The Economic Effects of Unemployment Compensation

by

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ABSTRACT

This paper has analyzed the experience rating feature of an unemployment compensation system. The question of how the costs of maintaining the unemployed are allocated was addressed. A review of the current literature found a lack of research on the impact of the UI tax structure on the economy. The problem of cost allocation was seen to lie in determining which output prices reflect these costs and thus determine how the market allocates resources. The model developed involves three steps. The first two of these; which are the perfectly competitive solution to compensating the unemployed and the solution imposed by a perfectly experience rated UI system, respectively; developed benchmarks to be compared to the third model, that of the UI system as it actually is. The primary conclusion of the model is that imperfect experience rating of the UI tax causes an interfirm subsidization of seasonal unemployment with resulting non-optimal allocation of resources among firms. The secondary, and empirically testable conclusion, is that the degree of experience rating of the UI tax is inversely related to a firm's layoff rate. The available data was tested using ordinary least squares methods. The regression results yielded inconclusive evidence to support the hypothesized relationship between tax rate ranges and layoff rates.

ACKNOWLEDGMENTS

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DEDICATION

This thesis is dedicated to the University Undergraduate Fellows Program. The Program has definitely been the most challenging and fruitful learning experience of my college career. It has provided me with invaluable preparation for graduate study in economics. I thank all of those connected with the program for the opportunity to participate and strongly urge anyone desiring a challenge to enter the Program.

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Introduction

It is hoped that any prospective goverment program be analyzed to identify both the benefits and the costs of the endeavor. This is so not only to determine the desirability of starting a program, but more importantly, to ascertain that level at which a program need be maintained in order to maximize net social benefits. The primary difficulty of this approach is in identifying those effects of the program which were unforeseen and unintended prior to its inception, and, therefore, usually result in additional costs to society. This paper will attempt to analyze how the experience rating feature of an unemployment compensation system affects the allocation of resources in the economy.

Unemployment insurance (UI) was begun in all states[1] in 1936 after the passage of the Social Security Act in 1935. Titles III and IX of the SSA provided for a federal unemployment compensation system. Financing of benefits was to come from federal taxes upon employers, and administrative expenses were to be met from general federal revenues. In addition, the act stated that employers making "contributions" (i.e., tax payments) to an approved state UI system could receive up to 90 percent[2] credit for such contributions against their federal taxes. This provision was the incentive for states to

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[1] A few states already had UI systems, however, this was the first federally administered system.

[2] This provision was later changed to 100 percent credit.

establish their own UI systems. From its beginning, the expressed objective of unemployment insurance has been the maintenance of income during unemployment. This income maintenance via government is intended to allow workers to engage in additional job search, rather than "prematurely" accepting lower wage jobs which are less productive.

Literature Review

Most of the current literature on unemployment compensation has been concerned with the benefit, or "pay-out", side of the program. These studies analyze the effect of benefit payments on the length of unemployment, on the one hand, compared to their effect on post unemployment earnings on the other. Two representative papers of this type are there by Ehrenberg and Oaxaca, and Burgess and Kingston. Other closely related work includes that by Holen and Horowitz on how UI benefits lead to higher unemployment rates, and that by Chapin which explores the effect of UI benefits on the incentive to seek work. This research has tried to identify the various economic inefficiencies encountered on the benefit side of a UI system. Due to a lack of research on the tax, or "pay-in" side of employment compensation, this paper concentrates on theoretically analyzing and providing empirical evidence about the allocative effects caused by the tax structure of a UI system.

The Problem

The main problem which arises when deciding upon the tax

structure for an unemployment compensation system is that of the allocation of costs. Historically, our society has relied upon the market as the major mechanism for the allocation of resources. Thus, any scheme of unemployment taxes which structures incentives in a manner similar to the market mechanism provides a reference, or framework, for comparison of the actual effects of our current UI system. Also, some would argue that a market system is "best" in the sense that it allocates the economy's resources in accordance with the preferences of society as revealed by dollar "votes" in the market place.

Applying this principle to unemployment compensation, it is apparent that the costs of unemployment must somehow be reflected in the proper prices. Becker (p. 47) states that, "In the performance of its function as the chief allocator of resources, the market operates the more efficiently as prices reflect costs more accurately. Therefore, to the extent that the maintenance of unemployed workers is a cost of production, it should be reflected in the prices associated with the productive activities that gave rise to the unemployment."

The experience rating feature of all state unemployment compensation systems is the mechanism which allows the unemployment tax to allocate costs in accord with employer behavior. Experience rating is the practice of varying the tax rate that an employer pays in some positive relation to each employer's experience with unemployment. Within each state, an account is maintained for each firm which keeps a record of all inflows (the taxes paid by the firm) and outflows

(benefit payments to unemployed persons which are charged to the firm). In general, benefit payments made to a recipient[3] are charged against the account of the recipient's most recent employer. An employer's tax rate is based upon the relative size of these inflows and outflows over time (usually three years), being increased as more benefits are charged against the firm and decreased as fewer benefits are paid out. This "pay as you go" scheme thus allocates the cost of unemployment more accurately than uniform taxes would, allowing the price system to work effectively.

The relative efficiency of this allocation depends upon the degree of "perfectness" of the experience rating. Perfect experience rating results in the entire amount of a firm's unemployment cost being paid by that firm, and thus reflected in its prices. This would entail a system in which unemployment benefits are paid by the firm directly to the recipient with no UI system per se. In practice, all states have imperfect experience rating to some degree in their UI systems. This imperfection takes three forms: 1) in every state's system there is a lag of three or more months between determining a firm's tax rate and its implementation; 2) in every state there is a statutory maximum tax rate which causes firms with very numerous past layoffs[4] to be under-taxed; and 3) in most states, there is a

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[3]To qualify for benefits, a recipient must have been separated from his employer "through no fault of his own," thus eliminating persons who quit or are fired with just cause from receiving UI benefits.

[4]In accord with the previous definition of a qualifying recipient, the layoff experience of a firm is a very good measure of the amount of compensable separations which it has "caused."

non-zero statutory minimum tax rate which causes firms with no or very low amounts of past layoffs to be over-taxed. The problem of analyzing the allocation of costs within a UI system thus becomes the problem of determining the misallocation that imperfect experience rating imposes upon the economy.

The Model

Formulation of an economic model of an unemployment compensation system with imperfect experience rating requires three steps. The first is to determine how a purely competitive economy with no formal UI system solves the problem of compensating the seasonally unemployed. The second is to then specify how the same economy solves this problem if a perfectly experience rated UI system is present. The final step involves characterizing the present scheme, that of an imperfectly experience rated unemployment insurance system, using the first two models as benchmarks for comparison.

In a competitive economy, suppose that there are only two industries which each hire labor from a homogeneous labor force. Industry one provides stable employment throughout the year. In industry two there is some positive probability of a worker being seasonally unemployed for a variable portion of the year. Assuming that workers prefer stable employment to intermittent employment, a self-interested individual would require a higher wage to accept employment in industry two. This is because the individual must be paid a premium for accepting the risk of being unemployed for a portion of the year.

The additional utility from the increased earnings a worker in industry two receives while employed must just offset the loss of utility caused by the loss of earnings when he is periodically unemployed. This causes industry one and two to face, in effect, two distinct labor supply curves, (S_1 and S_2, respectively in Figure 1a). Thus, in equilibrium, industry two must pay a higher wage W_2, which reduces employment to E_2, a smaller amount than in industry one paying wage W_1.

At the level of the individual employer, each firm in industry two would face the infinitely elastic supply curve s_2 shown in Figure 1b, and thus would maintain employment level e_2. The demand for labor curve in industry two in this and subsequent analyses is actually a "mean" value of the marginal product of labor curve. The true demand curve in this industry varies within some range since, by the assumption that this industry experiences fluctuations in employment, the price of its output varies. Likewise, each firm in industry one would hire e_1 at the market wage W_1. Therefore, in a perfectly competitive economy, resources would be allocated efficiently because all costs, including the cost of unemployment, would be internalized for each firm. In other words, higher labor costs in industry two would raise the price of it's output relative to that of industry one and consumers would, all else equal, buy less of industry two's output.

Now that the optimal or "free-market" solution to this cost allocation problem has been specified, the next step is to determine the allocative efficiency of a UI system which has perfect experience

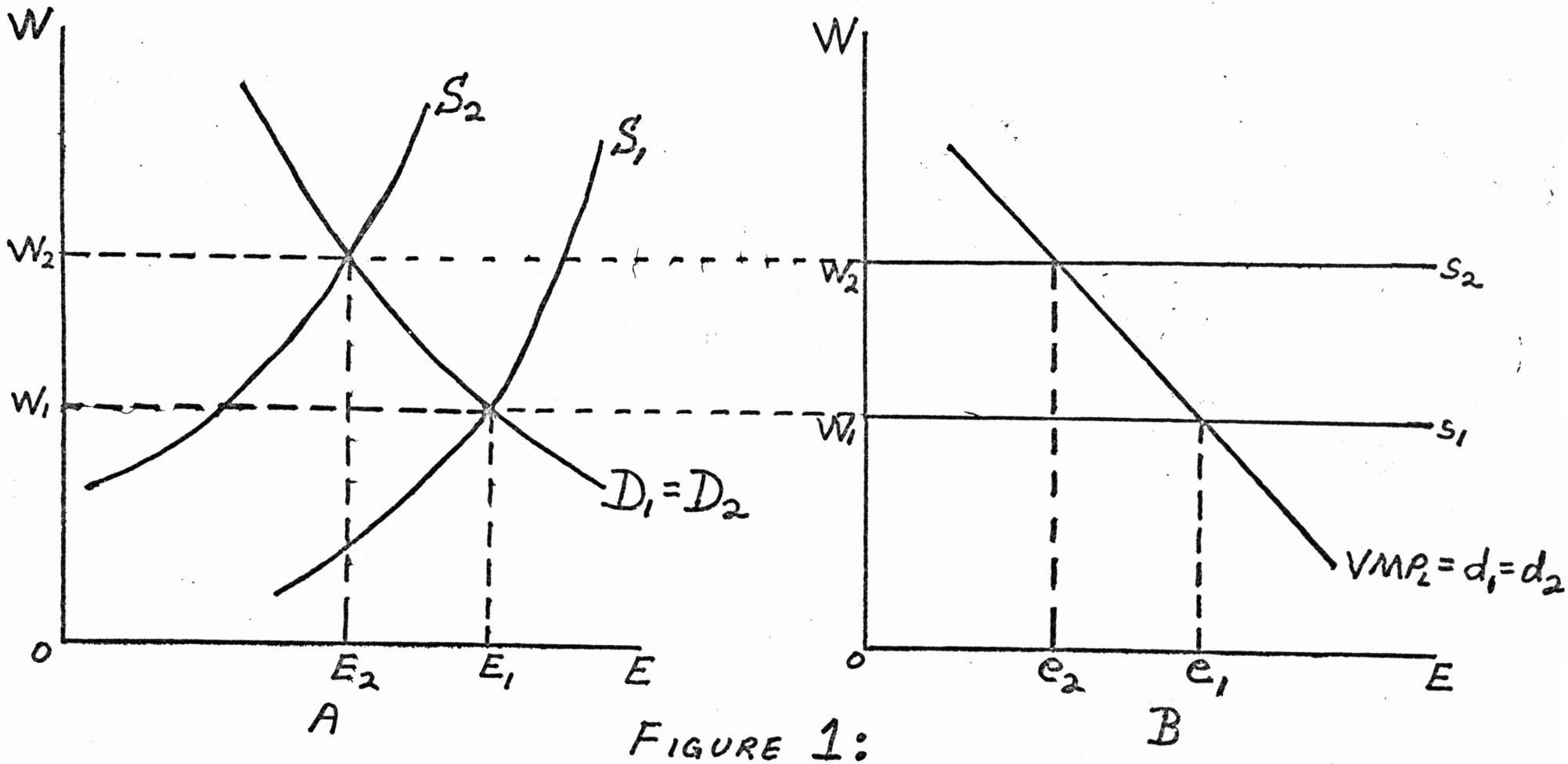

FIGURE 1:

WAGE AND EMPLOYMENT IN TWO INDUSTRIES WITH NO UNEMPLOYMENT INSURANCE SYSTEM

rating. As previously defined, perfect experience rating would entail a firm's accumulating a fund from which it would pay benefits directly to its employees that it laid-off. This would operate much like a pension system in that the amount of regular (per pay period) contributions per employee, say R, made by a firm to the fund would be actuarially determined from the expected mean duration of unemployment per employee and from the expected compensatory payment per employee per period of unemployment. This compensatory payment, which depends on workers' preferences, would be that amount which, if combined with the additional leisure time enjoyed during the unemployment period, affords an individual the same amount of additional utility that he would receive by being employed the entire year and thus, receiving no compensatory payment.

The second step of the formulation assumes the same two industry economy. Industries one and two hire comparably skilled laborers. Industry two has some positive probability of seasonal unemployment, while industry one offers stable employment. Since firms in industry two pay market determined compensation to their seasonally unemployed workers, individuals view each firm in each industry as equal and thus, each firm in both industry one and two faces the same infinitely elastic supply curve for labor (S in Figure 2). However, the mean demand curves for labor for firms in industry two are different from those for firms in industry one (which are constant, unlike those in industry two). This is because the amount of regular contribution (per par period) per employee that a firm in industry two makes to its unemployment fund would have the same effect as a per unit tax

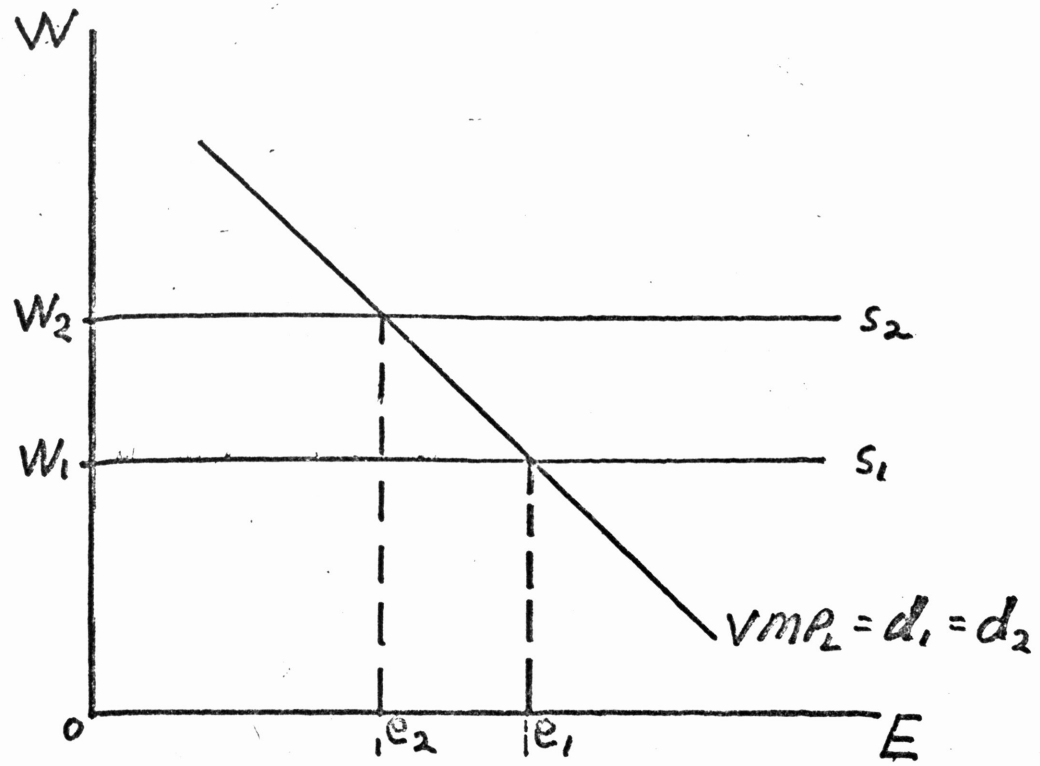

FIGURE 1B

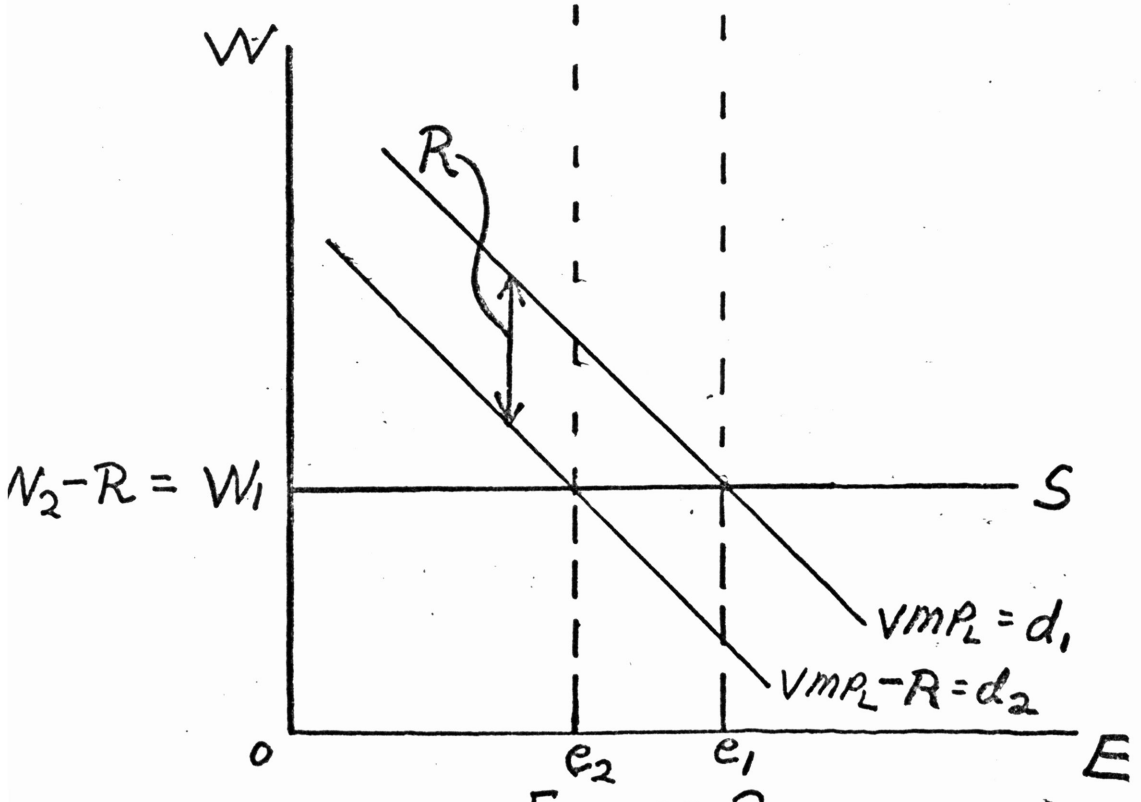

FIGURE 2

WAGE AND EMPLOYMENT IN TWO FIRMS WITH A PERFECTLY EXPERIENCE RATED UI SYSTEM

on employment. Thus, the relevant demand curve for labor for a single firm in industry two is d_2 (Figure 2), which is equal to the mean value of the marginal product of labor (VMP_L) less the regular contribution per employee to the unemployment fund (R). This displacement of the VMP_L curve by R is constant resulting in a parallel shift of the curve. It should be noted that R in Figure 2 is equal to $W_2 - W_1$ in Figure 1b since R is equivalent to the expected or actuarial premium that a worker in industry two must receive while employed to compensate him for accepting the given risk of seasonal unemployment in industry two. The only difference is whether the individual receives the premium in the form of wages during employment or receives the accumulated amount while periodically unemployed. A UI system with perfect experience rating would thus result in the same efficient allocation of resources as would the perfectly competitive model, namely with firms in industry two having employment level e_2 smaller than employment e_1 in industry one (Figure 2). Presumably, it is shifts in consumer demand for the output of industry two that "cause" the seasonality of its employment practices. With perfect experience rating of the UI system, consumers face the "costs" of these shifts in the form of higher prices for the particular output.

Given these two models as a framework, it is possible to construct a model of the same two industry economy under an unemployment compensation system with imperfect experience rating administered by state government. Employees view all firms as equally attractive employers since a compensating benefit payment is made to seasonally unemployed

workers. The distributional effects of the amount of this benefit payment on employment between industries one and two is ignored by assuming all workers have equal utility functions. Relaxing this assumption would result in some benefit level being paid in equilibrium, with the wages in industries one and two being adjusted accordingly by workers' employment preferences under the given exogeneous benefit amount. Thus, all firms in both industries face the same infinitely elastic labor supply curve S in Figure 3. An efficient tax structure for a UI system in this economy must raise the same amount, R, per worker per wage period for employees in industry two. Nothing need be raised for workers in industry one since the probability of their being seasonally unemployed is zero and thus R is also zero in industry one. It must be stressed that this R is exogeneously determined by workers' preferences and is the same in this analysis no matter what method is used to maintain the unemployed.

In Figure 3, the two demand for labor curves for a firm in industries one and two, assuming a perfectly experience rated UI system, are $d_1 = VMP_L$ and $d_2 = VMP_L - R$, respectively as redrawn from Figure 2. Now assume a UI system with imperfect experience rating which has a specified non-zero minimum employer tax (T_1) and a specified maximum employer tax (T_2) which is less than R. These minimum and maximum taxes are determined from a statutory minimum tax rate (α_1) and maximum tax rate (α_2) and a similarly defined taxable wage base (B) (i.e., $T_1 = \alpha_1 B$ and $T_2 = \alpha_2 B$). In Figure 3, T_1 is the minimum tax imposed upon the firms in the industry one with

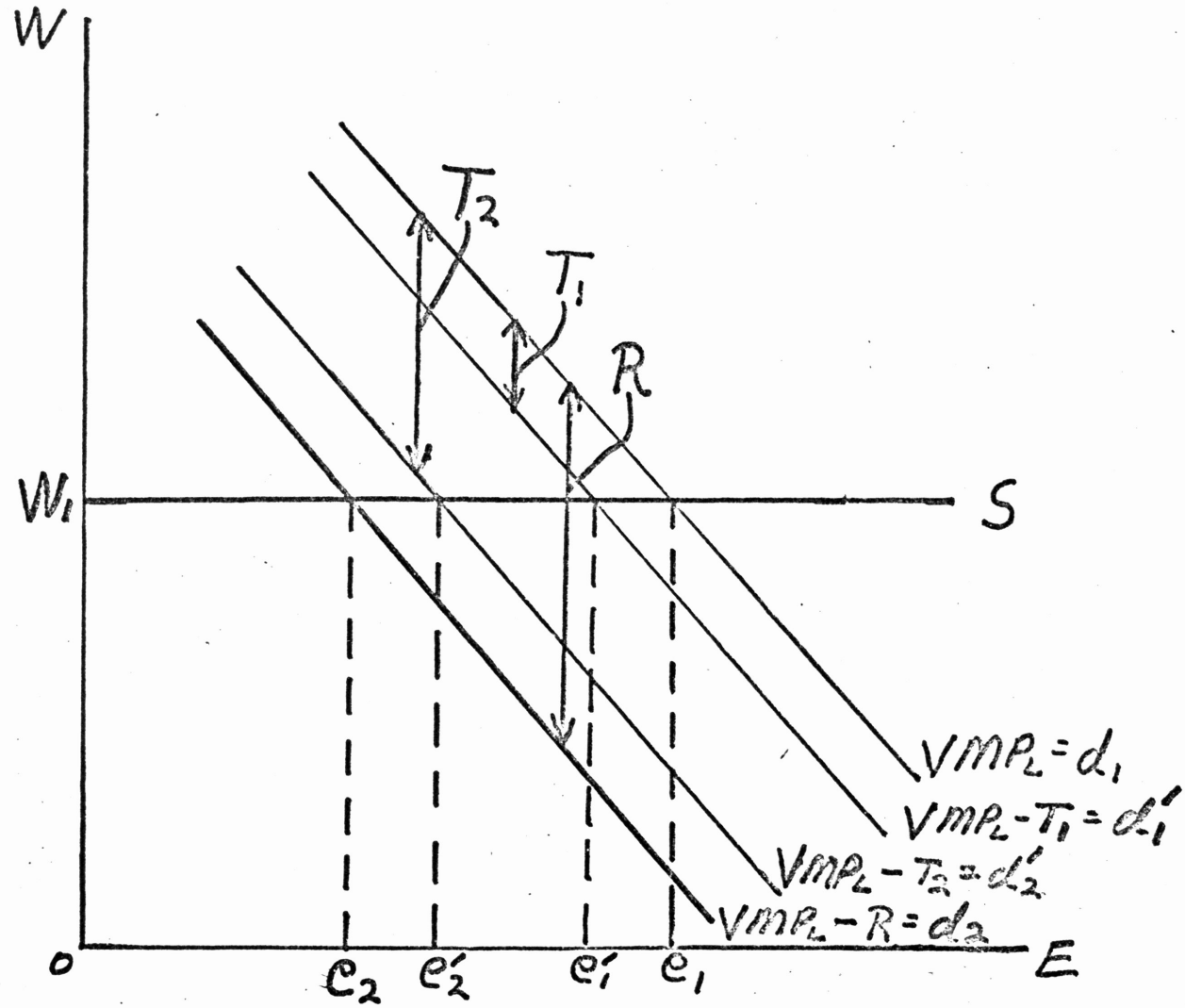

FIGURE 3

WAGE AND EMPLOYMENT IN TWO FIRMS WITH AN IMPERFECTLY EXPERIENCE RATED UI SYSTEM

no seasonal unemployment and T_2 is the maximum tax imposed on the employers in industry two. The relevant demand for labor curves for an individual firm is industries one and two then become $d_1' = VMP_L - T_1$ and $d_2' = VMP_L - T_2$, respectively. This results in an inefficient shift of resources from the firms in industry one to the firms in industry two as evidenced by the new equilibrium employment levels for a single firm, namely $e_2' > e_2$ for industry two and $e_1' < e_1$ for industry one. For simplicity, total employment and total wages are the same as in the analysis with a perfectly experience rated UI, however, there is too much output from industry two and too little from industry one, resulting in consumers not facing the real costs of satisfying their demands.

The amount of this "inter-firm subsidy" depends upon the taxes T_1 and T_2. In equilibrium, $aT_1 + bT_2 = R$ with $a + b = 1$, where a and b are weights determined by the relative number of employees in industries one and two, respectively. As T_2 approaches R and as T_1 approaches zero, the subsidy approaches zero and misallocation disappears. Therefore, the extent to which imperfect experience rating of the UI system results in inter-firm subsidies causes the market to not allocate resources according to the true costs of unemployment.

This result is very difficult to test empirically due to the many factors which influence firm or industry size, and the UI system is only one determinant. In addition, the benchmark or free market solution is not now observable empirically for comparison purposes either. Consequently, no attempt was made to find such empirical

evidence. However, other misallocative effects of an unemployment compensation system with imperfect experience rating, particularly those affecting the amount of seasonal unemployment itself, are empirically testable.

In his paper on "The Incentive Effects of the U.S. Unemployment Insurance Tax," Brechling derives several empirically testable hypotheses concerning a firm's layoff behavior, which are consistent with the model developed here. Brechling's basic model of the firm's behavior under an imperfectly experience rated UI system assumes that the firm attempts to maximize profits. The net cash flow attributable to the firm's layoff activity and the UI tax is assumed to be separable from the firm's other profit-making activities. An increase in layoffs in the present period generates immediate cash flow to the firm, but with an experience rated UI tax, these layoffs also generate a future cost in the form of increased payroll taxes. The profit maximizing firm will attempt to equate the present marginal benefit with the future marginal cost of its layoff activity.

The net cash flow (P_t) to the firm in time period t can be defined as:

$$P_t = Nf(l_t) - T_t Nm(l_t)$$

where N is the average annual stock of employees; T_t is the UI tax rate in time period t; $f(l_t)$ is the net contribution (per man) of layoffs to the firms cash flow (which depends on the layoff rate l_t); and, $m(l_t)$ is the taxable payroll per man which also depends on the layoff rate. Applying standard dynamic optimization techniques and

differentiating with respect to an exogeneous measure of the degree of experience rating of the UI tax yields the following sign prediction concerning the optimal layoff rate l^*:

$$\frac{\partial l^*}{\partial S} < 0$$

where S is the slope of the UI tax schedule.

The general format of a UI tax rate schedule appears in Figure 4. Along the vertical axis are the tax rates. Some measure of a firm's experience with unemployment is along the horizontal axis. There are several different methods which states use to gauge a firm's unemployment experience, but the tax schedule in each state has these basic features. T_{MIN} and T_{MAX} are the statutory limits within which UI tax rates may vary. At some point, C, associated with unemployment experience U_1, the tax schedule begins to slope upward so that increases in a firm's experience with unemployment result in increases in its UI tax rate above T_{MIN}. At another point, D, associated with unemployment experience $U_2 > U_1$, the tax schedule again becomes horizontal at the maximum tax rate T_{MAX}. In practice, the slope of the tax schedule, S, between points C and D varies between zero and one. The magnitude of S effects the rate at which inflows (UI taxes) to a firm's UI account adjust to changes in outflows (benefit payments) from a firm's UI account. In this manner, S is a measure of the degree of experience rating of a UI system. As S approaches zero, the inflows tend to never adjust to the outflows and experience rating disappear. As S approaches one, the inflows tend to adjust instantaneously to the outflows, and experience rating approaches perfect.

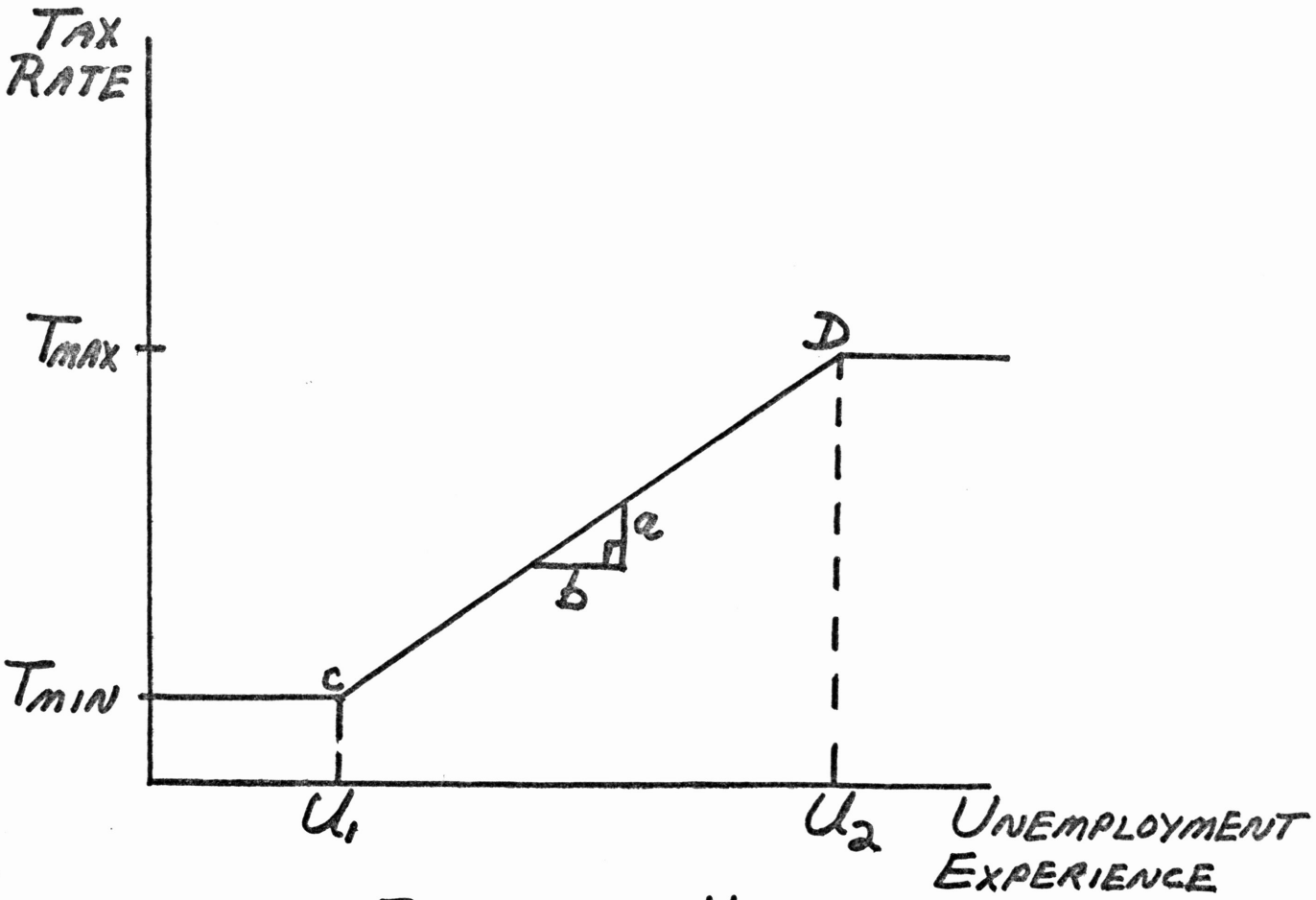

FIGURE 4

THE GENERAL FORM OF AN UNEMPLOYMENT INSURANCE TAX RATE SCHEDULE

Thus, the closer the slope of the tax schedule is to one the more perfectly experience rated is the system. This allows $\frac{\partial l^*}{\partial S} < 0$ to be interpreted as an inverse relationship between the degree of experience rating of the UI tax and the firm's optimal layoff rate.

Another measure of the degree of experience rating is the level of the statutory tax rate limits, T_{MAX} and T_{MIN}. Since at the maximum and minimum tax rates, the tax schedule becomes horizontal ($S = 0$), the range between these two rates, which is the only effectively experience rated portion ($S > 0$), is also a measure of the degree of experience rating. The narrower the range over which the tax schedule has a positive slope, the more likely it is that firms will be located at T_{MAX} and T_{MIN} and thus, the lower is the degree of experience rating embodied in the tax structure. In practice, this means that a firm with very low unemployment experience, and subsequently at the minimum tax rate, that decreases its layoff activity will generally receive no tax rate decrease. Analogously, a firm with high unemployment experience, and thus at T_{MAX}, that increases its layoff activity will generally not incur an increase in its tax rate. Thus, layoff activity should be higher ceteris paribus the narrower is the UI tax rate range as more firms are not subject to financial incentives for decreasing layoffs nor to financial disincentives for increasing layoffs.

The Data

The data used in the following analysis was derived from two sources. All of the information on UI tax rates and taxable wage

bases[5] came ultimately from the individual states' unemployment security agencies. The data on layoff rates was furnished by the Bureau of Labor Statistics section of the United States Department of Labor.

Tax rates and taxable wage bases were available for all states for selected years. The analysis uses data from 1968, 1969, and 1972 (1972 was the most recent data available on layoff rates). Table 1 gives descriptive statistics of the UI tax rate ranges and taxable wage bases used in the analysis.

The layoff rates are for manufacturing industries at the two-digit Standard Industrial Classification level. The formal definition of a layoff which is used in gathering the data on layoff rates is the separation of a worker from his employer due to no fault of the worker. Only fourteen of the twenty-two industries[6] in this category provided enough observations to be useful in the analysis. The layoff rates are measured in terms of layoffs per one hundred employees. Table 2 gives some descriptions of the layoff data which was used in the analysis.

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[5]The taxable wage base is the dollar amount of an employees earnings which are subject to UI taxes. The base varies across states with the federally stipulated minimum of $3000 for 1968 and 1969 and $4200 for 1972.

[6]The twenty-two industries are: Ordnance and Accessories; Lumber and Wood Products; Furniture and Fixtures; Stone, Clay, and Glass Products; Primary Metal Industries; Fabricated Metal Products; Machinery, except Electrical; Electrical Equipment and Supplies; Transportation Equipment; Instruments and Related Products; Miscellaneous Durable Goods; Food and Kindred Products; Tobacco Manufactures; Textile Mill Products; Apparel and Other Textile Products; Paper and Allied Products; Printing and Publishing; Chemicals and Allied Products; Petroleum and Coal Products; Rubber and Plastic Products; Leather and Leather Products; Miscellaneous Non-Durable Goods.

TABLE 1

UI Tax Rate Ranges and Taxable Wage Bases

1968	Mean	Standard Deviation
Tax Rate Range	3.011	1.001
Taxable Wage Base	$3356.25	502.21
1969		
Tax Rate Range	3.705	0.996
Taxable Wage Base	$3514.06	870.99
1972		
Tax Rate Range	3.989	1.037
Taxable Wage Base	$4521.88	1131.02

TABLE 2

LAYOFF RATES BY INDUSTRY

1968	Mean	Standard Deviation
Transportation Equipment	1.771	1.292
Electrical Equipment & Supplies	0.630	0.276
Machinery except Electrical	0.776	0.521
Fabricated Metal Products	1.015	0.872
Primary Metal Industries	0.796	0.484
Stone, Clay & Glass Products	0.086	1.075
Chemicals & Allied Products	0.032	0.421
Printing and Publishing	0.513	0.334
Paper and Allied Products	0.643	0.411
Furniture and Fixtures	0.772	0.621
Lumber and Wood Products	1.072	0.636
Apparel & Other Textile Products	1.421	1.088
Textile Mill Products	1.019	0.694
Food & Kindred Products	2.146	1.318
1969		
Transportation Equipment	1.780	0.955
Electrical Equipment & Supplies	0.590	0.358
Machinery except Electrical	0.581	0.451
Fabricated Metal Products	0.067	0.881
Primary Metal Industries	0.604	0.511
Chemicals and Allied Products	0.553	0.268
Printing and Publishing	0.463	0.297
Paper & Allied Products	0.659	0.522
Furniture and Fixtures	0.694	0.442
Lumber and Wood Products	1.144	0.814
Apparel & Other Textile Products	1.453	1.077
Textile Mill Products	1.353	0.990
Food & Kindred Products	3.204	3.878
1972		
Transportation Equipment	1.567	1.065
Electrical Equipment & Supplies	0.541	0.356
Machinery except Electrical	0.538	0.339
Fabricated Metal Products	1.041	0.651
Primary Metal Industries	0.636	0.470
Stone, Clay & Glass Products	1.143	0.966
Chemicals & Allied Products	0.506	0.303
Printing & Publishing	0.505	0.358
Paper & Allied Products	0.724	0.518
Furniture & Fixtures	0.688	0.584
Lumber and Wood Products	0.974	0.759
Apparel & Other Textile Products	1.437	1.341
Textile Mill Products	0.860	0.762
Food & Kindred Products	2.904	2.711

The empirical investigation involved a regression of the dependent variable, the layoff rate, on the two independent variables, the tax rate range and the taxable wage base, and a constant term using ordinary least squares. The equation that was estimated is:

$$l_{ij} = \alpha_1 + \alpha_2 Xj + \alpha_3 B_j + \varepsilon_{ij}$$

where l_{ij} is the layoff rate in industry i in state j; Xj is the tax rate range in state j ($T_{MAX} - T_{MIN}$); Bj is the taxable wage base in state j; α_1, α_2, and α_3 are the coefficients to be estimated; and ε_{ij} is random disturbance term associated with l_{ij}. Only cross-state regressions were estimated, there was no attempt made to analyze time trends within a single state.

As for methods to control other factors which may affect the layoff rates of these industries across states, there are none that can be both readily identified and easily applied in this analysis. It can be mentioned, however, that it is generally assumed that manufacturing industries are in homogeneous national markets, and thus, all firms in such an industry face the same demand for their output, no matter where they are located. This assumption eliminates the need to control for varying shifts in consumer demand across states; decreases in consumer demand being the major cause of the seasonal unemployment which a firm experiences.

The results of the regressions on the data from 1969 are given in Table 3. The three estimated coefficients are given along with their associated t-values in the first three columns. In the fourth column, R^2, which is a measure of the amount of variation in the dependent variable that is explained by the model, is reported for each

TABLE 3

1969 Regression Results

Industry	Coefficients with t-values in Parentheses α_1	α_2	α_3	R^2
Transportation Equipment	2.70 (1.63)	-0.44 (-1.89)*	-0.001 (-1.78)	.29
Electrical Equipment and Supplies	0.12 (0.18)	0.15 (1.82)*	-0.001 (-0.20)	.16
Machinery except Electrical	0.29 (0.34)	0.18 (1.76)*	-0.001 (-0.57)	.16
Fabricated Metal Products	0.41 (0.24)	-0.06 (-0.29)	0.001 (0.58)	.02
Primary Metal Industries	-0.16 (-0.17)	-0.01 (-0.08)	0.001 (1.01)	.05
Chemicals and Allied Products	0.43 (0.71)	0.06 (0.60)	-0.001 (-0.24)	.03
Printing and Publishing	0.29 (0.54)	0.001 (0.02)	0.001 (0.46)	.01
Paper and Allied Products	1.206 (1.19)	-0.07 (-0.54)	-0.001 (-0.32)	.02
Furniture and Fixtures	0.68 (0.66)	-0.08 (-0.49)	-0.001 (-0.36)	.03
Lumber & Wood Products	0.06 (0.04)	-0.15 (-0.63)	0.001 (1.16)	.10
Apparel & Other Textile Products	-4.25 (-1.17)	0.35 (1.02)	0.002 (1.51)	.14
Textile Mill Products	0.09 (0.02)	0.17 (0.44)	0.001 (0.18)	.01
Food & Kindred Products	-9.623 (-3.41)	0.02 (0.04)	0.004 (7.16)	.70

* Significant at ten percent level.

regression. It is apparent from the t-values for the coefficients of the tax rate range that most of them are statistically insignificant at the ten percent level. This coupled with the low R^2 values reveals that the data lends inconclusive evidence to the hypothesized inverse relationship between UI tax rate ranges and layoff rates.

The data for 1972, presented in Table 4 in the same format as Table 3, shows similar results to that of the 1969 data. The insignificance of the coefficients for the tax rate range and the low R^2 values indicate that the data neither supports nor rejects the hypothesized relationship.

The data for 1968, presented in similar format in Table 5, yields somewhat different results. The data on minimum and maximum tax rates in the individual states was more accurate for this year. Statutory minimum and maximum tax rates were used for the analysis of 1969 and 1972 data. In 1968, the actual minimum and maximum rates that were charged to any firm in a state were available. This would cause the tax rate ranges to be narrower. This is because each state has more than one tax schedule that it can use. The particular schedule in force for any one year depends on the solvency of the general state UI fund. The statutory minimum and maximum tax rates are reflected by the minimum tax rate of the lowest of the schedules and the maximum tax rate of the highest of these schedules. Each of these "sub-schedules" is actually a subset of the state's total schedule pictured in Figure 4, with each sub-schedule being a parallel shift upward of the next lower schedule. These more accurate tax rate ranges gave

TABLE 4

1972 Regression Results

Industry	Coefficients with t-values in Parentheses α_1	α_2	α_3	R^2
Transportation Equipment	-6.85 (-0.84)	0.09 (0.35)	0.002 (0.97)	.07
Electrical Equipment and Supplies	-1.60 (-1.16)	0.26 (4.05)*	0.001 (0.82)	.46
Machinery except Electrical	-0.86 (-0.54)	0.16 (2.21)*	0.001 (0.48)	.21
Fabricated Metal Products	-3.52 (-1.23)	-0.18 (-1.40)*	0.001 (1.95)	.27
Primary Metal Industries	0.98 (0.43)	-0.09 (-1.02)	0.001 (0.01)	.05
Stone, Clay and Glass Products	-12.37 (-1.94)	0.08 (0.25)	0.003 (1.99)	.23
Chemicals and Allied Products	0.89 (1.30)	-0.17 (-1.91)*	0.001 (0.81)	.27
Printing and Publishing	0.34 (0.44)	0.10 (1.08)	-0.001 (-0.30)	.08
Paper & Allied Products	1.78 (0.53)	0.05 (0.38)	-0.001 (-0.50)	.03
Furniture and Fixtures	-2.23 (-0.80)	0.22 (1.25)	0.001 (0.76)	.12
Lumber and Wood Products	1.22 (0.29	0.05 (0.22)	-0.001 (-0.11)	.01
Apparel & Other Textile Products	-3.59 (-0.41)	0.69 (1.78)*	0.001 (0.28)	.18
Textile Mill Products	2.65 (0.39)	-0.06 (-0.16)	-0.001 (-0.35)	.03
Food & Kindred Products	-5.41 (-3.21)	-0.21 (-0.65)	0.002 (7.81)	.74

* Significant at ten percent level

TABLE 5

1968 Regression Results

Industry	Coefficients with t-values in Parentheses α_1	α_2	α_3	R^2
Transportation Equipment	-0.35 (-0.14)	-0.16 (-0.52)	0.001 (1.14)	.09
Electrical Equipment and Supplies	0.57 (1.05)	0.25 (0.40)	-0.001 (-0.08)	.01
Machinery except Electrical	0.54 (0.56)	-0.13 (-1.69)*	-0.001 (-0.19)	.07
Fabricated Metal Products	-0.60 (-0.34)	0.08 (0.39)	0.001 (0.87)	.05
Primary Metal Industries	-0.14 (-0.17)	-0.02 (-0.17)	0.001 (1.35)	.08
Stone, Clay and Glass Products	1.41 (0.75)	-0.23 (-0.78)	0.001 (0.28)	.04
Chemicals & Allied Products	-0.92 (-1.24)	0.77 (0.76)	0.001 (1.93)	.22
Printing and Publishing	0.65 (1.16)	-0.04 (-0.49)	-0.001 (-0.03)	.01
Paper and Allied Products	1.21 (1.70)	-0.12 (-1.42)*	-0.001 (-0.30)	.10
Furniture and Fixtures	0.86 (0.64)	-0.01 (-0.05)	-0.001 (-0.05)	.00
Lumber and Wood Products	1.93 (1.48)	-0.28 (-1.36)*	0.001 (0.04)	.11
Apparel & Other Textile Products	-0.01 (-0.01)	-0.24 (-0.75)	0.001 (0.67)	.10
Textile Mill Products	-1.95 (-0.79)	-0.08 (-0.37)	0.001 (1.53)	.22
Food and Kindred Products	0.19 (0.08)	-0.08 (-0.29)	0.001 (1.02)	.05

* Significant at ten percent level.

results which lend greater support to the model than did the 1969 and 1972 data. This is evident from the greater number of tax rate range coefficients that have a negative sign and from the greater number of statistically significant coefficients at the ten percent level.

These inconclusive results can be largely explained by three factors. First, firms may be violating the assumption that they are seeking to maximize the profits of their layoff activity. They may instead, be operating under other motives, such as public relations. Second, the effect of UI taxes on a firm's layoff behavior may be too small to be detected separately from the other factors influencing the level of layoff activity. Third, and most important, the data used in the analysis was not as detailed as the model really requires. As mentioned, the tax rate data was imperfect. In addition, aggregating the layoff rates at the two-digit industry level inherently assumes that all firms in an industry are the same with respect to their layoff behavior which is an invalid assumption.

Conclusion

This paper has analyzed the experience rating feature of an unemployment compensation system. The question of how the costs of maintaining the unemployed are allocated was addressed. A review of current literature found a lack of research on the impact of the UI tax structure on the economy. The problem of cost allocation was seen to lie in determining which output prices reflect these costs and and thus determine how the market allocates resources. The model

developed involves three steps. The first two of these; which are the perfectly competitive solution to compensating the unemployed and the solution imposed by a perfectly experience rated UI system, respectively; developed benchmarks to be compared to the third model, that of the UI system as it actually is. The primary conclusion of the model is that imperfect experience rating of the UI tax causes an interfirm subsidization of seasonal unemployment with resulting non-optimal allocation of resources among firms. The secondary and empirically testable conclusion, is that the degree of experience rating of the UI tax is inversely related to a firm's layoff rate. The available data was tested using ordinary least squares methods. The regression results yielded inconclusive evidence to support the hypothesized relationship between tax rate ranges and layoff rates. Much work still needs to be done empirically so that the model can be either conclusively accepted or rejected. This can primarily be done by gathering and analyzing more detailed data. Only after such a definitive analysis, can the fall impact of the UI system be measured and subsequent policy decisions be adjusted accordingly.

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