balances increase and experience-rating provisions come into play.

Each of these effects is discussed in more detail below.

1.4.1.1 The Direct Effect on Employer Federal UI Taxes

The Federal tax implications of any change are straightforward. Because the Federal tax is levied at a flat rate (0.8 percent of taxable wages in 1994), employers would experience an increase in Federal UI payroll taxes unless the Federal tax rate were also changed at the same time. Even if changes in the Federal taxable wage base are offset by changes in the tax rate (e.g., an increase in the tax base from $7,000 to $14,000 is accompanied by a decrease in the FUTA rate from 0.8 percent to 0.4 percent), many employers would still incur different tax liabilities. The changes in tax liabilities would be a result of changes in taxes associated with low-wage workers, those earning less than $7,000 and those earning between $7,000 and $14,000. Employers would pay less in Federal payroll taxes for any workers whose salaries fell in these ranges even if the maximum payment of $56 per worker were not altered.

1.4.1.2 The Direct Effects on State UI Taxes

The most important factor in determining how an increase in the Federal taxable wage base will affect State UI taxes is the level of current State taxable maxima relative to the proposed increase in the Federal maximum wage base. The 12 States with State tax bases equal to the Federal taxable wage base will have to raise their wage bases to the new Federal level in order to receive the 5.4 percent FUTA tax credit offset. In addition, any States with wage bases below the new Federal level would have to increase their State wage bases. The number of States that would be required to increase their wage bases would vary based on the magnitude of the increase. The number of States would be much greater if the maximum taxable wage were increased to the current wage base used for Social Security, $60,600, than if it were increased to $10,000 as proposed by Congressman Downey in 1991. Similarly, if the Federal tax base were increased to 100 percent of national average covered earnings, all States would be affected.[15] However, the effect on employers would still

[15] Three programs currently index their State taxable wage base to 100 percent of average earnings: Hawaii, Idaho, and the Virgin Islands. Because average covered earnings are less than the national average in all three of these States, they also would be affected by an increase in the Federal taxable wage base to 100 percent of national

vary by State, with the largest effects felt in low-wage States and in States that currently have a $7,000 taxable wage base.

The following example illustrates how a change in the Federal wage base would have different effects on State UI wage bases. Assuming that increases in the Federal taxable wage base are not accompanied by changes in State or Federal UI tax rates, an increase in the Federal wage base to $14,000 would not affect State tax bases in the 12 States that currently have maximum taxable wage levels in excess of $14,000. Thus, the tax base in the State of Alaska, which is currently set at $23,800, would be unaffected. However, Arizona's tax base, which is currently at $7,000, would have to be raised to $14,000 to receive the FUTA tax credit offset. Accordingly, the only effect that such a change would have on employers in the State of Alaska would be an increase in the Federal UI tax; whereas, employers in Arizona would experience an increase in both State and Federal UI taxes.

1.4.1.3 Possible Offsetting Effects Against Increases in the State Wage Base

With no other change affecting UI tax statutes, an increase in the Federal taxable wage base would raise total revenues and improve the fiscal situation of many State programs. However, at least two offsetting changes in UI tax rates may vitiate the net effect on State tax revenues. First, coincident with or following the increase in the tax base, there could be offsetting reductions in the tax rates specified in State tax rate schedules. Second, the positive effect of the higher tax base on trust fund balances may reduce tax rates in subsequent years through experience-rating adjustments. Each of these responses is examined below.

The Legislative Response

To offset the positive effect of an increase in the Federal taxable wage base on revenues and trust fund balances, States may legislate a number of different changes in their UI programs. Lowering the statutory rates in each of the tax schedules, creating new schedules with lower tax rates, or lowering the trigger thresholds that activate the individual tax rate schedules would all offset an increase in the wage base. A combination of these responses would also decrease the effective tax rate on taxable wages and offset (either partially or completely) the positive effect on revenues caused by the higher tax base.

It is unclear how quickly States are likely to react to a change in the Federal taxable wage base. The year immediately prior to an increase is probably the most important because it will show State legislative activity in anticipation of the higher Federal tax base. However, States may also exhibit a lagged response due to legislative delays and/or favorable experiences, i.e., higher trust funds, under the higher tax base. To examine when States react to changes in the tax base, legislative summaries were examined for the 3-year period surrounding the three most recent changes in the Federal tax base (1972, 1978, and 1983). Legislative changes during the year prior to, the year of, and the year following an increase in the Federal tax base were examined.

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average earnings.

As noted, when the Federal tax base is raised, the States are required to at least match their taxable wage bases to the level of the new higher Federal base (a conformity requirement on the States).[16] These actions, usually taken in the year immediately prior to the year that the higher Federal tax base became effective, typically were not accompanied by a lowering of scheduled tax rates.

Exhibit 1-2 provides details of all State UI tax increases and decreases in each of these 3-year periods surrounding the three most recent tax base increases. The counts of State tax legislative actions are based on summaries prepared by the UIS. Each change was classified as either a tax increase or a tax decrease.[17] The data in the Exhibit show that tax increases dominated the tax legislation of these years. Most of the few tax reductions that did occur took place in 1972 and 1973. Tax rate schedules were reduced five times in 1972 and three times in 1973, evidence of a direct response to offset the effects of the higher Federal (hence State) tax base. "Other" tax reductions include several instances where the thresholds that trigger lower tax rate schedules were reduced. Note that during the 1971-1973 period tax increases became predominant in 1973, perhaps because the solvency position of some State trust funds had deteriorated.

During the 3-year periods surrounding the 1978 and 1983 tax base increases, several State trust funds were in debt to the U.S. Treasury, and the predominant form of tax legislation was to raise UI taxes. The number of tax increases was especially high in 1983, following 3 consecutive years of substantial borrowing by the States and Federal legislative initiatives that encouraged improved solvency in States with large UI debts.[18] Other significant changes include a series of maximum State UI tax rate increases in 1984. These increases were enacted in anticipation of a Federal conformity requirement that raised the lowest permissible maximum State tax rate to 5.4 percent (from 2.7 percent), effective January 1, 1985.

The data in Exhibit 1-2 provide evidence that an increase in the Federal tax base is only one of the factors that could affect State actions on tax rates. Much more important are the solvency situations of State fund balances when the new higher tax base goes into effect. Comparing State reactions to the prior changes in the taxable wage base illustrates this point. Between 1971 and 1973, fund balances were generally adequate, and there were offsetting reductions in the tax rates in some States. In the two periods surrounding the later increases, however, fund solvency concerns were paramount, and the enactment of a higher Federal tax base did not lead to many tax rate reductions. Probably the main effect of the higher tax base in these years was to reduce the scale of other tax actions required in the States to improve solvency.

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[16] If a State does not satisfy Federal conformity requirements, it cannot experience-rate its employer tax rates, i.e., each employer would be subject to the full FUTA tax rate (2.7 percent through 1984 and 5.4 percent since 1985).

[17] In the counts of tax increases and decreases in Exhibit 1-2, a given State may appear more than once if it enacted more than a single tax change in a year, e. g., a lowering of tax schedules and a change in solvency taxes.

[18] The Social Security legislation of 1983 included an explicit section to have debtor States improve solvency through both tax increases and benefit reductions. For details see Chapter 1 in *Unemployment Insurance Trust Fund Adequacy in the 1990s*, Wayne Vroman, 1990.

Previous State reactions to increases in the Federal tax base indicate that State trust fund solvency is a primary factor in States' decisions to alter their scheduled tax rates. Because many States still are not confident that trust fund balances are adequate, it is unlikely that large-scale reductions in scheduled tax rates would be enacted. However, due to the magnitude of the proposed increases in the tax base, which are significantly larger than past increases in the tax base, most, if not all, of the States will make reductions in their scheduled tax rates. The likely size of such reductions in individual States increases as the State feels more confident that its trust fund balance will adequately meet its needs and as the increase in the tax base increases.

Exhibit 1-2

Legislative Tax Changes Surrounding the Three Most Recent Federal Tax Base Increases

	Tax Increases						Tax Reductions				
Year	Other Tax Base Increases	New Tax Rate Schedules	Maximum Tax Rate	Solvency Taxes	Other	Total	Tax Base Decreases	New Tax Rate Schedules	Solvency Taxes	Other	Total
1971	1	1	2	3	5	12	0	5	1	7	13
1972†	0	0	0	1	0	1	0	3	1	5	9
1973	3	2	4	2	2	13	0	0	0	5	5
1977	4	2	8	2	4	20	0	0	1	3	4
1978†	0	0	1	0	1	2	0	0	0	0	0
1979	4	2	3	1	0	10	0	0	0	0	0
1982	3	1	5	1	2	12	0	0	1	2	3
1983†	13	4	11	13	7	48	1	1	1	1	4
1984	2	1	15	2	5	25	0	0	1	5	6

† Federal tax base increased

Source: Summaries of State legislation prepared by UIS. Changes in new employer tax rates, standard rates, and reimbursable employer rates excluded. More than one change may be recorded for a State in a given year.

The Experience-Rating Response

The experience-rating response is more difficult to characterize because the details of State-level experience-rating procedures are so varied. In all instances, a higher tax base initially will raise both employer UI taxes and the State's trust fund balance through the direct effect of the increase on the level of taxable wages. To describe the subsequent response, however, it becomes necessary to delve into specific details of State experience- rating systems.

Two elements of the State experience-rating systems are most crucial in determining the long-run State effects of an increase in the taxable wage base: the type of experience-rating system used in the State and the time period from which the taxable payrolls used to calculate a firm's experience rating is taken. Four different types of experience-rating systems are used in the 53 State UI systems: reserve ratio, benefit ratio, benefit-wage ratio, and payroll declines. Only three States[19] use systems other than the reserve and benefit ratio systems, so the discussion here will focus only on the various effects increasing the tax base would have on the two most prominent systems. Other important details of State UI systems that, in addition to an increase in the tax base, would have minor long-run effects on the State trust funds have been omitted. Omitted details include the trigger mechanisms that activate individual experience-rated tax schedules, the functioning of solvency taxes that are often present, and the tax-rate intervals.

Reserve Ratio Systems

In a reserve ratio system, each firm maintains a UI reserve that is equal to its total contributions less the total benefits paid out for a specific period of time (generally, the life of the firm). The experience rating for firms in reserve ratio States is then calculated by dividing the firm's reserve by its taxable payrolls for a given period of time. Tax rates are then assigned to firms on the basis of their reserve ratio: the more positive the ratio, the lower the assigned tax rate. The long-run effects of an increase in the taxable wage base would vary depending on the number of years of taxable payrolls used in the denominator of the experience-rating formula. Thirty of the 33 reserve ratio States use taxable payrolls from at least a 3-year period, and the other 3 use the taxable payrolls from the previous year only.

The three States (Massachusetts, South Carolina, and Wisconsin) that use only the past year's taxable payrolls would notice an immediate increase in tax revenues through two mechanisms. In addition to the first-year effect caused by the increase in taxable wages, additional revenues would be generated in the second year by a fall in firms' reserve ratios and the resulting increase in tax rates.[20] As the trust fund balance increased, there would be an offsetting reduction in tax rates caused by the subsequent increase in the reserve ratio. However, there may be a permanent long-

[19] Alaska uses a payroll-declines system. Delaware and Oklahoma use a benefit-wage-ratio system.

[20] This statement assumes that the proportional increase in taxable wages exceeds the first-year increase in the trust fund balance caused by the increase in taxable wages, thus leading to a lower reserve ratio.

term positive effect on annual tax revenues caused by the increase in taxable wages. Again, the size of this effect would depend on the number of tax schedules, the slope of the schedules, and the levels of minimum tax rates on the individual schedules.

States that use more than 1 year of taxable payrolls would also experience the first-year effect caused by the one time increase in taxable payrolls. However, the fall in the reserve ratio for individual firms would occur gradually, over the course of the number of years used in the experience rating formula, as the payrolls calculated under the new, higher base were included in the formula. Thus, firms' tax rates would not increase as dramatically after the first year as they would if the State used only the past year's payroll in its experience-rating equation. Over time, the trust fund balances would increase, and there would be an offsetting reduction in tax rates. As in the reserve ratio States using only year of payrolls, there may be a permanent long term positive effect on annual tax revenues, the size of which would depend on the number of tax schedules, the slope of the schedules, and the levels of minimum tax rates on the individual schedules.

Benefit Ratio Systems

Seventeen States currently use a benefit ratio experience-rating system. Unlike the reserve ratio systems, benefit ratio systems establish tax rates based on the short-term experiences of firms. The benefit ratio is calculated by dividing the benefits charged to an employer by the employer's taxable payrolls. This ratio becomes the employer's contribution rate after adjusting for noncharged or ineffectively charge benefits. All but one State uses the benefits and payrolls from the last 3 to 5 years in their computation of the firm's experience rating. Pennsylvania's benefit ratio formula, which includes a reserve ratio element, uses the firm's benefits and payrolls from an average 3-year period.

In this situation, the benefit ratio is reduced in the long run by the same percentage as the percentage increase in taxable wages.[21] In the short run, however, the positive effect on taxable wages increases revenues. As the higher taxable wages start to lower the benefit ratio in the year after the increase, there is an automatic tendency for the average tax rate to decline to a level that causes the long-run effect on annual revenues to be zero.[22] During the transition to the long-run situation, there would be a buildup in the level of the trust fund balance. The net effect would be a permanent increase in the equilibrium level of the trust fund.

Both the reserve ratio and benefit ratio systems, regardless of the number of years of payrolls used, have a common result, namely a short-run positive effect on trust fund balances. The short-run effect is caused by the first-year effects of the higher tax base on taxable wages. In some cases, increases in trust fund balances are augmented by effects caused by the specific experience-rating system. In no case,

[21] This statement assumes the proportionate reduction in the benefit ratio is matched by an equal proportionate reduction in the average tax rate.

[22] Again, if there is a solvency tax that is also present, its rates would decline and cause the long-run effect on the trust fund balance to move toward zero.

however, does the tax base increase, as worked through the experience-rating system, leave the trust fund balance unchanged in the long run.[23]

Considering both the statutory responses and the experience-rating responses, three summary comments are in order. First, the States have not reacted to prior increases in the taxable wage base by lowering scheduled tax rates, but the proposed increases in the tax base are of such magnitude to virtually guarantee the reduction of scheduled tax rates in some States. Second, the experience-rating response to the higher tax base does not completely offset the initial positive effects on tax revenues and leads to higher trust fund balances. Third, in light of both the statutory and the experience-rating response, an increase in the tax base does raise employer payroll costs, at least in the short run. Because employer costs do increase, it is necessary to consider the question of employer payroll tax incidence when examining an increase in UI payroll taxes.

1.4.2 The Effect on UI Trust Funds

An increase in the Federal taxable wage base will increase the amount of Federal UI taxes collected unless this increase is accompanied by a decrease in the Federal tax rate. Such an increase will have differing effects on State UI trust funds.

Several factors influence how large an effect a given increase in the Federal taxable wage base will have on UI trust funds. These include the factors cited above: the level of the State's taxable wage base, the average tax rate and subsequent changes to this rate, the degree of experience-rating in the State, and the proportion of nonchargeable benefits. In addition, the State's earnings distribution will influence how large an impact the increase will have on State UI trust fund balances.

In general, the higher the earnings distribution in the State, the greater the effect of an increase in the Federal maximum taxable wage. Because an increase in the taxable maximum would have no effect on the taxes paid on individuals with earnings that are equal to or lower than the current maximum, it will not affect State trust fund levels either. In fact, if the increase in the taxable maximum results in a reduction in the State payroll tax rate, the aggregate tax on the earnings of those with earning levels equal to or below the new taxable maximum may actually decrease.

[23] Again, recall that the possible offsetting effects of reduced solvency taxes are not being considered. To the extent that a State has a solvency tax whose rates are triggered by the aggregate trust fund balance (regardless of its method of experience rating), any tendency for the balance to deviate from the balance in the no-tax-base-increase scenario will be offset by reductions in the solvency tax.

1.4.3 Long-Run Effects of an Increase in the Taxable Wage Base

In the longrun, the effect of raising the taxable maximum depends upon the eventual incidence of the tax increase. The incidence of increased employer UI payroll taxes need not coincide with the nominal impact associated with increased tax payments. Instead of accepting reduced profits, a firm may try to pass the real burden of increased payroll taxes on to other economic agents either by raising the selling prices of the firm's products or reducing the prices paid for labor and other inputs into its production processes. These two responses are termed forward and backward shifting, respectively.

The main theoretical approach to tax incidence was first developed by Harberger.[24] Harberger reaches the general conclusion that a tax on labor, such as the UI employer payroll tax, is ultimately borne by workers. Payroll taxes are transferred to workers either by shifting them backward onto money wages or shifting them forward onto higher prices.

When taxes are shifted backward, the ultimate burden of the employer tax resides with factor inputs in the firm's production process. Since labor is usually the most important input in producing any output when taxes are shifted backward, nominal wage rates of the firm's workers are reduced, or more accurately, their rate of increase is reduced. Backward shifting causes the nominal wages of employed workers to decline somewhat in order to provide the benefits that are being financed by the higher employer payroll taxes. The employer acts as the collection agent for the taxes, but workers actually experience the economic burden of the tax through reduced pre-tax wages. This outcome could be characterized as an insurance or pooling arrangement among workers. If the tax is fully shifted backward onto money wages, input costs to the employer, output prices, and profits are all unaffected.

If increases in the UI tax are not fully backward shifted, employers will experience an increase in the price (cost) of labor. An increase in the price of labor would be expected to result in decreased demand for labor. The magnitude of the decrease in the demand for labor depends upon the elasticity of the demand for labor. This decrease in turn depends upon the elasticity of the demand for the outputs for which labor is used and the elasticity of substitution between labor and other factors. To estimate the reduction in the demand for labor that would occur as a result of an increase in the maximum taxable wage, therefore, requires several assumptions regarding the elasticity of labor demand.

Forward shifting of employer payroll taxes can affect the relative prices of products as well as the overall or average price level. Under forward shifting, employers with above-average UI taxes would increase their output prices relative to other prices. (In the aggregate, such behavior would raise the average price of final goods, and the ultimate burden of the tax would rest on buyers of final products.) In a market economy where customers have the information to compare relative prices, such firms could experience a reduction in the demand for their products.

[24] Arnold Harberger, "The Incidence of the Corporation Income Tax," *Journal of Political Economy*, (June 1962).

The ultimate burden of increased employer UI payroll taxes is not clear. All three outcomes (no shifting, backward shifting, and forward shifting) would occur across industries and for individual firms within industries. If no shifting takes place, output prices, wages, and other input prices are unaffected, and the tax causes a reduction in the firm's profits.

In a social insurance program like UI that levies taxes and pays benefits, an important determinant of the direction of tax shifting is knowledge that the taxes and benefits are linked. Backward shifting onto money wages is more likely when workers are aware of the benefits paid by the program. This consideration would seem to make backward shifting more likely in an industry such as building construction where workers frequently collect UI benefits or know workers who presently are or have been UI beneficiaries. When the receipt of benefits is fully perceived and benefits are valued by workers, an increase in employer UI taxes may be fully offset by slower money wage growth leaving employer labor costs unaffected.

1.5 Methodology Employed in The Study

Two methods of analysis were used in this study to measure the effects of a change in the Federal maximum taxable wage base for Unemployment Insurance. One was the development of a macro model for estimating the effects of the change in the Federal taxable maximum wage on employment and trust fund revenues by State and for the nation as a whole. The second method uses State level microdata to measure the effects of raising the Federal taxable maximum wage on firms of different sizes, effects on different industries, higher and lower wage firms, and firms with different experience-rated tax rates. These methodologies are outlined below.

1.5.1 Macroanalysis

For this analysis, a model was estimated that related changes in the Federal taxable maximum wage to the taxable wage proportion or the proportion of total wages subject to taxation at alternative taxable maxima. This was done using prior changes in the UI and OASDI taxable maximums to estimate the effect on the taxable wage proportion. Having done this, the potential changes in the UI Federal taxable maximum could be estimated in terms of the taxable wage proportion for each State at each level of the taxable maximum wage. This, in turn, could be used to estimate the effects of changing the Federal maximum taxable wage on the contributions to the trust fund and the effects in terms of the demand for labor on the part of firms and the labor supply on the part of individuals in the labor market. The results are presented in Chapter 3.

1.5.2 Microanalysis

For this analysis, States were selected in which individual wage record data could be obtained for calendar years 1990 and 1991 (the most recent full years available at the outset of the study). Data from four States, Colorado, Maryland, Missouri, and Texas, were used. Universe data from these States were processed by the Regional Dynamics Center of the University of Baltimore. The taxable wage proportion was estimated for alternative levels of the Federal maximum taxable wage, assuming States complied in changing their maximum taxable wage. Also estimated were the

Federal and State tax revenues for these States for each alternative level of the maximum taxable wage.

Within the States where universe microanalysis data (by individual employee by firm) were collected, selection of a sample of firms by size and industry was also done. This sample, originally of 30 firms per industry and size cell (75 cells in all), was used to estimate the effects of changing the Federal taxable wage base on firms by size category (1<5, 5<25, 25<100, 100 <250, 250+). These data were used to estimate the effects of a Federal taxable wage base change on firms by size, industry, average wage level, and experience-rated tax rate. An attempt was also made to relate the changes in the taxable wage base to changes in contributions relative to benefit payout for firms at the minimum or maximum tax rate in the State.

1.5.3 Outline of Report

The remainder of this report explores the various effects of an increase in the taxable wage base. Chapter 2 discusses the theoretical literature on the demand for labor. Chapter 3 presents the results of the macroeconomic analysis conducted for this study. In particular, the effects of an increase in the taxable wage base on national employment are explored. Chapter 4 presents the results of the microeconomic analysis. The first section looks at the effect of different size increases in the Federal taxable UI wage base on UI trust funds by using universe data in several States. The second section examines the effects on employer taxes and employment, both by industry and firm sizes, using sample data from several States. Finally, Chapter 5 summarizes the major findings of the study.

* * * *

Chapter 2

The Demand for Labor

An increase in the Federal taxable wage base will increase the cost of labor relative to other inputs and will reduce the demand for labor. In an effort to control the costs of production, employers will do one or more of the following: reduce money wages, increase average hours per worker, alter the mix of employment toward labor that is less heavily taxed, and substitute capital and other inputs for labor. This section examines the response of employment to increases in the cost of labor. The material is divided into two parts. First, there is a review of the theoretical framework used by economists to study this question. Second, the previous empirical analysis of the demand for labor is summarized.

2.1 Theoretical Analysis of Labor Demand

Economists typically examine the demand for labor within the framework of a production function where labor, capital, energy, and other inputs are combined to generate real output. Production decisions are assumed to be based on profit maximizing/cost minimizing criteria where employers take as given the technology of production and the prices of the various inputs. When the price of one input increases, a firm's optimum mix of production inputs is affected. This firm will use less of the input whose price has increased and more of other inputs when producing its product. The key question to be addressed is the following: how much does the demand for labor decrease when the price of labor (hourly compensation) increases?

An increase in the price of labor has two separable effects on the quantity of labor to be employed. First, employers will tend to substitute capital and other inputs for labor in order to reduce the effect on the overall cost of production. Second, even after substituting away from labor and toward other inputs, the per-unit cost of production will increase when the price of labor increases. This trend will lead to higher prices and lower sales and production as customers buy less of the firm's products. Both the relative price effect and the output effect reduce the demand for labor when the price of labor increases. For capital and other inputs, however, the two effects work in opposite directions when the price of labor increases. Taking into account both the relative price effect and the output effect, it is not clear whether the demand for capital and other inputs increases, decreases, or remains unchanged.

To discuss the demand for labor in a systematic manner, it will be helpful to introduce some definitions, concepts, and a few simple formulas. The technical terms needed to discuss

labor demand theory are the following:[1]

σ = The elasticity of substitution between labor and capital, i.e., the percentage response of the capital-labor ratio to a one percentage point increase in the price of labor when the price of capital (r) is held constant.

s = Labor's share of total factor income, i.e., wL/Y where w is real compensation per hour, L is total labor hours, and Y is the value of real output.

ϵ = The elasticity of product demand, i.e., the percentage reduction in the quantity of a product demanded per percentage point increase in the product price.

ϵ_{LL} = The own wage elasticity of demand for labor at a constant output (Y) and a constant price of capital (r).

ϵ'_{LL} = The total elasticity of demand for labor including the effect on output caused by the increase in costs attributable to increased compensation per hour.

These variables are related as follows:[2]

(1) $$\epsilon'_{LL} = -(1 - s)\,\sigma < 0, \text{ and}$$

(2) $$\epsilon_{LL} = -(1 - s)\,\sigma - s\epsilon$$

Both the substitution elasticity (σ) and the product demand elasticity (ϵ) are negative numbers, but the standard convention is to refer to the absolute value of each, i.e., to treat them as positive. Thus, there are negative signs in front of the righthand sides of Equations (1) and (2). Three aspects of the relationships presented in Equations (1) and (2) are important. First, the total elasticity of demand for labor (ϵ'_{LL}) is larger than the own wage elasticity of demand (ϵ_{LL}). The reason for this difference is that the total elasticity of demand output incorporates changes in output that occur as a result of changes in the price of labor, whereas output effects are held constant in the own wage elasticity of demand. Second, both the total elasticity of demand and the own price elasticity of demand become

[1] The presentation in the text is based on work by Daniel Hamermesh (1986, 1991). Most of the symbols used in the text are taken from his work. The initial presentation assumes output is produced by homogeneous inputs, i.e., all labor is identical as is all capital.

[2] The formulas shown are based on the assumption that labor and capital both have very high supply elasticities. To the extent that factor supply elasticities are low, they will act to reduce the demand elasticities as shown in the text.

larger when the elasticity of substitution (σ) is increased. The amount of labor that becomes idle increases as the technical ability to substitute capital for labor increases. Third, both labor demand elasticities are a function of the share of labor in total production costs (s). Thus, the own wage elasticity of demand (ϵ_{LL}) becomes smaller as labor's share is increased. When labor represents a larger share of production costs, an increase in the price of labor results in a smaller change in the quantity demanded because the firm has less capital to replace labor. However, the effect that a larger labor share has on the total elasticity of demand (ϵ'_{LL}) is dependent on the relative sizes of the elasticity of substitution (σ) and the elasticity of product demand (ϵ).

Three factors must be considered when estimating the effect of an increase in hourly labor compensation on labor demand and employment: the substitution elasticity (σ), the product demand elasticity (ϵ), and the labor share of total production costs (s). The values of the these variables will determine whether a given firm or industry will significantly reduce employment given an increase in the Federal taxable wage base. Even if an increase in the taxable wage base caused all employers in a given State to experience the same percentage increase in hourly labor costs, the proportionate effects on each firm's overall production costs and employment would not be the same. Larger changes in employment would be observed in firms or industries where the elasticity of capital-labor substitution (σ) is large, where the product demand elasticity (ϵ) is large, or where the expression ($s(\sigma - \epsilon)$) is large.

It should also be noted that the effects of product demand elasticity will generally be larger the smaller the size of the market is within the overall economy. This effect can be ignored at the level of economy-wide aggregates.

Because the UI taxable wage base is low relative to average annual wages, a tax base increase would be expected to have different effects on labor costs across industries and different skill classes of labor. Raising the tax base should reduce the cost disadvantages experienced by low- wage and part-time workers and by low-wage industries.

2.2 A Summary of the Empirical Estimates of Labor Demand

The analysis of labor demand, a major area of empirical labor market research, has generated an extensive literature. A recent summary by Hamermesh (1991) identifies nearly 200 studies. This section presents the findings of Hamermesh's literature review that are relevant to this project. Studies are classified into related groups to make meaningful comparisons across studies. Three broad classes of studies are distinguished: those that examine labor as a homogeneous unit, those that treat labor as a heterogeneous unit, and those that examine the relationship between hours and employment. Within each of these three classes, studies are separated and grouped along five distinct dimensions. They are:

(1) **Level of aggregation.** Three levels are distinguished: national or major industry, small industry or geographic area, or micro data.

(2) **Time period examined.** Time series or cross-section data are used.

(3) **Unit of Analysis.** Firm or household data are used.[3]

(4) **Method of parameter estimation.** Three methods are identified: direct estimation of σ,[4] labor demand conditions, or system estimation.

(5) **Data source.** Studies examine the demand for either U.S. or foreign labor.

The reliability of parameter estimates from a given study depends on how successfully the study addresses common measurement and estimation problems. Common problems include determining the appropriate way to measure labor input and the price of labor, measurement errors in individual variables, and simultaneity effects arising from endogenous labor supply.[5] Labor input, for example, can be measured either as employment or hours. Furthermore, studies can analyze hours paid or (preferably) hours worked. A separate problem involves measuring the price of labor. Decisions regarding the appropriate method to handle overtime payments, fringe benefit costs, and other training costs arising from labor turnover must be made. Another common problem that runs through all the literature is the question of simultaneity. To what extent are the purported labor demand coefficients influenced by labor supply behavior? The studies reviewed employ a variety of approaches to accommodate these issues.

2.2.1 Estimates of the Elasticity of Demand for Homogeneous Labor

Studies that estimate the elasticity of demand for homogeneous labor fall into three groups: those that derive the elasticity of labor demand from the elasticity of substitution between capital and labor and that use aggregate data; those that use aggregate data but that estimate the elasticity of labor demand directly; and those that use micro or disaggregated data.

The studies that estimate the elasticity of substitution between labor and capital (σ) in highly aggregated data are of limited usefulness for estimating the elasticity of labor demand. These studies derive the implied constant output-own wage elasticity of demand for labor (ϵ_{LL}) from the empirical estimate of σ by multiplying the

[3] The usual study would be expected to use firm data, but he argues that some labor demand parameters can also be derived from household data. In fact, the vast majority of the studies are based on firm data and usually at some level of aggregation above micro data.

[4] He further identifies four different ways to estimate σ.

[5] This brief listing is by no means comprehensive. Rather, the purpose is to identify some major pitfalls that could affect the reliability of the findings from a specific study.

estimate by (1 - s).[6] The direct estimates of σ are highly variable. Two reasons are provided for this variability: errors in measuring the price of capital and inadequate controls for shifts in labor supply over time. Because the underlying estimates of σ are so unreliable, the derived estimates of ϵ_{LL} are of limited usefulness.

More reliable are the direct estimates of labor demand based on factor demand equations and production function equation systems. The estimates of ϵ_{LL} derived from labor demand studies almost always fall in the range from 0.1 to 0.9 while the range is even tighter (0.3 to 0.6) for most studies that use an equation system approach.

Hamermesh draws three conclusions from his review of studies that estimate labor demand elasticity using macro data. First, most estimates of ϵ_{LL} are smaller than 0.75. Second, very few estimates of ϵ_{LL} fall below 0.15.[7] Third, the modal estimate of ϵ_{LL} across all studies is approximately 0.3. In addition, inferences can be made regarding the values of the other parameters in Equation (1) based on the results of these studies. An estimate of 0.3 for ϵ_{LL} is consistent with a labor share (s) of 0.75 and an elasticity of capital-labor substitution (σ) of 1.2.

The preceding result, i.e., $\epsilon_{LL} = 0.3$, is the key finding of Hamermesh's summary that is relevant for the current project. It means if there is a change in the price of labor to firms, the constant output - constant cost of capital - constant technology-longrun effect on the quantity of homogeneous labor demanded is to reduce labor demand by a multiple of 0.3 times the percentage increase in labor costs.

Compared to studies based on aggregate data, studies based on disaggregated and micro data produce a wider variety of parameter estimates. Despite the wide variation in estimates, these studies are important to understanding the demand for labor because parameter estimates derived from aggregate data may be influenced by compositional effects rather than substitution within industries. Thus, what appears to be substitution between production inputs may actually be caused by a change in the composition of production across industries with the mix of capital and labor inputs unchanged within individual industries. Using disaggregated industry data and micro data removes these compositional shifts.

Because these studies use data from narrow sectors of the economy, the assumption of constant output is less tenable. Therefore, many of the estimates of labor demand

[6] This is simply equation (1) shown earlier.

[7] Studies where the estimates of ϵ_{LL} fall close to 0.15 often include an explicit formulation regarding employer expectations about future levels of the capital stock.

are for the total elasticity of demand (ϵ'_{LL}), not the own-wage elasticity of demand (ϵ_{LL}) as in aggregate data.

Hamermesh's summary of the micro level studies emphasizes three points. First, the parameter estimates generated by these studies generally confirm the estimates produced using aggregate data. In particular, the estimate of 0.3 for ϵ_{LL} is strongly supported by these studies. Second, these estimates come from data with richer patterns of variation than are available in aggregate data. Third, estimates from studies based on narrow industries and individual firms use data where the underlying technology of production is more likely to be constant than in aggregate data. Thus, the findings from aggregate studies are strengthened by the disaggregated studies.

Much of the literature that Hamermesh summarizes focuses on demand for four, not just two, factors of production, i.e., energy and materials as well as labor and capital.[8] Thus there are analogous substitution parameters and demand elasticities for the other factors as well as a full set of partial substitution and cross elasticities to be considered when the price of one or more of the factors of production changes.

In a broader framework that considers three or more factors of production, it is possible that some factors are complements as well as substitutes. A factor complementary with labor is one whose usage also declines when the (constant output) usage of labor declines due to an increase in the price of labor. For present purposes, the analysis of demand for different factors of production that is most relevant concerns the demand for different types of labor.

2.2.2 Estimates of the Elasticity of Demand for Heterogeneous Labor

The literature on the demand for heterogenous labor is so varied in approach and conclusions that it cannot be summarized easily. This section focuses on studies that estimate the degree of substitutability between different types of labor and capital.

Studies have disaggregated labor along a variety of dimensions. Worker skill is the main dimension of disaggregation that has been studied. Other studies have distinguished workers according to their major occupation, years of educational attainment, and demographic characteristics (age and gender). Recent studies have examined differences between the demand for immigrant and native-born labor. Under the assumption that hourly earnings (compensation) are an indicator of skill, there are clear cut patterns of earnings differentials among workers classified along each of the preceding dimensions.

[8] The acronym KLEM (Kapital, Labor, Energy, and Materials) is commonly used in reference to this literature on production function estimation.

The simplest way to disaggregate labor into different skill levels is the blue collar-white collar dichotomy with white collar workers assumed to be generally more skilled.[9] The advantage of using this dichotomy is that data available from firms frequently distinguish blue collar workers from white collar employees. This classification allows researchers to study factor demand and substitution using data sets that also include information on output, capital, energy, and material inputs.

Because it is difficult to measure a worker's skill level directly, other variables, such as occupational status, schooling, demographics, and immigrant status, are often used as proxies. Information on workers grouped along dimensions other than skill levels, however, typically comes from household surveys. Because these surveys do not collect information on a firm's output, or the firm's use of capital or other inputs in its production process, it becomes more difficult to make reliable estimates of labor demand using these data. Missing variables, e.g., the capital stock, may bias parameter estimates in empirical studies.

By introducing different skill classes of labor, it is possible to identify cross price effects involving labor and capital. The terms p-substitutes and p-complements respectively refer to partial elasticities of demand for factor i when there is an increase in the price of factor j. If an increase in the price of j causes the demand for i to increase, i and j are said to be p-substitutes. But if an increase in the price of j causes the demand for i to decrease, i and j are said to be p-complements.[10]

Since different types of labor are of interest, more notation will be helpful.

σ_{BK} = The elasticity of substitution between blue collar workers and capital, i.e., the percentage response of the capital-blue collar worker ratio in response to a 1 percentage point increase in the price of blue collar labor with the price of capital held constant.

σ_{WK} = The elasticity of substitution between white collar workers and capital, i.e., the percentage response of the capital-white collar worker ratio in response to a 1 percentage point increase in the price of white collar labor with the price of capital held constant.

σ_{BW} = The elasticity of substitution between blue collar workers and white collar workers, i.e., the percentage response of the white collar-blue collar

[9] In data from sources like the Survey of Manufactures, these categories are respectively production workers and nonproduction workers.

[10] There also are q-complements and q-substitutes that describe the partial effect on prices of other inputs in response to an exogenous (outside) change in the quantity of a given input.

worker ratio in response to a 1 percentage point increase in the price of blue collar labor with the price of white collar labor held constant.

ϵ_{BB} = The own wage elasticity of demand for blue collar labor at a constant output (Y) and a constant price of capital.

ϵ_{WW} = The own wage elasticity of demand for white collar labor at a constant output (Y) and a constant price of capital.

The empirical literature on labor demand finds that blue collar workers are substitutes with capital. White collar workers, on the other hand, are often found to be complements with capital. In other words, an increase in the wage of blue collar workers will increase the demand for capital, whereas an increase in the wage of white collar workers would reduce the demand for capital. Hamermesh summarizes this situation by characterizing skill and capital as being complements.

These studies produce three other principal findings regarding the demand for the two broad classes of labor (blue collar and white collar). First, there is high substitutability between the two types of labor, i.e., σ_{BW} is large. Second, the demand for capital is more responsive to changes in wages of blue collar employees than to changes in the wages of white collar employees, i.e., $\sigma_{BK} > \sigma_{WK}$. Third, the own wage elasticity of demand for blue collar is greater than for white collar labor, i.e., $\epsilon_{BB} > \epsilon_{WW}$.

Similar findings emerge from studies of labor demand by occupation and educational group. First, as one moves up the skill distribution (gauged by average occupational pay or years of school completed), the own wage demand elasticity declines and the elasticity of substitution with capital declines. Second, the highest own wage elasticities of demand were found for young workers, whose skill levels tend to be lower than older, more experienced workers. Finally, studies of substitution between immigrants and native-born workers exhibit an unusually wide range of own wage elasticities of demand for immigrant labor.

Four summary observations on the demand for heterogeneous labor can be made. First, to obtain good estimates of substitution between various types of labor, it is necessary to have a measure of capital in the data set, because different classes of labor exhibit differing degrees of substitutability with capital. Second, the own wage elasticity of demand for labor declines as one moves up the skill distribution. Third, exogenous changes in supply (or wages) of one skill group have small effects on the wages of other groups. This relationship holds because the pairwise elasticities of substitution between different classes of labor are usually quite high. Thus firms adjust to a change in the price of labor principally through quantity adjustments (i.e. by altering employment and/or worker hours) rather than through price adjustments.

Fourth, the estimated parameters on labor-labor substitution, e.g., σ_{BW}, exhibit more variability across studies than the estimates of capital labor substitution, e.g., σ_{BK} and σ_{WK}. Further methodological work may be needed to examine how to properly estimate the degree of substitutability between different classes of labor.

One obvious inference that can be drawn from the results of the empirical literature on heterogenous labor demand is that an increase in the UI taxable wage base would confer some advantages to low-wage labor. A higher tax base would increase the cost of using high-wage labor and through substitution lead to increased demand for low-wage labor. The size of this effect would be largest in States where the present taxable wage base equals the Federal wage base, i.e., $7,000 per worker.

The cost implications for use of high-wage labor are more subtle. The largest proportionate increase in costs would be for those whose earnings are at the new, higher tax base. An increase in the wage base would generally favor low-wage workers, but among those earning more than the previous tax base the largest proportionate cost increments would typically be experienced by relatively low-paid workers.[11] Thus there is no simple generalization regarding high-wage workers.[12]

2.2.3 Estimates of the Elasticity of Substitution Between Workers and Hours

Firms can use a given level of labor input through many different combinations of employment and average hours per employee. Under an assumption of equal productivity, employment and average hours would have an elasticity of substitution of one, so that a one percent increase in average hours accompanied by a one percent reduction in employment would leave total hours worked and total output unchanged.

Only a limited number of studies that examine the substitution between employment and average hours have been undertaken. Often a specific policy concern has motivated the research, e.g., the effect on employment of the overtime pay premium. Many areas of potential work have yet to be undertaken. For example, no work completed to date has examined worker-hours substitution among different skill

[11] Consider the effects of raising the tax base from $7,000 to $10,000. If the tax rate is assumed to be 2 percent, the maximum UI tax would increase from $140 to $200 per worker. The percentage increases in employer costs for workers at five different annual wage levels would be as follows: $7,000 - zero; $8,000 - 0.25 percent; $10,000 - 0.6 percent; $20,000 - 0.3 percent; and $30,000 - 0.2 percent. Those with annual earnings exactly at the new, higher tax base would be the most disadvantaged by the increase.

[12] The one way that higher-wage workers would be progressively disadvantaged at all higher levels of annual earnings would be in the extreme case where the taxable wage base is increased to cover all annual wages.

levels of labor. These studies pose two problems beyond those usually encountered in labor demand studies. First, careful attention must be given to how the prices of the two types of labor inputs are measured. Second, the study must include a measure of capital among the inputs into production.

Very few inferences concerning the degree of substitution between employment and worker hours are robust because of the preceding pair of problems and the limited volume of previous research done on this subject. Two general findings emerge from these studies, however. First, raising the overtime premia and/or lowering the standard work week both would raise the ratio of workers to total hours, but the magnitude of the increase is not known with confidence. Second, both employment and average hours are p-substitutes with capital, i.e., an increase in the price of either form of labor input will cause an increased demand for capital.

Raising the taxable wage base should affect employer decisions regarding the use of workers versus average hours because increasing the Federal tax base will increase the cost of employment for all workers except those earning less than the current taxable wage base. But, as already noted, the largest proportionate increase in costs would be for those earning at the new, higher tax base. Thus, such a change would generally favor low wage workers. Among those earning more than the current tax base, the percentage increase in labor costs first increases (up to the new, higher tax base) and then decreases. This makes it difficult to generalize about the effects of an increase in the taxable wage base on labor costs for employers using high wage workers.

2.3 Summary

Four of the empirical literature's main findings are relevant to this project. First, a good estimate of the constant-output elasticity of demand for labor (ϵ_{LL}) is 0.3. This elasticity will be used to estimate the disemployment effects of a higher UI tax base in the following chapters. Second, capital and labor skill are complements. An increase in the price of low-skill labor will cause a proportionately larger increase in the demand for capital than a similar proportional increase in the price of high-skill labor. Third, the own wage elasticity of demand for labor decreases with skill, i.e., $\epsilon_{BB} > \epsilon_{WW}$. Fourth, workers and average hours are both substitutes for capital.

* * * *

Chapter 3

Simulating the Employment Effects of UI Tax Base Increases

This chapter examines the employment effects of raising the UI taxable wage base. The method of analysis is to conduct simulations with a model developed for use with State-level data. The chapter is divided into six main sections. Section 3.1 uses regression analysis to examine the linkage between the UI taxable wage base and taxable wages. Section 3.2 describes the simulation model developed to estimate the effects on employment of increases in the UI tax base. Section 3.3 reports the results of simulations based on the labor demand model. Section 3.4 looks at the effects of increasing the taxable wage base on State UI trust fund revenues. Section 3.5 analyzes the supply side of the labor market. Section 3.6 discusses the effects of increases in the wage base when both labor supply and labor demand change. Finally, Section 3.7 summarizes the main findings of the chapter.

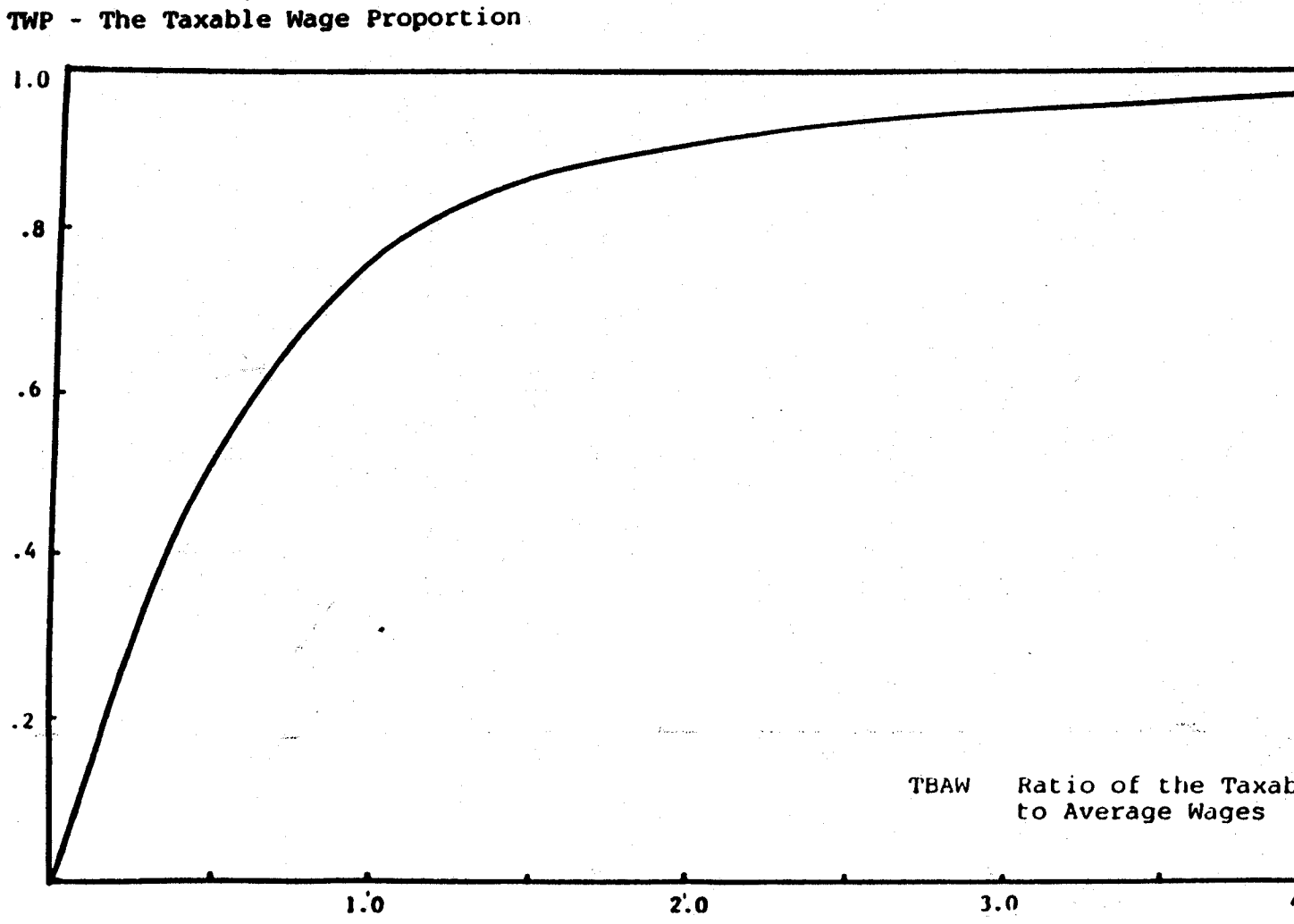
3.1 The Taxable Wage Proportion

The taxable wage proportion (TWP) is the share of total covered wages that are taxable. A key technical relationship examined by this study is the linkage between the UI tax base and the share of total covered wages that are taxable. This relationship is significant because one of the compliance requirements is that the State taxable maximum at least equal the Federal taxable maximum. Therefore, increasing the Federal taxable maximum has implications for State programs. Increases in the tax base raise the taxable wage proportion, although equal increments to the tax base yield successively smaller increases in the taxable wage proportion. Further, because money wages tend to increase from one year to the next, the position of the tax base within the overall wage distribution will change over time (more precisely, it will decrease relative to the upper tail) unless the taxable wage base is periodically raised. The increases may come about through discretionary upward revisions or through indexation that automatically ties the tax base to average wages.

To accurately assess the impacts of alternative increases in the taxable wage base on employment, it is crucial to determine the exact nature of the tax base-taxable wage relationship. The approach followed here emphasizes the relationship between the taxable wage proportion (TWP) and the ratio of the taxable wage base to the average annual wage (TBAW). Exhibit 3-1 presents a graphic summary of how this relationship might look. The TWP is bounded between zero and unity and has a positive but ever decreasing slope as the TBAW increases. To estimate the exact nature of this relationship, information is available from aggregate data, both time series and cross-section data, and from microdata. The empirical analysis of this chapter uses time series and cross-section data, but at quite high levels of aggregation. The next chapter reports the results of our analysis using microdata.

Exhibit 3-1

The Taxable Wage Proportion, The Taxable Maximum and Average Wages Per Worker



The UI tax base varies from a minimum of $7,000 (the current Federal maximum) to a maximum of more than $20,000 across States. A wide range of variation in average wages also exists. In 1991, for example, average annual UI covered wages ranged from a low of $16,276 in South Dakota to a high of $32,656 in the District of Columbia.[1] As a result, State-to-State variation in the TBAW ratio arises both from interstate variation in the UI tax base and from interstate variation in average covered wages. In 1991 annual data, the TBAW ranged from a low of 0.231 in Connecticut to 0.932 in Idaho.[2]

To estimate the relationship between the TBAW and the TWP, two different data files were used. The first data source combines UI time series data from the States of California and New York along with national data from the Old Age, Survivors and Disability Insurance (OASDI) or Social Security program. This file covered the years 1951 through 1991. Because the labor force coverage of the OASDI program is quite similar to UI program coverage, the relationship between the TBAW and the TWP should be similar to that of the UI program. This data source has an advantage for estimating the relationship between the TBAW and the TWP. It provides a wider range of variation in the TBAW ratio than is available only from UI data for recent years because the Social Security tax base has been located high in the annual wage distribution for more than a decade (approximately 90 percent of OASDI covered wages have been taxable). The TBAW ratio has averaged approximately 2.0 in the OASDI data available from recent years.

The second data file consists of State data for 1989, 1990, and 1991, three recent years of *Handbook* data.[3] These data pertain exclusively to the UI system but have a more limited range of variation in the TBAW than the data in the first data file, therefore, in the TWP as well. The TBAW ratio has fallen below 0.5 for most States in recent years, and even for those with "high" tax bases, the ratio does not exceed 1.0. Consequently, the taxable wage proportion is also less than 0.5 in most States, although its maximum is approximately 0.7 in this data file.

After some experimentation with alternative functional forms, a second-degree polynomial formulation was found to fit both data sets with a high degree of accuracy.[4] Estimating the TWP beyond the range of available data, however, caused difficulties.[5] Thus, the approach

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[1] The range is even wider when Puerto Rico is considered; its average wage in 1991 was $13,728.

[2] Again, the range is even wider considering the Virgin Islands, where the ratio was 0.985 in 1991.

[3] These are annual data by State that extend back to 1938. In recent years, the UI service of the U.S. Department of Labor has published these data approximately 12 months after the end of each calendar year. See U.S. Department of Labor, Unemployment Insurance Financial Data, ET Handbook 394 (Washington, D.C.: U.S. Department of Labor, 1983), and annual updates published as Unemployment Insurance Program Letters. These data are commonly referred to as Handbook data. Although Handbook data from Puerto Rico and the Virgin Islands are also available, these jurisdictions were not used in this analysis.

[4] Two alternatives that fitted less well were semi log and double log specifications.

[5] The second-degree term in the polynomial increasingly dominates at higher levels of the TBAW. This causes projections of the TWP to decrease beyond a certain point as the TBAW continues to increase.

used in the simulations for estimating the TWP over its full potential range of variation combined an empirical regression equation over the lower ranges of the TBAW with a geometric progression in the upper tail of the relationship.

Exhibit 3-2 presents the average levels of the taxable wage proportion and summary regression results for second-degree and selected higher order polynomials. In the full-time series data set, the mean is 0.6056, a reflection of the importance of the high Social Security tax base of recent years and associated high levels of the TWP. The mean of the TWP is lower (0.4895) in the time series data from California and New York. The means are even lower in the 1989 to 1991 cross-sections of State data, ranging from 0.4420 in 1989 to 0.4194 in 1991. In these data, the maximum values for the TBAW are found in two States that index the tax base to 100 percent of average annual covered wages, Hawaii and Idaho.

From the goodness of fit measures in Exhibit 3-2 (i.e., the adjusted R^2s), it is clear that most of the variation in the TWP is explained by each regression. The second-degree polynomial specifications used in six of eight regressions all have positive coefficients on the linear term (TBAW), negative coefficients on the second-degree term (TBAW2), and all of the slopes are significant. The marginal effect on the TWP of increases in the TBAW is positive, but it decreases as the TBAW increases.

The two higher order polynomials fit the pooled 1951 to 1991 data somewhat better than the second-degree equations, but the extent of the improvement is modest. There is evidence of strong collinearity in the sixth-degree polynomial specification where the largest t ratio is only 2.2. Note that using time series data only from California and New York causes the slopes on the first- and second-degree terms to be larger than their counterparts in the first equation where Social Security data are also used.

The four cross-section regressions reveal strong similarities in the estimated relationship between the TWP and the TBAW. The estimated slopes are quite similar with the first degree term having a slope close to 1.0, but the second-degree slope is close to -0.35. Adding year dummies to the pooled regression does not significantly improve the fit. The State-specific residuals for the 3 years are very similar in size and sign. Thus, the main finding from the cross-section regressions is that the relationship between the TWP and the TBAW was very stable during the years 1989 to 1991.

3.2 The Labor Demand Model

The simulation model uses the individual States as units of observation. It presumes that the State is the appropriate level to examine the changes in labor demand and labor supply that result from changes in UI program financing. This level of disaggregation reflects the considerable variation in UI statutes and administrative procedures from one State to the next. In effect, the model characterizes the UI system as operating within 53 separate State labor markets with different UI laws and administration in the individual markets. National totals in the model are derived as aggregations of State-level detail.

The model uses an analytic framework described by economists as comparative statics. The consequences of a policy intervention are examined by comparing two equilibrium outcomes:

one before and one after a change (or changes) of interest. The model does not show the dynamics of the adjustment, i.e., the time path of moving from the old to the new equilibrium position.

Exhibit 3-2

Selected Regressions To Explain the Taxable Wage Proportion

	Time Series Data 1951 to 1991				Cross-Section Data			
	California + New York + Social Security			California + New York Only	Pooled	1989	1990	1991
Constant	0.0507	-0.0923	0.1166	-0.0264	0.0532	0.0622	0.0528	0.0491
	(5.9)	(4.9)	(1.8)	(1.6)	(3.6)	(2.1)	(2.1)	(2.0)
TBAW	1.0820	1.6637	0.1556	1.3183	1.0109	0.9842	1.0112	1.0212
	(55.9)	(17.7)	(0.3)	(19.1)	(16.9)	(8.6)	(9.8)	(9.8)
TBAW2	-0.3284	-0.9618	2.9338	-0.4560	-0.3533	-0.3335	-0.3536	-0.3597
	(39.4)	(6.3)	(2.0)	(6.7)	(6.5)	(3.3)	(3.8)	(3.7)
TBAW3	0.1973	-4.4549	-	-	-	-	-	-
	(2.0)	(2.2)						
TBAW4	-0.0047	2.7398	-	-	-	-	-	-
	(0.2)	(1.9)						
TBAW5	-0.7657	-	-	-	-	-	-	-
	(1.4)							
TBAW6	-	-	0.0788	-	-	-	-	-
			(1.1)					
No. of Observations	123	123	123	82	153	51	51	51
Mean	0.6056	0.6056	0.6056	0.4895	0.4316	0.4420	0.4335	0.4194
Adjusted R^2	0.983	0.995	0.996	0.989	0.964	0.957	0.965	0.964
Standard Error	0.0260	0.0147	0.0132	0.0140	0.0205	0.0217	0.0205	0.0204

t statistics in parentheses

Source: All data from the *UI Financial Handbook* except for national data from the Social Security Administration. TBAW is the ratio of the tax base to annual wages in covered employment. The TBAW ratio enters as a polynomial that has powers up to the 6th power. All data are annual.

It is implemented with annual data. Because most labor market adjustments would be expected to occur within 1 year, the use of a comparative statics framework with an annual model is appropriate. The rationale for using an annual model, as opposed to a quarterly model, is that most of the employment response occurs within one time period, particularly if the tax base change is anticipated.[6]

3.2.1 Changes in Employment

To estimate the labor demand effect on employment, the model combines three key elements:

E_1 The initial level of employment

ϵ_{LL} The elasticity of labor demand

U UI tax share of labor costs

The symbols for the three terms appear on the right side of Equation (1) where the subscripts 1 and 2 stand for the periods before and after the change of interest, respectively.

(1) $E_2 - E_1 = - E_1 * \epsilon_{LL} * (U_2 - U_1)$

The starting level of taxable covered employment (E_1) in Equation (1) is treated as exogenous to the model. The elasticity of demand for labor (ϵ_{LL}) is determined by four parameters whose values can be changed to yield alternative elasticities.[7] The change in the share of labor costs made up by UI taxes (U) also has a number of determinants, but central to the estimated change is the relationship between the tax base (more precisely the TBAW) and the TWP. Changes in employment are calculated for changes in both the Federal and State taxable wage bases. In the model, these changes are treated separately and added to find the total change in employment for a given change in the Federal taxable wage base.

[6] Chapter 7 in Hamermesh (1993, op. cit.) discusses and summarizes the empirical literature on the dynamics of employment responses. The proportion of the total response that occurs within 1 year of a change in labor costs is approximately 70 percent. In considering the effects of experience rating, however, the time paths of tax rates and employment would be expected to respond for several years. This response is not directly addressed by the model. Instead, the experience rating response is treated as a tax rate reduction in the second period, the period when the higher tax base applies.

[7] The demand for labor is downward sloping; thus, ϵ_{LL} is negative. The common convention is to describe the elasticity in terms of its absolute value with the understanding that it is negative. That convention is followed here. Note that, in Equation (1), a negative sign on the right side of the equation is used to generate the correct changes in employment when the UI tax share of labor costs change.

3.2.2 Elasticity of Labor Demand

The elasticity of demand for labor in the model is determined by four factors each of which can take on alternative values. The interaction of the four allows the user to explore a wide range of possible values for the elasticity of labor demand. The four variables are as follows:

s	Labor's share of total costs
σ	The elasticity of substitution between labor and capital
ϵ	The elasticity of product demand
r	An on-off variable for the elasticity of product demand

The relationship is shown as Equation (2).[8]

(2) $\epsilon_{LL} = - (1 - s)*\sigma - r*s*\epsilon$

Three of the right side variables in Equation (2), s, σ and ϵ can take on a range of values determined by the user of the model. The fourth (r) is an on-off dummy that equals either 1 or 0. The presence of r as a variable in Equation (2) allows the user to specify labor demand as either a total demand including an output effect or as a demand considering only a factor substitution effect. In most applications of the model where entire States are the units of observation, r would be set to zero.

3.2.3 Changes in the UI Tax Share of Labor Costs

The effect of a tax base change on the UI tax share of labor costs considers four factors:

t	The average UI tax rate
TWP	The taxable wage proportion
w	Wage costs as a proportion of all labor costs
z	The extent of backward shifting of cost increases

The right side of Equation (3) shows how these factors combine to produce an estimated cost increase. As before, the subscripts 1 and 2, respectively, identify the

[8] This expression for the demand for labor is discussed extensively in the work of Daniel Hamermesh. See, for example, Chapter 2 in Daniel Hamermesh, *Labor Demand* (Princeton, NJ: Princeton University Press, 1993). Chapter 3 of this book provides an extensive literature review of empirical labor demand estimation.

periods before and after the change of interest. The effects on the UI tax share of labor costs are calculated separately for changes in State and Federal tax bases, given changes in the Federal taxable wage base.

$$(3) \quad U_2 - U_1 = z*w*[(t_2*TWP_2) - (t_1*TWP_1)]$$

The extent of backward shifting onto money wages of any labor costs (z) is a variable that is continuous between 0 and 1. A value of 1.0 would indicate no backward shifting, whereas z = 0 would represent full backward shifting. In the short run, z would be expected to be close to 1.0, but to the extent backward shifting occurs, it restrains the increase in labor costs because of a higher UI tax base.[9]

The ratio of wages to all labor costs (w) may also theoretically take values between 0 and 1, but its range of variation is usually thought to be bounded between 0.8 and 0.95 in the United States. In initial simulations, a single value of 0.85 was used in all States. This assumption implies that the combined effects of health insurance contributions, pension contributions, other payroll taxes, and other nonwage labor costs amount to 15 percent of total labor costs to employers. The larger the value of w, the larger are the effects of a given increase in the TWP because of a higher UI tax base on labor costs.

The UI tax rate is treated as an exogenous variable in the model to conduct certain types of simulation exercises. The Federal tax rate is currently 0.8 percent levied uniformly on the first $7,000 of each worker's annual wages. By allowing the tax rate to vary exogenously, the investigator can determine a Federal tax rate that would be revenue neutral for a given increase in the tax base. Because States vary in average wages, revenue neutrality at the national level would not be neutral at the State level. The different effects on the States of such a change can be explored with the model.

When the change in the UI tax share of labor costs and employment due to an increase in the taxable wage base is calculated, the State UI tax rate that initially prevails (t_1) is an exogenous variable. However, the tax rate that applies after the higher tax base has been implemented (t_2) is determined within the model. It is allowed to deviate from t_1 because of experience rating effects. The tax rate adjustment is fairly straightforward. When the tax base is increased, it initially raises tax revenues and increases the level of the State's UI trust fund. After achieving a higher fund balance, the State's system of statutory tax rate schedules may automatically activate a lower tax schedule and reduce the average effective tax rate on taxable wages, i.e., tax receipts as a percent of taxable wages. Additionally, the tax rates for individual employers can decline as their experience measures (reserve ratios or benefit ratios depending on the type of experience rating system present in the State) improve following a change to a higher tax base.

[9] When there is backward shifting, however, changes in labor supply will also affect employment. These changes are addressed in Section 3.5.

Experience rating effects are determined exogenously in the model. In particular,

$$t_2 = t_1 - \text{ExpRat}$$

where ExpRat is the response of tax rates through experience rating. The experience rating parameter can range from 1.0 (indicating full experience rating) to 0.0 (no experience rating response). Federal UI tax rates before and after a tax base increase are equal; thus, ExpRat is equal to zero when determining the effect of an increase in the Federal tax base on Federal UI taxes. For State UI taxes, however, t_2 may be less than t_1 because of experience rating. In the initial year or two following an increase in the tax base, however, a value closer to 0.0 would be anticipated.[10]

The determination of the taxable wage proportion (TWP) is a key element in the model. After experimenting with several alternative approaches, the model uses the ratio of the tax base to annual average wages (TBAW) as the key determinant of the TWP as in the regressions of Exhibit 3-2. However, the TBAW-TWP relationship is treated as having two components. For values of the TBAW less than or equal to 1.0, the pooled 1989 to 1991 cross-section regression shown in Exhibit 3-2 is the determinant of the TWP in each State. Over this range of variation in the TBAW, the projection for each State is modified by the State's average residual from the pooled regression.

For values of the TBAW above 1.0, a geometric progression is used to cause the TWP to increase smoothly toward 1.0 as the TBAW increases. The function starts from the regression equation prediction of the TWP when the TBAW equals 1.0, and the increment to the TWP is determined by the formula given in Equation (4).[11]

$$(4) \qquad TWP_2 = TWP_1 + (1 - TWP_1)*(1 - 0.9^n)$$

In this equation, n is the number by which the new, higher TBAW exceeds 1.0 but is measured in tenths. Thus, for a TBAW of 2.0, n is 10. This function causes the TWP to reach an upper limit of 1.0 as the TBAW increases without limit.[12] By setting n arbitrarily high, the model can explore the employment effects of completely removing the taxable wage base and taxing all covered wages.

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[10] The model does not try to specify how experience rating operates within individual States or the relative importance of shifting to new (lower) tax rate schedules versus moving along given schedules to lower tax rates. Note also that the experience rating response that can influence t_2 applies only to State UI taxes, not to Federal UI taxes.

[11] The term inside the right parentheses is the sum of a geometric progression where the factor of geometric decay is 0.9. The factor 0.9 was selected after exploring a variety of other possible values.

[12] As with values of the TBAW below 1.0, the equation in this upper range also adds State-specific residuals based on the pooled 1989 to 1991 regression. It further adds constraints that: (i) the TWP cannot exceed 1.0 regardless of the value of the State-specific residual and the level of the TBAW and (ii) the State-specific residual decays to zero as the TBAW increases.

To summarize, the labor demand model derives national estimates of employment effects using State-level detail and distinguishing separate effects arising from increased Federal UI taxes versus State UI taxes. The key parameters of the model can be varied so that the effects of increasing the UI tax base can be estimated under several sets of alternative assumptions.

3.3 Simulated Labor Demand Effects

An increase in the Federal tax base above its present level of $7,000 has implications for both State and Federal UI taxes. State employer UI taxes are experience rated; that is, their State UI tax rate is determined by their own experiences in paying UI benefits and the experience rating provisions of their State's UI statute. The alternative is to pay State UI taxes at a uniform rate of 5.4 percent. For employers to receive full credit for the 5.4 percent State UI tax obligation specified in FUTA, a State's UI tax base must be equal to or greater than the Federal tax base. Because experience-rated taxes are almost always much lower than taxes levied at a uniform 5.4 percent rate, there is a strong interest in each State to have employers pay experience-rated State UI taxes. Thus, when the Federal tax base increases above $7,000, the State's tax base has to increase to comply with the requirement that it be at least equal to the Federal tax base.

3.3.1 Increasing the Federal Taxable Wage Base to $14,000

The first exercise undertaken here explores the effects of doubling the Federal tax base to $14,000. The analysis is conducted for 1991, a year for which all the required historic data are available. An advantage of using historic data is that one does not have to project the levels of covered employment, average wages, and average UI tax rates by State.

The other model parameters that underlie the simulation are set to the following values:

ϵ_{LL}	Labor demand elasticity	0.30
s	Labor's share of employer costs	0.75
σ	Elasticity of substitution	-1.20
ϵ	Elasticity of product demand	-1.00
r	Dummy variable for output effect	0.00
ExpRat	Response of tax rates to experience rating	0.00
TWP_2	The taxable wage proportion implied by the State's 1991 tax base or $14,000, whichever is greater	
w	Wage share of labor costs	0.85
z	Backward shifting of costs	0.00

Based on the preceding assumptions, the increase in the Federal tax base to $14,000 reduces employment by 97,800 workers. Of this total, 62,400 are attributable to higher State UI taxes and 35,500 by higher Federal UI taxes. The total reduction

represents 0.115 percent of nationwide taxable covered employment of 85.053 million.

Exhibit 3-3 provides summary details of the effects of a $7,000 increase in the taxable wage base by State. The largest employment effects occur in California, where higher State UI taxes lower employment by 10,400 workers, whereas increased Federal taxes reduce employment by another 4,000 workers. The changes in employment and UI taxes as a share of labor costs are broken down into effects caused by changes in Federal, State, and total UI taxes. Details that underlie the changes in the UI tax share of labor costs appear in Appendix B. Tax rates, tax bases, the TBAW, the TWP, and the UI tax share of labor costs by State are listed.

Three factors affect the relative importance of State versus Federal tax effects in the individual States. First, the existing level of the State's UI tax base influences whether State UI taxes are affected. In eight States, there are no State UI tax cost implications because the State's tax base in 1991 exceeded $14,000. Second, the level of the State's average UI tax rate affects the magnitude of tax changes. In low tax rate States, there are relatively smaller State UI tax employment effects. A comparison of the effects of increasing the tax base to $14,000 in Ohio and Pennsylvania illustrates this. Both States had a tax base of $8,000 in 1991, and their levels of employment and average wages were very similar. However, because the average tax rate was more than a full percentage point higher in Pennsylvania (3.4 percent versus 2.3 percent), the estimated reduction in employment from increased State UI taxes was 1,900 higher (5,700 versus 3,800). Third, larger effects on employment are experienced in States with lower average wage levels. For example, the effect of the increased Federal tax on employment is larger in Texas (2,400) than in New York (2,000); States with comparable levels of covered employment but differing average wages in 1991.

Exhibit 3-3

Summary of Labor Demand Effects (1991), Federal Tax Base = $14,000

		Employment (000s) Reduction Due to Changes in:				UI Tax Share of Labor Costs (%) Increases Due to Changes in:		
	Initial Level	State UI Tax	Fed. UI Tax	Total UI Tax	Average Weekly Wage ($)	State UI Tax	Fed. UI Tax	Total UI Tax
State								
Alabama	1,266	0.7	0.6	1.2	398	0.18	0.15	0.33
Alaska	168	0.0	0.1	0.1	559	0.00	0.12	0.12
Arizona	1,181	0.7	0.5	1.2	417	0.19	0.15	0.34
Arkansas	735	0.7	0.3	1.1	356	0.34	0.16	0.50
California	10,394	10.3	4.0	14.4	519	0.33	0.13	0.46
Colorado	1,211	0.4	0.5	1.0	464	0.12	0.14	0.26
Connecticut	1,233	1.1	0.4	1.6	592	0.30	0.12	0.42
Delaware	269	0.2	0.1	0.3	500	0.25	0.13	0.39
District of Columbia	323	0.2	0.1	0.3	628	0.24	0.11	0.36
Florida	4,305	2.2	1.9	4.1	410	0.17	0.15	0.32
Georgia	2,311	1.3	1.0	2.2	444	0.18	0.14	0.32
Hawaii	416	0.4	0.2	0.6	444	0.30	0.14	0.44
Idaho	309	0.0	0.1	0.1	371	0.00	0.15	0.15
Illinois	4,144	3.3	1.6	5.0	505	0.27	0.13	0.40
Indiana	1,983	1.2	0.9	2.1	431	0.21	0.14	0.35
Iowa	935	0.2	0.4	0.6	374	0.07	0.15	0.22
Kansas	953	0.8	0.4	1.3	397	0.29	0.15	0.44
Kentucky	1,112	1.1	0.5	1.6	391	0.32	0.15	0.47
Louisiana	1,199	1.0	0.5	1.6	417	0.29	0.15	0.44
Maine	382	0.5	0.2	0.7	387	0.46	0.15	0.61
Maryland	1,539	1.1	0.6	1.7	476	0.23	0.14	0.37
Massachusetts	2,222	3.5	0.8	4.3	537	0.52	0.13	0.65
Michigan	2,993	3.4	1.2	4.6	503	0.38	0.13	0.52
Minnesota	1,624	0.1	0.7	0.8	455	0.02	0.14	0.16
Mississippi	720	0.4	0.3	0.8	347	0.20	0.16	0.36
Missouri	1,768	1.5	0.8	2.2	429	0.28	0.14	0.42
Montana	263	0.0	0.1	0.1	349	0.01	0.16	0.17
Nebraska	549	0.3	0.3	0.6	360	0.18	0.16	0.34
Nevada	540	0.0	0.2	0.2	428	0.00	0.14	0.15
New Hampshire	375	0.2	0.2	0.3	451	0.15	0.14	0.29
New Jersey	2,725	0.0	1.0	1.0	573	0.00	0.12	0.12
New Mexico	418	0.1	0.2	0.3	372	0.08	0.15	0.24
New York	5,719	5.7	2.1	7.8	581	0.33	0.12	0.45
North Carolina	2,470	0.3	1.1	1.5	396	0.05	0.15	0.20
North Dakota	175	0.0	0.1	0.1	341	0.07	0.16	0.23
Ohio	3,728	3.8	1.6	5.4	452	0.34	0.14	0.48
Oklahoma	923	0.4	0.4	0.8	397	0.14	0.15	0.29
Oregon	961	0.0	0.4	0.4	420	0.00	0.15	0.15
Pennsylvania	3,831	5.7	1.6	7.3	460	0.49	0.14	0.63
Puerto Rico	567	1.8	0.3	2.1	264	1.08	0.17	1.25
Rhode Island	319	0.0	0.1	0.1	427	0.00	0.14	0.14
South Carolina	1,192	1.2	0.5	1.8	382	0.35	0.15	0.50
South Dakota	211	0.1	0.1	0.2	313	0.11	0.16	0.27
Tennessee	1,733	1.5	0.8	2.3	406	0.30	0.15	0.44
Texas	5,682	2.0	2.4	4.4	460	0.12	0.14	0.26
Utah	547	0.0	0.2	0.2	389	0.00	0.15	0.15
Vermont	183	0.2	0.1	0.3	402	0.39	0.15	0.54
Virginia	2,160	0.7	0.9	1.7	441	0.11	0.14	0.26
Virgin Islands	30	0.0	0.0	0.0	381	0.00	0.15	0.15
Washington	1,675	0.0	0.7	0.7	446	0.00	0.14	0.14
West Virginia	459	0.6	0.2	0.8	406	0.44	0.15	0.59
Wisconsin	1,787	0.9	0.8	1.7	411	0.17	0.15	0.32
Wyoming	141	0.1	0.1	0.2	387	0.20	0.15	0.35
National Total	85,053	62.4	35.5	97.8	464	0.25	0.14	0.39

Thus, several identifiable factors influence how the national total employment reduction has different effects by State. For this simulation, 36 percent of the overall employment reduction was due to higher Federal UI taxes. Relatively larger employment effects take place in States with larger increases in labor costs.

3.3.2 Increases in the Federal Taxable Wage Base

Next, a set of simulations was conducted that raised the Federal tax base to various levels above $7,000. States were assumed to match any Federal tax base increase if the increase would cause the State's tax base to fall below the new Federal tax base level. All other model parameters were the same as those used for the simulations reported in Exhibit 3-3. The summary in Exhibit 3-4 presents the results of these simulations. The table displays key national variables affected by these increases: TBAW ratio, TWP, changes in the UI tax share of labor costs, and the employment reductions caused by successive increases in the Federal taxable wage base up to $448,000.

Exhibit 3-4 shows the national TWP for both State and Federal UI taxes. The effects by State vary because 36 of the 53 State UI programs had taxable wage bases above $7,000 in 1991. With the Federal tax base at $7,000, the difference between the TWP is rather large, 0.366 versus 0.313. The difference narrows quickly as the Federal tax base increases, and it is eliminated altogether when the Federal tax base reaches $21,000.[13]

Primary interest in Exhibit 3-4 centers on the employment reductions caused by successively higher Federal tax bases. The exhibit shows mainly the effects of Federal tax base increments of $7,000. Increasing the Federal wage base by $7,000 increments has several consequences: total reduction in employment grows, although each incremental reduction in employment becomes successively smaller,[14] the share attributable to higher Federal taxes decreases, and, of course, the TWP approaches unity.

[13] One State had a tax base above $21,000 in 1991—Alaska at $22,400. Three factors combine in Exhibit 3-4 to make the State and Federal TWPs appear to be identical for a Federal tax base of $21,000: Alaska's small size, the small deviation of its tax base from $21,000, and rounding to three decimal places. Rounded to four places, the State and Federal TWPs, respectively, are 0.6584 and 0.6581.

[14] The incremental employment reductions initially increase for State UI taxes and then decline because several States already have tax bases that exceed $7,000. Thus, when the Federal tax base increases in fixed increments of, for example, $1,000 above $7,000, there is an interval wherein the marginal disemployment effects from higher State taxes actually increase, but the disemployment effects from higher Federal taxes decrease because several State tax bases continue to exceed the Federal tax base. For example, the State and Federal tax disemployment effects from raising the Federal tax base to $8,000 are 5,400 and 5,700, respectively.

Exhibit 3-4

Summary of Estimated Labor Demand Effects of Raising the Tax Base

FUTA Tax Base	Federal Tax Base to Avg. Wage (TBAW) (%)	Taxable Wage Proportion (TWP) State (%)	Taxable Wage Proportion (TWP) Federal (%)	Change in UI Tax as Share of Labor Costs (%)	Reduction in Employment (000s) Due to Changes in: State UI Taxes	Reduction in Employment (000s) Due to Changes in: Federal UI Taxes	Reduction in Employment (000s) Due to Changes in: Total UI Taxes	Percent Attributable to Changes in Federal UI Taxes
$7,000	29	37	31	0.00	0.0	0.0	0.0	-
$10,000	41	42	41	0.16	23.4	16.5	39.9	41.4
$14,000	58	52	52	0.39	62.4	35.5	97.8	36.3
$21,000	87	66	66	0.71	120.0	60.3	180.3	33.4
$28,000	116	75	75	0.94	160.2	76.9	237.1	32.4
$35,000	145	82	82	1.09	186.8	87.8	274.6	32.0
$42,000	174	87	87	1.20	206.0	95.8	301.8	31.7
$49,000	203	90	90	1.29	220.4	101.6	322.0	31.6
$56,000	232	93	93	1.35	230.9	105.9	336.8	31.4
$84,000	348	98	98	1.47	252.4	114.5	366.9	31.2
$112,000	464	99	99	1.51	259.1	117.1	376.3	31.1
$224,000	928	100	100	1.53	262.3	118.3	380.6	31.1
$448,000	1,856	100	100	1.53	262.3	118.3	380.7	31.1

All of these patterns are to be expected. The maximum employment effect from changes in State and Federal UI taxes combined is 380,700. The share of the total reduction in employment attributable to changes in Federal UI taxes starts at 41.4 percent but declines to 31.1 percent over the full range of taxable wage base increases.

Because total covered employment in 1991 was 85.053 million, total employment is only reduced by 0.45 percent even when the taxable wage base is raised to $448,000. The main explanation for this small employment effect is the relative insignificance of UI taxes in the labor cost structure of U.S. employers. The proportion of labor costs attributable to UI taxes in 1991 was estimated by the simulation model to be 0.81 percent (0.60 percent State UI taxes and 0.21 percent Federal UI taxes). Even when the tax base is raised to $448,000 per worker, the combined sum of Federal and State UI taxes is only 2.34 percent of labor costs.[15] It is very difficult to generate large disemployment effects from a tax that represents such a small component of employer labor costs.

3.3.3 Sensitivity Analysis

The simulated employment effects reported in Exhibits 3-3 and 3-4 depend on a number of parameters in the model. Exhibit 3-5 shows the sensitivity of the estimated employment effects to variation in the other parameters. These simulations used a Federal tax base of $24,000, the 1991 average annual wage in

covered employment rounded to the nearest $1,000. With this tax base, the U.S. TBAW ratio was 0.995 and the TWP was 0.705.

The top line in Exhibit 3-5 shows the effects of raising the Federal tax base to $24,000, keeping all other model parameters the same as in Exhibits 3-3 and 3-4 and having State tax bases match the Federal tax base. The State tax, Federal tax, and total employment reductions are 139,500, 68,400, and 207,900, respectively. These estimates provide a baseline for gauging the employment reductions arising from variation in other model parameters.

The approach followed in the sensitivity analysis of Exhibit 3-5 is to vary model parameters one at a time. Besides the baseline results previously noted, the table shows the results of varying four of the model's parameters: the wage share of labor costs, labor's share of total costs, the elasticity of substitution, and the experience rating cost offset.

[15] Exhibit 3-4 shows increments to labor costs above costs when the Federal tax base is $7,000. The 2.34 percent in the text is the sum of the 0.81 percent under the $7,000 base plus the 1.53 percent increment shown in Exhibit 3-4.

Exhibit 3-5

Sensitivity Analysis of Estimated Changes in Labor Demand

Model Parameters	Reduction in Employment (000s): Due to Changes in:		
	State UI Taxes	Federal UI Taxes	Total UI Taxes
Baseline With $24,000 Tax Base	139.5	68.4	207.9
Wage Share of Labor Costs			
0.80	131.3	64.4	195.7
0.85	139.5	68.4	207.9
0.90	147.7	72.4	220.2
0.95	155.9	76.4	232.4
Labor's Share of Total Costs			
0.55	251.2	123.1	374.3
0.65	195.3	95.8	291.1
0.75	139.5	68.4	207.9
0.85	83.7	41.0	124.8
Elasticity of Substitution			
-0.3	34.9	17.1	52.0
-0.6	69.8	34.2	104.0
-0.9	104.7	51.3	156.0
-1.2	139.5	68.4	207.9
-2.0	232.6	114.0	346.6
Experience Rating Cost Offset			
0.0	139.5	68.4	207.9
0.5	69.8	68.4	138.2
1.0	0.0	68.4	68.4

3.3.3.1 Wage Share of Labor Costs

Wages as a share of labor costs are varied from 0.80 to 0.95. As the wage share increases (or the fringe benefit share decreases), employment effects increase. The logic here is straightforward. Increasing the UI tax base has no effect on the costs of other fringe benefits. Because other fringe benefits are a larger share of total labor costs, the effect of the tax base increase on total labor costs is small. Because the variation of wages as a share of labor costs is comparatively modest, from 0.80 to 0.95, the simulated range of employment effects is rather small, from 195,700 to 232,400.

3.3.3.2 Labor's Share of Total Costs

A much wider range of employment effects arises from the simulated variation in labor's share of total costs. The labor intensity of production processes varies widely across industries. In Exhibit 3-5, labor's share of total employer costs is varied between 0.55 and 0.85. The total employment effects range from a high of 374,300 when labor's share is 0.55 to a low of 124,800 when labor's share is 0.85. The inference here is that when labor's share is smaller, employers have more ability to substitute away from labor (toward capital) in response to labor cost increases caused by a higher taxable wage base.

3.3.3.3 Elasticity of Substitution

A similar conclusion about substitution possibilities arises from variation in the elasticity of substitution. As the technical constraints on capital for labor substitution are greater (the elasticity becomes a smaller negative number), the employment effects are smaller. Over the range from -2.0 to -0.3, the total employment effect decreases from 346,600 to 52,000.

3.3.3.4 Experience Rating Cost Offset

Finally, the bottom section of Exhibit 3-5 shows the potential importance of experience rating as a labor cost offset. All of the preceding results in Exhibits 3-3 and 3-4 assumed there were no offsets, meaning that the higher tax base fully affected labor costs. However, to the extent that average State UI tax rates decline when the Federal taxable wage base increases (through experience rating and/or legislated reductions in statutory tax rates), the effects on labor costs, and therefore employment, are smaller. The table shows results with 0, 50 percent, and 100 percent experience rating offsets on t_2. In the long term, these offsetting reactions could be large, reducing the disemployment effects of a higher UI tax base. Note that the cost offsets apply only to State UI tax costs because there is no similar response of the Federal UI tax rate.

The most striking feature of the results in Exhibit 3-5 is the small size of the employment effects. The Federal tax base more than triples, increasing from $7,000

to $24,000, and the largest estimated effect on employment is a reduction of 374,300, less than half of 1 percent of taxable covered employment.

3.3.4 Other Proposals To Change the Federal Taxable Wage Base

Increases in the Federal Taxable Wage Base When the Conformity Requirement Is Dropped

Proposals to raise the FUTA tax base substantially were offered by former Congressman Downey in 1991 and 1992. One aspect of his proposals was to make the UI tax base increases applicable only to Federal UI taxes. In other words, there would be no financial penalties on the States if their UI tax bases no longer matched the Federal tax base when the higher Federal tax base became effective.

One possible policy change would be to increase the FUTA tax base but only require the States to have a tax base of at least $7,000.[16] Given the simulation model's structure with separate Federal tax and State tax employment effects, analyzing this policy initiative is a straightforward exercise. In this situation, raising the Federal tax base would not affect the State UI tax bases and, therefore, employer costs arising from State UI taxes, although it would still increase employer costs by increasing higher Federal UI taxes because the employment effects of Exhibits 3-3, 3-4, and 3-5 all show separate estimates of the effects of higher State and Federal UI taxes. Thus, the employment effects of such a policy change can be inferred from these tables. In Exhibit 3-4, the total Federal tax employment effect of raising the Federal tax base to $56,000 is a reduction of 105,900 in employment, much smaller than estimates made by the U.S. Department of Labor at the time of the Congressman Downey's 1991 proposal.

Increases in the Federal Taxable Wage Base That Are Offset by Reductions in the UI Tax Rate

Any proposal to increase the FUTA tax base would have labor cost and employment implications (regardless of its effects on State UI taxes), unless the effects on the TWP were offset by FUTA tax rate reductions. Another simulation with the model raised the Federal tax base to $24,000 but offset the cost implications by reducing the FUTA tax rate from 0.8 percent to 0.3548 percent. This change in the Federal taxable wage base reduced employment by 340 workers nationwide with changes by State reflecting interstate differences in wage levels. States experiencing the largest gains were the high wage States with large populations: New York (+210), California (+170) and Illinois (+100), whereas the States experiencing the largest losses were Florida (-160) and Puerto Rico (-120). The large number of States with average wage levels below the national average explains why the national employment effect of this revenue neutral change was negative. Nevertheless, given the small size of these estimated employment effects, this change could be instituted without having noticeable implications for covered employment.

[16] States could still establish tax bases that exceed $7,000.

3.3.5 Other Considerations

Aggregate employment effects of a higher Federal tax base offset by a reduced tax rate would have differing microlevel implications for employers. Low wage employers would experience a tax reduction, and high wage employers would pay increased UI taxes. These effects of a revenue neutral UI tax change are not recognized by the model.

All of the preceding simulations have assumed the output effect is zero, i.e., employers will produce the same level of output to be sold at the same price (employer adjustments are movements along a given isoquant). They adjust to increased UI taxes by substituting capital for labor in production. Much larger employment effects are estimated if real output is assumed to decline as employers raise prices and experience an associated reduction in sales. For example, assuming an output demand elasticity of -1.0 and making all the other changes assumed in Exhibit 3-3 (raising the Federal tax base to $14,000 and maintaining current financial incentives for States to match the Federal tax base), magnify the employment effect by three-and-one-half times. Total employment declines by 342,600 workers rather than 97,800, as previously simulated.

For analysis using State-level data, assuming the output effect is zero is more appropriate than assuming there is an output effect. The primary reason is that relative prices, not absolute prices, are the relevant variables to consider in causing output effects to take place. In essence, we are assuming relative prices are not noticeably altered because of increases in the taxable wage base. An output demand elasticity parameter is embedded within the model to allow the implications of alternative assumptions to be explored.

3.4 Changes in State Trust Fund Revenues

Raising the FUTA taxable wage base will increase Federal and State UI payroll tax revenues immediately. The increase in revenues will occur in the same year that the tax base increases and in future years as well. Assessing the longrun effects of Federal UI tax revenues is straightforward, but the effects on State UI taxes are more complicated because the effect of an increase in the wage base on future tax rates must also be recognized. Higher first-year tax revenues increase State UI trust fund balances. Average State UI tax rates may decrease in later years as reserve ratios and benefit ratios are altered by the increase in first-year tax revenues.

This project examined the effects of increasing the Federal taxable wage base on tax revenues using both the macromodel and microdata analysis. In both analyses, revenue effects were examined at the State level. Attention was focused primarily on first-year effects. This chapter reports the results using the macromodel. Chapter 4 reports results based on microdata from four States.

Each approach has different advantages. One advantage of the macromodel is that it covers all States. Thus, national, as well as State-level, effects can be estimated. In addition, the experience rating offset, incorporated into the model to determine future tax rates, makes it possible to approximate the longrun revenue-reducing effect of experience-rating adjustments. Finally, the macromodel incorporates the estimated effect on tax revenues because of reductions in employment. The analysis with microdata examines the effects of increasing the tax base on both the level of taxable wages and on the average tax rate on taxable wages in the first year. This is significant because the average State UI tax rate after the tax base is increased may differ from the average tax rate that prevailed under the previous (lower) tax base. Thus, the first-year effect on UI tax revenues is more accurately assessed using microdata because the effect on the UI tax rate is captured. However, in the macromodel, the State UI tax rate on taxable wages is treated as a parameter.

It should be emphasized that the macromodel does not determine the level of each State's UI trust fund balance. Thus, it is not structured to make a full assessment of the long-run effects of an increase in the taxable wage base on UI rates or tax revenues. Partly for that reason, the emphasis here will be on the first-year effects on revenues. As in previous sections of this chapter, the analysis focuses on calendar year 1991.

Exhibit 3-6 shows the effect of increasing the taxable wage base on Federal and State UI tax revenues. An increase in the Federal taxable wage base to $14,000 in 1991 would raise total tax revenues by $9.3 billion. The macromodel estimates that total Federal plus State UI taxes would increase from $19.6 billion to $28.9 billion. Of this increase, $6.0 billion would be increased State UI taxes (from $14.5 billion to $20.5 billion), and $3.3 billion would be increased Federal UI taxes (from $5.1 billion to $8.4 billion).

The estimated increases in State UI taxes are a function of both the increase in the TWP and the level of each State's average tax rate. Thus, the increase in tax revenues would be particularly large in California ($1.092 billion or 18.3 percent of the $5.956 billion total increase) and New York ($0.674 billion or 11.3 percent of the national total) because both States had above-average State UI tax rates in 1991 and taxable wages bases of $7,000. In contrast, the increase in tax revenues in Florida ($0.185 billion or 3.0 percent of the national total) and Texas ($0.189 billion or 3.2 percent of the national total) were proportionately smaller because each State had below-average State UI tax rates. The State-specific structure of the macromodel allows these State-level effects to be estimated and compared.

The model also estimated the revenue effects of increases in the Federal taxable wage base to other levels. Compared to the actual tax bases in effect in 1991, an increase in the Federal taxable wage base to $28,000 would have raised total UI revenues by $22.6 billion (to $42.3 billion). Increased State UI taxes would comprise $15.4 billion of this increase, whereas the other $7.2 billion would be due to increased Federal UI taxes. Completely removing the tax base and requiring that all wages be taxed would have raised total UI revenues by $36.6 billion (to $56.3 billion), $25.4 billion of increased State UI taxes, and $11.2 billion of increased Federal taxes.

Exhibit 3-6

Changes in Total Taxes as A Result of Increasing the Federal Taxable Wage Base, 1991. (Million U.S. Dollars)

State	$7,000 Federal Tax Base		$14,000 Federal Tax Base		$28,000 Federal Tax Base		Unlimited Federal Tax Base	
	State UI Taxes	Federal UI Taxes	Added State UI Taxes	Added Federal UI Taxes	Added State UI Taxes	Added Federal UI Taxes	Added State UI Taxes	Added Federal UI Taxes
Alabama	116.7	75.5	54.0	46.1	120.9	93.7	176.5	133.3
Alaska	102.4	12.0	0.0	7.1	11.9	16.5	53.9	26.9
Arizona	94.6	72.2	57.8	44.1	119.7	91.3	173.0	131.9
Arkansas	124.3	43.4	54.1	25.0	114.4	48.1	158.2	64.9
California	1662.1	650.0	1091.6	426.9	2507.2	980.5	4047.6	1583.0
Colorado	156.8	74.3	41.0	47.1	130.4	102.1	214.5	153.7
Connecticut	198.4	76.1	134.4	53.0	321.3	125.5	579.4	225.7
Delaware	46.4	16.1	20.7	10.9	55.0	24.7	92.2	39.6
District of Columbia	56.9	20.4	30.1	14.2	80.7	34.2	155.0	63.7
Florida	305.3	263.4	184.7	159.4	379.0	326.9	543.1	468.6
Georgia	267.3	138.0	113.2	89.0	283.3	190.4	445.3	287.0
Hawaii	56.6	26.7	33.9	16.0	71.7	33.9	105.3	49.7
Idaho	46.9	17.0	0.0	10.8	9.9	21.8	22.7	30.5
Illinois	886.6	249.0	340.1	168.5	969.5	382.7	1656.2	616.4
Indiana	169.2	116.6	109.3	75.3	231.9	159.8	345.0	237.8
Iowa	148.8	50.6	13.9	32.9	79.8	66.7	133.6	94.3
Kansas	165.6	65.2	67.4	34.6	145.2	67.9	200.5	91.7
Kentucky	177.6	64.1	83.9	40.1	188.6	81.8	274.9	116.1
Louisiana	216.2	71.8	88.5	44.8	215.2	93.2	325.8	135.5
Maine	66.8	22.3	40.9	13.7	82.4	27.5	116.2	38.8
Maryland	157.2	93.1	103.2	61.1	228.1	135.1	355.6	210.6
Massachusetts	635.9	154.3	380.1	92.2	882.1	214.1	1394.7	338.4
Michigan	1050.9	175.3	350.9	121.5	1076.8	275.2	1887.4	446.8
Minnesota	288.6	91.0	10.5	63.4	155.5	138.3	305.4	215.6
Mississippi	53.2	42.7	30.0	24.1	57.0	45.7	75.9	60.9
Missouri	196.9	102.0	129.3	66.9	273.9	141.9	410.1	212.4
Montana	35.3	18.0	0.8	8.8	10.1	15.8	15.9	20.1
Nebraska	35.9	30.6	22.1	18.8	43.8	37.3	60.3	51.3
Nevada	75.7	34.5	0.6	20.5	31.4	42.6	57.4	61.3
New Hampshire	23.2	21.3	15.8	14.5	34.4	31.6	53.2	48.8
New Jersey	939.8	172.6	0.0	116.2	477.1	271.8	1121.5	473.9
New Mexico	63.9	23.7	7.7	14.7	35.1	29.3	56.5	40.8
New York	983.9	356.7	673.9	244.3	1586.3	575.0	2807.6	1017.7
North Carolina	205.6	146.2	27.9	89.9	119.8	182.8	195.8	259.7
North Dakota	21.4	9.1	2.4	5.8	11.5	11.5	18.1	15.6
Ohio	709.7	221.5	351.0	144.6	836.6	312.2	1309.2	475.3
Oklahoma	112.3	52.9	31.9	33.6	91.2	69.1	141.1	99.0
Oregon	328.2	57.5	0.0	36.1	99.8	75.1	211.0	109.6
Pennsylvania	1052.1	225.7	528.1	149.6	1271.8	326.3	2013.8	502.5
Puerto Rico	203.1	31.7	97.8	15.3	160.8	25.1	193.4	30.2
Rhode Island	98.5	19.1	0.0	12.1	39.6	25.4	76.9	37.4
South Carolina	158.7	69.9	96.3	42.4	193.2	85.1	270.1	118.9
South Dakota	8.0	11.5	4.5	6.5	8.5	12.3	11.0	15.9
Tennessee	205.1	103.1	127.0	63.8	261.9	131.6	375.5	188.7
Texas	518.9	346.4	189.3	222.5	514.4	483.5	830.4	737.3
Utah	78.3	28.6	0.0	19.7	31.8	40.9	61.4	59.6
Vermont	37.0	10.8	17.3	6.7	39.1	13.7	57.5	19.6
Virginia	133.5	128.2	65.5	83.0	154.5	177.4	238.8	266.9
Virgin Islands	6.3	2.0	0.0	1.1	0.7	2.0	1.9	2.7
Washington	528.1	96.3	0.0	64.7	159.7	140.0	372.8	213.2
West Virginia	104.2	26.8	49.5	16.8	112.6	34.8	166.5	50.1
Wisconsin	350.3	100.5	77.3	66.3	262.9	138.7	429.8	203.8
Wyoming	31.9	8.0	6.7	5.1	22.2	10.3	34.9	14.6
National Total	14497.2	5136.3	5956.3	3311.8	15401.9	7220.6	25430.2	11208.6

3.5 Changes in Labor Supply Due to Increases in the Taxable Wage Base

To this point, the analysis of the employment effects of UI tax base increases has considered only the effects on employer costs and labor demand. As noted previously, employers may avoid part or all of these costs if they can shift the burden of tax increases backward onto workers through smaller money wage increases. To the extent that employers succeed, there are smaller implications for costs and employment demand due to an increase in the taxable wage base.[17]

If taxes are backward shifted, however, there may be employment effects arising from the supply side of the labor market. To the extent that increased UI taxes are shifted backward onto money wages, a higher tax base will reduce take home pay of workers. The associated labor supply effect on employment will depend on the elasticity of labor supply in the State, the relative size of the UI taxes related to take home wages, and the degree of backward shifting. This section describes how labor supply effects are treated in the simulation model.

3.5.1 The Labor Supply Model

The starting point is the specification of the labor supply curve. Labor supply is represented in a simple fashion: as an increasing function of the net take home wage.

(5) $LS = a + b*AWWN$

where the variables are:

LS	Labor Supply
AWWN	Average Weekly Wage, Net of taxes

Labor supply is estimated by the level of UI covered employment and net take home pay is estimated by the after-tax State average weekly wage. The parameters a and b in Equation (5) are both assumed to be positive.

The slope coefficient b in Equation (5) measures the marginal response of labor supply to a change in net take home pay. Assuming b to be positive means that if wages increase, total labor supply will increase. The sign of b is determined by two separate effects, the income effect and the substitution effect. When wages rise, worker income and the demand for goods and leisure increase. At the same time, the increase in the wage increases the opportunity cost of leisure (or the amount of foregone wages). The preceding two effects are referred to respectively as the income effect and the substitution effect of increased wages on labor supply. In the

[17] Employers can avoid the real burden (or incidence) of payroll taxes in two ways: backward shifting onto wages or forward shifting to product prices. In the present modeling effort, there is no price determination so that backward shifting could be interpreted more broadly, i.e., employer avoidance of the burden of payroll taxes, with the exact shifting mechanism being an unspecified combination of forward shifting and backward shifting.

model, the substitution effect is assumed to be larger, making b positive. At the aggregate State level, labor supply is quite inelastic, i.e., a 1 percent reduction in net take home pay reduces labor supply by much less than 1 percent.

There is extensive empirical literature on labor supply. Much of the recent work is based on microdata and estimates income and substitution effects of net wage changes using controls for several factors such as other income, the labor supply of other family members, marital status, worker age, number and age of children, family wealth, and health status. Two articles summarize the work done through the early 1980s. Pencavel (1986) summarizes the empirical research on the labor supply of men, whereas an article by Killingsworth and Heckman (1986) summarizes the research on the labor supply of women.[18]

The literature on labor supply has grown considerably since these review articles were completed. However, one qualitative result has continued to hold. The response of male labor supply to wage changes is much less elastic than the female response. Because women now account for approximately 45 percent of employment and approximately 40 percent of hours worked, aggregate labor supply may be more elastic now than two decades ago. The appropriate estimate of the supply elasticity is a number about which reasonable people can disagree. Model users can vary the labor supply elasticity to reflect their own judgment.[19]

3.5.2 After-Tax Weekly Wages

After-tax State average weekly wages can be expressed as follows:

$$(6)\quad AWWN_1 = AWW*[1 - t_y - (t_{SSE}*TWP_{SS}) - (z_{SS}*t_{SSR}*TWP_{SS}) - (t_{HIE}*TWP_{HI}) - (z_{HI}*t_{HIR}*TWP_{HI}) - (z_S*t_{S1}*TWP_{S1}) - (z_F*t_{F1}*TWP_{F1})] \text{ and}$$

$$(7)\quad AWWN_2 = AWW*[1- t_y - (t_{SSE}*TWP_{SS}) - (z_{SS}*t_{SSR}*TWP_{SS}) - (t_{HIE}*TWP_{HI}) - (z_{HI}*t_{HIR}*TWP_{HI}) - (z_S*t_{S1}*TWP_{S1}) - (z_F*t_{F1}*TWP_{F1}) - [z_S*(t_{S2}*TWP_{S2} - t_{S1}*TWP_{S1})] - [z_F*(t_{F2}*TWP_{F2} - t_{F1}*TWP_{F1})]]$$

[18] The articles are John Pencavel, "Labor Supply of Men: A Survey" and Mark Killingsworth and James Heckman, "Female Labor Supply: A Survey." These are Chapters 1 and 2 of the *Handbook of Labor Economics, Volume 1* (North Holland: Amsterdam, 1986).

[19] Because wages and salaries represent a large share of the total income of individuals and families, a change in net take home money wages has both income and substitution effects on labor supply. This causes difficulties in empirical estimation where the slope on wages incorporates both income and substitution effects. The coefficient b in the simulation model should be interpreted as the (positive) net substitution effect holding income constant.

Four taxes are considered in the labor supply model:

Personal income taxes
Social Security OASDI taxes
Social Security health insurance (HI) taxes
State and Federal UI payroll taxes

Each tax is modeled as an effective average rate on total wages (taxes as a share of total wages) and measured as a proportion of the State's average weekly wage (AWW). For personal income tax, this tax rate (t_y) is an average tax rate. For other taxes (t_{SS}, t_{HI}, t_S, t_F), which are all payroll taxes, tax rates are the product of the relevant statutory tax rates and the taxable wage proportion. The OASDI and HI payroll taxes have variable effective rates dependent on each State's taxable wage proportions (TWP_{SS} and TWP_{HI}). Of the two, the OASDI tax has more possibility for important interstate variation because its statutory rate is much larger and because TWP_{SS} would be expected to display larger interstate variation.[20] OASDI and HI taxes require employer, as well as employee, contributions. The employee portion of both is assumed to reduce the take home pay of workers whereas different assumptions regarding the incidence of the employer taxes can be made. The personal income tax rate in each State (t_y) is modeled as the sum of the average rates for Federal and State income taxes. The Urban Institute's TRIM model was used to calculate State-level average effective income tax rates in 1991.

As in other parts of the model, the subscripts 1 and 2 refer to the time periods before and after the UI tax base change of interest, respectively. AWW refers to the average weekly wage in UI taxable covered employment. The z's all are parameters that show the extent of backward shifting of employer payroll taxes onto money wages. The last two terms in Equation (6) and the last four terms in Equation (7) refer to UI taxes and were previously defined in the labor demand section (subscripts S and F refer to the State and Federal components, respectively). Of the other parameters inside the brackets, t_{SSE}, t_{SSR}, t_{HIE}, and t_{HIR} are constant across States (with $t_{SSE} = t_{SSR}$ and $t_{HIE} = t_{HIR}$), but t_y, TWP_{SS}, and TWP_{HI} vary by State.[21]

Each term in Equation (6) is identical to each term in Equation (7) except for the final two bracketed terms in Equation (7). These last terms are the effect on net take home wages (AWWN) of the backward shifting of the additional State and

[20] The taxable wage base for HI taxes is $135,000 in 1993 compared to $57,600 for OASDI taxes. Because the HI tax base is so high, practically all covered wages are taxable even in the highest wage States. Starting in 1994, HI taxes will be levied on all wages.

[21] As noted above, the OASDI tax base is set high in the overall wage distribution. Recently, the national average taxable wage proportion has averaged about 0.90. However, given the differences in average wages by State, the proportions can differ substantially between high-wage and low-wage States. A rough calculation would be as follows: If the national average equals 0.90, the average in South Dakota would be 0.95, but in Connecticut, it would be 0.85. Given the combined employer-employee statutory tax rates, State-level differences in effective tax rates can exceed a full percentage point for the OASDI part of the Social Security tax.

Federal UI taxes due to an increase the taxable wage base. The change in AWWN depends on the degree of backward shifting (z_S and z_F),[22] UI tax rates (t_S and t_F), and the increases in TWP_S and TWP_F arising from the higher UI taxable wage base. Even though the UI tax rates on taxable wages (t_S and t_F) are constant within each State for a given year, they nevertheless affect the increases in the effective State and Federal UI tax rates on total wages, each the product of a UI tax rate times its respective TWP.

3.5.3 Changes in Labor Supply When the Federal Taxable Wage Base Is Increased to $14,000

Exhibit 3-7 presents summary details of a simulation that assumes the Federal taxable wage base is raised to $14,000, but the State and Federal UI taxes are shifted fully backward onto money wages. Simulated outcomes are based on an assumed labor supply elasticity of 0.1.[23] At the national level, labor supply is projected to decrease by 54,900. The largest reductions in labor supply are concentrated in California (8,100), New York (4,500), and Pennsylvania (4,100).

Exhibit B-3 in Appendix B displays net weekly wages by State both before and after the tax base increase. It also shows the following different taxes: the effective income tax rate, the effective OASDI tax rate, the effective SS health tax rate (HI), the effective UI tax rate, and the effective total tax rate. The effective UI tax rate and the effective total tax rate are broken down to the initial and new rates. Total tax rates increase only because of higher effective (combined State and Federal) UI tax rates that are shown both before and after the increase in the tax base. Full backward shifting of employer OASDI and HI taxes is also assumed. Effective OASDI tax rates range from 10.61 percent in the District of Columbia and 10.80 percent in Connecticut to 12.08 percent in South Dakota and 12.23 percent in Puerto Rico.

Exhibit B-3 shows that the combined State and Federal personal income tax rate varies considerably by State. It ranges from highs of 21.72 percent in the District of Columbia and 18.51 percent in Hawaii to a low of 10.84 percent in Wyoming. This degree of interstate variation is much larger than for payroll taxes.

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[22] There are four z parameters in the model: z_S, z_F, z_{SS}, and z_{HI}. When any of the four depart from zero and approach 1.0, they indicate the degree of backward shifting of that particular employer payroll tax. The text focuses on z_S and z_F because the associated UI taxes vary within the model and cause changes in employer labor costs.

[23] The model estimates labor supply effects by directly combining an assumed elasticity of labor supply (0.1 in the present example) with the initial level and change in net weekly take home pay. These three items are sufficient to estimate the percent change in employment by State. The change in employment is then the product of this percentage change and the initial level of employment. Thus, the model does not directly use the slope and intercept of the labor supply relationship shown in Equation (5) of the text. The model's link to this equation is as follows: The intercept a = (1 - e)*Empl and the slope b = e*(Empl/AWWN1) where e is the elasticity of labor supply, Empl is the initial State-level labor supply, and AWWN1 is the initial net take home pay.

Exhibit 3-7
Labor Supply Effects of Increased State and Federal UI Taxes (1991), Federal Tax Base = $14,000

State	Initial Employment (000s)	Reduction in Employment (000s)	Change in Avg. Weekly Wage ($)
Alabama	1,266	0.68	-1.53
Alaska	168	0.03	-0.81
Arizona	1,181	0.68	-1.66
Arkansas	735	0.60	-2.08
California	10,394	8.12	-2.82
Colorado	1,211	0.54	-1.40
Connecticut	1,233	0.85	-2.93
Delaware	269	0.18	-2.27
District of Columbia	323	0.21	-2.64
Florida	4,305	2.21	-1.54
Georgia	2,311	1.26	-1.69
Hawaii	416	0.33	-2.31
Idaho	309	0.08	-0.67
Illinois	4,144	2.79	-2.37
Indiana	1,983	1.16	-1.79
Iowa	935	0.35	-0.97
Kansas	953	0.71	-2.07
Kentucky	1,112	0.88	-2.15
Louisiana	1,199	0.86	-2.15
Maine	382	0.39	-2.76
Maryland	1,539	0.96	-2.06
Massachusetts	2,222	2.55	-4.11
Michigan	2,993	2.66	-3.05
Minnesota	1,624	0.46	-0.88
Mississippi	720	0.41	-1.45
Missouri	1,768	1.26	-2.14
Montana	263	0.08	-0.71
Nebraska	549	0.31	-1.44
Nevada	540	0.13	-0.75
New Hampshire	375	0.18	-1.56
New Jersey	2,725	0.57	-0.82
New Mexico	418	0.16	-1.03
New York	5,719	4.49	-3.10
North Carolina	2,470	0.82	-0.92
North Dakota	175	0.07	-0.91
Ohio	3,728	3.03	-2.57
Oklahoma	923	0.46	-1.37
Oregon	961	0.24	-0.72
Pennsylvania	3,831	4.05	-3.42
Puerto Rico	567	1.17	-3.88
Rhode Island	319	0.08	-0.73
South Carolina	1,192	1.00	-2.25
South Dakota	211	0.09	-1.01
Tennessee	1,733	1.23	-2.12
Texas	5,682	2.36	-1.40
Utah	547	0.14	-0.69
Vermont	183	0.16	-2.54
Virginia	2,160	0.95	-1.32
Virgin Islands	30	0.01	-0.68
Washington	1,675	0.39	-0.74
West Virginia	459	0.45	-2.80
Wisconsin	1,787	0.99	-1.55
Wyoming	141	0.08	-1.62
National Total	85,053	54.88	-2.10

It is also instructive to compare the combined tax rate for all payroll taxes with the personal income tax rate. The national sum of UI, OASDI, and HI tax rates is 15.23 percent with the original UI tax bases and 15.68 percent with the $14,000 Federal tax base compared to the national average income tax rate of 14.83 percent. Under full backward shifting of all payroll taxes, the combined payroll tax rate exceeds the income tax rate. All (income plus payroll) taxes account for approximately 30 percent of pretax average weekly wages.

The results in Exhibits 3-7 and B-3 are interesting to consider in relation to those obtained when the effects of an increase are fully shifted back onto labor, which was presented in Exhibit 3-3. The earlier results predicted that raising the tax base to $14,000 would decrease labor demand by 97,800. These two simulations represent polar opposite cases as far as tax incidence because increased UI taxes fall fully on employers in the labor demand case but they fall fully on workers in the labor supply case. The comparative sizes of the employment reductions are strongly affected by assumptions in the model regarding the elasticity of labor demand and the elasticity of labor supply. Different assumptions regarding these key parameters would alter the sizes of the estimated employment effects. In particular, a demand elasticity larger than 0.3 would cause larger employment reductions in Exhibit 3-3 (Labor Demand), whereas a supply elasticity larger than 0.1 would cause larger employment reductions in Exhibit 3-7 (Labor Supply).

3.6 Combined Demand and Supply Effects

The employment effects of increasing the taxable wage base to $14,000 when both labor supply and demand effects are taken into account were also examined with the model. The only deviations from the earlier description of the model are that the new FUTA tax rate can be set by the user and the parameter for backward shifting has two components. This allows the extent of backward shifting to be different for Federal UI taxes and for State UI taxes. In this scenario, half of the UI tax is assumed to be shifted backward to wages; thus, both shift parameters were set at 0.5. The parameters for the degree of backward shifting of the various employer payroll taxes were also set at 0.5; thus, employer payroll taxes are assumed to be shared equally by employers and employees.

Exhibit 3-8 summarizes the employment effects under these assumptions for all 53 States. In particular, the exhibit displays changes in total employment, as well as the changes in employment due to changes in labor supply and changes in labor demand. Total employment is reduced by 74,800 workers, given these assumptions. Nationwide, decreased labor demand accounts for a reduction of 48,900 workers' jobs, and decreased labor supply reduces employment by 25,900 jobs.

3.7 Comparison to Universe Microdata

In the four States where the project obtained microdata on covered earnings, it was possible to compare model-based estimates of TWP with estimates from the microdata. Comparisons were made in four States (Colorado, Maryland, Missouri, and Texas) for 1991. Generally, the two approaches yielded similar estimates of the taxable wage proportion, particularly at lower levels of the taxable wage base. For the taxable wage bases between

Exhibit 3-8
Estimated Employment Effects of Increasing the Federal Taxable Wage Base to $14,000 in 1991, Half of Tax Shifted Backward (In 000s)

State	Initial Employment	Reduction in Labor Demand	Reduction in Labor Supply	New Employment
Alabama	1265.5	0.6	0.3	1264.6
Alaska	167.8	0.0	0.0	167.8
Arizona	1180.8	0.6	0.3	1179.9
Arkansas	734.8	0.5	0.3	734.0
California	10393.5	7.2	3.8	10382.5
Colorado	1210.7	0.5	0.3	1210.0
Connecticut	1232.6	0.8	0.4	1231.5
Delaware	269.1	0.2	0.1	268.8
District of Columbia	323.3	0.2	0.1	323.0
Florida	4304.8	2.1	1.0	4301.7
Georgia	2311.2	1.1	0.6	2309.5
Hawaii	415.8	0.3	0.2	415.4
Idaho	308.9	0.1	0.0	308.8
Illinois	4143.8	2.5	1.3	4140.0
Indiana	1983.4	1.1	0.5	1981.8
Iowa	935.1	0.3	0.2	934.6
Kansas	953.3	0.6	0.3	952.3
Kentucky	1111.6	0.8	0.4	1110.4
Louisiana	1199.0	0.8	0.4	1197.8
Maine	381.8	0.3	0.2	381.3
Maryland	1539.2	0.8	0.5	1537.9
Massachusetts	2221.8	2.2	1.2	2218.5
Michigan	2993.5	2.3	1.3	2989.9
Minnesota	1624.3	0.4	0.2	1623.7
Mississippi	719.6	0.4	0.2	719.1
Missouri	1767.5	1.1	0.6	1765.8
Montana	262.9	0.1	0.0	262.8
Nebraska	548.5	0.3	0.1	548.1
Nevada	539.7	0.1	0.1	539.5
New Hampshire	374.5	0.2	0.1	374.3
New Jersey	2725.2	0.5	0.3	2724.4
New Mexico	418.2	0.1	0.1	417.9
New York	5718.5	3.9	2.1	5712.5
North Carolina	2470.4	0.7	0.4	2469.3
North Dakota	174.7	0.1	0.0	174.6
Ohio	3727.6	2.7	1.4	3723.5
Oklahoma	922.5	0.4	0.2	921.9
Oregon	961.1	0.2	0.1	960.8
Pennsylvania	3830.8	3.6	1.9	3825.3
Puerto Rico	567.3	1.1	0.5	565.7
Rhode Island	318.9	0.1	0.0	318.8
South Carolina	1192.2	0.9	0.5	1190.9
South Dakota	210.9	0.1	0.0	210.7
Tennessee	1733.2	1.2	0.6	1731.5
Texas	5681.8	2.2	1.1	5678.5
Utah	546.7	0.1	0.1	546.5
Vermont	182.7	0.1	0.1	182.4
Virginia	2160.5	0.8	0.4	2159.2
Virgin Islands	29.9	0.0	0.0	29.9
Washington	1674.6	0.4	0.2	1674.0
West Virginia	458.6	0.4	0.2	458.0
Wisconsin	1787.4	0.9	0.5	1786.1
Wyoming	141.3	0.1	0.0	141.1
National Total	85053.3	48.9	25.9	84978.4

$7,000 and $28,000, the ratio of TWP from the microdata to TWP from the model fell into the range from 1.000 to 0.970 after adjusting for coverage differences (some reimbursable employment was included in the microdata). At higher levels of the tax base, the ratio of the two estimates declined below 0.970. The model estimates of TWP increased more relative to the microdata. Since the most likely increases in the FUTA tax base would be to levels below $28,000, the model-based estimates provide a good approximation to results based on microdata.

3.8 Conclusions

Increasing the Federal tax base to $28,000 would raise Federal tax contributions by $7.2 billion and, assuming conformity and no change in tax scenarios or experience rating, raise State tax contributions by $15.4 billion. Complete elimination of the Federal taxable wage base (so that UI taxes would cover all wages) would raise Federal tax contributions by $11.2 billion and State revenues by $25.4 billion. This would represent an increase (assuming complete elimination of State taxable maximum) of 120 percent for Federal and 75 percent for State taxes.

Interest in the employment effects of payroll tax changes is likely to remain high for some years. Proposals can be anticipated to finance new active labor market policies and expanded health insurance coverage with employer payroll taxes. The model described in this chapter is well suited to analyze the effects of UI tax proposals because it provides both State- and national-level detail. A similar type of model, but one emphasizing firms classified by industry and size, would also be useful.

The main qualitative conclusion to emerge from the simulations conducted here is the comparatively small size of the estimated employment effects. With a modest elasticity of labor demand and a low labor supply elasticity, the findings are hardly surprising. Raising the Federal UI taxable wage base to $14,000 from its present $7,000 would reduce employment by somewhat less than 100,000. This scale of reduction is only slightly more than 0.1 percent of UI-covered employment. When full backward shifting is assumed, the employment reduction is even smaller, approximately 55,000.

Several conclusions can be drawn from the analysis:

- When the Federal taxable wage base is raised from its present level of $7,000 per covered worker, the reductions in employment associated with the tax base increases are quite modest. If it is assumed that the tax bases for State UI taxes match increases in the Federal tax base, a doubling of the Federal base to $14,000 would reduce employment by about 100,000.

- Increased Federal UI taxes account for a measurable share of the total employment effect. Slightly more than one-third of the reduction associated with increasing the Federal tax base to $14,000 is due to higher Federal taxes, and the remainder is due to higher State tax bases.

- Eliminating the taxable wage base, i.e., making all UI-covered wages taxable, would only reduce employment by 381,000, less than half of 1 percent of covered employment.

- The estimated employment effects are even smaller when likely cost offsets to increased UI taxes are incorporated into the calculations.

- Under the labor demand assumptions, raising the Federal taxable wage base to $14,000 would raise Federal tax contributions by $3.3 billion (from $5.1 billion to $8.4 billion). Assuming State conformity, first-year State tax contributions would increase by $9.3 billion from $19.6 billion to $28.9 billion.

- Recognizing possible backward shifting of UI taxes onto worker wages and an associated reduction in labor supply does not change the qualitative findings. The estimated employment reductions remain modest in size when both labor demand and labor supply effects are considered.

* * * *

Chapter 4

Microanalysis of State Data

An increase in the Federal taxable wage base (TWB) for Unemployment Insurance (UI) will, in the short run, improve the solvency of the Federal and many State trust funds, increase the tax burden for most firms in affected States, alter the distribution of tax burden among firms, and have a negative impact on total employment. The model provided in Chapter 3 dealt with the macroeconomic effects of raising the taxable wage base. This chapter examines the effects of an increase in the Federal taxable wage base using individual and firm level data. The micro-level analysis estimates four effects that such a change will have: the effect on State UI trust funds; the effect on Federal UI trust funds; the effect on the taxable wage proportion (TWP); and, the impact on private employers' costs.

The first three components of this analysis, the changes in State and Federal trust fund contributions and the estimation of the TWP, are developed from calculations using universe data from four States. The remaining component of analysis is developed from calculations on sample data selected from the universe of data in those States. The analysis of sample data examines the effects that raising the taxable wage base have on firms of different sizes, industries, wage levels, and experience-rated tax rates, ignoring the fact that these four States have differing current taxable wage bases.

Although not a representative sample of the range of States in a statistical sense, the sample States are representative of the average State. The weighted average annual wage in the sample States in 1991 ($23,729) was 98.7 percent of the average wage in all of the States ($24,132). In any case, the results of the microanalysis on State data cannot be extrapolated to the U.S. as a whole. The results generated by the analysis are indicative of the direction of the effects of an increase in TWB, but they may not be of the proper magnitude.

The microanalysis attempts to answer the following questions: How would an increase in the Federal taxable wage base affect the contributions to State and Federal trust funds? What are the characteristics of firms that have a higher tax burden at the $7,000 Federal taxable wage base, and how will that tax burden change as the base is raised? Will raising the Federal taxable wage base erode the built-in disincentive for layoffs based on States' experience rating systems? Will enhanced contributions resulting from an increase in the Federal taxable wage base for firms operating at the State minimum and maximum tax rates offset what are otherwise ineffective charges?

The microanalysis focuses on the static effects of increasing the Federal taxable wage base. It examines how, for both 1990 and 1991, individual firms and States would have been affected had there been an increase in the Federal TWB for those years. It is recognized that raising the Federal taxable wage base would, over time, have other dynamic effects at the State and firm levels. In order to examine only the static effects of raising the Federal TWB, it is necessary to make four assumptions concerning State and firm actions: first, all States would comply with Federal UI legislation by setting their TWB to at least that of the Federal TWB; second, States would not lower their average tax rates to offset the increase

in the wage base; third, firms would not respond to an increase in the Federal TWB by reducing wages or employment; fourth, firm tax rates for 1991 would not be altered by the increase in the Federal TWB in 1990. In making these assumptions, we limit our analysis to the initial static effects of increasing the Federal TWB.

4.1 Data and Estimation of the Taxable Wage Proportion and Trust Fund Contributions

The data used in the microanalysis were gathered from Colorado, Maryland, Missouri, and Texas. This selection includes two States that use a reserve ratio experience-rating system (Colorado and Missouri) and two States that use a benefit ratio experience-rating system (Maryland and Texas). In addition to providing examples of the two major types of experience-rating systems, these four States were chosen because of the relative ease and assurance of data collection. The data from Colorado, Maryland, and Missouri had already been obtained prior to the start of this study. The data from Texas were obtained from Texas' UI office at our request upon the start of this study.

The microdata set used in this study combines firm-specific quarterly wage records during 1990 and 1991. The Wage Record data provide a scrambled Social Security number, a scrambled employer identification number (EIN), and four quarters of individual employee wage data for each year. Firm records report a scrambled EIN, an industry code, and eight quarters of unemployment tax rates for each firm based on the State's experience-rating system. Wage Records from each year were matched to the firm record by employer identification number and then to each other by Social Security number.

The use of microdata offers several advantages. First, although estimations of the effects of an increase in the Federal TWB on firms of differing characteristics would be possible using aggregated totals, the use of firm-level data is far more accurate. Second, firm-level data provide more flexibility to analyze the effects of raising the Federal TWB on the basis of a number of different firm characteristics. Third, it provides another source of analysis of the effects of raising the Federal TWB on the State and Federal trust funds and on the State TWPs.[1] Finally, the results generated by an analysis using microlevel data could be compared against results generated by analyses using aggregated data.

Calculations of the taxable wage proportion used the same methods for the universe and sample data. Taxable wages were calculated for each taxable wage base by taking the minimum of the taxable wage base or actual yearly wages for each employee. The TWP is equal to the sum of taxable wages (for each taxable wage base) divided by the sum of all wages for the relevant unit of analysis (State average, size, industry, wage level range, or experience-rated tax rate range).

Contributions to the trust fund (for each taxable wage base) were calculated as the sum of each firm's taxable wages times its tax rate. For the Federal trust fund, all firms had a tax rate of 0.8 percent. For the State trust fund, tax contributions were calculated using each firm's own tax rate based on its UI experience. In Colorado, Missouri, and Texas, this

[1] The Federal Trust Fund is actually the Federal Trust Fund Accounts.

process was straightforward because the tax rate only changed annually during the 1990-1991 period. For Maryland, the calculation was done on quarterly wages subject to the quarterly tax rates for each quarter until the desired taxable wage base was reached. In 1991, Maryland is also affected by an increase in tax rates. The effective tax rate (ETR)[2] was calculated only for the sample data and is equal to contributions to the State trust fund divided by the sum of all wages for the relevant unit of analysis. All calculations on sample data were weighted to account for differences in the proportion of firms in the universe to firms in the sample.

4.2 Universe Data Analysis

The universe data were used to determine the effects that an increase in the taxable wage base would have on the State and Federal trust fund contributions and on the taxable wage proportion in each State. The changes in the State and Federal trust fund contributions at each wage base were calculated as a percentage change from the tax contribution at the original $7,000 Federal wage base.[3] The results are shown in Exhibit 4-1.

Firms with a zero percent tax rate were initially excluded from the universe data analysis because changes in the taxable wage base would not affect the amount of contributions for these firms to their particular State trust funds. By excluding the zero-rate firms, the taxable wage proportions at each wage base were slightly altered, as were the calculations for Federal trust fund contributions. During 1990 and 1991, both Maryland's and Texas' effective minimum tax rates were positive. Missouri had an effective tax rate minimum of zero percent during 1990 and 1991, and Colorado had an effective tax rate minimum of zero percent in 1991. Thus, excluding zero-rate firms had little effect on any of the States' taxable wage proportions or Federal trust fund contributions except for Missouri (both years) and Colorado (only 1991). It was assumed, however, that the taxable wage proportion for the zero-rate firms was equivalent (or nearly so) to those of the other firms at each wage base level and would thus not alter the taxable wage proportion calculations for Missouri or Colorado (in 1991). It was also assumed that the percentage change in the Federal trust fund contributions would be only slightly affected by the exclusion of zero-rate firms.

By excluding the zero-rate firms, we also ensured that no reimbursing firms were included in the universe microanalysis. With the exception of Texas, all of the States' data included some reimbursing firms in the universe data set before zero-rated firms were excluded. Because reimbursing firms do not pay Federal or State UI taxes, they should be excluded from the analysis because changes in the wage base would have no effect on them. Further, the inclusion of reimbursing firms, which have different wage distribution patterns, sizes, and industries, could alter the results of the analysis

[2] It bears reiterating that the analysis assumes no changes in the State UI statutory tax rates. Raising TWB for a new calendar year after the rates have been set will not affect the statutory tax rate, only the ETR.

[3] Although it was recognized that most State taxable wage bases exceed $7,000, we calculated the percentage change in the State trust fund contributions on the $7,000 taxable wage base for the purposes of comparison.

Exhibit 4-1

Changes in Federal and State UI Contributions

Colorado					Maryland					
1990		1991			1990			1991		
Change in State tributions (%)	Pct. Change in Federal Contributions (%)	Taxable Wage Proportion (%)	Pct. Change in State Contributions (%)	Pct. Change in Federal Contributions (%)	Taxable Wage Proportion (%)	Pct. Change in State Contributions (%)	Pct. Change in Federal Contributions (%)	Taxable Wage Proportion (%)	Pct. Change in State Contributions (%)	Pct. Change in Federal Contributions (%)
0.00	0.00	33.80	0.00	0.00	34.37	0.00	0.00	33.13	0.00	0.00
7.83	8.35	37.13	9.41	9.85	37.82	10.06	10.05	36.55	11.46	10.32
14.96	16.05	40.27	18.22	19.14	41.08	19.55	19.53	39.78	22.71	20.09
21.47	23.18	43.24	26.50	27.92	44.15	28.50	28.48	42.85	33.82	29.35
27.47	29.81	46.05	34.28	36.22	47.06	36.96	36.95	45.76	44.81	38.13
33.04	36.00	48.71	41.63	44.09	49.82	44.97	44.97	48.52	55.65	46.46
38.20	41.80	51.23	48.55	51.55	52.43	52.55	52.56	51.14	66.30	54.37
43.01	47.23	53.62	55.09	58.63	54.90	59.72	59.74	53.62	76.74	61.87
47.51	52.33	55.89	61.26	65.34	57.23	66.49	66.54	55.98	86.95	68.98
51.70	57.12	58.04	67.08	71.70	59.44	72.87	72.96	58.21	96.89	75.73
55.62	61.62	60.07	72.58	77.72	61.52	78.91	79.03	60.33	106.54	82.11
59.29	65.85	62.00	77.76	83.42	63.50	84.60	84.76	62.33	115.89	88.16
62.72	69.82	63.82	82.63	88.81	65.36	89.97	90.18	64.22	124.91	93.88
65.94	73.56	65.54	87.23	93.90	67.11	95.04	95.28	66.02	133.62	99.29
68.95	77.07	67.17	91.55	98.72	68.76	99.82	100.09	67.71	141.99	104.40
71.77	80.38	68.71	95.62	103.27	70.32	104.33	104.63	69.31	150.02	109.22
74.40	83.49	70.16	99.46	107.57	71.80	108.59	108.91	70.82	157.72	113.78
76.88	86.41	71.54	103.07	111.64	73.18	112.61	112.96	72.25	165.08	118.09
79.19	89.16	72.84	106.46	115.49	74.50	116.39	116.77	73.60	172.11	122.17
81.35	91.74	74.07	109.66	119.12	75.73	119.96	120.36	74.87	178.81	126.01
83.37	94.16	75.23	112.66	122.55	76.89	123.31	123.74	76.07	185.17	129.64
85.27	96.43	76.32	115.48	125.79	77.98	126.46	126.92	77.20	191.21	133.05
95.57	108.96	82.51	131.14	144.09	84.07	143.92	144.64	83.47	225.38	151.99
102.17	117.13	86.78	141.56	156.71	88.09	155.03	156.32	87.64	248.34	164.55
106.45	122.43	89.71	148.65	165.40	90.78	162.08	164.16	90.45	263.63	173.04
107.53	123.76	90.47	150.49	167.64	91.47	163.81	166.18	91.17	267.51	175.23
108.41	124.84	91.09	151.99	169.47	92.04	165.21	167.82	91.77	270.67	177.02
110.80	127.78	92.80	156.18	174.53	93.60	168.96	172.36	93.41	279.27	181.97
111.93	129.17	93.60	158.15	176.91	94.34	170.69	174.51	94.18	283.29	184.30

Exhibit 4-1(2)

	Missouri						Texas					
	1990			1991			1990			1991		
Federal Taxable Wage Base ($)	Taxable Wage Proportion (%)	Pct. Change in State Contributions (%)	Pct. Change in Federal Contributions (%)	Taxable Wage Proportion (%)	Pct. Change in State Contributions (%)	Pct. Change in Federal Contributions (%)	Taxable Wage Proportion (%)	Pct. Change in State Contributions (%)	Pct. Change in Federal Contributions (%)	Taxable Wage Proportion (%)	Pct. Change in State Contributions (%)	Pct. Change in Federal Contributions (%)
7,000	34.94	0.00	0.00	34.27	0.00	0.00	33.97	0.00	0.00	32.54	0.00	0.00
8,000	38.43	9.64	9.99	37.73	9.77	10.10	37.28	9.84	9.75	35.78	9.85	9.94
9,000	41.72	18.66	19.40	41.00	18.94	19.63	40.38	19.07	18.88	38.82	19.10	19.27
10,000	44.82	27.11	28.28	44.08	27.54	28.62	43.29	27.74	27.45	41.67	27.79	28.03
11,000	47.75	35.03	36.65	46.99	35.60	37.11	46.03	35.92	35.51	44.36	35.98	36.30
12,000	50.51	42.46	44.55	49.74	43.18	45.13	48.62	43.65	43.13	46.90	43.73	44.11
13,000	53.11	49.43	52.01	52.34	50.29	52.71	51.06	50.96	50.32	49.30	51.05	51.49
14,000	55.57	55.95	59.02	54.78	56.94	59.85	53.37	57.86	57.11	51.58	57.96	58.48
15,000	57.87	62.06	65.62	57.09	63.17	66.57	55.55	64.39	63.52	53.73	64.51	65.09
16,000	60.04	67.78	71.83	59.26	69.00	72.90	57.60	70.56	69.58	55.77	70.69	71.36
17,000	62.08	73.14	77.66	61.30	74.44	78.85	59.55	76.39	75.31	57.70	76.54	77.29
18,000	63.99	78.16	83.14	63.22	79.54	84.45	61.39	81.89	80.71	59.53	82.06	82.91
19,000	65.79	82.86	88.27	65.02	84.32	89.72	63.12	87.09	85.82	61.26	87.28	88.22
20,000	67.47	87.26	93.09	66.71	88.79	94.66	64.76	91.99	90.63	62.89	92.21	93.25
21,000	69.05	91.38	97.61	68.31	92.97	99.31	66.30	96.61	95.18	64.44	96.85	98.00
22,000	70.53	95.24	101.85	69.80	96.89	103.67	67.76	100.96	99.47	65.90	101.24	102.50
23,000	71.92	98.85	105.84	71.21	100.57	107.78	69.14	105.07	103.53	67.29	105.38	106.76
24,000	73.23	102.25	109.58	72.53	104.02	111.64	70.44	108.94	107.36	68.60	109.30	110.79
25,000	74.46	105.44	113.10	73.78	107.25	115.26	71.67	112.58	110.98	69.84	112.99	114.61
26,000	75.62	108.44	116.40	74.94	110.28	118.67	72.83	116.01	114.40	71.02	116.47	118.23
27,000	76.70	111.26	119.51	76.04	113.12	121.86	73.92	119.24	117.62	72.14	119.75	121.65
28,000	77.72	113.91	122.43	77.07	115.79	124.87	74.96	122.28	120.68	73.19	122.85	124.90
35,000	83.34	128.27	138.49	82.79	130.58	141.57	80.81	139.15	137.90	79.23	140.29	143.45
42,000	86.91	137.11	148.72	86.53	140.09	152.47	84.76	150.20	149.53	83.42	152.07	156.31
49,000	89.19	142.60	155.25	88.94	145.95	159.50	87.44	157.58	157.41	86.30	160.06	165.17
51,300	89.76	143.96	156.89	89.54	147.38	161.26	88.12	159.46	159.43	87.04	162.11	167.46
53,400	90.22	145.07	158.21	90.03	148.53	162.68	88.68	160.99	161.06	87.65	163.79	169.32
60,600	91.50	148.09	161.85	91.37	151.69	166.59	90.23	165.21	165.61	89.34	168.45	174.52
65,000	92.10	149.51	163.58	92.00	153.18	168.45	90.96	167.22	167.78	90.15	170.68	177.01

4.2.1 Federal Trust Fund Effects

A change in the Federal taxable wage base would, assuming that the Federal tax rate was not subsequently lowered, improve the solvency of the Federal UI trust fund. Obviously, larger wage base increases would result in larger increases in tax contributions to the Federal trust fund for each State. By calculating the percentage change in the contributions to the Federal trust fund, cross-State comparisons are made more meaningful.

Because the Federal UI tax rate remains a constant 0.8 percent across firms and across States, changes in the Federal trust fund due to changes in the Federal wage base should be similar across States. The results of this analysis are shown in Exhibit 4-1. Across all the States, the percentage change in the Federal trust fund contributions increased from one year to the next. For Maryland and Texas, the percentage increase in the Federal trust fund contributions was roughly 10 percent greater at the $65,000 base in 1991 than in 1990; for Missouri, the percentage change at the same base ($65,000) was only 5 percent from one year to the next. With the exception of Colorado in 1990, an increase in the wage base from $7,000 to $23,000 would have doubled the State contribution to the Federal trust fund.

The data from Colorado in 1990 are quite different from the data for the following year. In 1990, an increase in the wage base from $7,000 to $28,000 would not have even doubled the contributions to the Federal trust fund; the same change in the wage base would have resulted in a 125 percent increase in contributions to the Federal fund in 1991. Furthermore, increasing the Federal taxable wage base to $65,000 would have only increased Colorado's contributions to the Federal trust fund by 129 percent in 1990, but would have increased its contributions in 1991 by 177 percent. It appears that the universe microdata for Colorado in 1990 were somehow incomplete. Comparison of the totals from the universe microdata at our disposal to those totals printed in the UI Handbook reveals that there is a substantial difference in total wages for the State between the two sources of data.[4]

In general, raising the taxable wage base by $1,000 to $8,000 would increase Federal fund contributions by almost 10 percent in all four States. Doubling the taxable wage base to $14,000 would increase Federal trust fund contributions by more than 50 percent, except for Colorado in 1990. Tripling the Federal taxable wage base to $21,000 would roughly double the contributions to the Federal trust fund, again with the exception of Colorado in 1990.

4.2.2 State Trust Fund Effects

An increase in the Federal taxable wage base would, all else held constant, increase contributions to the State trust funds. The more the wage base is increased, the

[4] It is possible that the data contained in the universe microdata do not include the fourth quarter wages for some firms in the State. This might be the result of the timing of the collection of the data.

greater the increase in the contribution to State trust funds. Although differences in UI tax schedules and experience-rating systems make direct comparisons of changes in State trust fund contributions across States and across years difficult, calculation of the percentage change in the State trust fund contributions permits some comparison. For comparative purposes, percentage changes in the State trust fund were calculated for every State compared to a State wage base of $7,000.

The changes in the contributions to the State trust funds caused by an increase in the taxable wage base are more likely to vary significantly across States due to differences in the tax rating systems, distribution of wages, and industries. As with the percent changes in the Federal trust fund contributions, the percent change in the State trust fund contributions increased from one year to the next. The most notable change occurred in Maryland, where, at the $22,000 wage base, there is nearly a 50 percent differential between the changes across years due to a change in the tax rates over the year.

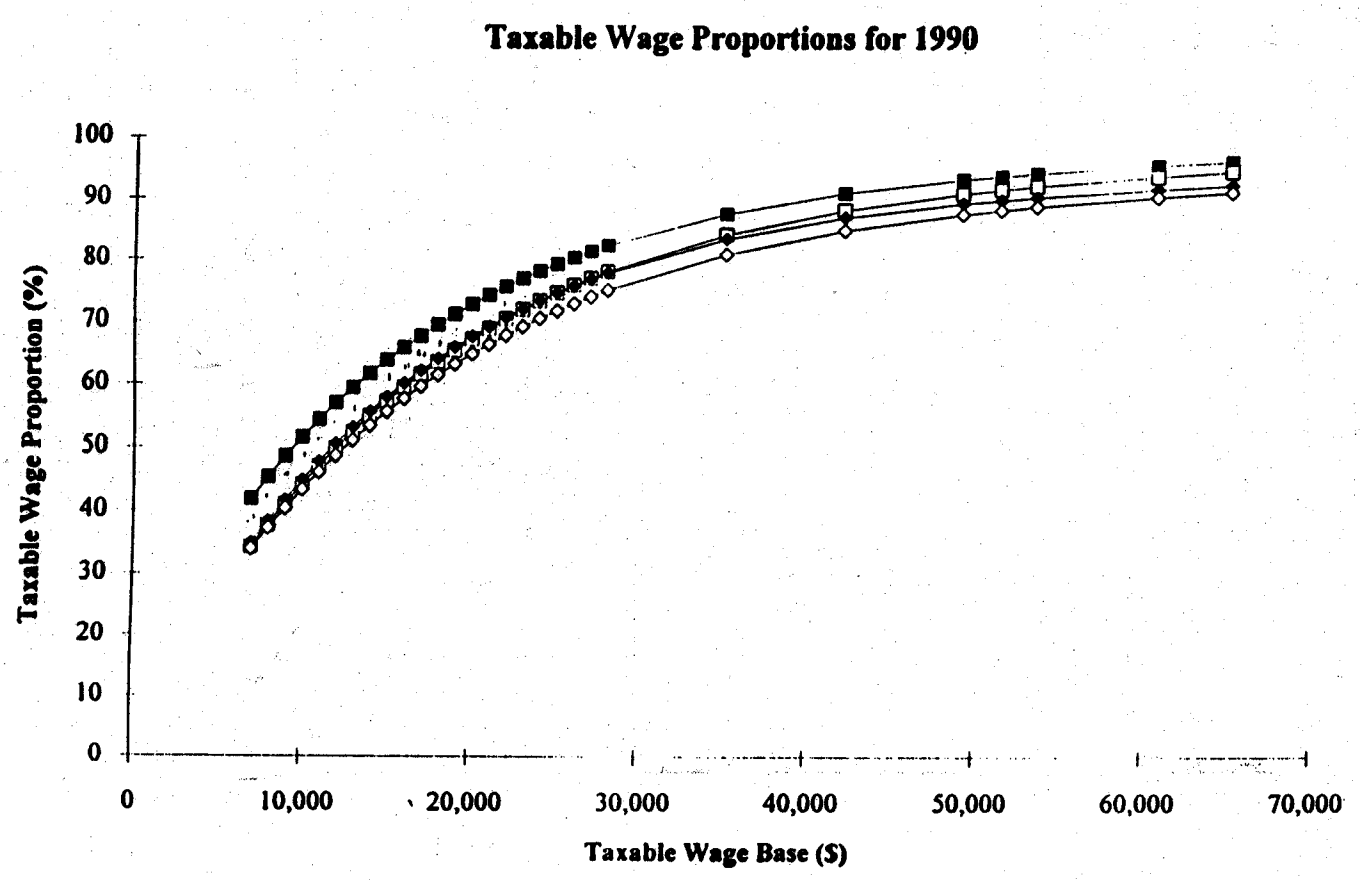
For both years, Maryland's trust fund would have been affected the most by a change to any given wage base. In fact, in 1991 an increase in the wage base from $7,000 to $35,000 would have more than tripled the intake of the State trust fund (a similar increase in 1990 would have resulted in only a 143 percent increase). The dramatic change in Maryland's trust fund is the direct result of the substantial (1.7 percent) increase in the tax rates of firms in the State that occurred between the second and third quarters of 1991.

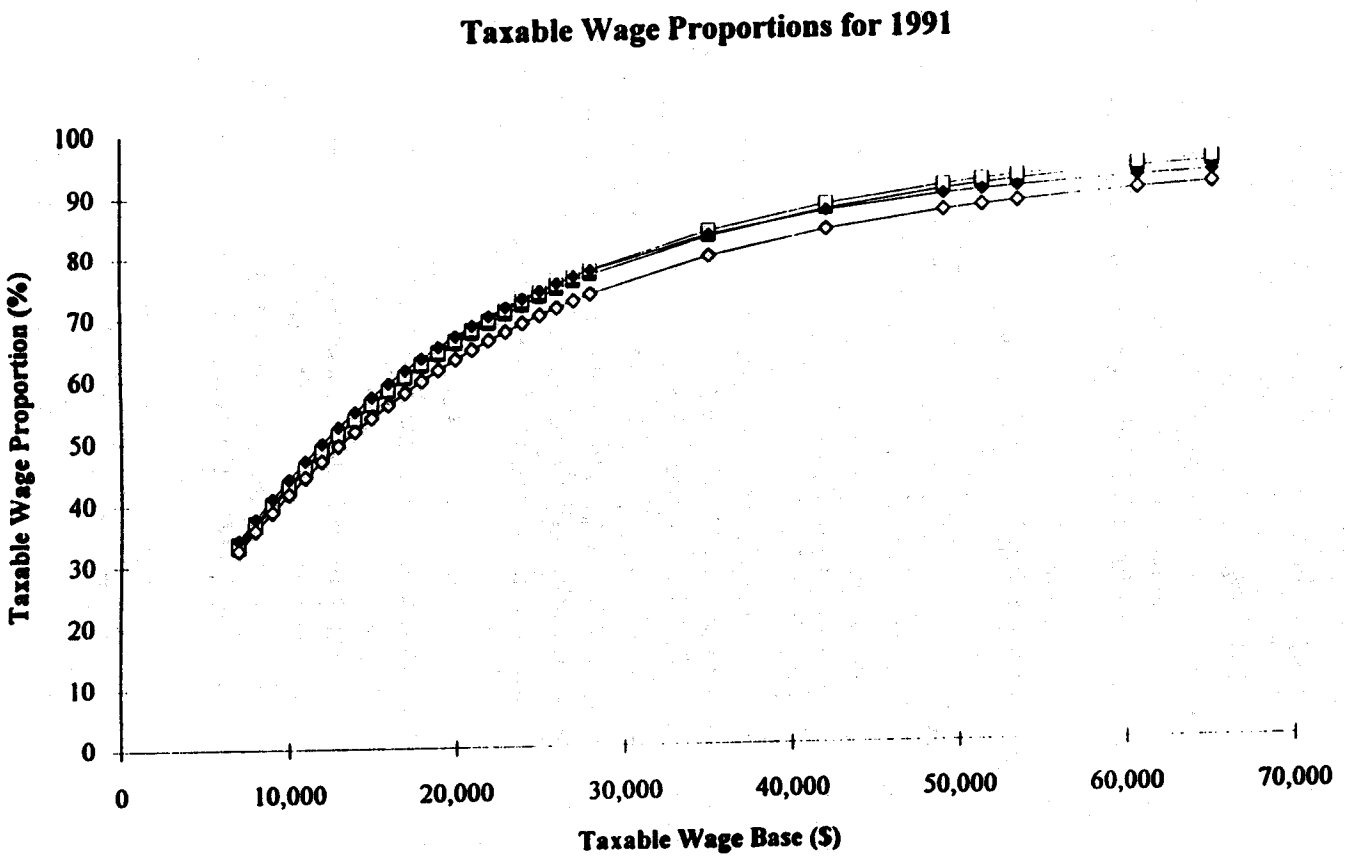
In general, doubling the Federal Taxable wage base to $14,000 would increase the contributions to the State trust funds by roughly 50 percent. Relative to a $7,000 tax base, tripling the base to $21,000 would roughly double contributions to the trust fund. The exceptions to this generalization are the lower increase in Colorado in 1990 and the larger increases in Maryland in 1991.

4.2.3 Changes in the Taxable Wage Proportion

Differences in the TWP are expected across States, primarily due to differences in State wage distributions. However, there is little reason to believe that the TWP for a given State should vary significantly from one year to the next at a given taxable wage base. The data collected from Texas, Missouri, and Maryland verify these expectations. Of these three States, Texas has the lowest TWP at all the wage bases investigated. From year to year, there is generally a 1 or 2 percent difference in the TWPs at the lowest wage bases, but at the $65,000 wage bases for Texas, Maryland, and Missouri, there is never more than a 0.81 percent change from 1990 to 1991.

As with the changes in the Federal and State trust funds across the wage bases for Colorado across years, there is also a change in the TWP from 1990 to 1991. At the lowest wage bases, the difference between years in Colorado is substantial (more than 8 percent for all wage bases at $14,000 or less); as the wage base increases, the difference decreases to only 2 percent at the $65,000 base (which is still substantially more than the other States). From the results generated by the universe microdata,


Taxable Wage Proportions for 1990
Taxable Wage Proportion (%)
100
90
80
70
60
50
40
30
20
10
0
0
10,000
20,000
30,000
40,000
50,000
60,000
70,000
Taxable Wage Base ($)


Taxable Wage Proportions for 1991
Taxable Wage Proportion (%)
100
90
80
70
60
50
40
30
20
10
0
0
10,000
20,000
30,000
40,000
50,000
60,000
70,000
Taxable Wage Base ($)

it is obvious that the cause of the change in the TWP is also the cause of the dramatic changes in the trust funds. Graphical representations of the TWP for each wage base for each State are provided in Exhibits 4-2 and 4-3.

4.3 Sample Data Analysis

Sample data were used to evaluate the effects of raising the taxable wage base on firms of different characteristics: industry, size, wage level, and experience-rated tax rates. A sample of firms was chosen for the analysis. The sample firms were selected randomly from the universe of firms with at least one UI covered employee in each of the eight quarters of 1990 and 1991. This strategy excludes firms that either started up, went out of business, or temporarily laid-off all of their UI eligible employees for seasonal or other reasons within the eight quarters of the study. The reason for the exclusion is so that differences of interest would not be affected or overcome by large changes in employment. The point of this selection was that the desired analysis was of firms in "equilibrium" and to have the analysis relative to firm characteristics rather than being driven by exogenous variables such as firm births, deaths, etc.

To obtain the sample data, a random selection was made of 30 firms within each size-industry category (see Exhibits C-1 through C-8 in Appendix C.) If 30 firms were not available in a particular cell, all firms in that cell were selected. In some of the large firm categories, there were not 30 firms in a given cell in the State. Cells with three or fewer firms in the universe data were included in the analysis but, for purposes of confidentiality, were excluded from disaggregated reporting.

In the States of Colorado, Missouri, and Maryland, firms were selected from among those that had at least one employee in each of eight quarters according to the State's Employer Registration ES202 database. Unfortunately, the number of employees in this database does not necessarily agree with the Wage Record database. It appears that the ES202 database includes employees not covered by UI. This discrepancy allowed firms with only an owner and no employees to enter into the sample selection. Such firms had to be discarded from the sample. Consequently, for these industry-size categories, fewer than 30 firms were selected.

The microanalysis of the sample data examines the effects of raising the Federal taxable wage base to 29 different levels. These include each $1,000 increment from $7,000 to $28,000, each $7,000 increment from $28,000 to $49,000, a $51,300 wage base, the two most recent Social Security taxable wage bases of $53,400 and $60,600, and a wage base of $65,000. Exhibits included in this chapter show how the TWP and ETR[5] would increase if the Federal TWB is raised from $7,000 to $14,000, $28,000, $53,400 or $65,000.

[5] The effective tax rate is the total taxable wages multiplied by the firm's tax rate as compared to total wages at each level of the taxable wage base.

4.3.1 Effects on Labor Costs of the Firm

Before examining firms by characteristic (size, industry, average wage level, and experience-rated tax rate), it is useful to discuss some general factors that influence tax contributions as the taxable wage base is raised. The number of UI eligible employees, the average wage, distribution of wages, the experience-rated tax rate (experience rate) of the firm, and the taxable wage base all affect tax contributions. By examining taxes paid as a percentage of wages (the effective tax rate) rather than the change in contributions, we control for the number of employees.

At a low taxable wage base, high wage firms will pay a lower effective tax rate. For higher taxable wage bases, the tax burden (effective tax rate) for high and low wage firms will tend to converge. The distribution of wages within the firm will also affect taxes paid. Two firms with the same number of employees, the same average wage and the same experience-rated tax rate might pay different UI taxes. The amount each firm pays is a function of the firm's wage distribution. A firm with little variation in its wage structure will pay more in payroll taxes than a firm with the same average wage, but more disparity in its wage structure. As the taxable wage base is increased, the difference in payroll taxes between the two firms will decrease. Firms with the same average wage level and wage distribution will differ in taxes paid to the extent that their experience-rated tax rates differ.

Several general conclusions can be drawn about the differential impact on firms of raising the taxable wage base. First, raising the base will have a greater impact on high wage firms than low wage firms. Second, it will have a greater impact on firms with little variability in its wage structure for moderate increases in the base, but greater impact on firms with a more variable wage structure for very large increases in the base. Third, the impact on firms with high versus low experience-rated tax rates will be equivalent in the sense that they would pay the same percentage increase in taxes.

Exhibit 4-4 displays 1991 data from Texas for "low" and "high" wage employers as well as data for the utility and retail industries and illustrates some of the differential effects of increasing the TWB on high and low-wage firms and industries.

The analysis here first examines the effects of a revenue neutral implementation of an increase in the TWB on the ETR of firms of all characteristics. Then, the analysis focuses on differences brought about by changes in the tax base in both the TWP and the ETR on firms with specific characteristics. Taxable wage proportion data exclude the effect caused by differences in experience rates among categories of firms. They focus attention on the differences among groups of firms caused by differences in average wages. Data on the Effective Tax Rate include the effect of differences in experience rates across categories of firms. They focus attention on the full effect of raising the TWB on firms with different characteristics.

Exhibit 4-4

Effects of Increased Tax Base on Selected Low and High-Wage Firms for Texas

	Tax Base	Average Wage	Avg. No. of Workers	TWP	Avg. UI Tax Rate	ETR
"Low" Average Wage Firms	$7,000			0.846		1.08%
	$14,000			0.948		1.20%
	$28,000	$3,963	11	0.98	1.17%	1.24%
	$53,400			0.99		1.25%
	$65,000			0.992		1.25%
"High" Average Wage Firms	$7,000			0.165		0.20%
	$14,000			0.311		0.37%
	$28,000	$46,123	40	0.549	1.52%	0.65%
	$53,400			0.786		0.92%
	$65,000			0.831		0.98%
Utilities	$7,000			0.194		0.16%
	$14,000			0.369		0.30%
	$28,000	$37,990	83	0.655	0.99%	0.52%
	$53,400			0.898		0.71%
	$65,000			0.927		0.74%
Retail Trade	$7,000			0.482		0.36%
	$14,000			0.694		0.51%
	$28,000	$11,070	39	0.882	1.15%	0.64%
	$53,400			0.955		0.70%
	$65,000			0.967		0.71%

4.3.2 Revenue Neutral Implementation

An increase in TWB will have two effects. One is to enhance revenues and increase the tax burden on firms. The other effect is to restructure the effective tax rates, shifting the tax burden toward high-wage firms and away from low-wage firms. States that are not now experiencing solvency problems in their State trust funds may decide to opt for a revenue-neutral implementation of the increase in the TWB. They could, for example, halve every firm's tax rate, if they estimate that raising the wage base would otherwise double revenues.

By dividing the Statewide average of ETR for each wage base into the categorywide (size, industry, wage level, experience-rate level) average, it is possible to calculate figures which neutralize the revenue enhancing effect. These results are shown in Exhibits 4-5 through 4-8.

The relative impact of a revenue-neutral implementation of increasing the wage base on firms would be minimal for most firm sizes. For example, in Colorado for 1990, firms with 100 to fewer than 250 employees, would see their ETR increase from 1.11 to 1.13 times the State average as the wage base is increased from $7,000 to $65,000. The smallest and largest sizes of firms would experience the most impact, but even here the impact would be minor. In Maryland for 1990, the smallest firms would experience a decline in their ETR from 0.84 to 0.71 times the State average, while the largest firms would experience an increase from 0.81 to 0.98 times the State average.

The relative impact of a revenue-neutral implementation of increasing the Federal wage base on firms among industries would be considerable for low-and-high wage industries. In Texas during 1991, for example, agriculture, with an average wage of $9,002 (less than one-half the State average) would experience a near halving of its ETR, from 2.11 to 1.20 times the State average ETR at $65,000. Mining had the highest wages, averaging $38,537. This is more than double the State average. This industry would experience an increase in its ETR from 0.54 to 0.82 times the State average ETR.

Firms of different experience-rate levels would experience almost no change in their ETR as the wage base is raised from $7,000 to $65,000. In Missouri during 1990, for example, the second from the largest experience rate group of firms would experience an increase in their ETR from 0.68 to 0.77 times the State average. The highest experience rated firms would only see their ETR falling from 4.22 to 4.19 times the State average. This outcome is to be expected because a revenue neutral increase in the wage base neither enhances nor erodes the impact of experience rating.

A revenue-neutral implementation of an increase in the Federal taxable wage base would have a very large impact on the tax burden for firms with low or high wages.

Exhibit 4-5

Revenue Neutral Implementation[1]: Effects by Firm Size

Size (Number of Employees)	1990 $7,000	$14,000	$28,000	$53,400	$65,000	1991 $7,000	$14,000	$28,000	$53,400	$65,000
Colorado										
Less than 5	1.02	0.97	0.92	0.92	0.92	0.87	0.85	0.78	0.75	0.75
5 (incl.) - 25	1.22	1.19	1.16	1.16	1.16	1.24	1.20	1.15	1.12	1.12
25 (incl.) - 100	1.50	1.45	1.39	1.34	1.34	1.46	1.43	1.39	1.34	1.33
100 (incl.) - 250	1.11	1.12	1.13	1.13	1.13	1.22	1.24	1.25	1.24	1.24
250 or more	0.63	0.67	0.71	0.74	0.74	0.62	0.64	0.69	0.74	0.74
Average	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Maryland										
Less than 5	0.84	0.78	0.72	0.72	0.71	1.01	0.97	0.88	0.81	0.81
5 (incl.) - 25	0.90	0.85	0.77	0.72	0.72	1.07	1.05	0.99	0.91	0.91
25 (incl.) - 100	1.19	1.18	1.14	1.10	1.11	1.24	1.24	1.20	1.14	1.14
100 (incl.) - 250	1.45	1.42	1.35	1.29	1.28	1.40	1.37	1.28	1.21	1.20
250 or more	0.81	0.85	0.92	0.98	0.98	0.75	0.77	0.84	0.92	0.92
Average	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Missouri										
Less than 5	1.68	1.56	1.40	1.38	1.38	1.64	1.51	1.36	1.34	1.34
5 (incl.) - 25	1.44	1.45	1.46	1.46	1.46	1.44	1.47	1.50	1.50	1.50
25 (incl.) - 100	1.21	1.21	1.25	1.27	1.27	1.21	1.21	1.23	1.25	1.25
100 (incl.) - 250	1.12	1.12	1.14	1.15	1.15	1.15	1.15	1.16	1.17	1.17
250 or more	0.68	0.68	0.67	0.67	0.66	0.68	0.69	0.68	0.67	0.67
Average	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Texas										
Less than 5	0.88	0.80	0.71	0.73	0.73	0.94	0.88	0.81	0.84	0.84
5 (incl.) - 25	0.97	0.91	0.83	0.80	0.80	0.90	0.86	0.82	0.81	0.81
25 (incl.) - 100	1.12	1.09	1.04	1.01	1.01	1.15	1.12	1.07	1.03	1.03
100 (incl.) - 250	1.22	1.22	1.20	1.19	1.19	1.28	1.28	1.27	1.25	1.25
250 or more	0.93	0.96	1.01	1.03	1.03	0.91	0.94	0.98	1.00	1.00
Average	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

[1] Calculated by dividing the effective tax rate in each cell by the Statewide effective tax rate.

Exhibit 4-6

Revenue Neutral Implementatio
Effects by Firm Industry

Industry (SIC Range)	1990 $7,000	$14,000	$28,000	$53,400	$65,000	1991 $7,000	$14,000	$2
					Colorado			
Agriculture, Forestry, Fisheries (0100 - 0999)	1.81	1.56	1.35	1.26	1.25	2.13	1.87	
Mining (1000 - 1499)	1.38	1.52	1.70	1.84	1.85	1.22	1.34	
Construction (1500 - 1799)	2.94	2.86	2.76	2.67	2.65	3.82	3.71	
Nondurable Manufacturing (2000 - 2399, 2600 - 3199)	0.99	1.07	1.13	1.12	1.11	1.05	1.12	
Durable Manufacturing (2400 - 2599, 3200 - 3999)	1.23	1.29	1.33	1.32	1.31	1.42	1.54	
Transportation (4000 - 4799)	0.87	0.91	0.95	0.95	0.94	0.87	0.89	
Communication (4800 - 4899)	0.53	0.62	0.73	0.78	0.78	0.40	0.46	
Utilities (4900 - 4999)	0.31	0.37	0.47	0.52	0.52	0.33	0.39	
Wholesale (5000 - 5199)	0.92	0.97	1.02	1.03	1.04	0.96	1.03	
Retail trade (5200 - 5999)	1.29	1.14	1.00	0.94	0.93	1.09	0.95	
Banking (6000 - 6199)	0.79	0.82	0.79	0.76	0.75	0.70	0.74	
Insurance and Real Estate (6200 - 6799)	0.94	0.94	0.93	0.94	0.95	0.83	0.84	
Business and Repair Services (7300 - 7699)	1.27	1.18	1.09	1.05	1.05	1.26	1.15	
Personal Services (7000 - 7299, 7800 - 7999, 8800 - 8899)	1.57	1.34	1.14	1.02	1.00	1.61	1.40	
Professional Services (8000 - 8799, 8900 - 8999)	0.46	0.50	0.54	0.58	0.59	0.41	0.45	
Average	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
					Maryland			
Agriculture, Forestry, Fisheries (0100 - 0999)	2.25	1.96	1.62	1.44	1.42	2.25	1.95	
Mining (1000 - 1499)	3.16	3.45	3.55	3.24	3.20	1.63	1.60	
Construction (1500 - 1799)	2.42	2.42	2.35	2.25	2.23	2.23	2.15	
Nondurable Manufacturing (2000 - 2399, 2600 - 3199)	1.50	1.50	1.39	1.29	1.28	1.14	1.20	
Durable Manufacturing (2400 - 2599, 3200 - 3999)	1.86	2.09	2.49	2.80	2.80	1.65	1.79	
Transportation (4000 - 4799)	1.08	1.05	1.00	0.94	0.93	1.13	1.10	
Communication (4800 - 4899)	0.43	0.47	0.52	0.55	0.56	0.35	0.40	
Utilities (4900 - 4999)	0.16	0.18	0.22	0.25	0.26	0.14	0.16	
Wholesale (5000 - 5199)	0.75	0.78	0.79	0.78	0.79	0.76	0.84	
Retail trade (5200 - 5999)	0.96	0.86	0.77	0.72	0.72	1.38	1.25	
Banking (6000 - 6199)	0.72	0.75	0.73	0.72	0.72	0.81	0.99	
Insurance and Real Estate (6200 - 6799)	0.75	0.79	0.79	0.79	0.80	0.76	0.83	
Business and Repair Services (7300 - 7699)	1.15	1.03	0.95	0.93	0.93	1.28	1.15	
Personal Services (7000 - 7299, 7800 - 7999, 8800 - 8899)	1.43	1.23	1.02	0.91	0.90	1.60	1.44	

Exhibit 4-6(2)

Industry (SIC Range)	1990 $7,000	$14,000	$28,000	$53,400	$65,000	1991 $7,000	$14,000	$2
Professional Services (8000 - 8799, 8900 - 8999)	0.37	0.38	0.37	0.38	0.38	0.40	0.43	
Average	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
					Missouri			
Agriculture, Forestry, Fisheries (0100 - 0999)	2.34	2.21	2.02	1.89	1.88	2.46	2.27	
Mining (1000 - 1499)	2.03	2.21	2.37	2.40	2.39	2.15	2.35	
Construction (1500 - 1799)	2.77	2.92	3.13	3.17	3.16	3.03	3.19	
Nondurable Manufacturing (2000 - 2399, 2600 - 3199)	0.88	0.94	0.97	0.99	0.99	0.91	0.97	
Durable Manufacturing (2400 - 2599, 3200 - 3999)	1.16	1.27	1.29	1.26	1.25	1.28	1.39	
Transportation (4000 - 4799)	1.53	1.49	1.47	1.43	1.41	1.65	1.60	
Communication (4800 - 4899)	0.23	0.25	0.29	0.32	0.33	0.21	0.24	
Utilities (4900 - 4999)	0.09	0.10	0.12	0.12	0.12	0.09	0.10	
Wholesale (5000 - 5199)	0.90	0.94	0.99	1.05	1.07	0.86	0.92	
Retail trade (5200 - 5999)	1.39	1.25	1.14	1.08	1.07	1.36	1.22	
Banking (6000 - 6199)	0.55	0.61	0.63	0.64	0.64	0.50	0.54	
Insurance and Real Estate (6200 - 6799)	0.72	0.76	0.79	0.82	0.83	0.66	0.70	
Business and Repair Services (7300 - 7699)	1.50	1.39	1.37	1.40	1.40	1.52	1.42	
Personal Services (7000 - 7299, 7800 - 7999, 8800 - 8899)	1.65	1.43	1.27	1.22	1.23	1.56	1.38	
Professional Services (8000 - 8799, 8900 - 8999)	0.36	0.34	0.32	0.33	0.34	0.33	0.31	
Average	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
					Texas			
Agriculture, Forestry, Fisheries (0100 - 0999)	1.93	1.63	1.31	1.16	1.14	2.11	1.74	
Mining (1000 - 1499)	0.84	0.92	1.06	1.20	1.24	0.54	0.59	
Construction (1500 - 1799)	2.83	2.76	2.70	2.64	2.62	2.63	2.56	
Nondurable Manufacturing (2000 - 2399, 2600 - 3199)	0.87	0.92	0.96	0.95	0.94	1.03	1.08	
Durable Manufacturing (2400 - 2599, 3200 - 3999)	1.23	1.34	1.45	1.46	1.45	1.26	1.38	
Transportation (4000 - 4799)	0.91	0.93	0.95	0.91	0.90	0.84	0.87	
Communication (4800 - 4899)	0.64	0.71	0.81	0.85	0.84	0.66	0.73	
Utilities (4900 - 4999)	0.34	0.40	0.48	0.54	0.54	0.37	0.43	
Wholesale (5000 - 5199)	0.72	0.77	0.81	0.84	0.84	0.82	0.87	
Retail trade (5200 - 5999)	0.81	0.72	0.61	0.57	0.56	0.83	0.74	
Banking (6000 - 6199)	0.80	0.84	0.82	0.80	0.80	0.88	0.94	
Insurance and Real Estate (6200 - 6799)	0.75	0.78	0.80	0.82	0.84	0.79	0.81	
Business and Repair Services (7300 - 7699)	1.26	1.15	1.05	1.02	1.02	1.25	1.15	
Personal Services (7000 - 7299, 7800 - 7999, 8800 - 8899)	1.26	1.03	0.82	0.75	0.74	1.28	1.05	
Professional Services (8000 - 8799, 8900 - 8999)	0.66	0.65	0.63	0.64	0.65	0.68	0.67	
Average	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

Exhibit 4-7

Revenue Neutral Implementation: Effects by Experience Rating

Experience-Rated Tax Category		1990 $7,000	$14,000	$28,000	$53,400	$65,000	1991 $7,000	$14,000	$28,000	$53,400	$65,000
					Colorado						
	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1	0.22	0.22	0.21	0.23	0.24	0.12	0.12	0.11	0.11	0.12
	2	0.37	0.39	0.42	0.43	0.43	0.30	0.31	0.32	0.33	0.33
	3	0.59	0.58	0.56	0.55	0.55	0.51	0.50	0.48	0.47	0.47
	4	0.69	0.68	0.68	0.68	0.68	0.61	0.60	0.59	0.59	0.59
	5	0.92	0.94	0.94	0.94	0.94	0.90	0.91	0.93	0.93	0.93
	6	2.07	2.03	1.98	1.95	1.95	1.55	1.54	1.51	1.45	1.44
	7	3.86	3.86	3.88	3.92	3.92	4.32	4.32	4.34	4.39	4.41
Average		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
					Maryland						
	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1	0.26	0.20	0.13	0.11	0.11	0.94	1.00	0.57	0.44	0.43
	2	0.10	0.10	0.09	0.09	0.09	0.44	0.49	0.50	0.50	0.51
	3	–	–	–	–	–	–	–	–	–	–
	4	0.32	0.32	0.31	0.31	0.31	0.52	0.56	0.63	0.69	0.70
	5	0.86	0.82	0.77	0.73	0.73	0.87	0.89	0.94	0.93	0.93
	6	1.32	1.27	1.20	1.16	1.16	1.30	1.25	1.20	1.16	1.17
	7	2.85	2.92	3.02	3.08	3.07	2.65	2.57	2.43	2.38	2.36
Average		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
					Missouri						
	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1	0.25	0.26	0.28	0.30	0.30	0.21	0.22	0.24	0.25	0.26
	2	0.68	0.70	0.74	0.76	0.77	0.63	0.65	0.68	0.71	0.71
	3	1.12	1.12	1.13	1.14	1.14	1.10	1.10	1.12	1.14	1.14
	4	1.44	1.46	1.47	1.47	1.47	1.48	1.50	1.49	1.49	1.49
	5	2.18	2.15	2.07	2.03	2.03	2.27	2.23	2.17	2.12	2.12
	6	2.86	2.66	2.52	2.49	2.48	2.85	2.66	2.53	2.50	2.49
	7	4.22	4.27	4.26	4.21	4.19	4.59	4.66	4.66	4.61	4.58
Average		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
					Texas						
	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1	–	–	–	–	–	–	–	–	–	–
	2	0.17	0.16	0.15	0.15	0.15	0.20	0.19	0.18	0.17	0.18
	3	–	–	–	–	–	–	–	–	–	–
	4	0.38	0.37	0.37	0.38	0.37	0.43	0.42	0.42	0.43	0.43
	5	0.78	0.78	0.77	0.78	0.79	0.69	0.69	0.69	0.69	0.70
	6	1.39	1.38	1.37	1.37	1.37	1.40	1.39	1.38	1.36	1.36
	7	2.75	2.78	2.81	2.79	2.78	2.81	2.85	2.88	2.88	2.87
Average		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exhibit 4-8

Revenue Neutral Implementation: Effects by Average Wage

Average Annual Wage Category	1990 $7,000	$14,000	$28,000	$53,400	$65,000	1991 $7,000	$14,000	$28,000	$53,400	$65,000
Colorado										
Less than $3,120	2.38	1.66	1.25	1.08	1.06	3.16	2.15	1.55	1.37	1.35
$3,120 (incl.) - $4,840	2.22	1.62	1.24	1.08	1.06	1.61	1.15	0.85	0.72	0.70
$4,840 (incl.) - $7,460	2.08	1.62	1.28	1.12	1.10	2.44	1.88	1.43	1.21	1.18
$7,460 (incl.) - $11,540	1.68	1.42	1.17	1.04	1.02	1.64	1.42	1.15	1.00	0.97
$11,540 (incl.) - $17,820	1.40	1.31	1.17	1.07	1.06	1.59	1.51	1.34	1.20	1.18
$17,820 (incl.) - $27,520	0.87	0.88	0.87	0.84	0.84	0.88	0.92	0.92	0.88	0.87
$27,520 (incl.) - $42,520	0.74	0.85	0.96	1.01	1.02	0.69	0.78	0.91	0.97	0.97
$42,520 (incl.) - $65,680	0.84	1.01	1.21	1.40	1.44	0.72	0.85	1.06	1.34	1.41
$65,680 or more	0.38	0.45	0.52	0.56	0.59	0.22	0.26	0.33	0.43	0.47
Average	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Maryland										
Less than $4,300	2.62	1.72	1.20	1.00	0.98	3.23	2.05	1.29	1.00	0.96
$4,300 (incl.) - $6,160	1.35	0.95	0.69	0.58	0.57	2.50	1.69	1.11	0.88	0.85
$6,160 (incl.) - $8,840	2.17	1.67	1.25	1.07	1.05	2.62	1.99	1.36	1.10	1.07
$8,840 (incl.) - $12,680	1.44	1.21	0.95	0.82	0.81	1.78	1.57	1.17	0.99	0.96
$12,680 (incl.) - $18,180	1.36	1.29	1.11	1.00	0.99	1.47	1.50	1.26	1.07	1.05
$18,180 (incl.) - $26,080	1.29	1.30	1.25	1.18	1.17	1.15	1.20	1.19	1.08	1.06
$26,080 (incl.) - $37,400	0.65	0.71	0.78	0.80	0.81	0.63	0.69	0.84	0.89	0.89
$37,400 (incl.) - $53,620	0.80	0.94	1.18	1.40	1.41	0.70	0.76	0.96	1.24	1.27
$53,620 or more	0.19	0.20	0.22	0.27	0.29	0.16	0.19	0.25	0.32	0.36
Average	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Missouri										
Less than $2,940	4.31	2.89	2.18	1.93	1.90	4.29	2.88	2.15	1.90	1.86
$2,940 (incl.) - $4,400	2.85	2.01	1.55	1.38	1.36	2.87	2.04	1.56	1.38	1.36
$4,400 (incl.) - $6,580	2.69	2.04	1.63	1.48	1.46	2.72	2.07	1.64	1.48	1.45
$6,580 (incl.) - $9,860	2.59	2.16	1.76	1.59	1.57	2.50	2.12	1.72	1.56	1.54
$9,860 (incl.) - $14,760	1.61	1.53	1.37	1.28	1.26	1.62	1.56	1.40	1.30	1.29
$14,760 (incl.) - $22,100	1.06	1.14	1.13	1.08	1.07	1.06	1.14	1.13	1.07	1.06
$22,100 (incl.) - $33,100	0.76	0.86	0.99	1.02	1.02	0.74	0.84	0.98	1.03	1.03
$33,100 (incl.) - $49,560	0.36	0.42	0.53	0.63	0.65	0.35	0.40	0.51	0.60	0.62
$49,560 or more	0.28	0.34	0.44	0.56	0.60	0.28	0.33	0.42	0.55	0.59
Average	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Texas										
Less than $2,980	2.26	1.48	1.04	0.89	0.87	3.19	2.05	1.44	1.22	1.18
$2,980 (incl.) - $4,560	2.08	1.42	1.02	0.88	0.86	2.52	1.72	1.23	1.04	1.02
$4,560 (incl.) - $6,960	1.79	1.33	0.99	0.86	0.84	1.86	1.39	1.03	0.89	0.87
$6,960 (incl.) - $10,640	0.97	0.79	0.61	0.53	0.52	0.96	0.79	0.62	0.54	0.52
$10,640 (incl.) - $16,260	1.55	1.41	1.20	1.08	1.06	1.65	1.52	1.30	1.17	1.14
$16,260 (incl.) - $24,880	1.33	1.36	1.32	1.24	1.22	1.40	1.44	1.41	1.33	1.31
$24,880 (incl.) - $38,040	1.05	1.14	1.25	1.28	1.27	1.03	1.13	1.24	1.27	1.27
$38,040 (incl.) - $58,160	0.54	0.62	0.75	0.89	0.91	0.47	0.54	0.65	0.77	0.80
$58,160 or more	0.24	0.28	0.34	0.43	0.47	0.23	0.26	0.33	0.44	0.48
Average	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Without exception, firms with very low average wages (firms in the two lowest wage categories for each State) experience more than a halving in their ETR relative to the mean ETR as the TWB is increased from $7,000 to $65,000. As an extreme example, the ETR for the lowest wage firms in Maryland in 1991 would decrease from 3.2 times the mean (at the $7,000 tax base) to 0.96 times the mean. On the other hand, the ratio of the ETR of high wage firms (firms in the two highest wage categories) to the mean ETR nearly doubles as the TWB is increased from $7,000 to $65,000. Still, the highest wage firms pay ETRs significantly lower than the mean even at a $65,000 tax base.

4.3.3 Effects by Firm Size

The analysis by firm size divides firms into five categories: fewer than 5 employees, 5 to fewer than 25 employees, 25 to fewer than 100, 100 to fewer than 250, and over 250. Firms were assigned to each category on the basis of their eight-quarter average employment level.Within firm size categories, the taxable wage proportion increases substantially at lower levels of the taxable wage base, but only moderately as the taxable wage base rises to higher levels. The result is consistent across the four States. For example in Exhibit 4-9 raising the taxable wage base from $7,000 to $28,000 increases the average TWP for Texas in 1990 from 34 percent to 75 percent. Roughly doubling it again to $53,400 raises the TWP only to 89 percent.

Uniformity of the TWP among firm sizes and across States is the general rule. Exhibit 4-9 shows that with few exceptions[6] the TWP for all but the largest firm size is roughly 35 percent at the $7,000 wage base. Differences in the TWP among firm of different sizes diminish as the taxable wage base is increased. At $14,000, the TWP would be roughly 55 percent for all but the largest size group. At $28,000, it would be roughly 76 percent, and at $53,400, it would tend to center around 87 percent. At $65,000, the TWPs tend to center around 90 percent.

The TWP for the largest firm size rises faster than for other firm sizes as the wage base is raised. It increases from the lowest (or almost lowest in Colorado) to the highest TWP of the five firm size categories in all four States and for both years. This is because the firms of 250 and more employees have the highest wages (or nearly the highest wages in Colorado), and there is very little variation in the average wage among the other firm size categories.

There is no consistent pattern, among the four States, as to which firm size group has the highest ETR at the $7,000 TWB. As can be seen in Exhibit 4-10, the smallest firm size in Missouri pays the highest ETR. In Colorado it is the 5 to 25 employee group. In Maryland and Texas it is the 100 to 250 employee group. However, there is a pattern as to which firm size has the lowest ETR. In all States and both years, except Texas in 1990, the 250 and more employee group pays the lowest effective tax rate at the lowest wage base.

As the wage base increases, relative differences in ETR among firm size categories tend to diminish. This trend is especially true for firm sizes that would pay the

[6] Colorado in 1990, for all firm sizes, and the smallest firm size in Missouri for 1990 and Colorado for 1991 are exceptions.

Exhibit 4-9

Taxable Wage Proportions by Firm Size

Size (Number of Employees)	1990 $7,000	$14,000	$28,000	$53,400	$65,000	1991 $7,000	$14,000	$28,000	$53,400	$65,000
Colorado										
Less than 5	33.4	49.2	66.1	80.3	83.5	28.3	44.5	62.8	78.7	83.1
5 (incl.)-25	42.3	61.2	79.3	90.8	93.2	34.7	54.2	74.0	86.0	88.9
25 (incl.)-100	43.7	63.5	82.8	93.3	95.2	34.9	55.1	77.8	91.3	93.7
100 (incl.)-250	41.3	61.7	82.5	93.8	95.7	33.8	54.5	77.8	91.3	93.6
250 or more	36.4	57.6	82.6	96.3	97.7	29.7	50.1	76.7	94.0	96.1
Average	39.4	59.5	81.0	93.4	95.3	32.1	52.1	75.8	90.8	93.2
Maryland										
Less than 5	34.8	54.0	75.3	89.0	91.8	33.8	53.5	74.7	88.1	90.7
5 (incl.)-25	35.1	55.0	75.8	87.3	89.7	34.2	54.6	75.8	87.4	89.8
25 (incl.)-100	32.6	53.3	75.9	88.8	91.2	31.5	51.9	74.8	87.7	90.1
100 (incl.)-250	35.8	57.4	80.4	92.7	94.7	34.5	56.2	79.6	92.4	94.5
250 or more	29.1	49.8	76.8	94.4	96.5	27.6	48.0	75.2	93.5	95.8
Average	32.0	52.6	76.9	91.7	93.9	30.6	51.2	75.8	91.0	93.3
Missouri										
Less than 5	38.9	58.9	75.1	86.4	88.7	37.4	57.0	73.6	84.5	86.9
5 (incl.)-25	35.2	55.9	76.1	86.2	88.1	34.6	55.5	76.9	87.9	89.8
25 (incl.)-100	35.5	56.2	78.1	89.4	91.2	34.2	54.4	76.2	87.8	89.7
100 (incl.)-250	34.4	55.7	78.6	90.4	92.3	34.0	55.2	78.0	89.9	91.8
250 or more	32.9	54.6	79.5	92.4	93.9	31.7	52.9	78.2	92.4	94.1
Average	34.2	55.5	78.4	90.3	92.1	33.1	54.1	77.4	90.2	92.0
Texas										
Less than 5	35.6	52.7	68.2	80.2	83.3	33.6	52.0	68.8	81.8	85.5
5 (incl.)-25	35.3	54.0	71.9	82.6	85.2	31.9	49.7	67.4	78.3	80.9
25 (incl.)-100	35.7	55.5	75.7	87.3	89.6	34.1	53.7	74.0	85.4	87.6
100 (incl.)-250	34.3	54.2	75.8	88.1	90.2	32.7	52.6	74.6	87.7	90.0
250 or more	31.8	51.9	76.7	91.5	93.6	30.5	50.2	74.5	90.3	92.8
Average	33.5	53.2	75.3	88.5	90.8	31.8	51.1	73.1	86.9	89.4

Exhibit 4-10

Effective Tax Rates by Firm Size

Size (Number of Employees)	1990 $7,000	$14,000	$28,000	$53,400	$65,000	1991 $7,000	$14,000	$28,000	$53,400	$65,000
Colorado										
Less than 5	0.45	0.63	0.80	0.92	0.95	0.25	0.39	0.52	0.60	0.62
5 (incl.)-25	0.53	0.77	1.01	1.17	1.20	0.36	0.56	0.77	0.89	0.92
25 (incl.)-100	0.65	0.94	1.21	1.35	1.38	0.42	0.66	0.93	1.07	1.09
100 (incl.)-250	0.49	0.73	0.99	1.14	1.17	0.35	0.57	0.84	0.99	1.02
250 or more	0.27	0.43	0.62	0.74	0.76	0.18	0.30	0.46	0.59	0.61
Average	0.44	0.65	0.87	1.01	1.03	0.29	0.46	0.67	0.80	0.82
Maryland										
Less than 5	0.26	0.40	0.54	0.65	0.66	0.39	0.69	1.08	1.30	1.34
5 (incl.)-25	0.28	0.43	0.58	0.66	0.67	0.41	0.75	1.22	1.46	1.52
25 (incl.)-100	0.37	0.60	0.86	1.00	1.02	0.48	0.88	1.48	1.84	1.90
100 (incl.)-250	0.45	0.72	1.02	1.17	1.19	0.54	0.97	1.58	1.94	2.00
250 or more	0.25	0.44	0.69	0.89	0.90	0.29	0.55	1.03	1.47	1.53
Average	0.31	0.51	0.75	0.91	0.93	0.39	0.71	1.23	1.61	1.66
Missouri										
Less than 5	0.66	0.96	1.16	1.29	1.31	0.67	0.96	1.19	1.33	1.36
5 (incl.)-25	0.56	0.89	1.21	1.36	1.39	0.58	0.94	1.31	1.49	1.52
25 (incl.)-100	0.48	0.75	1.03	1.18	1.21	0.49	0.77	1.07	1.24	1.26
100 (incl.)-250	0.44	0.69	0.95	1.08	1.10	0.47	0.74	1.02	1.16	1.18
250 or more	0.27	0.42	0.56	0.62	0.63	0.28	0.44	0.59	0.66	0.67
Average	0.39	0.61	0.83	0.93	0.95	0.41	0.64	0.87	0.99	1.01
Texas										
Less than 5	0.50	0.72	0.93	1.11	1.15	0.40	0.61	0.82	1.00	1.03
5 (incl.)-25	0.55	0.82	1.07	1.22	1.26	0.39	0.60	0.82	0.96	0.99
25 (incl.)-100	0.63	0.98	1.35	1.54	1.58	0.49	0.78	1.08	1.23	1.26
100 (incl.)-250	0.69	1.10	1.56	1.81	1.86	0.55	0.89	1.28	1.50	1.54
250 or more	0.52	0.87	1.31	1.58	1.62	0.39	0.66	0.99	1.19	1.23
Average	0.56	0.91	1.30	1.53	1.57	0.43	0.70	1.01	1.19	1.23

highest and lowest ETR at the $7,000 wage base. For example, in Colorado in 1991, the 250 and more employee firm size would pay an 0.18 percent ETR at the $7,000 wage base. This is 62 percent of the average of 0.29 percent for all firms. At the $65,000 wage base these firms would pay a 0.61 percent ETR or 74 percent of the average for all firms. The 25 to 100 employee firm size group, at the $7,000 wage base, would pay a 0.42 percent ETR or 46 percent more than the average for all firms. At the $65,000 wage base, these firms would pay a 1.09 percent ETR or 33 percent more than the average for all firms. The exception here is Missouri, where the tax rate for the largest firm category remains substantially below the average for all firm sizes.

To summarize the effects of raising the wage base on firms of varying sizes, firms of all sizes would pay more as the wage base is raised in States that do not have an existing taxable wage base lower than the new Federal wage base. The relative differences among most firm size groups would be generally reduced as the wage base is increased. The data collected from the four sample States suggest that there is no correlation between firm size and tax rates.

4.3.4 Effects by Industry

For the analysis of the effects on firms by industry, firms are divided into 15 industry groups according to SIC codes as shown in Exhibit 4-11. The industry Exhibits 4-11 and 4-12 are the same format as the size Exhibits 4-9 and 4-10 except the category is by industry rather than by size.

Several general points can be made. First, as might be expected, industries that have either a cyclical character or have been affected by structural changes in the economy pay a higher tax rate and would continue to pay a high ETR as the wage base increased. Second, high wage industries would see a substantially higher ETR than low wage industries as the wage base is raised. Third, ETRs tend to converge if the wage base is raised. Fourth, despite convergence and high growth in ETR for high wage industries, those industries that paid the highest ETRs would continue to pay the highest ETRs at the $65,000 wage base and those industries that paid the lowest ETRs would continue to pay the lowest.

The TWP data show that the industries with the highest TWPs at low tax bases are the same across States, and they tend to be industries with the lowest wages. For example, Exhibit 4-10 and Exhibits C-1 through C-8 in appendix C, show that in all four States, the four industries with the highest TWP at the $7,000 wage base are agriculture, retail trade, personal services, and business and repair services. These are also the four lowest wage industries. Utilities and communication are among the industries with the lowest TWP for all four States. They are also among the industries with the highest wages.

As the wage base is raised, the differences in TWPs across industries tend to converge. For example, in Texas during 1990, the TWP for each industry is within 73 percent of the average for the State at the $7,000 wage base. If the wage base were raised to $28,000, the TWP for each industry would be within 24 percent of the average, and would be within 17 percent at the $65,000 wage base. That is, raising the wage base compensates for differences in the average wage across industries.

Exhibit 4-11

Taxable Wage Proportions by F
Industry

Industry (SIC Range)	1990 $7,000	$14,000	$28,000	$53,400	$65,000	$7,000	$14,000	$
						Colorado		
Agriculture, Forestry, Fisheries (0100-0999)	54.6	72.3	86.6	95.1	96.8	45.8	67.1	
Mining (1000-1499)	26.5	45.1	70.0	89.6	93.1	20.4	37.0	
Construction (1500-1799)	43.3	63.5	84.7	96.0	97.3	38.1	59.8	
Nondurable Manufacturing (2000-2399, 2600-3199)	36.3	58.1	82.3	94.2	95.8	30.5	52.7	
Durable Manufacturing (2400-2599, 3200-3999)	37.1	59.2	83.3	96.1	97.5	29.9	52.4	
Transportation (4000-4799)	34.5	54.8	79.5	93.8	95.5	28.5	48.4	
Communication (4800-4899)	25.9	46.6	78.3	95.8	97.2	20.3	38.3	
Utilities (4900-4999)	23.5	43.0	74.6	97.1	98.5	20.0	38.4	
Wholesale (5000-5199)	34.9	54.9	78.0	92.7	95.4	27.3	47.1	
Retail trade (5200-5999)	55.5	73.0	87.5	95.4	96.8	48.6	68.2	
Banking (6000-6199)	43.1	66.8	86.7	96.1	97.6	34.5	58.9	
Insurance and Real Estate (6200-6799)	35.4	54.2	73.9	87.2	90.1	28.0	46.9	
Business and Repair Services (7300-7699)	48.4	66.7	83.9	94.4	96.3	40.2	59.6	
Personal Services (7000-7299, 7800-7999, 8800-8899)	65.6	83.5	95.1	98.9	99.4	55.2	76.9	
Professional Services (8000-8799, 8900-8999)	35.5	56.3	78.9	91.5	93.4	27.3	46.6	
Average	39.4	59.5	81.0	93.4	95.3	32.1	52.1	
						Maryland		
Agriculture, Forestry, Fisheries (0100-0999)	45.8	67.3	85.2	93.7	95.1	44.1	66.4	
Mining (1000-1499)	29.0	51.8	82.8	96.6	97.7	24.9	44.6	
Construction (1500-1799)	35.2	57.3	81.4	93.8	95.5	33.8	56.3	
Nondurable Manufacturing (2000-2399, 2600-3199)	31.5	54.8	82.3	94.8	96.2	29.7	52.8	
Durable Manufacturing (2400-2599, 3200-3999)	25.4	46.2	75.3	95.2	97.1	23.7	44.0	
Transportation (4000-4799)	32.6	54.9	82.1	95.3	96.5	31.4	53.3	
Communication (4800-4899)	21.9	40.7	71.3	95.0	97.6	19.9	37.8	
Utilities (4900-4999)	18.3	35.4	65.3	94.9	98.0	16.8	32.7	
Wholesale (5000-5199)	28.0	48.4	73.3	89.4	92.5	27.2	47.6	
Retail trade (5200-5999)	45.4	66.0	85.2	94.7	96.1	44.8	65.8	
Banking (6000-6199)	33.7	57.2	79.4	91.3	93.7	30.1	53.0	
Insurance and Real Estate (6200-6799)	27.8	48.1	72.3	86.7	89.7	26.1	46.2	
Business and Repair Services (7300-7699)	36.3	55.3	77.2	92.3	94.9	34.4	53.8	
Personal Services (7000-7299, 7800-7999, 8800-8899)	47.8	69.0	87.2	95.7	97.2	45.0	66.9	
Professional Services (8000-8799, 8900-8999)	28.2	48.4	72.7	88.1	90.7	27.2	47.4	
Average	32.0	52.6	76.9	91.7	93.9	30.6	51.2	

Exhibit 4-11(2)

Industry (SIC Range)	1990 $7,000	$14,000	$28,000	$53,400	$65,000	2000 $7,000	$14,000	$
						Missouri		
Agriculture, Forestry, Fisheries (0100-0999)	49.4	73.3	90.7	96.3	97.2	49.4	73.6	
Mining (1000-1499)	27.5	48.5	75.1	89.7	91.7	27.9	49.2	
Construction (1500-1799)	35.7	58.7	84.4	96.0	97.1	34.6	57.0	
Nondurable Manufacturing (2000-2399, 2600-3199)	26.8	46.5	69.3	83.0	85.1	26.4	46.3	
Durable Manufacturing (2400-2599, 3200-3999)	30.6	54.3	81.0	93.4	94.9	29.9	53.1	
Transportation (4000-4799)	36.9	59.6	84.9	95.6	96.4	36.1	58.6	
Communication (4800-4899)	20.6	38.7	68.1	90.9	93.6	19.9	37.4	
Utilities (4900-4999)	21.1	40.5	73.2	96.6	98.2	20.1	38.8	
Wholesale (5000-5199)	28.8	48.9	72.4	87.2	90.1	27.8	47.7	
Retail trade (5200-5999)	49.2	70.6	89.3	96.7	97.5	48.4	69.6	
Banking (6000-6199)	34.0	58.8	81.5	93.1	95.1	33.5	58.4	
Insurance and Real Estate (6200-6799)	27.7	47.8	70.6	84.7	87.5	25.9	45.4	
Business and Repair Services (7300-7699)	38.8	57.5	77.2	89.3	91.3	37.6	56.5	
Personal Services (7000-7299, 7800-7999, 8800-8899)	43.9	61.2	74.2	80.7	82.1	41.8	59.2	
Professional Services (8000-8799, 8900-8999)	34.0	55.6	78.5	89.4	91.1	32.2	53.4	
Average	34.2	55.5	78.4	90.3	92.1	33.1	54.1	
						Texas		
Agriculture, Forestry, Fisheries (0100-0999)	57.8	80.6	93.4	98.1	98.6	52.8	74.5	
Mining (1000-1499)	19.2	34.5	58.6	81.6	86.4	16.3	29.9	
Construction (1500-1799)	39.3	60.8	83.9	95.2	96.7	36.9	58.1	
Nondurable Manufacturing (2000-2399, 2600-3199)	31.0	53.3	80.5	95.5	96.9	29.8	51.6	
Durable Manufacturing (2400-2599, 3200-3999)	30.1	51.8	77.8	91.1	93.0	28.8	50.7	
Transportation (4000-4799)	30.1	51.1	77.4	90.6	92.3	28.6	49.3	
Communication (4800-4899)	23.6	43.3	73.9	93.0	95.2	22.5	41.8	
Utilities (4900-4999)	20.1	38.3	67.3	90.4	92.9	19.4	36.9	
Wholesale (5000-5199)	27.4	46.8	70.8	87.6	90.9	26.4	45.6	
Retail trade (5200-5999)	49.7	70.8	89.0	96.0	97.1	48.2	69.4	
Banking (6000-6199)	32.5	55.8	78.4	90.9	93.4	30.9	54.0	
Insurance and Real Estate (6200-6799)	26.6	44.3	64.2	77.8	81.2	25.0	42.0	
Business and Repair Services (7300-7699)	46.8	66.7	84.2	93.9	95.7	43.8	63.5	
Personal Services (7000-7299, 7800-7999, 8800-8899)	52.5	70.0	81.1	86.9	88.1	50.4	68.6	
Professional Services (8000-8799, 8900-8999)	27.8	44.0	60.9	72.6	75.5	26.3	42.3	
Average	33.5	53.2	75.3	88.5	90.8	31.8	51.1	

Exhibit 4-12

Effective Tax Rates by Firm Ind

Industry (SIC Range)	1990 $7,000	$14,000	$28,000	$53,400	$65,000	$7,000	$14,000	$
					Colorado			
Agriculture, Forestry, Fisheries (0100-0999)	0.79	1.01	1.18	1.28	1.29	0.62	0.87	
Mining (1000-1499)	0.60	0.99	1.48	1.85	1.91	0.35	0.62	
Construction (1500-1799)	1.29	1.85	2.41	2.70	2.74	1.11	1.72	
Nondurable Manufacturing (2000-2399, 2600-3199)	0.43	0.69	0.99	1.13	1.15	0.30	0.52	
Durable Manufacturing (2400-2599, 3200-3999)	0.54	0.84	1.16	1.33	1.35	0.41	0.71	
Transportation (4000-4799)	0.38	0.59	0.83	0.96	0.97	0.25	0.42	
Communication (4800-4899)	0.23	0.40	0.64	0.78	0.80	0.12	0.21	
Utilities (4900-4999)	0.14	0.24	0.41	0.52	0.53	0.09	0.18	
Wholesale (5000-5199)	0.40	0.63	0.88	1.04	1.07	0.28	0.48	
Retail trade (5200-5999)	0.56	0.74	0.87	0.95	0.96	0.32	0.44	
Banking (6000-6199)	0.35	0.53	0.69	0.76	0.78	0.20	0.34	
Insurance and Real Estate (6200-6799)	0.41	0.61	0.81	0.95	0.98	0.24	0.39	
Business and Repair Services (7300-7699)	0.56	0.76	0.95	1.06	1.08	0.37	0.54	
Personal Services (7000-7299, 7800-7999, 8800-8899)	0.69	0.87	0.99	1.03	1.04	0.47	0.65	
Professional Services (8000-8799, 8900-8999)	0.20	0.32	0.47	0.59	0.61	0.12	0.21	
Average	0.44	0.65	0.87	1.01	1.03	0.29	0.46	
					Maryland			
Agriculture, Forestry, Fisheries (0100-0999)	0.70	1.00	1.22	1.30	1.31	0.87	1.39	
Mining (1000-1499)	0.98	1.76	2.67	2.94	2.96	0.63	1.14	
Construction (1500-1799)	0.75	1.24	1.77	2.04	2.07	0.86	1.53	
Nondurable Manufacturing (2000-2399, 2600-3199)	0.46	0.76	1.05	1.17	1.18	0.44	0.85	
Durable Manufacturing (2400-2599, 3200-3999)	0.57	1.07	1.87	2.54	2.59	0.63	1.28	
Transportation (4000-4799)	0.33	0.53	0.75	0.85	0.86	0.43	0.78	
Communication (4800-4899)	0.13	0.24	0.39	0.50	0.52	0.13	0.28	
Utilities (4900-4999)	0.05	0.09	0.16	0.23	0.24	0.06	0.11	
Wholesale (5000-5199)	0.23	0.40	0.59	0.71	0.73	0.29	0.60	
Retail trade (5200-5999)	0.30	0.44	0.58	0.66	0.67	0.53	0.89	
Banking (6000-6199)	0.22	0.38	0.55	0.65	0.67	0.31	0.70	
Insurance and Real Estate (6200-6799)	0.23	0.40	0.60	0.71	0.74	0.29	0.59	
Business and Repair Services (7300-7699)	0.36	0.53	0.71	0.84	0.86	0.49	0.82	
Personal Services (7000-7299, 7800-7999, 8800-8899)	0.44	0.63	0.77	0.83	0.84	0.62	1.02	
Professional Services (8000-8799, 8900-8999)	0.12	0.19	0.28	0.34	0.35	0.15	0.30	
Average	0.31	0.51	0.75	0.91	0.93	0.39	0.71	

Exhibit 4-12(2)

Industry (SIC Range)	1990 $7,000	$14,000	$28,000	$53,400	$65,000	$7,000	$14,000
					Missouri		
Agriculture, Forestry, Fisheries (0100-0999)	0.92	1.36	1.67	1.77	1.78	1.00	1.45
Mining (1000-1499)	0.80	1.36	1.96	2.24	2.28	0.87	1.50
Construction (1500-1799)	1.09	1.79	2.59	2.96	3.01	1.23	2.04
Nondurable Manufacturing (2000-2399, 2600-3199)	0.35	0.58	0.80	0.92	0.94	0.37	0.62
Durable Manufacturing (2400-2599, 3200-3999)	0.46	0.78	1.07	1.17	1.19	0.52	0.89
Transportation (4000-4799)	0.60	0.91	1.22	1.33	1.34	0.67	1.02
Communication (4800-4899)	0.09	0.16	0.24	0.30	0.31	0.09	0.15
Utilities (4900-4999)	0.04	0.06	0.10	0.11	0.11	0.03	0.06
Wholesale (5000-5199)	0.35	0.58	0.82	0.98	1.02	0.35	0.59
Retail trade (5200-5999)	0.55	0.77	0.94	1.01	1.02	0.55	0.78
Banking (6000-6199)	0.22	0.37	0.52	0.60	0.61	0.20	0.35
Insurance and Real Estate (6200-6799)	0.28	0.46	0.65	0.76	0.79	0.27	0.45
Business and Repair Services (7300-7699)	0.59	0.86	1.13	1.31	1.33	0.62	0.91
Personal Services (7000-7299, 7800-7999, 8800-8899)	0.65	0.88	1.06	1.14	1.17	0.63	0.88
Professional Services (8000-8799, 8900-8999)	0.14	0.21	0.27	0.31	0.32	0.13	0.20
Average	0.39	0.61	0.83	0.93	0.95	0.41	0.64
					Texas		
Agriculture, Forestry, Fisheries (0100-0999)	1.09	1.48	1.70	1.78	1.79	0.90	1.21
Mining (1000-1499)	0.48	0.83	1.38	1.84	1.94	0.23	0.41
Construction (1500-1799)	1.59	2.50	3.50	4.03	4.10	1.13	1.79
Nondurable Manufacturing (2000-2399, 2600-3199)	0.49	0.84	1.24	1.45	1.47	0.44	0.75
Durable Manufacturing (2400-2599, 3200-3999)	0.69	1.22	1.88	2.23	2.27	0.54	0.97
Transportation (4000-4799)	0.51	0.84	1.24	1.40	1.41	0.36	0.61
Communication (4800-4899)	0.36	0.64	1.05	1.29	1.32	0.28	0.51
Utilities (4900-4999)	0.19	0.36	0.62	0.82	0.85	0.16	0.30
Wholesale (5000-5199)	0.41	0.69	1.04	1.28	1.32	0.35	0.61
Retail trade (5200-5999)	0.46	0.65	0.80	0.87	0.88	0.36	0.51
Banking (6000-6199)	0.45	0.76	1.06	1.22	1.25	0.38	0.66
Insurance and Real Estate (6200-6799)	0.42	0.71	1.03	1.26	1.31	0.34	0.57
Business and Repair Services (7300-7699)	0.71	1.04	1.36	1.56	1.60	0.54	0.80
Personal Services (7000-7299, 7800-7999, 8800-8899)	0.71	0.93	1.07	1.14	1.16	0.55	0.74
Professional Services (8000-8799, 8900-8999)	0.37	0.59	0.82	0.98	1.02	0.29	0.47
Average	0.56	0.91	1.30	1.53	1.57	0.43	0.70

As the wage base is increased, ETRs converge only slightly compared to the convergence of the TWPs. For example, in Texas during 1990, the ETR for each industry is within 183 percent of the average at the $7,000 wage base. If the wage base were raised to $28,000, the ETR for each industry would be within 170 percent of the average, and would be within 162 percent at the $65,000 wage base.

Construction, agriculture, mining, and durable manufacturing are four industries which experience cyclical, seasonal, or structural changes to employment. They also have the highest ETR at the $7,000 wage base in most States.High wage industries would experience much larger increases in their ETR than low wage industries. For example, in Texas during 1990, utilities had the second highest average annual wage of $36,552. The increase in the ETR for utilities would grow the most of any industry if the wage base was raised from $7,000 to $65,000. Agriculture had the lowest average annual wage of $9,002. Its ETR would grow 64 percent if the wage base were raised from $7,000 to $65,000, almost the least of any industry.

The highest and lowest ETR industries remain the highest and lowest when the wage base is raised from $7,000 to $65,000. For example, in Texas during 1990, utilities would have continued to pay the lowest ETR at the $65,000 wage base. Agriculture would have only dropped from the second to fourth highest ETR paying sector at $65,000. Construction would pay the highest ETR at the $7,000, and $65,000 wage bases. Utilities and professional services, among the lowest ETR paying industries at the $7,000 wage base, would remain paying the lowest ETR at $65,000 wage base.

In sum, raising the wage base would cause all industries to pay more and encourage some convergence in the effective tax rates. It would also increase the ETR for high wage industries more than for low wage industries. However, it would not significantly alter the relative order of high ETR industries to low ETR industries.

4.3.5 Effects on Firms With Different Experience-Rated UI Tax Rates

For the analysis of the effects by firms with different experience-rated tax rates, we divided firms into eight groups. The first group is the 0.00 tax rate firms.[7] The others are divided into seven percentile groups based on the weighted average of their tax rate. The lowest experience-rated firms above 0.00 would be in group 1, the highest experience-rated firms would be in group 7. The firms by experience rate shown in Exhibits 4-13 and 4-14 are in the same format as the size exhibits, except for the category is by experience-rated tax rate group rather than by size.

In several cases, a higher proportion of firms had the same tax rate than should be in a septile (14 percent). For example, firms in Texas with tax rates of 0.29 percent in 1990 and 0.27 percent in 1991 and firms with tax rates in Maryland of 0.10 percent and 1.075 percent in 1991 accounted for 20 to 25 percent of the firms. Consequently, Texas is missing the first and third categories and Maryland is missing the third experience-rated tax rate category.

[7] In Colorado, Maryland and Missouri these zero experience-rated firms most likely include reimbursing firms.

Exhibit 4-13

Taxable Wage Proportions by Experience-Rated Tax Category

Experience-Rated Tax Category	1990 $7,000	$14,000	$28,000	$53,400	$65,000	1991 $7,000	$14,000	$28,000	$53,400	$65,000
Colorado										
0	38.0	61.4	87.1	98.2	99.0	30.9	53.4	82.3	97.4	98.5
1	32.3	46.9	61.8	77.0	81.0	33.0	48.7	64.3	78.8	83.8
2	34.1	53.0	76.5	90.8	92.5	28.7	46.7	70.9	88.1	90.8
3	42.8	62.6	81.8	93.0	95.1	35.3	55.6	76.8	90.8	93.6
4	40.2	59.0	78.8	90.9	93.2	32.1	51.0	72.3	86.2	88.8
5	39.7	59.8	81.1	93.7	95.7	31.9	52.1	75.8	91.2	93.8
6	43.6	63.5	83.5	94.7	96.5	35.8	56.5	79.2	91.8	94.1
7	41.0	60.4	81.4	95.0	97.1	32.3	51.8	74.8	91.2	94.4
Average	39.4	59.5	81.0	93.4	95.3	32.1	52.1	75.8	90.8	93.2
Maryland										
0	30.8	53.8	82.7	98.1	99.3	30.7	54.4	83.7	98.7	99.3
1	79.8	100.0	100.0	100.0	100.0	80.9	100.0	100.0	100.0	100.0
2	31.7	49.6	69.1	81.4	84.7	30.4	48.6	68.1	80.9	84.1
4	30.4	49.9	73.8	90.0	92.7	28.6	47.9	72.2	89.4	92.4
5	34.3	55.7	79.4	92.4	94.4	32.7	53.7	78.3	91.8	94.0
6	34.4	55.5	79.0	92.7	94.9	32.7	53.7	77.2	91.1	93.6
7	31.3	52.3	77.6	93.5	95.4	30.1	51.1	76.7	92.8	94.9
Average	32.0	52.6	76.9	91.7	93.9	30.6	51.2	75.8	91.0	93.3
Missouri										
0	31.5	54.4	82.3	95.7	97.0	30.0	51.9	79.3	94.1	95.5
1	29.1	48.9	73.0	88.3	90.8	28.4	47.7	71.7	87.7	90.4
2	31.0	50.0	70.7	82.3	84.3	31.1	50.8	72.6	85.1	87.2
3	37.6	58.5	79.7	90.7	92.5	35.1	55.2	76.7	88.4	90.4
4	35.7	56.9	77.3	87.1	88.8	34.8	55.9	76.2	86.5	88.3
5	41.8	64.6	84.3	93.2	94.7	41.9	64.6	85.4	94.9	96.2
6	45.5	66.3	84.6	94.3	95.7	44.3	65.4	84.8	94.9	96.3
7	41.0	64.9	86.8	96.4	97.5	39.3	62.8	85.5	95.7	96.8
Average	34.2	55.5	78.4	90.3	92.1	33.1	54.1	77.4	90.2	92.0
Texas										
0	45.1	67.1	91.0	98.1	98.9	44.8	66.7	90.6	97.9	98.7
2	33.1	50.1	66.2	77.1	80.1	32.0	49.5	65.8	76.6	79.7
4	32.7	52.1	74.5	88.5	90.6	31.5	50.7	73.3	88.2	90.5
5	31.8	51.2	73.1	87.4	90.0	29.7	48.2	69.7	84.8	87.6
6	33.9	54.3	77.1	90.5	92.7	31.7	51.6	74.2	87.8	90.3
7	33.5	54.4	78.7	92.2	94.3	31.6	52.2	76.3	90.4	92.6
Average	33.5	53.2	75.3	88.5	90.8	31.8	51.1	73.1	86.9	89.4

Exhibit 4-14

Effective Tax Rates by Experience-Rated Tax Category

Experience-Rated Tax Category	1990 $7,000	$14,000	$28,000	$53,400	$65,000	1991 $7,000	$14,000	$28,000	$53,400	$65,000
					Colorado					
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1	0.10	0.14	0.19	0.23	0.24	0.04	0.05	0.07	0.09	0.10
2	0.16	0.26	0.37	0.44	0.45	0.09	0.14	0.21	0.27	0.27
3	0.26	0.38	0.49	0.56	0.57	0.15	0.23	0.32	0.38	0.39
4	0.30	0.44	0.59	0.68	0.70	0.18	0.28	0.40	0.47	0.48
5	0.40	0.61	0.82	0.95	0.97	0.26	0.42	0.62	0.74	0.77
6	0.90	1.31	1.73	1.97	2.01	0.45	0.72	1.00	1.16	1.19
7	1.69	2.50	3.38	3.96	4.05	1.25	2.01	2.90	3.51	3.63
Average	0.44	0.65	0.87	1.01	1.03	0.29	0.46	0.67	0.80	0.82
					Maryland					
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1	0.08	0.10	0.10	0.10	0.10	0.36	0.71	0.71	0.71	0.71
2	0.03	0.05	0.07	0.08	0.08	0.17	0.35	0.62	0.80	0.84
4	0.10	0.16	0.24	0.28	0.29	0.20	0.40	0.77	1.11	1.17
5	0.27	0.42	0.58	0.66	0.67	0.33	0.64	1.16	1.49	1.54
6	0.41	0.65	0.90	1.05	1.08	0.50	0.89	1.48	1.87	1.94
7	0.88	1.49	2.27	2.79	2.85	1.02	1.83	3.00	3.83	3.93
Average	0.31	0.51	0.75	0.91	0.93	0.39	0.71	1.23	1.61	1.66
					Missouri					
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1	0.10	0.16	0.23	0.28	0.28	0.08	0.14	0.21	0.25	0.26
2	0.27	0.43	0.61	0.71	0.73	0.26	0.42	0.60	0.70	0.72
3	0.44	0.69	0.94	1.06	1.09	0.44	0.70	0.98	1.13	1.15
4	0.57	0.90	1.22	1.37	1.40	0.60	0.96	1.30	1.47	1.50
5	0.86	1.32	1.72	1.90	1.93	0.92	1.43	1.89	2.11	2.14
6	1.12	1.63	2.08	2.32	2.36	1.16	1.71	2.21	2.48	2.51
7	1.66	2.62	3.53	3.93	3.98	1.86	2.98	4.07	4.57	4.63
Average	0.39	0.61	0.83	0.93	0.95	0.41	0.64	0.87	0.99	1.01
					Texas					
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.10	0.15	0.19	0.22	0.23	0.09	0.13	0.18	0.21	0.22
4	0.21	0.34	0.49	0.57	0.59	0.18	0.29	0.43	0.51	0.53
5	0.44	0.70	1.00	1.20	1.24	0.30	0.48	0.69	0.83	0.85
6	0.79	1.25	1.78	2.10	2.15	0.60	0.97	1.39	1.63	1.67
7	1.55	2.52	3.64	4.26	4.36	1.21	1.99	2.90	3.44	3.52
Average	0.56	0.91	1.30	1.53	1.57	0.43	0.70	1.01	1.19	1.23

Several points emerge from the data. Of course, the effective tax rate is higher for firms with a higher experience-rated tax rate. While each group of firms would experience an increase in ETR if the wage base were raised, the relative differences among them would remain constant in the first year. The disincentives for layoffs or the relative ETR differences among high experience rate firms and low experience rate firms remain constant as the wage base is raised. For example, in Texas, the lowest experience-rated firms pay 17 percent of the average ETR at the $7,000 wage base and 15 percent at the $65,000 wage base. The highest experience-rated firms pay approximately 275 percent of the average at both wage bases. Of course, over more than 1 year, States with different experience-rating systems will be affected differently, as discussed in Chapter 1.

The taxable wage proportion increases within each experience-rated tax rate category as the taxable wage base increases. However, there seems to be no discernable relationship between the taxable wage proportion and the experience-rated tax rate. Apparently, absent any control for industry, there is no systematic relation between the wage distribution and layoff experience.

4.3.6 Effects on Firms With Different Wage Levels

The analysis of the effects by firms of different average wage levels divides firms into nine wage-level groups according to the wage ranges in Exhibit 4-15. These ranges were chosen by dividing firms into one-half standard deviation ranges around the mean of the natural log of wages. The natural log of wages was used since it conforms more closely to a normal curve than do wages. The lowest and highest wage groups are open ended, to include firms with average wage levels more than 2.25 standard deviations below and above the mean for all firms. The wage level Exhibits 4-15 and 4-16 are the same format as the size Exhibits except that the category is by wage-level rather than by size.

Several general points can be made. First, at lower wage bases, low wage firms pay a higher ETR than high wage firms. Second, as the wage base is increased, high wage firms experience a greater increase in their ETR than low wage firms. It therefore follows that raising the wage base would equalize the tax burden among firms with different wage levels. Finally, despite the tendency towards equalization, the highest wage level firms would still have an ETR that is 30 to 60 percent of that of the average firm even at the $65,000 wage base.

As can be seen in Exhibit 4-15, there is a definite pattern between average wages and the TWP. There are large differences in the TWP among firms with different average wages at the $7,000 wage base and hardly any at the $65,000 wage base. At $7,000 there is as much as a ten-fold difference between the TWP of the highest wage-level firm group and the lowest wage-level group in Colorado during 1991. At the $65,000 wage base those differences all but disappear for all wage-level groups except the largest. For the highest average wage category, the TWP is substantially lower. This is because, as is obvious in Colorado, the average annual wage of workers in the highest wage firms is considerably higher than $65,000. In Maryland and Missouri the average annual wage of workers in the highest wage firms is only slightly higher than $65,000.

Exhibit 4-15

Taxable Wage Proportions by Average Wage Level

Average Annual Wage Category	1990 $7,000	$14,000	$28,000	$53,400	$65,000	1991 $7,000	$14,000	$28,000	$53,400	$65,000
Colorado										
Less than $3,120	90.2	94.1	97.0	99.2	99.6	84.1	90.3	94.7	98.3	99.2
$3,120 (incl.)—$4,840	85.7	94.0	97.6	98.9	99.2	79.7	91.1	97.0	99.1	99.4
$4,840 (incl.)—$7,460	79.4	90.9	97.4	99.4	99.7	72.5	88.4	96.6	99.2	99.5
$7,460 (incl.)—$11,540	68.8	87.0	96.3	98.8	99.2	58.0	81.1	94.2	98.1	98.7
$11,540 (incl.)—$17,820	53.6	76.4	92.6	98.1	98.9	44.7	69.7	90.3	97.2	98.2
$17,820 (incl.)—$27,520	39.6	62.1	85.3	96.0	97.3	31.5	54.1	80.9	94.9	96.5
$27,520 (incl.)—$42,520	27.9	48.0	75.4	93.2	95.6	22.1	40.8	69.4	90.3	93.5
$42,520 (incl.)—$65,680	22.0	39.2	62.7	84.5	89.0	15.9	29.8	52.5	77.7	83.6
$65,680 or more	12.7	21.7	35.3	50.4	55.9	8.4	16.4	29.6	45.3	51.3
Average	39.4	59.5	81.0	93.4	95.3	32.1	52.1	75.8	90.8	93.2
Maryland										
Less than $4,300	85.4	95.2	99.2	99.9	100.0	82.3	93.2	98.9	99.7	99.8
$4,300 (incl.)—$6,160	76.4	89.5	96.5	98.8	99.0	74.4	88.5	96.4	98.5	98.8
$6,160 (incl.)—$8,840	68.3	86.5	96.0	98.7	99.1	65.2	84.7	95.6	98.7	99.2
$8,840 (incl.)—$12,680	55.0	77.4	92.7	98.1	98.7	53.3	76.5	91.6	98.0	98.7
$12,680 (incl.)—$18,180	44.1	68.5	88.4	95.9	96.9	42.7	67.9	89.1	96.8	97.9
$18,180 (incl.)—$26,080	35.4	59.8	85.7	95.8	97.0	33.0	57.3	84.5	96.2	97.3
$26,080 (incl.)—$37,400	25.4	46.2	74.7	92.7	95.1	25.0	45.9	74.7	92.1	94.5
$37,400 (incl.)—$53,620	18.5	34.9	61.6	87.0	91.2	17.2	32.8	59.0	85.3	90.0
$53,620 or more	11.6	21.5	37.0	54.7	61.0	10.2	19.4	34.2	51.4	57.7
Average	32.0	52.6	76.9	91.7	93.9	30.6	51.2	75.8	91.0	93.3
Missouri										
Less than $2,940	93.5	98.1	99.9	100.0	100.0	92.3	98.0	99.8	100.0	100.0
$2,940 (incl.)—$4,400	80.9	91.8	97.7	99.3	99.6	80.1	91.3	97.5	99.4	99.6
$4,400 (incl.)—$6,580	74.7	89.1	96.8	99.0	99.3	73.6	88.8	96.6	98.9	99.2
$6,580 (incl.)—$9,860	64.9	86.3	96.4	98.9	99.1	62.6	84.3	95.2	98.4	98.9
$9,860 (incl.)—$14,760	49.8	75.3	92.5	97.9	98.5	47.9	73.3	91.3	97.6	98.3
$14,760 (incl.)—$22,100	38.3	64.9	89.2	96.9	97.6	37.0	63.1	88.5	97.0	97.8
$22,100 (incl.)—$33,100	28.7	51.2	79.6	92.8	94.5	27.1	49.1	77.9	92.6	94.3
$33,100 (incl.)—$49,560	19.4	36.9	65.2	87.5	90.8	18.6	35.2	62.5	85.5	88.9
$49,560 or more	10.4	19.5	33.9	49.2	53.5	10.6	19.9	34.8	51.8	56.6
Average	34.2	55.5	78.4	90.3	92.1	33.1	54.1	77.4	90.2	92.0
Texas										
Less than $2,980	92.3	97.4	98.7	99.1	99.3	92.3	98.2	99.7	99.9	100.0
$2,980 (incl.)—$4,560	85.7	93.9	97.3	98.7	99.0	84.6	94.8	98.0	99.0	99.2
$4,560 (incl.)—$6,960	75.4	89.3	95.9	98.3	98.6	73.7	88.7	95.5	98.0	98.4
$6,960 (incl.)—$10,640	58.0	79.4	94.2	98.3	98.8	56.3	78.2	93.7	98.2	98.7
$10,640 (incl.)—$16,260	51.2	76.1	92.6	97.5	98.1	49.0	74.2	91.1	96.6	97.3
$16,260 (incl.)—$24,880	37.4	61.9	85.6	95.0	96.2	35.5	59.9	84.5	94.8	96.1
$24,880 (incl.)—$38,040	26.6	47.5	75.8	91.3	93.7	25.0	45.1	73.0	89.3	91.8
$38,040 (incl.)—$58,160	17.8	33.2	58.2	81.5	85.6	16.5	31.1	54.9	78.6	83.1
$58,160 or more	10.2	18.9	32.9	49.4	54.7	9.6	18.0	31.6	47.7	53.0
Average	33.5	53.2	75.3	88.5	90.8	31.8	51.1	73.1	86.9	89.4

Exhibit 4-16

Effective Tax Rates by Average Wage Level

Average Annual Wage Category	1990 $7,000	$14,000	$28,000	$53,400	$65,000	1991 $7,000	$14,000	$28,000	$53,400	$65,000
Colorado										
Less than $3,120	1.04	1.08	1.09	1.09	1.09	0.91	1.00	1.03	1.09	1.11
$3,120 (incl.)—$4,840	0.97	1.05	1.08	1.09	1.10	0.46	0.54	0.57	0.58	0.58
$4,840 (incl.)—$7,460	0.91	1.05	1.12	1.13	1.13	0.71	0.87	0.95	0.97	0.97
$7,460 (incl.)—$11,540	0.74	0.92	1.02	1.05	1.05	0.47	0.66	0.77	0.80	0.80
$11,540 (incl.)—$17,820	0.61	0.85	1.02	1.08	1.09	0.46	0.70	0.90	0.96	0.97
$17,820 (incl.)—$27,520	0.38	0.57	0.76	0.85	0.86	0.25	0.43	0.61	0.70	0.72
$27,520 (incl.)—$42,520	0.33	0.55	0.84	1.02	1.05	0.20	0.36	0.61	0.78	0.80
$42,520 (incl.)—$65,680	0.37	0.65	1.05	1.42	1.48	0.21	0.40	0.71	1.07	1.16
$65,680 or more	0.17	0.29	0.45	0.56	0.60	0.06	0.12	0.22	0.34	0.39
Average	0.44	0.65	0.87	1.01	1.03	0.29	0.46	0.67	0.80	0.82
Maryland										
Less than $4,300	0.81	0.88	0.91	0.91	0.91	1.25	1.46	1.59	1.60	1.60
$4,300 (incl.)—$6,160	0.42	0.49	0.52	0.52	0.53	0.96	1.20	1.37	1.42	1.42
$6,160 (incl.)—$8,840	0.67	0.85	0.94	0.97	0.97	1.01	1.42	1.68	1.76	1.77
$8,840 (incl.)—$12,680	0.45	0.62	0.72	0.75	0.75	0.68	1.12	1.44	1.58	1.60
$12,680 (incl.)—$18,180	0.42	0.66	0.84	0.91	0.91	0.57	1.07	1.55	1.72	1.75
$18,180 (incl.)—$26,080	0.40	0.67	0.94	1.07	1.08	0.44	0.86	1.46	1.73	1.77
$26,080 (incl.)—$37,400	0.20	0.36	0.59	0.73	0.75	0.24	0.49	1.03	1.43	1.49
$37,400 (incl.)—$53,620	0.25	0.48	0.89	1.27	1.31	0.27	0.54	1.18	1.99	2.12
$53,620 or more	0.06	0.10	0.17	0.24	0.27	0.06	0.14	0.31	0.51	0.60
Average	0.31	0.51	0.75	0.91	0.93	0.39	0.71	1.23	1.61	1.66
Missouri										
Less than $2,940	1.69	1.77	1.80	1.80	1.80	1.74	1.84	1.88	1.88	1.88
$2,940 (incl.)—$4,400	1.12	1.24	1.28	1.29	1.29	1.17	1.30	1.36	1.37	1.37
$4,400 (incl.)—$6,580	1.06	1.25	1.35	1.38	1.39	1.10	1.32	1.43	1.46	1.47
$6,580 (incl.)—$9,860	1.02	1.33	1.46	1.49	1.49	1.02	1.35	1.50	1.55	1.55
$9,860 (incl.)—$14,760	0.63	0.94	1.13	1.19	1.20	0.66	1.00	1.22	1.29	1.30
$14,760 (incl.)—$22,100	0.42	0.70	0.94	1.01	1.02	0.43	0.73	0.99	1.07	1.07
$22,100 (incl.)—$33,100	0.30	0.53	0.82	0.96	0.97	0.30	0.54	0.86	1.02	1.04
$33,100 (incl.)—$49,560	0.14	0.26	0.44	0.59	0.62	0.14	0.26	0.44	0.60	0.62
$49,560 or more	0.11	0.21	0.36	0.53	0.57	0.11	0.21	0.37	0.55	0.60
Average	0.39	0.61	0.83	0.93	0.95	0.41	0.64	0.87	0.99	1.01
Texas										
Less than $2,980	1.27	1.34	1.35	1.36	1.36	1.37	1.43	1.45	1.45	1.45
$2,980 (incl.)—$4,560	1.17	1.28	1.32	1.34	1.35	1.08	1.20	1.24	1.25	1.25
$4,560 (incl.)—$6,960	1.01	1.21	1.29	1.31	1.32	0.80	0.97	1.04	1.06	1.07
$6,960 (incl.)—$10,640	0.55	0.71	0.78	0.80	0.81	0.41	0.55	0.62	0.64	0.64
$10,640 (incl.)—$16,260	0.87	1.28	1.56	1.65	1.66	0.71	1.06	1.31	1.39	1.40
$16,260 (incl.)—$24,880	0.75	1.23	1.71	1.89	1.91	0.60	1.01	1.42	1.59	1.61
$24,880 (incl.)—$38,040	0.59	1.04	1.63	1.95	2.00	0.44	0.79	1.25	1.52	1.56
$38,040 (incl.)—$58,160	0.30	0.56	0.98	1.36	1.43	0.20	0.37	0.65	0.92	0.98
$58,160 or more	0.13	0.25	0.44	0.66	0.74	0.10	0.18	0.33	0.52	0.58
Average	0.56	0.91	1.30	1.53	1.57	0.43	0.70	1.01	1.19	1.23

Raising the wage base would result in a significant convergence of ETRs among firms with differing average wages. In all States and in both years, the lowest wage firms would pay an ETR two to four times higher than the average firm at the $7,000 wage base. Despite dramatic increases for high wage-level firms in all States, the highest wage-level group generally would pay considerably less than the mean at the $65,000 wage base because the average firm in this category pays wages higher than $65,000 and therefore continues to have a relatively low TWP and tax burden. In no State, except Colorado during 1990, would the highest wage level group pay more than 50 percent of the average ETR at the $65,000 wage base.

In summary, raising the tax base would largely eliminate the higher taxable wage proportions and consequent higher ETR which low-wage firms pay at low wage bases. It would not, however, completely eliminate the lower TWPs and consequently lower ETRs, which the highest wage firms pay even if the wage base were raised to $65,000. Only if no cap was put on taxable wages would this disappear.

4.3.7 Effects on Minimum and Maximum Tax Rate Firms

Since all States have a legislated minimum and maximum UI tax rate, the experience-rating systems used to determine annual UI tax rates and tax contributions are imperfect measures of experience rating. Firms operating at the minimum UI tax rate consistently contribute more UI taxes than the benefits charged to them and are subsidizing the UI system. Likewise, firms operating at the maximum UI tax rate that consistently generate ineffective charges are subsidized by the State UI system.

Using the sample of firms from the wage record microdata and data extracted from 1991 ES204 reports, we examined the effects that changing the Federal wage base would have on the subsidization issues surrounding the minimum and maximum tax rate firms in each State.

Since the ES204 data contain only aggregated totals for taxes paid and benefits charged by all firms operating at a given tax rate, it was necessary to estimate the changes in tax contribution that would occur for firms operating at both the minimum and maximum tax rates[8] if the wage base were increased. The ES204 data contained information that allowed us to calculate for the minimum and maximum rate firms the actual ratio of taxes paid to total payrolls at the 1991 State taxable wage base. We calculated an estimated ratio for the minimum and maximum tax rate firms from our sample data at various wage bases. We then adjusted the estimated ratios so

[8] Although the maximum tax rate in Missouri in 1991 was 10.8 percent, the maximum tax rate of any firm in our data was 7.2 percent. This is not a problem, however, because a total of only 8 firms had tax rates higher than 7.2 percent in Missouri in 1991. Furthermore, although the minimum tax rate in Colorado in 1991 was 0.0 percent, the ES204 data we were provided did not contain information on 0.0 percent firms. Consequently, our analysis of Colorado firms is based on firms with experience rates of 6.6 percent as the maximum and 0.1 percent as the minimum.

that the 1991 taxable wage base figures were identical for the ES204 and the sample data.[9] Using the adjusted ratios and total payrolls from the ES204 data, we were able to calculate estimated total tax contributions paid by the minimum and maximum tax rate firms at each wage base. We used the changes that occurred in total contributions as the taxable wage base increased to calculate the percentage of change in the ineffective charges for the minimum and maximum tax rate firms. Using the precentages of change, we were thus able to determine the effects that changing the Federal wage base would have on minimum and maximum tax rate firms.

With the exception of the minimum rate firms in Missouri, the minimum tax rate firms in the States examined in the study were found to be contributing more taxes to the trust funds than they were accruing in benefit charges, i.e., the minimum tax rate firms had "positive" ineffective charges (and were subsidizing the UI system), at their 1991 respective wage bases. As could be expected, an increase in the Federal wage base would only further exaggerate the amount of excess taxes paid by the minimum tax rate firms. An increase to a $28,000 wage base would more than double the excess taxes paid by minimum tax rate firms in Maryland and would increase the excess taxes paid by minimum tax rate firms in Colorado and Texas by approximately two-thirds.

Missouri's minimum tax rate firms are the exception. In 1991, the minimum tax rate charged to firms was 0.00 percent. Thus, all the benefits charged to minimum tax rate firms at any wage base will be negative ineffective charges in Missouri. Missouri is also a reserve-ratio experience rating State, and in 1991 the minimum tax rate firms in the State had reserves nearly forty times the size of the benefit charges accrued against them. Furthermore, the negative ineffective charges accrued to the minimum tax rate firms in Missouri represent only 0.14 percent of the total payrolls for those firms. The results obtained for the minimum tax rate firms in each state are displayed in Exhibit 4-17.

At the 1991 taxable wage bases,[10] the maximum tax rate firms in all four States had substantial ineffective charges. In fact, more than half of all benefits charged to the maximum tax rate firms in Missouri were ineffective charges. Of the four States, Maryland's maximum tax rate firms had the lowest percentage of ineffective charges, roughly 26 percent. Increasing the Federal wage base to $14,000 would eliminate the ineffective charges accrued to maximum tax rate firms in Maryland and would reduce the ineffective charges accrued to maximum tax rate firms in the other states by roughly half. If the Federal wage base were increased to $28,000, the ineffective

[9] We adjusted all of the ratios calculated using the sample data by subtracting the difference between the sample data ratio at the State's 1991 wage base and the ES204 data ratio. For higher wage bases this same difference was subtracted from the estimated sample data ratios.

[10] In 1991, Colorado's taxable wage base was $10,000; Texas' wage base was $9,000; and Maryland and Missouri's wage bases were $7,000.

Exhibit 4-17

Changes in Ineffective Charges

Percentage Decrease in Ineffective Charges

Colorado	$10,000	$14,000	$28,000	$53,400	$65,000
Minimum	0.00%	22.90%	68.62%	107.20%	115.40%
Maximum	0.00%	50.32%	155.22%	202.65%	207.52%
Maryland	$7,000	$14,000	$28,000	$53,400	$65,000
Minimum	0.00%	81.37%	186.83%	247.72%	261.21%
Maximum	0.00%	156.48%	415.70%	629.29%	646.08%
Missouri	$7,000	$14,000	$28,000	$53,400	$65,000
Minimum	0.00%	0.00%	0.00%	0.00%	0.00%
Maximum	0.00%	47.97%	99.05%	125.38%	128.87%
Texas	$9,000	$14,000	$28,000	$53,400	$65,000
Minimum	0.00%	26.22%	64.28%	89.28%	95.87%
Maximum	0.00%	44.79%	120.65%	168.04%	176.62%

Ineffective Charges as a Percentage of Total Payrolls

Colorado	$10,000	$14,000	$28,000	$53,400	$65,000
Minimum	-0.04%	-0.05%	-0.06%	-0.08%	-0.08%
Maximum	1.26%	0.63%	-0.70%	-1.30%	-1.36%
Maryland	$7,000	$14,000	$28,000	$53,400	$65,000
Minimum	-0.27%	-0.50%	-0.78%	-0.95%	-0.99%
Maximum	0.74%	-0.42%	-2.34%	-3.92%	-4.05%
Missouri	$7,000	$14,000	$28,000	$53,400	$65,000
Minimum	0.14%	0.14%	0.14%	0.14%	0.14%
Maximum	2.77%	1.44%	0.03%	-0.70%	-0.80%
Texas	$9,000	$14,000	$28,000	$53,400	$65,000
Minimum	-0.12%	-0.15%	-0.19%	-0.22%	-0.23%
Maximum	1.89%	1.04%	-0.39%	-1.29%	-1.45%

charges accrued to maximum tax rate firms would be eliminated in Maryland, Colorado, and Texas; in Missouri, less than 1 percent of UI charges for maximum tax rate firms would be ineffective. These results are also provided in Exhibit 4-17.

In summary, it appears that over a 1-year period, an increase in the tax base will decrease the degree of experience rating when the State has a large number of employers at the minimum tax rate and a relatively high maximum tax rate. Results from Missouri, however, suggest that States with a large number of employers at a very low maximum tax rate will tend to experience an increase in experience rating. Basically, the effect of a tax base change on the degree of experience rating depends on the distribution of employer tax rates across the tax schedule in a State.

* * * *

Appendix A

Using the Macro Simulation Model—Trust Fund and Employment Effects of UI Tax Base Increases

The spreadsheet model is easy to use. There are four main blocks, three with State-specific output displays and a fourth with the model's parameters and a national summary. The first three blocks are: (1) State-level detail on employment and labor cost effects, (2) estimates of the TBAW ratio, the TWP, employment, and cost associated with State UI taxes before and after the change of interest, and (3) estimates of these same variables for changes in Federal UI taxes.

The fourth block has the model's control parameters and national summaries of cost and employment effects. Exhibit A-1 displays this block setting the FUTA tax base parameter to $14,000. The top half of Exhibit A-1 shows the labor demand and labor cost parameters of the model as described earlier. The only deviations from the earlier description are that (1) the FUTA tax rate for period 2 (after the before-after comparison) is a variable that can be altered by the user and (2) the parameter for the cost offsets has two components so the extent of cost offsetting can be different for Federal UI taxes than for State UI taxes. The user changes one or more of these parameters and the model automatically recomputes.

The bottom half of Exhibit A-1 shows a few key national summary variables. These are employment effects, cost changes, the TBAW ratio, and the TWP and labor costs before and after the change of interest. Separate lines are shown for State, Federal, and total (State plus Federal) effects of the change. Finally, there is a line showing the number of States whose tax bases continue to exceed the Federal tax base. For a Federal tax base of $14,000 in 1991, the number was 8. This summary display resides at the bottom of the spreadsheet.

Exhibit A-1

Model Parameters and National Summary of Employment and Cost Effects

Labor Demand Parameters	Value	Labor Cost Parameters	Value
Labor's Share	0.75	Federal Tax Base2	14000
Elasticity of Sub	-1.2	Federal Tax Rate2	0.008
Elasticity Prod Demand	-1.0	Wage/Labor Comp	0.85
Output Effect	0.0	Cost Offset State	0.00
Elast Labor Demand	0.3	Cost Offset Federal	0.00

	Emp	D Labor Cost	TBAW2 Level	TWP2 Level	Labor Cost 1	Labor Cost2
State Tax Change	62.4	0.0025	0.5854	0.5181	0.0060	0.0085
Fed Tax Change	35.5	0.0014	0.5801	0.5151	0.0021	0.0035
Total Tax Change	97.9	0.0039			0.0081	0.0120
Federal Share	0.3623					
No States>Fed Tax Base						

Appendix B

Additional Macrodata Tables

Exhibit B-1
Summary of Labor Demand Effects (1991), Due to Changes in State UI Taxes, Federal Tax Base = $14,000

State	Average Weekly Wage ($)	Initial Tax Rate (%)	Initial Tax Base ($)	New Tax Base ($)	Initial UI Tax Share of Labor Costs (%)	New UI Tax Share of Labor Costs (%)	Initial Tax Base/Avg. Annual Wage (%)	New Tax Base/Avg. Annual Wage (%)	Initial Taxable Wage Proportion (%)	New Taxable Wage Proportion (%)
Alabama	398	1.12	8,000	14,000	0.38	0.55	39	68	40	58
Alaska	559	3.22	22,400	22,400	1.78	1.78	77	77	65	65
Arizona	417	1.05	7,000	14,000	0.31	0.51	32	65	35	57
Arkansas	356	2.09	8,000	14,000	0.78	1.12	43	76	44	63
California	519	2.05	7,000	14,000	0.50	0.84	26	52	29	48
Colorado	454	1.30	10,000	14,000	0.47	0.59	42	59	42	53
Connecticut	592	2.06	7,100	14,000	0.44	0.75	23	45	25	43
Delaware	500	1.99	8,500	14,000	0.56	0.82	33	54	33	48
District of Columbia	628	2.02	8,000	14,000	0.46	0.70	24	43	27	41
Florida	410	0.93	7,000	14,000	0.28	0.45	33	66	36	58
Georgia	444	1.34	8,500	14,000	0.43	0.61	37	61	37	53
Hawaii	444	1.69	7,000	14,000	0.50	0.80	30	61	35	56
Idaho	371	1.17	18,000	18,000	0.67	0.67	93	93	67	67
Illinois	505	2.35	9,000	14,000	0.69	0.96	34	53	35	48
Indiana	431	1.16	7,000	14,000	0.32	0.53	31	62	33	54
Iowa	374	1.56	12,200	14,000	0.70	0.76	63	72	53	57
Kansas	397	1.87	8,000	14,000	0.72	1.01	39	68	45	64
Kentucky	391	2.01	8,000	14,000	0.67	0.98	39	69	39	58
Louisiana	417	2.09	8,500	14,000	0.71	1.00	39	64	40	56
Maine	387	2.40	7,000	14,000	0.74	1.19	35	70	36	59
Maryland	476	1.35	7,000	14,000	0.35	0.58	28	57	31	51
Massachusetts	537	3.30	7,000	14,000	0.87	1.39	25	50	31	50
Michigan	503	3.78	9,500	14,000	1.14	1.52	36	53	35	47
Minnesota	455	1.55	13,300	14,000	0.64	0.66	56	59	48	50
Mississippi	347	1.00	7,000	14,000	0.35	0.55	39	78	41	64
Missouri	429	1.54	7,000	14,000	0.42	0.70	31	63	32	54
Montana	349	1.07	13,400	14,000	0.63	0.64	74	77	69	70
Nebraska	360	0.94	7,000	14,000	0.30	0.48	37	75	37	60
Nevada	428	1.11	13,800	14,000	0.54	0.54	62	63	57	57
New Hampshire	451	0.87	7,000	14,000	0.22	0.38	30	60	30	51
New Jersey	573	2.55	14,400	14,400	0.98	0.98	48	48	45	45
New Mexico	372	1.49	11,700	14,000	0.67	0.75	60	72	53	59
New York	581	2.21	7,000	14,000	0.48	0.82	23	46	26	44
North Carolina	396	0.79	11,500	14,000	0.34	0.39	56	68	51	58
North Dakota	341	1.28	11,800	14,000	0.59	0.65	66	79	54	60
Ohio	452	2.32	8,000	14,000	0.69	1.03	34	60	35	52
Oklahoma	397	1.33	9,700	14,000	0.50	0.64	47	68	44	57
Oregon	420	2.58	16,000	16,000	1.33	1.33	73	73	61	61
Pennsylvania	460	3.37	8,000	14,000	0.98	1.47	33	58	34	51
Puerto Rico	264	5.13	7,000	14,000	2.22	3.29	51	102	51	76
Rhode Island	427	2.48	14,400	14,400	1.18	1.18	65	65	56	56
South Carolina	382	1.82	7,000	14,000	0.57	0.92	35	70	37	59
South Dakota	313	0.55	7,000	14,000	0.20	0.31	43	86	42	66
Tennessee	406	1.59	7,000	14,000	0.48	0.77	33	66	35	57
Texas	460	1.00	9,000	14,000	0.32	0.44	38	59	38	52
Utah	389	1.27	14,500	14,500	0.60	0.60	72	72	56	56
Vermont	402	2.49	8,000	14,000	0.82	1.21	38	67	39	57
Virginia	441	0.75	8,000	14,000	0.23	0.34	35	61	36	53
Virgin Islands	381	1.39	19,500	19,500	0.90	0.90	99	99	77	77
Washington	446	2.33	16,800	16,800	1.16	1.16	72	72	58	58
West Virginia	406	2.82	8,000	14,000	0.92	1.35	38	66	38	57
Wisconsin	411	2.05	10,500	14,000	0.78	0.95	49	65	45	55
Wyoming	387	2.36	10,500	14,000	0.95	1.16	52	70	48	58
National Total	464	1.93	8,763	14,127	0.60	0.85	36	59	37	52

Exhibit B-2
Summary of Labor Demand Effects (1991), Due to Changes in Federal UI Taxes, Federal Tax Base = $14,000

State	Average Weekly Wage ($)	Initial UI Tax Share of Labor Costs (%)	New UI Tax Share of Labor Costs (%)	Initial Tax Base/Avg. Annual Wage (%)	New Tax Base/Avg. Annual Wage (%)	Initial Taxable Wage Proportion (%)	New Taxable Wage Proportion (%)
Alabama	398	0.25	0.40	34	68	36	58
Alaska	559	0.21	0.33	24	48	31	49
Arizona	417	0.24	0.39	32	65	35	57
Arkansas	356	0.27	0.43	38	76	40	63
California	519	0.20	0.33	26	52	29	48
Colorado	454	0.22	0.36	30	59	32	53
Connecticut	592	0.17	0.29	23	45	25	43
Delaware	500	0.20	0.33	27	54	29	48
District of Columbia	628	0.16	0.28	21	43	24	41
Florida	410	0.24	0.39	33	66	36	58
Georgia	444	0.22	0.36	30	61	32	53
Hawaii	444	0.24	0.38	30	61	35	56
Idaho	371	0.24	0.40	36	73	36	58
Illinois	505	0.19	0.33	27	53	29	48
Indiana	431	0.22	0.37	31	62	33	54
Iowa	374	0.24	0.39	36	72	35	57
Kansas	397	0.28	0.43	34	68	41	64
Kentucky	391	0.24	0.39	34	69	35	58
Louisiana	417	0.23	0.38	32	64	34	56
Maine	387	0.25	0.40	35	70	36	59
Maryland	476	0.21	0.34	28	57	31	51
Massachusetts	537	0.21	0.34	25	50	31	50
Michigan	503	0.19	0.32	27	53	28	47
Minnesota	455	0.20	0.34	30	59	30	50
Mississippi	347	0.28	0.44	39	78	41	64
Missouri	429	0.22	0.36	31	63	32	54
Montana	349	0.32	0.48	39	77	47	70
Nebraska	360	0.25	0.41	37	75	37	60
Nevada	428	0.24	0.39	31	63	36	57
New Hampshire	451	0.21	0.35	30	60	30	51
New Jersey	573	0.18	0.30	23	47	27	44
New Mexico	372	0.25	0.40	36	72	37	59
New York	581	0.18	0.30	23	46	26	44
North Carolina	396	0.24	0.39	34	68	36	58
North Dakota	341	0.25	0.41	39	79	37	60
Ohio	452	0.22	0.36	30	60	32	52
Oklahoma	397	0.24	0.39	34	68	35	57
Oregon	420	0.23	0.38	32	64	34	56
Pennsylvania	460	0.21	0.35	29	58	31	51
Puerto Rico	264	0.35	0.51	51	102	51	76
Rhode Island	427	0.23	0.37	31	63	34	55
South Carolina	382	0.25	0.40	35	70	37	59
South Dakota	313	0.29	0.45	43	86	42	66
Tennessee	406	0.24	0.39	33	66	35	57
Texas	460	0.22	0.36	29	59	32	52
Utah	389	0.22	0.37	35	69	32	55
Vermont	402	0.24	0.39	33	67	35	57
Virginia	441	0.22	0.36	31	61	32	53
Virgin Islands	381	0.29	0.44	35	71	43	65
Washington	446	0.21	0.35	30	60	31	52
West Virginia	406	0.24	0.38	33	66	35	57
Wisconsin	411	0.22	0.37	33	65	33	55
Wyoming	387	0.24	0.39	35	70	35	58
National Total	464	0.21	0.35	29	58	31	52

Exhibit B-3

Labor Supply Effects of Increased State and Federal UI Taxes (1991), Federal Tax Base = $14,000

State	Average Weekly Wage ($)	Effective Income Tax Rate (%)	Effective OASDI Tax Rate (%)	Effective SS Health Tax Rate (%)	Initial Effective UI Tax Rate (%)	New Effective UI Tax Rate (%)	Initial Total Tax Rate (%)	New Total Tax Rate (%)	Initial Net Avg. Weekly Wage ($)	New Net Avg. Weekly Wage ($)
Alabama	398	12.99	11.74	2.90	0.73	1.12	28.36	28.74	285	283
Alaska	559	12.12	10.96	2.87	2.34	2.49	28.30	28.45	401	400
Arizona	417	15.16	11.65	2.89	0.65	1.05	30.36	30.76	290	289
Arkansas	356	12.87	11.92	2.90	1.23	1.82	28.93	29.51	253	251
California	519	15.61	11.16	2.88	0.82	1.37	30.48	31.02	361	358
Colorado	454	15.84	11.48	2.89	0.81	1.12	31.02	31.32	313	312
Connecticut	592	14.08	10.80	2.87	0.72	1.22	28.47	28.97	423	420
Delaware	500	15.33	11.26	2.89	0.89	1.35	30.37	30.82	348	346
District of Columbia	628	21.72	10.61	2.86	0.73	1.15	35.92	36.34	403	400
Florida	410	11.63	11.69	2.90	0.62	1.00	26.84	27.21	300	298
Georgia	444	15.26	11.53	2.89	0.76	1.14	30.45	30.83	309	307
Hawaii	444	18.51	11.52	2.89	0.87	1.39	33.79	34.32	294	292
Idaho	371	13.49	11.86	2.90	1.07	1.25	29.32	29.50	262	262
Illinois	505	15.04	11.22	2.88	1.04	1.51	30.19	30.66	352	350
Indiana	431	13.64	11.59	2.89	0.64	1.06	28.76	29.18	307	305
Iowa	374	14.81	11.85	2.90	1.10	1.36	30.65	30.91	259	258
Kansas	397	13.85	11.75	2.90	1.17	1.69	29.67	30.19	279	277
Kentucky	391	15.06	11.77	2.90	1.07	1.62	30.79	31.34	271	269
Louisiana	417	12.74	11.65	2.89	1.11	1.62	28.39	28.91	299	297
Maine	387	14.69	11.79	2.90	1.16	1.87	30.54	31.26	269	266
Maryland	476	15.94	11.37	2.89	0.66	1.09	30.86	31.29	329	327
Massachusetts	537	18.06	11.06	2.88	1.27	2.04	33.28	34.04	358	354
Michigan	503	16.07	11.24	2.88	1.56	2.17	31.76	32.36	344	341
Minnesota	455	16.27	11.48	2.89	0.99	1.18	31.62	31.82	311	310
Mississippi	347	11.19	11.96	2.90	0.74	1.16	26.79	27.20	254	252
Missouri	429	14.64	11.59	2.89	0.76	1.26	29.89	30.38	301	299
Montana	349	13.70	11.95	2.90	1.12	1.32	29.66	29.87	245	245
Nebraska	360	13.62	11.90	2.90	0.65	1.05	29.07	29.47	255	254
Nevada	428	12.16	11.60	2.89	0.92	1.09	27.57	27.75	310	309
New Hampshire	451	12.27	11.49	2.89	0.51	0.85	27.15	27.50	329	327
New Jersey	573	16.26	10.88	2.87	1.37	1.51	31.39	31.53	393	392
New Mexico	372	12.71	11.85	2.90	1.08	1.36	28.54	28.82	266	265
New York	581	17.61	10.85	2.87	0.78	1.31	32.11	32.64	394	391
North Carolina	396	15.09	11.75	2.90	0.69	0.92	30.43	30.66	275	275
North Dakota	341	14.08	11.98	2.90	0.99	1.25	29.95	30.21	239	238
Ohio	452	14.56	11.49	2.89	1.06	1.63	30.00	30.57	316	314
Oklahoma	397	14.68	11.75	2.90	0.87	1.21	30.19	30.54	277	276
Oregon	420	15.90	11.64	2.89	1.84	2.01	32.28	32.45	284	284
Pennsylvania	460	14.00	11.45	2.89	1.39	2.14	29.73	30.47	323	320
Puerto Rico	264	11.00	12.23	2.90	3.01	4.48	29.15	30.62	187	183
Rhode Island	427	16.15	11.60	2.89	1.66	1.83	32.31	32.48	289	289
South Carolina	382	13.98	11.81	2.90	0.96	1.55	29.65	30.24	269	267
South Dakota	313	10.25	12.08	2.90	0.57	0.89	25.80	26.12	232	231
Tennessee	406	10.81	11.71	2.90	0.84	1.36	26.25	26.77	300	298
Texas	460	11.80	11.45	2.89	0.64	0.94	26.77	27.08	337	335
Utah	389	12.62	11.78	2.90	0.97	1.14	28.26	28.44	279	279
Vermont	402	14.05	11.73	2.90	1.25	1.88	29.92	30.56	282	279
Virginia	441	16.47	11.54	2.89	0.53	0.83	31.43	31.73	302	301
Virgin Islands	381	11.00	11.82	2.90	1.41	1.59	27.12	27.30	277	277
Washington	446	12.56	11.51	2.89	1.61	1.77	28.57	28.74	319	318
West Virginia	406	13.03	11.71	2.90	1.36	2.04	28.99	29.68	288	285
Wisconsin	411	15.81	11.68	2.90	1.18	1.56	31.57	31.95	281	280
Wyoming	387	10.84	11.79	2.90	1.40	1.82	26.93	27.35	283	281
National Total	464	14.83	11.38	2.89	0.96	1.41	30.06	30.51	325	322

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