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Recalls and unemployment insurance taxes

Š. JURAJDA

CERGE-EI, POB 882, Politickych veznu 7, Prague 1, 111, 21, Czech Republic
E-mail: stepan.jurajda@cerge-ei.cz

The US unemployment insurance (UI) system draws its funds from a payroll tax on employers. The tax rate varies directly with an employer's layoff history. There exists extensive evidence on the effect of this so-called experience rated tax on layoff decisions. However, since firms are typically liable for each dollar of regular UI benefits paid to laid off former employees, experience rating may also affect recall behaviour. This note therefore measures the effect of the UI financing system on the duration of unemployment. This article finds some evidence that higher layoff tax costs shorten the duration of recall unemployment.

I. INTRODUCTION

The method of financing unemployment insurance (UI) in the USA is unique. Where other governments usually draw funds from various sources and tax all employers uniformly, the US system of UI financing draws its funds from a payroll tax on employers and varies the tax rate according to the individual employer's layoff history. The tax rates that rise and fall with layoffs are said to be experience rated. The firm's liability to the UI system depends on the amount of unemployment benefits collected by the workers laid off by the firm. In all states, however, payroll taxes are only partially experience rated, i.e. many firms are not responsible for the full amount of the UI benefits collected by their workers. In particular, firms which are at the maximum or minimum UI tax rate are not experience rated since a marginal change in the dollar amount of benefits paid to their workers has no effect on their future UI tax rate.

The empirical literature measuring the effect of experience rating on (temporary) layoffs starts with Feldstein (1976) and relies on cross-sectional data on individual workers. Recently, Card and Levine (1994) estimated that incomplete experience rating causes 50% of temporary layoffs during economic downturns. A large portion of temporary layoffs end in recall (e.g. Katz and Meyer, 1990). Since experience rated firms face an increase in their future UI taxes for each dollar of regular UI benefits paid to their unemployed workers, one might expect firms to compare the cost of keeping a worker laid off to the cost of re-employment. This would suggest that experience rating will, *ceteris paribus*, make firms recall workers earlier than they would otherwise. This article explores this potential effect empirically.

II. DATA DESCRIPTION

The source of individual unemployment histories analysed in this article is the Trade Adjustment Assistance (TAA) dislocated workers survey. The data was collected in seven states and covers approximately 3.5 years for each worker between 1974 and 1978.[1] The sample includes a mixture of regular UI recipients and TAA recipients, who were entitled to more generous compensation.[2] The combination of TAA and UI recipients makes for a rich variation in UI entitlement and benefits. Further, the sample covers a period with many dramatic changes in UI entitlement, caused by various extended coverage programmes being triggered on and off, and the original data was

[1] The TAA programme was designed to compensate workers harmed by market fluctuations resulting from a rise in imports. The programme was amended several times and remains active. The data comes from California, Indiana, Massachusetts, New York, Ohio, Pennsylvania and Virginia.
[2] Their entitlement was extended by up to 52 additional weeks of UI coverage. Also, their dollar benefits were calculated as 70% of their previous wages as opposed to the typical 50%.

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Table 1. *Individual and spell characteristics*

Variable	Mean	SD	Dummy variable	Mean
Education	11.0	(2.66)	Union	0.47
Age	37.1	(12.5)	Previous recall	0.45
Previous wage	1.94	(1.04)	UI non-recipient	0.16
UI entitlement	43.2	(22.4)		
UI benefits	0.83	(0.51)		
Unemployment duration	36.4	(47.6)		

Note: Duration and entitlement are in weeks; wages and benefits are weekly logarithms in 1975 dollars. Number of individuals = 1245, Number of spells=2050.

augmented with information on the timing of these programmes. The data set and the extended benefits programmes are more fully described in Corson and Nicholson (1981) and Jurajda (2002).

From the initial sample of 1501 individuals cases in which the initial unemployment spell was in fact a period of reduced hours as well as inconsistent records were omitted, yielding a sample of 1245 workers. The data includes the level of initial entitlement and benefits only for the first unemployment spell. Entitlement and benefit levels for the subsequent unemployment spells are therefore imputed using the state specific UI laws and the individual employment histories, including the reason for job separation and the level of wages.[3]

Table 1 presents the data means at the first week of 2050 spells.

Measuring experience rating

There are two main types of UI payroll tax schedules in the USA: the reserve ratio system and the benefit ratio system.[4] Both are described in detail in Card and Levine (1992). Under all UI tax systems, the firm's tax rate is an increasing function of the amount of UI benefits paid to laid off former employees. Most of the previous work on experience rating therefore used the fraction of a dollar paid in UI benefits to a laid off worker that the firm has to pay in future taxes as the relevant measure of experience rating. This marginal tax cost (MTC) is ideally constructed by taking the firm's tax rate, locating its position on the state tax schedule and computing what the discounted future stream of taxes paid by the firm for a dollar increase in UI benefits will be, given the expected payroll growth. The degree to which the MTC is less than (or greater than) one is a measure of the subsidy of the state UI tax system to keeping a laid off worker unemployed.

In the absence of firm level data on the UI tax rates, existing studies typically rely on state-industry proxies constructed from insured unemployment rates. The literature was followed and measures of experience rating using the formulae described in detail in Card and Levine (1992) constructed. Yet, one is able to at least partially improve upon the quality of the imputation procedure by using the actual average industry-state specific UI tax rates, instead of constructing their proxies from the insured unemployment rates as previous studies did.[5] The annual state specific UI tax rates were obtained from the Bureau of Labor Statistics of the US Department of Labor for five major industry categories: manufacturing, construction, services, finance and retail trade. Observations from other industries are dropped, resulting in a loss of approximately 3% of the data. The MTC is constructed from year specific tax schedules and using annual values of the industry and state specific UI tax rates and employment growth. Table 2 reports the estimated values of MTC for the present sample.

The combination of TAA and UI recipients leads to a rich variation not only in UI entitlement and benefits, but also in the degree of experience rating. TAA firms are not responsible for UI benefits paid to their workers and that allows for the comparison of workers from experience rated firms within the industry classes where TAA petitions were approved.[6]

There are also other, more general sources of imperfect experience rating. As pointed out by Burgess and Low (1992), UI benefits are charged to a 'base period' employer, not necessarily the most recent employer. Since the UI 'base period' is typically defined as the first four of five preceding quarters, a firm which lays off workers within the first quarter of employment is not charged for the layoffs unless the worker was employed in the firm during the base period. Furthermore, layoffs occurring during the worker's UI benefit year (that is within a year of filing a UI claim) are, in most states, charged to all base period employers. A newly hired worker may therefore be laid off at low cost as long as she has an active UI claim. Even a firm which is fully experience rated in terms of the usual definition can take advantage of this subsidy to layoffs.

[3] I assume that workers are able to correctly calculate their UI compensation even in future UI claims. For further details see Jurajda (2002).

[4] With the exception of Pennsylvania and Virginia, all states covered by the data use the reserve ratio system. Pennsylvania has a hybrid system with the total tax rate being a sum of tax rates determined by both schedules. The combination of the benefit ratio and reserve ratio systems makes it difficult to compute the measure of experience rating for some values of taxes. For these tax values, it is still possible to derive tight bounds of the extent of experience rating. Virginia had a benefit ratio system in the sample period.

[5] A typical MTC computation (e.g. Topel, 1983; Card and Levine, 1994) uses insured unemployment rates to compute a 'steady state' tax rate which would equate UI tax payments with UI benefits for a given industry.

[6] Such a comparison is interesting as most previous studies analysing the effect of UI taxes on layoffs relied on variation across industries.

Table 2. *MTC estimates based on the industry-specific actual average UI tax rates*

Year and State	Manufacturing	Construction	Trade	Services	Finance
1974					
CA	0.00	0.00	0.28	0.00	0.48
IN	0.93	0.92	0.94	0.97	0.97
MA	0.35	0.00	0.37	0.68	0.75
NY	0.66	0.00	0.68	0.69	0.89
OH	0.84	0.85	0.84	0.85	0.77
PA	0.99	1.14	1.07	1.10	1.08
VA	0.10	0.11	0.10	0.11	0.11
1975					
CA	0.00	0.00	0.14	0.00	0.29
IN	0.83	0.81	0.86	0.93	0.93
MA	0.18	0.00	0.21	0.55	0.66
NY	0.42	0.00	0.48	0.50	0.78
OH	0.70	0.73	0.74	0.75	0.61
PA	0.65	0.77	0.82	0.88	0.83
VA	0.07	0.08	0.09	0.09	0.09
1976					
CA	0.77	0.00	0.63	0.30	0.77
IN	0.94	0.94	0.95	0.95	0.94
MA	0.00	0.00	0.00	0.00	0.32
NY	0.53	0.00	0.37	0.54	0.81
OH	0.77	0.77	0.78	0.78	0.78
PA	0.86	0.83	0.95	0.95	0.91
VA	0.11	0.09	0.12	0.12	0.10
1977					
CA	0.68	0.00	0.54	0.22	0.69
IN	0.94	0.95	0.94	0.94	0.96
MA	0.00	0.00	0.00	0.00	0.36
NY	0.55	0.00	0.71	0.56	0.55
OH	0.79	0.00	0.79	0.79	0.79
PA	0.90	0.98	0.94	0.96	0.94
VA	0.22	0.23	0.22	0.22	0.24
1978					
CA	0.72	0.00	0.62	0.29	0.73
IN	0.96	0.96	0.96	0.96	0.97
MA	0.71	0.71	0.70	0.71	0.71
NY	0.78	0.77	0.60	0.77	0.78
OH	0.87	0.00	0.85	0.86	0.86
PA	1.77	1.66	1.56	1.71	1.81
VA	0.38	0.39	0.35	0.41	0.40

Note: CA = California; IN = Indian; MA = Massachusetts; NY = New York; OH = Ohio; PA = Pennsylvania; VA = Virginia.

The extent to which firms are charged for layoffs varies over the duration of unemployment spells. The detailed information available in the data set allows me to impute individual UI eligibility status and the amount of unemployment benefits for each worker at each point in time. This is important as laid off workers not eligible for UI compensation do not bring any additional charges to the firm. Finally, after workers exhaust regular UI benefits they bring no additional charges to the firm, making liability for UI benefit charges a function of elapsed unemployment duration. (Firm tax costs are zero when the worker's UI is covered by a federal extended benefits programme.) While the estimates of MTC in Table 2 are comparable to previous studies, adjusting the experience rating measure to these rules results in only 34% of the weekly observations of unemployment for UI recipients having positive values of MTC.

III. ESTIMATION AND RESULTS

Duration model

To differentiate between the effect of experience rating on recall unemployment and on permanent layoffs, one

estimates a competing risk duration model for recalls and new jobs. (The use of duration data is important as experience rating varies over the duration of individual unemployment spells.) Let $\lambda_j(t, x_t)$ be the conditional probability (hazard) of leaving unemployment at duration t for someone with person specific characteristics x_t.[7] The j subscript stands either for a recall or for a new job finding ($j \in \{r, n\}$). One works in discrete time with weekly hazards in logit specification:

$$\lambda_j(t, x_t) = \frac{1}{1 + e^{-h_j(t, x_t)}} \tag{1}$$

where

$$h_j(t, x_t) = r_j(e_t, \alpha_j) + \beta_j' z_t + g_j(t, \gamma_j) \tag{2}$$

Here, $r_j(e_t, \alpha_j)$ denotes a function of remaining entitlement e_t, $x_t' = (e_t, z_t')$, where the vector z_t includes the UI costs of layoff, the levels of benefits and wages, demographic characteristics, time changing demand measures and a constant. Finally, $g_j(t, \gamma_j)$ is a function capturing the duration dependence.

Assuming that recall notices arrive in the morning mail, the unconditional probability of someone leaving unemployment through a recall at duration t becomes:

$$L_r(t) = \lambda_r(t, x_t) S(t-1)$$

where

$$S(t-1) = \prod_{v=1}^{t-1} [1 - \lambda_r(v, x_v)][1 - \lambda_n(v, x_v)]$$

is the probability of survival up to duration $t-1$ and where λ_r and λ_n denote the recall and new job hazards, respectively. The likelihood contribution for someone who finds a new job is similar. For an unemployment spell which is still in progress at the end of the sampling frame, at duration T, one enters the survival probability $S(T)$. The sample likelihood then equals the product of individual likelihood contributions.

Hazard function estimates

Economic theory suggests that the effect of the UI system on recall decisions depends on the relative magnitudes of UI compensation, UI taxes, and the training costs. Existing studies of layoff behaviour measure UI taxes with the marginal tax cost (MTC), which is the fraction of a dollar paid in UI benefits to a laid off worker that the firm has to pay in future taxes. The expense the firm is likely to consider in the weekly recall decision, however, is the product of the MTC with the weekly UI benefit amount (WBA) – the actual weekly tax cost.

The training costs are proxied by industry dummies and worker demographics (age and education in particular). Controlling for industry structure is also crucial for a proper interpretation of the estimated experience rating effects. For example, many firms in the construction industry will be at the maximum UI tax rate and therefore not experience rated, but one would not want to interpret that as the cause of frequent temporary layoffs in the industry. One therefore conditions on both a set of industry dummies[8] and on the industry specific national monthly unemployment rate. All specifications also include state unemployment rate averages and monthly deviations from these state specific means to control for permanent and temporary differences in local demand conditions. In all specifications The TAA dummy is entered as well as a set of annual dummies, which disentangles the effect of changing tax rates from that of the business cycle (see Card and Levine, 1994). Both the effect of remaining UI entitlement and the duration dependence are parametrized as step functions. Five entitlement steps chosen to cover similar fractions of transitions out of unemployment have been included.[9] Each step of the duration step function covers about 5% of exits.

Table 3 presents the unemployment hazard estimates.[10] Column (1) lists the recall hazard UI coefficients from a specification not controlling for state fixed effects. The estimated effect of the weekly UI tax cost (MTC*WBA) is positive and statistically significant, confirming the theoretical prediction. Remaining UI entitlement depresses the recall hazard and the estimated adverse effect is strongest when 14–39 weeks of benefits remain. Column (2) presents a specification including a set of state dummies. These additional controls absorb part of the variation in the experience rating measure and drive the UI tax coefficient towards zero and render it statistically insignificant.

Column (3) lists the new job hazard estimates. The UI tax cost of layoff does not appear to significantly affect the probability of finding a new job, providing a useful check on the recall UI tax estimate. Finally, column (4) offers the new job hazard estimates controlling for state fixed effects. The estimates are qualitatively identical to those presented in column (3).

[7] Individual i subscript is not used in any of the formulae in order to streamline notation.
[8] Apparel and footwear, other nondurable manufacturing, automobile, steel, other durable manufacturing, finance, retail trade, and construction.
[9] The first two steps, i.e. 1–13 and 14–26, also control for collection of regular UI benefits.
[10] The estimates of the baseline hazard coefficients are all significant at the 1% level in both hazards and are available from the author upon request. Both hazards exhibit negative duration dependence.

Table 3. *Unemployment hazard function estimates*

	Recall		New Job	
Type of hazard variable	(1)	(2)	(3)	(4)
UI Coefficients				
Weekly tax cost	0.392**	0.138	−0.299	−0.026
	(0.198)	(0.211)	(0.209)	(0.216)
Remaining entitlement over 52 weeks	−0.387	−0.462*	−1.289***	−1.399***
	(0.261)	(0.269)	(0.280)	(0.283)
39 to 52	−0.474*	−0.528**	−0.713***	−0.785***
	(0.256)	(0.260)	(0.254)	(0.256)
27 to 39	−0.677***	−0.656**	−0.634**	−0.727***
	(0.259)	(0.263)	(0.255)	(0.255)
14 to 26	−0.862***	−0.837***	−0.508**	−0.607**
	(0.267)	(0.269)	(0.252)	(0.253)
01 to 13	−0.444	−0.395	0.031	0.063
	(0.270)	(0.270)	(0.244)	(0.246)
TAA dummy	0.465***	0.380**	−0.618***	−0.545***
	(0.144)	(0.149)	(0.153)	(0.155)
Non-eligible dummy	−1.250***	−1.253***	−0.987***	−1.032***
	(0.234)	(0.240)	(0.168)	(0.167)
Weekly benefits	0.026	0.013	−0.346*	−0.370**
	(0.135)	(0.137)	(0.191)	(0.192)
Demographics				
Weekly wage $*10^{-2}$	0.023	0.016	0.113**	0.118**
	(0.046)	(0.047)	(0.047)	(0.047)
Years of education $*10^{-1}$	−0.333**	−0.348**	0.336*	0.336**
	(0.147)	(0.152)	(0.172)	(0.171)
Male dummy	0.002	0.038	0.166	0.153
	(0.094)	(0.095)	(0.111)	(0.110)
Age $*10^{-1}$	0.268	0.283	−0.351	−0.443*
	(0.186)	(0.188)	(0.235)	(0.236)
Age squared $*10^{-2}$	−0.020	−0.022	0.020	0.031
	(0.023)	(0.023)	(0.030)	(0.030)
Demand conditions				
Average of state unemployment rate $*10^{-1}$	−0.091	–	1.441***	–
	(0.447)		(0.480)	
Deviations from state average $*10^{-1}$	−1.387***	−0.765	−0.165	−0.644
	(0.458)	(0.548)	(0.489)	(0.587)
National industry unemployment rate $*10^{-1}$	0.257	0.388	0.097	0.063
	(0.254)	(0.270)	(0.021)	(0.221)
State fixed effects	No	Yes	No	Yes
Log-likelihood	−4193.7	−4178.4	−3140.4	−3123.8

Notes: Standard errors in parentheses. All specifications include industry and annual dummies as well as a step function in duration. * denotes significance at 10% level; ** at 5% level; *** at 1% level.

IV. CONCLUSION

This article provided what appears to be a first estimate of the effect of experience rating on the duration of temporary layoffs. Imputing tax costs to firms of UI benefits paid to laid-off workers reveals substantial variation in experience rating over the duration of unemployment spells related to, e.g. extended benefits programmes. Using both time and state variation in the extent of experience rating, it found that higher costs of layoff make recalls more likely. However, this result is sensitive to the inclusion of the state fixed effects, which may be related to the size of the sample: while the data used in this study has advantages,[11] they are relatively small and old. Hence, the main contribution of this note is in motivating future research on the recall effects of UI taxes utilizing similar methodology but richer data (such as the Current Population Survey).

[11] In particular, the data allow for within-industry comparison of workers with different level of experience rating, which is particularly important in absence of firm-specific tax rates when the imputed extent of experience rating is industry-specific.

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