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Starting with the recession of 1958, the potential duration of unemployment benefits that are regularly provided by states has been extended by six separate temporary Federal programs. These temporary extensions have been controversial because they raise a variety of questions about the optimal potential duration of unemployment insurance (UI): Should the potential duration of benefits be linked to labor market conditions, and if so, how should the link between potential duration and labor market conditions be made? That is, how should extended benefits be activated or "triggered"? Should the same eligibility conditions apply to extended benefits as to regular benefits? Should extended benefits be financed differently than regular benefits?

These questions about temporary benefit extensions have become increasingly controversial since 1970, when Congress passed a permanent "stand–by" Extended Benefits program. In principle, the EB program activates automatically when unemployment durations rise in the wake of a recession. But, especially since the "triggers" that activate EB were changed in the early 1980s, the EB program has activated only infrequently. For example, EB activated in only 10 states during the recession of the early–1990s, and never activated in some of the largest states that were hard–hit by the recession, such as California, New Jersey, New York, and Pennsylvania. As a result, four of the six temporary extensions have occurred since implementation of the permanent EB program, and each successive temporary extension has been increasingly complicated.

This paper provides background and a review of some of the analytical issues that arise in making policy on the potential duration of UI benefits. Section I reviews briefly the history of Federal extensions of unemployment insurance and illustrates the increasing complexity of each successive emergency benefit extension. Section II provides a brief review of how the potential duration of benefits is determined under regular state programs, since it is important to understand how potential durations are set in state programs as a background to accessing extended benefit programs.

The main analytical issue surrounding emergency extensions of unemployment benefits is whether (or to what extent) they create a disincentive for workers to seek reemployment, and hence lengthen spells of unemployment. Accordingly, the next three sections of the report focus on various aspects of this issue. Section III reviews the theoretical issues that arise in estimating the impact of extending the potential duration of UI benefits, and discusses the main class of model that has been relied on in grounding those empirical estimates.

Section IV provides a critical review of the empirical techniques that have been used to obtain estimates of the disincentive effects of increasing the potential duration of unemployment, pointing up the strengths and weaknesses of the various techniques. Section IV also provides a summary of the empirical estimates that have been obtained in past studies

Section V offers some new estimates of the impact of increased potential benefit duration on the duration of unemployment, using two data sets. In one of these data sets -- from Washington State in 1988-89 -- variation in the potential duration of benefits exists because the state provides greater potential duration of benefits to workers with stronger work histories. In the other data set -- from Illinois in 1984-85 -- variation in the potential duration of benefits exists because an emergency benefit extension program expired. This expiration allows a before-after comparison that

yields an estimate of the impact of the emergency extension on the duration of unemployment. These are the two types of variation in potential duration of benefits that have been the basis of most estimates of the disincentives of benefit extensions. The main purpose of section V is to explore the sensitivity of the estimates to changes in model specification, estimating technique, and source of variation in potential benefit duration. The main question addressed is, How robust (or how fragile) are estimates of the disincentive effects of extending the potential duration of unemployment benefits?

Finally, section VI summarizes the main points and suggests some directions for future research. The main conclusion, perhaps, is that most existing research has avoided the difficult issue of testing the sensitivity of econometric estimates, tending instead to put forward one or another rather fragile set of estimates as representing the truth. In the process, many of the issues that are central to designing sensible and defensible extended benefit programs have been side-stepped, and research has focused instead on econometric issues that, while technically interesting, may yield only a modest return to policy.

I. A Brief History of Federal Extended Benefit Programs

Currently, the maximum potential duration of unemployment benefits provided to job losers by regular state programs is 26 weeks in all states except Massachusetts and Washington (where the maximum potential duration is 30 weeks). In 10 states, the potential duration of benefits is 26 weeks for all claimants who qualify for any benefits (Illinois and New York are the only large states that provide such "uniform" potential duration of benefits). In all other states, the potential duration of benefits varies with a claimant's work experience in the base period — roughly the year preceding the claim for benefits. The ways in which "variable" potential duration states compute the potential duration of benefits are described in section II below. The regular state programs is sometimes referred to as the "first tier" of the UI system.

Table 1 provides a summary of the main features of the six Federal programs that have temporarily extended the potential duration of unemployment benefits beyond the duration provided by state programs. The permanent stand-by Extended Benefit program is also summarized there. The stand-by EB program is often referred to as the "second tier" of the UI system, and emergency extensions are collectively referred to as the "third tier."

The first two Federal emergency benefit extensions — Temporary Unemployment Compensation (TUC) and Temporary Extended Unemployment Compensation (TEUC) — were enacted in 1958 and 1961. They were similar in that each lasted slightly over a year and extended the potential duration of benefits to workers who exhausted their regular state benefits by 50%, up to a maximum of 13 weeks. They differed, however, in that TUC was a voluntary program financed by interest-free loans to 17 participating states. TEUC, on the other had, was mandatory and was financed through increases in the Federal Unemployment Tax.

Nearly ten years after the first two emergency extended benefit programs, Congress enacted the permanent stand–by Extended Benefit program (EB). EB was modeled on TUC and TEUC in that it extends benefits to claimants who exhaust their regular state benefits by an amount equal to one–half their regular benefit duration, up to 13 weeks. Also, the weekly benefit amount is the same as the weekly benefit amount under the regular state program. EB is financed half–and–half by Federal and state revenues. It was originally activated either nationally by a "trigger" based on the national insured unemployment rate, or on a state–specific basis by state–level insured unemployment rates. The Federal trigger activated the program whenever the national insured unemployment rate reached 4 percent for a three-month period; the state trigger activated the program whenever a state's insured unemployment rate reached 4 percent for 13 consecutive weeks, and was at least 20 percent above the average insured unemployment rate of the corresponding 13-week periods in the two previous years.

As shown in Table 1, in 1980 and 1981, the national trigger was dropped and the state–level trigger was raised from an insured unemployment rate of 4 percent to a rate of 5 percent. Both changes made it less likely that EB would be activated in a recession. Also, the amendments of the early-1980s made eligibility for EB more restrictive -- the program now requires that workers have at least 20 weeks of work (or the equivalent) in the base period to qualify for EB. Combined with falling insured unemployment rates, which have resulted mainly from decreased participation in unemployment insurance, the changes of 1981 led to a situation in which EB was nearly defunct by the time of the recession of the early 1990's. As already noted, EB was activated in only 10 states during that recession and failed to activate in several states where many observers felt labor market conditions were bad enough to warrant it. In response to the failure of EB to be activated widely during the early–90's

recession, Congress passed legislation allowing states to adopt an alternative trigger based on the total unemployment rate (TUR) in 1993, although few states have adopted the alternative trigger (see below).

States were allowed to adopt EB as early as October 1970, and required to do so no later than January 1972. But even before EB became available in all states, Congress adopted the Emergency Unemployment Compensation Act (sometimes called "Temporary Compensation" or "TC"), which provided up to 13 weeks of extended benefits to claimants who either exhausted EB or exhausted regular benefits in states where EB was not available. Temporary Compensation was activated by special triggers that differed from the stand–by EB triggers. It was financed from Federal Unemployment Tax revenues in the Extended Unemployment Compensation Account (EUCA). The program, which originally was set to run from January 1972 until September 1972, was extended through March 1973.

During the severe recession of mid–1970s, the national EB trigger activated the Extended Benefits in all states, permitting workers to receive up to 26 weeks regular unemployment benefits followed by up to 13 weeks of EB. Nevertheless, the recession was so severe that Congress enacted another emergency extension in January 1975 -- Federal Supplemental Benefits (FSB), which provided up to 13 additional weeks of benefits to those who exhausted regular benefits and EB.

In March 1975, the FSB program was extended and made more generous by providing yet another 13 weeks of benefits. As a result of this and further extensions of FSB, a claimant could receive up to 65 weeks of unemployment benefits for the period March 1975 through March 1977 — 26 weeks of regular state benefits, 13 weeks of EB, and 26 weeks of FSB.

In April, 1977, FSB was extended again (through January 1978), but the potential duration of benefits was reduced to 13 weeks from May 1977 through the end

of the program. This extension also added special federal disqualifications for refusal of suitable work and failure to actively seek work, defined suitable work for the FSB program, and added special penalty and repayment provisions for fraudulent acts on the part of both claimants and employers. This was the first time such disqualifications had been imposed as part of an emergency extension.

As already noted, Congress eliminated the national trigger for EB in 1980, and increased the rate of insured unemployment needed to activate EB in a recession. In addition, Congress changed the definition of insured unemployment to omit EB claimants from the computation, and imposed special eligibility and disqualifying conditions on EB claimants. All of these changes reflected a changed attitude toward extended benefits, one that suggested an intent by the new Reagan Administration and Congress to reduce the cost of domestic programs. These changes clearly did reduce the cost of EB -- indeed, they very nearly disabled the program. But ironically, the parade of emergency unemployment benefit extensions continued.

In 1982, Congress enacted Federal Supplemental Compensation (FSC) as part of the Tax Equity and Fiscal Responsibility Act of 1982. FSC was different from previous emergency extended benefit programs in that the number of weeks payable in each state varied according to different criteria at different times. In fact, FSC went through four "phases," each of which provided different potential benefit durations for each state depending on the state's labor market conditions (see Table 1, under "potential duration of extended benefits provided"). Under Phase II, a UI claimant in a high unemployment state could be eligible for up to 55 weeks of benefits -- 26 from the regular state program, 13 from EB (assuming the state had triggered on), and 16 from FSC.

Potential durations were somewhat shorter under Phases III and IV of FSC, but the interstate differences in potential benefit durations remained. Under FSC, then,

there was more tinkering (or, more charitably, greater effort to fine-tune the program) than under previous emergency extensions in two senses. First, the idea that emergency extensions should provide different potential benefit durations to different states was wholly new -- even the stand-by EB program has never done this. Second, four phases of FSC led to frequent changes in potential benefit duration and created administrative difficulties for the states. Both of these aspects of FSC began to call into question the roll of emergency extensions and seemed to be an admission that the stand-by EB program was already defunct.

The most recent emergency extension of unemployment benefits, Emergency Unemployment Compensation (EUC), was enacted in November 1991 after months of foot-dragging by the Bush Administration, which had vetoed several earlier emergency extensions. EUC was the most complicated emergency benefit extension of all: it went through *five* phases, provided different potential durations across states at a given time, and different potential durations within a state over time (see Table 1). The potential duration of benefits within a state could change either because of Congressional fiat (that is, a change from one phase to the next), or because a state changed its classification as either high-unemployment or low-unemployment. By all accounts, EUC was a UI administrator's nightmare. In Pennsylvania, for example, the potential duration of benefits changed *nine* times between November 1991 when EUC became effective and February 1994 when Phase V of EUC terminated. Five of these changes resulted from enactment of EUC or a change from one phase to another, and four resulted because Pennsylvania was reclassified as high- or low-unemployment. At one point, Congress let EUC lapse, but subsequently resuscitated it, and during the hiatus, state administrators were left hanging.

During Congressional debate on whether to extend EUC, Republicans in Congress argued that if Congress continued its pattern of enacting emergency

extensions whenever the economy went into recession, then there would be no incentive for the states to switch to the new alternative EB trigger, based on the total unemployment rate (TUR). The old insured unemployment rate trigger, as already discussed, has been ineffective since the early-1980s and rarely moves a state onto EB, whereas the alternative TUR trigger would be more effective. But states naturally prefer to have the Federal government step in and provide emergency benefits, since financing of emergency benefits is wholly Federal, rather than 50-50 state-Federal as with EB. As long as the states can argue that EB is not providing adequate benefit durations, they can reasonably urge Congress to enact emergency extensions. And as long as Congress accommodates the states in enacting emergency extensions, the states have no incentive to switch to the alternative TUR trigger, which would be more effective but would also result in greater benefit payments from the state UI trust funds.

A cynic might argue that Congress really does not want the stand-by EB program to work effectively -- that members would prefer to step in and enact an emergency program whenever the economy slumps. An emergency program shows that Congress has "done something" in an economic downturn and offers the politicians a concrete program to point to when they stand for reelection. Such a cynical view is not wholly unrealistic. Congress could require the states to switch to the alternative TUR trigger, but it has not done so.

The future of the EB program and emergency extensions is highly unclear at this time. Congress seems to pay attention to the Unemployment Insurance System only when there is a recession, so the role of politics would seem to be more important than the role of policy analysis in determining the future of extended benefits. It needs to be noted that very little effort has been devoted to understanding what is (or would be) the socially optimal potential duration of benefits, or to analyzing the extent to which that optimal potential duration should change with changing labor market

conditions. These gaps, convincingly addressed, could have an impact on policy and the future direction of unemployment insurance in this country.

II. How States Determine the Potential Duration of Benefits

From the beginning of the UI program in the United States, the generally accepted goal has been to provide a limited number of weeks of benefits, payable only long enough to tide an unemployed worker and household over a temporary spell of unemployment. Consensus on the meaning of "temporary" has changed -- from 15 weeks, which was the most common potential duration at the beginning of the program in 1935, to 26 weeks, which is the maximum in all but two states today.

The apparent consensus that 26 weeks is a reasonable duration of benefits masks considerable variation among the states in how the duration of benefits is determined. Some states provide the same duration of benefits to all eligible claimants, whereas others vary benefit duration with the extent of a claimant's past employment or wages. Accordingly, there are substantial differences among the states in the amount of prior work or wages required to qualify for different benefit durations.

Table 2 provides a summary of the methods used by the states to determine the potential duration of benefits. As can be seen in the first two columns, nine states currently provide the same potential duration of benefits to all who meet the minimum qualifying requirement (that is, the minimum and maximum potential durations are the same). These are usually referred to as uniform duration states. The number of states providing uniform duration has fallen over the years, as Blaustein (1993, Table 10.7, p. 304) has shown.

The other 44 states vary potential duration according to each claimant's past employment or earnings. These states use one of two methods to compute potential duration. In 6 states -- Florida, Michigan, New Jersey, Ohio, Oklahoma, and Pennsylvania -- potential duration is an increasing function of the number of "credit" weeks worked (or wages, in the case of Oklahoma) in the base period, up to the

maximum 26 weeks. A credit week is a week in which earnings equaled or exceeded some specified minimum, so that,

(2.1) $$D_{pot} = \min [\, f(\text{credit weeks}), 26],$$

where D_{pot} denotes the potential duration of UI benefits and f is a function increasing in credit weeks. For example, in Florida, a credit week is a week in which a worker earned at least $20, and potential duration equals one-half the number of credit weeks.[1] It follows that, in order to be eligible for the maximum potential duration of 26 weeks of benefits, a worker must have 52 credit weeks; that is, the worker must have worked in every week of the base period.

In 38 states, the potential duration of benefits depends on the ratio of a claimants' base-period earnings to high-quarter earnings, up to the maximum 26 weeks. If we let BPE denote base period earnings and HQE denote high-quarter earnings, then,

(2.2) $$D_{pot} = \min [\, f(BPE/HQE), 26],$$

where f denotes a function increasing in BPE/HQE. Note that BPE/HQE ranges from 1 for a worker all of whose base period earnings were earned in a single quarter (BPE = HQE for such a worker) to 4 for a worker who had identical earnings in all four quarter (BPE = 4[HQE]). The idea here is that a worker with stable earnings throughout the base period will have a higher BPE/HQE and hence a higher potential duration of UI benefits.

In 5 states, the relationship between BPE/HQE and potential duration is explicit. For example, in North Carolina, potential duration is simply 8.67 times BPE/HQE (up to 26 weeks), so that a UI-eligible worker with BPE/HQE of 3 or greater is eligible for the maximum potential duration of 26 weeks of benefits.

In 33 states, however, the relationship between BPE/HQE and potential

[1] In Florida, a worker must have at least 20 weeks in which there were earnings of at least $20 to be eligible for any UI benefits, so the minimum potential duration of UI benefits is 10 weeks.

duration is masked by the formula used to calculate potential duration. In these states, potential duration is calculated as some fraction a of base period earnings divided by the weekly benefit amount (WBA), up to the maximum:

(2.3) $D_{pot} = \min [a(BPE)/WBA; 26]$.

The parameter a limits the total UI benefits paid to a worker in the benefit year to some fraction of base period earnings. In 18 states, a = 1/3, and in the other 15, a ranges between .25 and .6. What needs to be noted is that in all of these states the weekly benefit amount is computed in turn as a fraction of high-quarter earnings (or in some cases, average earnings in the two highest quarters of the base period) up to some maximum:

(2.4) $WBA = \min [b(HQE), WBA_{max}]$.

Typically, b is 1/25 (.04), so that the weekly benefit amount equals one-half of average weekly earnings in the high quarter. [The parameter b ranges from 1/26 (.038) to 1/20 (.05) in these 33 states.] Substituting the WBA equation (2.4) into the potential duration function (3) yields:

(2.5a) $D_{pot} = a(BPE)/b(HQE)$, if $WBA < WBA_{max}$,

or

(2.5b) $D_{pot} = a(BPE)/WBA_{max}$, if $WBA = WBA_{max}$.

It follows that for eligible claimants whose WBA is less than the state's maximum,

(2.6) $D_{pot} = g(BPE/HQE)$,

where

(2.7) $g = a/b$,

so the dependence of potential duration on BPE/HQE is clear for claimants whose WBA is below the maximum. For claimants whose WBA is at the maximum, potential duration will still depend on the relationship between base period and high-quarter

earnings. For example, a worker who obtains the maximum WBA as a result of high earnings in just one quarter may have potential duration below the maximum 26 (or 30) weeks, since base period earnings will be low relative to the weekly benefit amount for such a worker.

The parameter g can be usefully interpreted as an index of a state's duration generosity. Specifically, it gives the increase the number of weeks of potential duration that result from a unit increase in BPE/HQE. In Table 2, g has been computed for all 53 "states" (that is, UI jurisdictions). For states that do explicitly use the parameters a or b in computing the potential duration of benefits, an implied g has been calculated numerically.

Table 2, also displays the minimum base period earnings and high-quarter earnings that an eligible claimant would need in order to receive the state's maximum potential duration of benefits.

An examination of g and the minimum earnings required for maximum potential duration in Table 2 shows that the variations in states' duration provisions are significant. Claimants with similar base-period work experience qualify for quite different potential durations depending on the state in which they reside, and the requirements for 26 weeks of regular benefits vary dramatically among the states. For example, to qualify for 26 weeks of regular benefits requires as little as $130 in the base period (and $33 to $105 in the high-quarter) in Hawaii to as much as $18,757 in the base period (and $4,800 in the high quarter) in Indiana.

Variable duration reflects the notion that workers "earn" their rights to benefits by working, and that each week of benefits is earned by a given number of weeks of employment or earnings. The widespread use of variable duration also reflects two further concerns: first, that uniform duration is more expensive than variable duration, and second, that uniform duration can generate a high ratio of total benefits paid to

base period earnings, which could in turn lead to strong work disincentives.[2] These issues are explored further below.

[2] See Advisory Council on Unemployment Compensation (1995, p. 129) for a discussion replacement rates based on the administrative records of six states. Although the ACUC discussion is based on a different definition of the replacement rate (the ratio of weekly benefits to average base period earnings) than the definition used in the text, it does suggest that benefit durations in excess of base period employment durations would imply strong work disincentives.

III. Theoretical Issues

Most estimates of the effects of both benefit duration and benefit amounts on the duration of joblessness have been based on one or another model of job search (see Mortensen 1986 for a review)[3]. The job search models provide a theoretical link between the duration of joblessness, on the one hand, and job–search intensity, individual characteristics, and labor market conditions, on the other. It is useful to review a general job-search model as a prelude to the empirical work that is reviewed and developed below.

Let T denote the week in which a UI recipient returns to work, and let P_t denote the probability that a UI recipient returns to work in week t, given that she has not already returned to work by then; that is, $P_t = Pr[T=t|T \geq t]$. Then P_t can be expressed as the product of (a) the probability of receiving a job offer in week t and (b) the probability of accepting that job offer, given that an offer has been made. The probability of receiving an job offer in week t (J_t) depends on the intensity of the worker's job search (i) and a vector of characteristics of the worker that determine the demand for the worker's labor (c); that is, $J_t = J_t(i,c)$. The probability of offer acceptance (A_t) depends on whether the offered wage (w^o) equals or exceeds the worker's reservation wage (w^r); that is, $A_t = Pr[w^o \geq w^r | J_t]$. Hence, the probability of finding reemployment during week t (given that reemployment has not already occurred) can be expressed as:

(3.1) $$P_t = J_t(i,c)\, A_t.$$

[3] The income-leisure model developed by Moffitt and Nicholson (1982) is also appealing because of its link to well-known principles of consumer theory, but it has been the basis of relatively little empirical work. One reason may be that the income-leisure model implicitly views unemployment as compensated leisure, and views the combination of income and leisure (that is, unemployment) as chosen by the worker subject to the constraints posed by the available wage rate and the UI system. Since the extent to which unemployment is voluntary is itself an important question, a model that assumes that unemployment is voluntary may be rather uninformative.

P_t has been defined in discrete time above. In the limit, as the time interval over which reemployment is measured approaches zero, P_t becomes an instantaneous rate of reemployment, or hazard rate, h(t). The hazard rate is linked to unemployment duration in the following way. If t has cumulative distribution F(t), and frequency distribution f(t), then $h(t) = f(t)/[1 - F(t)] = f(t)/S(t)$, where S(t) is the so–called survivor function, or the probability of being unemployed to time t (Lancaster 1979). The survivor function can also be expressed in terms of the hazard: $S(t) = f(t)/h(t)$. Thus, the hazard rate is inversely related to the survival probability, and any factor that increases the hazard rate should decrease expected unemployment duration.

Equation (3.1) highlights the fact that longer spells of joblessness can result from less–intense job search, from individual characteristics (c) that imply lower demand for a worker's services, or from a lower probability of job–offer acceptance. From the point of view of work disincentives, the probability of offer acceptance, A_t, and the intensity of job search, i, are central, since they depend on the generosity and potential duration of UI benefits.

IV. Potential Duration of Unemployment Benefits and the Duration of Joblessness: Models and Existing Estimates

Since the mid–1970s, the most–researched question about the Unemployment Insurance (UI) system has been whether and to what degree higher weekly UI–benefit amounts lengthen UI recipients' jobless spells. But an equally important and under–researched question is how the potential duration of those benefits influences the length of jobless spells. The latter question is important for two reasons. First, as already discussed, Congress has legislated six temporary or emergency extended UI–benefit programs since the 1950s, making the potential duration of UI benefits a highly variable aspect of the UI system. Second, as will become clear, econometric problems make inferences about the influence of UI–benefit extensions on the expected length of UI recipients' jobless spells especially tenuous.

This section offers a summary of the evidence on the disincentives effects of extending the potential duration of benefits by an additional week. Rather than simply provide a range of estimates, though, an effort is made to provide some insight into the quality of the existing evidence. Subsection A begins with a discussion of the problems that arise in using censored data, which has generally been used in obtaining estimates of the disincentives of unemployment insurance. Subsection B then reviews several models that have been used to infer the effects of extended benefits -- a simple linear duration model, a parametric jobless duration model that accounts for censoring of the dependent variable and non–normality of the error term, and a semi–parametric model of the conditional probability (or hazard) of returning to work. Subsection B also summarizes the estimates that have been derived from each of the models.

A. Censoring Problems

Most analyses of the effects of potential benefit duration on jobless duration have used claims and benefits data from UI administrative files. These data are extremely rich: For example, they usually contain demographic data on claimants, the dates of their UI claims, and the amount and timing of benefits received. But claims and benefits data from UI administrative files are usually deficient in that they exclude any information on the subsequent earnings of claimants. Hence, they fail to offer data on actual spells of unemployment. Rather, they indicate only the duration of *insured* unemployment experienced by a claimant.

In some data sets -- including both the Illinois and Washington State data used in section V, this deficiency can be overcome to some extent by using data from Unemployment Insurance Wage Records, which contain information on the earnings histories of workers both before and after their spell of insured unemployment. By matching a claimant's Wage Records to his or her claims and benefits data, it is possible to determine whether a spell of insured unemployment was followed by a period of earnings. If the observed spell of insured unemployment was followed by a period of earnings, then it can be inferred that the insured spell and the actual spell of joblessness were the same. On the other hand, if the insured spell was not followed by a spell of earnings, the insured spell must be considered a censored or truncated measure of the actual spell of joblessness.

It was rare for early studies of the disincentive effects of UI to make use of Wage Records, as will be done in Section V below. As a result, existing research using administrative data has necessarily taken a different approach to drawing inferences about actual spells of joblessness from observations on insured unemployment spells. First, because the number of weeks of unemployment that can be observed in

administrative data is limited by the potential duration of UI benefits, it has been assumed that any spell of insured unemployment that is at the maximum potential is an incomplete spell. For example, a worker eligible for 26 weeks of state regular benefits who is observed receiving 26 weeks of UI benefits would be considered to have had a jobless spell of greater than 26 weeks. Second, and conversely, a workers eligible for 26 weeks of benefits who is observed receiving less than 26 weeks of UI benefits would be considered to have had a jobless spell of exactly the observed length.

Neither of these assumptions is necessarily correct, as can be seen in Table 3, which uses a random sample of administrative data on male UI recipients in Illinois during 1984-85 to illustrate four cases, labeled A through D.[4] Cases A and B are those of workers who received the maximum potential weeks of UI benefits—that is, exhausted their benefits. It is possible for such workers to return to work immediately after receiving their last benefit payment (Case A), or to continue to be out of covered employment (Case B, which implies either continuing to seek employment or dropping out of the labor force after receiving the last benefit payment).[5] The usual assumption is that all workers who exhaust benefits continue without covered employment, as in Case B. But the right–most column of Table 3 shows that this assumption is incorrect for nearly 40 percent of the workers who exhausted their benefits in this sample. That is, 283 of the 717 workers who exhausted their benefits returned to work immediately (or very shortly) after receiving their last benefit payment.

It is also possible to misclassify a worker who did not exhaust his or her benefits. Cases C and D in Table 3 are for workers who received fewer than the potential weeks of benefit payments. Again, the usual assumption is that all such

[4] The data are for men in the control group of the Illinois Reemployment Bonus experiment. These data are described further in section V, where they are used further.

[5] Obtaining uncovered (usually underground) employment and moving out of state are additional possibilities.

workers returned to work immediately after they stopped receiving benefits, as in Case C. But the right–most column shows that 405 (or 28 percent) of the 1,445 workers who ended their benefits before exhausting did not return to covered employment.[6]

The problems of using censored data to infer the effects of extended UI benefits on expected unemployment duration can also be illustrated using the Illinois data that underlie Table 3. About one-half of the sample used in Table 3 was drawn before expiration of Phase IV of the Federal Supplemental Compensation (FSC) program in late 1984, and the other half was drawn after FSC expired. Phase IV of FSC in Illinois provided an additional 12 weeks of potential benefits to initial claimants who satisfied the usual state eligibility criteria plus a somewhat more stringent monetary eligibility criterion that was specific to FSC.[7] As a result, the workers sampled, all of whom were eligible for regular state benefits, can be divided into four categories: (a) those who were eligible for FSC because they met the additional monetary eligibility criteria for FSC and filed their initial UI claim while FSC was still in effect; (b) those who were monetarily eligible for FSC, but claimed benefits too late to actually receive FSC; (c) those who were monetarily ineligible for FSC and filed their initial claim before FSC expired; and (d) those who were monetarily ineligible for FSC, and filed their initial claim after FSC expired.

Table 4 shows the mean insured unemployment duration for each of these four groups. The expiration of FSC appears to offer a natural experiment. The mean unemployment duration of workers eligible for FSC (21.4 weeks) can be compared with the mean unemployment duration of workers monetarily eligible but temporally ineligible because they filed after FSC expired (17.9 weeks). As a quasi–control, the mean unemployment duration of workers who were monetarily *in*eligible but who filed

[6] Most likely, these workers either dropped out of the labor force or took uncovered employment, although it is possible that they stopped participating in UI and continued to seek employment. There is no way of distinguishing between the two possibilities in the administrative data.

[7] That is, not all UI claimants who were monetarily eligible for regular state benefits were also monetarily eligible for FSC.

for benefits while FSC was still in effect (16.5 weeks) can be compared with the mean unemployment duration of workers who were neither monetarily nor temporally eligible (20.1 weeks).

Two comparisons are shown in the bottom row of Table 4 (labeled "Difference"). The difference between the two groups of monetarily eligible workers, 3.5 weeks, suggests that FSC prolonged unemployment spells significantly. Moreover, the difference between the two groups of monetarily ineligible workers, –3.5 (with a large standard error), suggests that there was no underlying macroeconomic or other reason for expecting unemployment spells to be longer after the expiration of FSC. The conclusion would seem to be that workers eligible for FSC tended to take over three weeks longer to return to work than did workers who were not eligible for FSC.

Such an inference would clearly be wrong, though, because the claims and benefits data make it impossible to observe more than 26 weeks of unemployment among FSC-ineligibles, whereas we can observe up to 38 weeks of unemployment among FSC-eligibles. The truncation or censoring of unemployment spells at the maximum potential duration leads to a situation in which the two group means cannot be compared. To take Moffitt's (1985a) extreme example, every worker in each of the two groups might have an actual spell of joblessness of 30 weeks, but we would observe an average of 26 weeks for the first group (because the data are censored at 26 weeks) and 30 weeks for the second (because censoring occurs only at 38 weeks). It may still be the case that FSC tended to lengthen jobless spells, but the data in Table 4 cannot be used to make such an inference.

In the presence of censoring, quasi–experimental comparisons like those presented in Table 4 fail to yield reliable estimates of the effects of extended benefits on jobless duration. Hence, other methods of inference must be considered.

B. Models of Unemployment Duration and Reemployment Hazard

Estimates of how potential benefit duration affects the expected duration of joblessness have progressed through three stages. This section outlines the approach represented by each of these stages and summarizes past studies that have used each of the methods. Table 5 provides a synopsis of the various studies that are referred to.

1. *Linear Models of Insured Unemployment Duration*. The earliest empirical work on the effects of potential duration on expected jobless duration simply regressed the duration of insured unemployment in weeks (D), or the natural logarithm of weeks of unemployment on appropriate explanatory variables ($x_1, ..., x_K$), including measures of the replacement ratio and potential duration of benefits:

(4.1) $D = a_0 + a_1x_1 + ... + a_Kx_K + u,$

where u is assumed to be a normally distributed disturbance term. The coefficients of x_1 through x_K provide an estimate of the relationship between the explanatory variables and weeks of insured unemployment. Studies taking this approach include Ehrenberg and Oaxaca (1976), and Holen (1977), among others; however, only Holen estimated the effect of additional weeks of benefit entitlement. Her estimates suggest that a 1-week increase in the potential duration of benefits increases unemployment duration by about .8 week -- a very high estimate.

It seems unlikely that such estimates can be relied on for convincing assessments of the behavioral impact of an additional week of benefit entitlement on the duration of unemployment. The model used takes no account of censoring in the data, so that any measured impact of longer benefit entitlement could simply be the result of the ability to observe more weeks of unemployment for workers whose benefit entitlement is longer, as discussed in section A above. The estimates provided by such

studies do provide accurate *descriptive* evidence on extended benefits. That is, they they do give an unbiased and consistent estimate of the average weeks of extra benefit payments that are paid to workers who receive an additional week of benefit entitlement. But this descriptive estimate cannot be used to infer how an increase in the potential duration of benefits would change the behavior of workers. As a result the descriptive estimate cannot be used to predict how unemployment durations would increase if benefits were extended.

2. *Parametric Models of Time to Reemployment.* The problem with applying Ordinary Least Squares (OLS) to equation (4.1) is that the error them u in the equation is not normal, as OLS requires. There are two reasons for this. First, as already discussed, D is a censored measure of actual jobless duration, since each worker is eligible for a specified maximum number of weeks of benefits. As a result, the distribution of D is truncated at the maximum benefit duration. Realization of this problem lead to some studies that assumed that the underlying distribution of jobless spells is normal, and assumed in turn that the distribution of u in equation (4.1) is truncated normal. For example, Classen (1979) and Newton and Rosen (1979) both used Tobit analysis—which assumes that u has the truncated normal distribution — to correct for the truncation of the dependent variable. Classen's estimates suggest that an additional week of potential benefit duration leads to at most an additional 0.12 week of insured unemployment, whereas Newton and Rosen's estimates suggest an additional .6 week (see Table 5).

The second reason for questioning the assumption that u in equation (4.1) is normal is that the empirical frequency distribution of weeks of insured unemployment in most data is not bell–shaped, as the normality assumption requires. Rather, it shows one spike at zero weeks of unemployment, and falling frequencies for greater unemployment durations, until a spike appears where censoring occurs (that is, at

maximum benefit duration.) Except for the spike at the censoring point, the empirical distribution looks much like an inverse exponential. This latter problem can be solved in a jobless–duration equation like (4.1) by making an appropriate assumption about the distribution of u, and estimating equation (4.1) under that alternative distributional assumption. The Weibull distribution has been widely assumed in studies of jobless duration because it provides an approximation to the empirical distribution of jobless duration that appears to be valid (Lancaster 1979). (The exponential distribution is a special case of the Weibull. Whereas the exponential restricts the conditional probability that a UI recipient will become reemployed (P_t, or the hazard rate) to be constant over the spell of unemployment, the Weibull allows for the possibility that a UI recipient's probability of reemployment rises or falls over the spell. The greater generality of the Weibull distribution makes it the preferred choice.)

Several studies have imposed a more appropriate distributional assumption on u in equation (4.1) to examine the effects of potential benefit duration on the length of unemployment spells. These studies have obtained estimates suggesting that an additional week of benefit entitlement increases the duration of unemployment by about .2 to .4 week. For example, Katz and Ochs (1980) estimate that an additional week of benefit entitlement increases the duration of unemployment by .17-.23 week. Moffitt (1985b) estimates an additional .45 week for men and an additional .28 week for women using a 15-state sample. Using Georgia data, he obtains an estimate of .17 week for men and .37 for women. Solon (1985) also uses Georgia data and estimates that an additional week of potential benefit duration leads to 0.36 additional weeks of insured unemployment.

Such estimates are far more convincing than those based on Ordinary Least Squares, in that they take account of the censoring of data and make a defensible assumption about the distribution of unemployment spells. Nevertheless, they have

been criticized for imposing any distributional assumption, and because they are unable to take account of factors that change during a spell of unemployment and that may influence the ultimate duration of unemployment

3. *Semi–Parametric Hazard Models.* The two problems just mentioned cannot be handled in either of the duration modeling frameworks discussed to this point. They are important enough to discuss in somewhat more detail. The first is that the duration models force an assumption about the distribution of the error term u in equation (4.1). Incorrect distributional assumptions may yield misleading inferences about the effects of extended benefits. For example, the Weibull seems a good approximation to the empirical distribution of jobless spells as long as it is true that the spike in the empirical distribution in the week following benefit exhaustion results from censored data. But if the distribution of jobless spells shows a true spike in the week following benefit exhaustion—that is, if workers tend to put off finding taking a job until just after their benefits terminate—then the Weibull is a poor choice. Ideally, one would like to impose no distributional assumption at all.

The second problem is that some variables may change during a worker's spell of joblessness. For example, the number of weeks until exhaustion of benefits can be thought of as a variable that decreases weekly. There is no way of understanding the effects of such "time–varying" explanatory variables in a duration model.

To analyze the effects of time–varying explanatory variables and to avoid any assumptions about the distribution of jobless spells requires reconceptualizing the duration problem as a problem of rate of escape from joblessness. In other words, rather than regress some measure of duration on various explanatory variables, one could regress a dummy variable (R_t) equal to one if a worker escaped from unemployment in week t (zero otherwise) on various explanatory variables, some of which are time–invariant ($x_1, ..., x_K$), and others which are time–varying ($z_1(t), ..., z_N(t)$).

Since the dependent variable is a measure of a worker's probability of escaping joblessness in week t (given that the worker was "at risk" of escaping joblessness at the beginning of the week), it is appropriate to interpret the dependent variable as a hazard rate, and to call it h(t). Hence, this model can be written:

(4.2) $R_t = h(t) = b_0 + b_1x_1 + ... + b_Kx_K + c_1z_1(t) + ... + c_Nz_N(t) + e.$

If e is assumed normally distributed, then this a linear probability model, which is useful in exploratory work.[8]

Each coefficient in equation (4.2) represents the change in the probability of reemployment that results from a unit change in the independent variable. For example, if x_1 were age in years, then b_1 would show the change in probability of reemployment associated with an additional year of age. This change in probability would be assumed constant over the spell of unemployment (unless age were interacted with a time–varying explanatory variable). Note that a positive coefficient indicates a higher probability of returning to employment, and hence a shorter duration of unemployment.

Whereas the unit of observation in the various duration models represented by equation (1) is the *claimant*, the unit of observation in a hazard model is the *claimant–week*. The transformation of claimant records into claimant–week records is illustrated in Table 6. Panel A shows records for three claimants, who experienced 4, 38, and 0 weeks of insured unemployment. The first and third claimant became reemployed after receiving their last UI benefit payment, whereas the second remained jobless. Also, the first and third were ineligible for FSC, whereas the second was eligible.

The second panel of Table 6 shows the claimant–week records that are

[8] If e is assumed to have the logistic distribution, then we have a logit model, which is preferred to a linear probability model because it yields, consistent, and efficient coefficient estimates. In practice, logit estimates of equation (4.2) are virtually identical in statistical significance and quantitative response to changes in explanatory variables to linear probability estimates.

generated by the three claimant records in Panel A. The first claimant contributes a total of 6 observations to the claimant–week data set—one for the waiting week, one for each week in which UI benefits were received, and one more for the week following the spell of insured unemployment, since this worker became reemployed. The dependent variable in the hazard analysis, reemployment, is zero in all weeks except the last, in which reemployment occurred. The second claimant contributes 39 observations to the claimant–week data set—one for the waiting week, and one for each week in which UI benefits were received. The reemployment variable is zero for all of these observations, and since this claimant did not find reemployment after exhausting his UI benefits, there is no fortieth observation following the spell of insured unemployment in which the reemployment variable equals one. Note that, when claimant records are transformed into claimant–week records, each claimant contributes exactly as much information as is known about him or her to the analysis of reemployment probability (Allison 1982).

Hazard models such as (4.2) start from the pioneering work of Cox (1972), and are often referred to as "semiparametric" because they implicitly make no assumption about the distribution of u in the duration equation (4.1). Studies that have estimated hazard models such as (4.2) that also provide estimates of the effects of increases in potential benefit duration on jobless duration include Moffitt (1985a, 1985b), Ham and Rea (1987), Grossman (1989), and Katz and Meyer (1990). The estimates provided by these studies are wide-ranging: The estimates in Moffitt (1985a, 1985b) and Katz and Meyer (1990) suggest that a one–week addition to potential duration leads to an increase in unemployment duration of only .15 to .2 week. Ham and Rea's (1987) estimate of .26-.35 week is somewhat higher. Grossman's (1989) estimate of .9 week, derived from Phase IV of FSC, is the highest of all.

V. How Robust Are the Estimates? Some Exploratory Findings

The estimates of the impact of extending UI benefits reviewed above are based on different estimating techniques, various data sources, and various specifications of the incentives (or disincentives) facing UI claimants. The estimates vary widely, from virtually no impact of extending the potential duration of benefits to an increase in unemployment duration of .9 week for each additional week of benefit eligibility. This is a disturbingly wide range of estimates. In order to get a better understanding of how robust (or how fragile) these estimates are, this section reports results from two data sets that are typical of the data used in the studies reviewed above. The first are data from the Washington Reemployment Bonus experiment, which was conducted during 1988-89, and was evaluated using administrative data from the Washington State Unemployment Insurance system (see Spiegelman, O'Leary,and Kline 1991 for a full description). The advantage of using the Washington data is that Washington is a variable duration state -- that is, the potential duration of UI benefits depends on the earnings history of workers during their base period, and varies from a low of 10 weeks to a high of 30 weeks.[9] Since many estimates of how the potential duration of benefits affects unemployment come from data in which the main source of variation in potential duration occurs within-state (that is, under a given "regime" of potential duration), it seems useful to explore the extent to which various model specifications yield different findings in such a setting. The workers examined below are the 9,982 UI–eligible claimants who filed valid claims and were assigned either to the control group or to one of three treatments that offered low bonuses and had on impact on behavior.

[9] The distribution of potential durations is highly skewed in Washington: Less than 1 percent of eligible claimants have potential duration of 16 or fewer weeks; about 15 percent are eligible for 17 to 21 weeks (about 3 percent each for 17, 18, 19, 20, and 21 weeks); about 28 percent are eligible for 22 to 28 weeks (about 4 percent each for 23, 24, 25, 26, 27, and 28 weeks); about 5 percent are eligible for 29 weeks, and 51 percent are eligible for 30 weeks.

The second data set used is from the Illinois Reemployment Bonus experiment, which was conducted during 1984-85, and like the Washington experiment, was evaluated using administrative records of the State of Illinois Unemployment Insurance system (see Woodbury and Spiegelman 1987 for a complete description). The advantage of the Illinois data is that they span the expiration of one of the the emergency UI benefit extensions -- the Federal Supplemental Compensation program (FSC), which expired about half-way into the enrollment period of the Illinois bonus experiment. In Illinois, Phase IV of FSC provided 12 weeks of Federal benefit eligibility on top of the 26 weeks of regular state benefit eligibility that Illinois provides (Illinois is a uniform duration state). Consequently, the Illinois data permit one to compare the jobless spells of workers who were eligible for FSC (that is, were eligible for a total of 38 weeks of benefits, and knew this at the time they filed their initial claim) with the spells of workers who were eligible for only 26 weeks of benefits, but who would have been eligible for an additional 12 weeks if they had become unemployed and filed for benefits only one to six weeks earlier.

It is important to remark that, although FSC was terminated by Congress because national labor market conditions had improved following the severe recession of the early 1980s, it did not "trigger off" as the standing Extended Benefits program would have done. That is, whereas EB would have triggered off when specific conditions in Illinois had improved, FSC ended by Congressional fiat and in response to the impression that labor market conditions nationwide no longer required a Federal emergency benefit program. Accordingly, the expiration of FSC provides a "natural experiment" and an alternative method of making inferences about the independent contribution of potential benefit duration to the length of a jobless spell -- one that might be more convincing than inferences from data where potential duration is correlated with work history (as in the Washington data). The workers examined below

are the 7,443 UI–eligible claimants who filed valid claims and were assigned to either the control or Employer experimental groups of the experiment.[10]

Both the Washington and the Illinois data are typical of the data used in past studies of the effects of extended benefits on the duration of unemployment because they are administrative data—that is, data gathered and maintained by agencies responsible for administering the UI program. But both the Washington and the Illinois data include both earnings history data, which allow an improved classification of jobless spells as complete or censored.[11] Most of the studies described and reviewed in section IV had to impose what appear to be erroneous assumptions about whether a spell of insured unemployment represents a complete or censored spell of joblessness. The consequences of this issue were discussed above in section IV.A.

A. Potential Duration and Unemployment in a Variable Duration State: Washington

1. *Estimates from Duration Models.* Table 7A displays the results of estimating various specifications of model (4.1) using the Washington State data. In each case the dependent variable is the natural log of the weeks of benefits paid to the claimant during the benefit year. Hence, the models are flawed in that they fail to account for censoring of the dependent variable and impose the assumption of log-normality on the dependent variable. Although the latter is an improvement over assuming normality, assuming a Weibull or inverse exponential distribution would be an

[10] The Employer bonus experiment had no measured impact on behavior. Hence, including it in the analysis provides a way of increasing the sample size. As it turns out, the basic results would be the same if only the Control group were examined.

[11] Because these are administrative data, there is no way of distinguishing unemployment from out-of-the labor force status for workers who have no earnings after the spell of insured unemployment ends. Accordingly, I refer to the duration of joblessness (meaning either unemployment or out-of-labor force status) and the probability of return to work.

improvement (this is done below).[12]

The point of the estimates displayed in Table 7A is to explore the sensitivity of estimates of the effects of the potential duration of benefits to various specifications of the incentives facing UI claimants. Columns 1 through 4 use two different measures of the replacement rate, along with base period earnings, to characterize the disincentives to reemployment faced by UI recipients. Columns 5 through 7 use a combination of the weekly benefit amount and base period earnings to characterize those disincentives, and columns 8 through 10 use a specification suggested by Welsh (1977) and implemented by Classen (1979). Welsh's suggestion was to include earnings in the two high-quarters of the base period (the amount from which the weekly benefit amount is calculated) and the amount by which earnings in the two high quarters exceed the amount that would give a claimant the maximum weekly benefit amount. His argument is that there is no independent information contained in the weekly benefit amount, base period earnings, or the replacement rate that is not contained in these two variables.

Two other aspects of the models estimated need to be noted. First, a "recall" variable is included, which equals one if the claimant was reemployed by the same employer after the spell of insured unemployment as before. Also, the recall variable is interacted with the potential duration of benefits, D_{pot}, so that differences in the impact of potential benefit duration that might arise between workers on temporary layoff and others can be estimated. Second, a measure of earnings variability -- the standard deviation of each worker's four quarterly earnings amounts -- is added to some specifications (or substituted for D_{pot} in some cases). Since less earnings variability is

[12] Note that a variety of control variables, which are of secondary importance for present purposes, have also been included in the model: age (4 dummies), gender, ethnicity (4 dummies), the number of referrals received by the claimant from the Employment Service, the number of employers that the claimant worked for during the base period, geographic location (20 dummies),and industry of employment before job loss (10 dummies).

precisely what leads to longer potential duration of benefits -- as shown in section II above -- some control for earnings variability is required in order to ensure that the potential duration variable does not merely reflect greater earnings stability during the base period.

Table 7A's estimates of the impact of an additional week of benefit eligibility on the duration of unemployment range from a low of .7 percent (specification 8) to a high of 2.8 percent for workers who are not recalled to their pre-layoff employer (specifications 1 and 3).[13] Since the sample mean of the dependent variable is 16.13 weeks, this range amounts to an increase in the duration of unemployment of between .11 and .45 week as a result of an additional week of benefit eligibility. This spans the range of a large number of the estimates summarized in Table 5. A rather striking implication of this result is that a fairly wide range of estimates of the disincentive effects of an additional week of benefits can be obtained simply by manipulating the way benefit levels are entered in an estimating equation.

Note that controlling for earnings variability in the base period does not reduce the estimated impact of an additional week of benefit eligibility (columns 3, 4, 7, and 10). In fact, just the opposite is true. The highest estimates of the impact of an additional week of benefit eligibility come from the specifications that include the replacement rate that is based on base period earnings (columns 1 and 3). If we discount this estimate, we can narrow the range of estimates from between .11 and .45 week to between .11 and .29 week.

The estimates in Table 7A are all based on a flawed estimating method, as already noted. The estimates displayed in Table 7B are intended to show the extent to which different estimating techniques yield different answers to questions about the impact of increased potential duration of benefits. Columns 1 and 2 display linear OLS

[13] Since the specification is semi-logarithmic, the coefficients can be interpreted as the percentage change in the dependent variable induced by a unit change in the respective independent variable.

estimates of two insured unemployment duration models -- the first controls for the weekly benefit amount and base period earnings (as did specifications 5 through 7 in Table 7A); the second is the Welch-Classen specification described above (specifications 8 through 10 in Table 7A). Columns 3 and 4 in Table 7A display the same two models, but this time estimated with the natural log of the weeks of benefits paid as the dependent variable. (These estimates are identical to those already displayed in columns 7 and 10 of Table 7A.) Finally, columns 5 and 6 show the results of estimating the two models with a correction for censoring of the dependent variable and with the assumption that the underlying distribution of unemployment spells in characterized by the Weibull distribution. This is the parametric model of time to reemployment that was discussed in section IV.

The estimates displayed in Table 7B suggest that the differences between the two specifications are minimal (compare column 1 with column 2, column 3 with column 4, and column 5 with column 6), but that the different estimating techniques give rather different answers about the impact of an additional week of benefit eligibility. The linear OLS estimates suggest that an additional week of benefit eligibility adds about .28 week to the duration of unemployment. The semi-log estimates suggest that an additional week of benefit eligibility adds about .20 week to the duration of unemployment. But the Weibull models, which are the most defensible, suggest that an additional week of benefit eligibility adds about .45 week to the duration of unemployment. If we take the Weibull models' estimates as "true," and if these results are representative of the estimates reported in the literature, then they suggest that models that fail to account for censoring and that make questionable assumptions about the distribution of unemployment spells may understate the disincentive effects of additional weeks of unemployment eligibility.

Although the models displayed in Table 7B include a control for the variability of

earnings, the question remains whether the potential duration of unemployment (D_{pot}) is really just a proxy for some aspect of a worker's experience before being laid off and claiming benefits. This is more than possible, since a worker's potential benefit duration is inversely related to the variability of his or her earnings during the base period. That base period experience experience may in turn reflect some unobserved characteristics of the worker that would influence his or her unemployment duration. If so, then the estimated coefficient of D_{pot} in a duration equation may capture not the disincentive effect of longer potential duration of benefits, but rather some unobserved characteristic.

One way of gaining some insight into this issue is to take data on UI claimants in a state where the potential duration of benefits is in fact uniform, and simulate a potential duration of benefits for each claimant as if he or she were in a variable duration state. This can be done using one of the potential duration formulas discussed in section II. If such a *simulated* potential duration variable, when included in the duration equation, were to yield results similar to those obtained above for Washington State, then it would reduce confidence in estimates obtained from variable duration states.

Table 8 displays the results of such an exercise. Illinois is a uniform duration state -- all eligible claimants have a 26-week potential duration of benefits. Using the potential duration formula from Washington State, a simulated potential duration of benefits was created for each of the workers in two subsamples of Illinois UI claimants -- those eligible and those ineligible for FSC -- and included in Weibull duration models similar to those displayed in Table 7B.

The main result of the estimates shown in Table 8 is that the simulated D_{pot} variable is a weak predictor of the duration of unemployment. This is true whether or not the earnings variability measure is included in the estimating equation. If anything,

the simulated D_{pot} variable is negatively related to unemployment duration, suggesting that workers who would be eligible for more weeks of benefits under the Washington State formula could be expected to have shorter spells of unemployment. (This makes sense, since workers with stable work histories would be expected to have a stronger attachment to the labor force, and to return to work relatively quickly.) The inference to be drawn is that the estimated coefficients of potential duration in the Washington State models (in Table 7B, for example) should perhaps be taken seriously as estimates of the disincentive effects of increasing the potential duration of UI benefits. That is, Table 8's results make it more difficult to dismiss estimates of the disincentive effects of increased potential benefit duration from states where potential duration varies only with work history during the base period.

2. *Estimates from Hazard Models.* Table 9 displays unadjusted estimates of the conditional probability of reemployment--or discrete reemployment hazards--for each of three groups of UI recipients in Washington State: workers who were eligible for 19 to 21 weeks of benefits; those eligible for 24 to 26 weeks; and those eligible for 30 weeks.[14] These hazards, which are based on the well-known Kaplan-Meier estimator, are descriptive in that they do not adjust for observable differences among these three groups of workers.

Because UI claimants in Washington State are certified for two weeks of benefits at a time, time until exhaustion of benefits is measured in two-week intervals.[15] The unadjusted reemployment hazards in Table 9 are computed by dividing the

[14] Workers eligible for 19, 20, and 21 weeks of benefits are aggregated in order to yield a group of workers large enough to give a hazard function in which some confidence can be placed. Similarly for workers eligible for 24, 25, and 26 weeks. The results reported below are not appreciable changed if workers are not aggregated in this way.

[15] Some information is lost by using discrete two-week time periods. Any worker who ended his or her spell of unemployment an even number of weeks before exhaustion (including zero) and gained reemployment in the following week is counted as gaining reemployment one week too late. The importance of this information loss is lessened by the fact that, as Harris (1987) found, only about half as many workers receive an even number of weeks of benefits as receive odd number of weeks, mainly because of the system of certifying for two weeks of benefits at a time. The increased simplicity that results from using two-week periods outweighs the information loss that may result.

number of workers who became reemployed during two-week period t prior to benefit exhaustion by the number of workers who were unemployed at the beginning of period t. This latter group--the so-called risk set, or the number of workers "at risk" of reemployment--is shown in the columns labeled Risk Set, and the unadjusted reemployment probability is shown in the columns labeled Hazard.

Consider the 877 workers who began their spell of unemployment with potential benefit duration of 19 to 21 weeks. Since 78 of these workers were reemployed by the end of weeks 19 and 20 before exhausting their benefits, the reemployment hazard for this period is 0.0889. Other reemployment hazards are computed similarly. Note that the risk set in period t-1 does not generally equal the risk set in period t minus the number of workers who gained reemployment by the end of period t. For example, there were 877 workers eligible for 19-21 weeks of benefits at the beginning of pre-exhaustion weeks 19 and 20, and 78 of these found reemployment before pre-exhaustion weeks 17 and 18. But the risk set in period 18 is 775, which is less than 877 minus 78. This occurs because 24 workers left the labor force (that is, stopped searching for work and collecting UI benefits) during pre-exhaustion weeks 19 and 20.[16]

The general time-pattern of the hazards shown in Table 9 is similar for the three groups: All three hazard functions have an early spike, then fall gradually to a flat segment with hazards in the neighborhood of .02 to .03., and finally show a large spike at the time of benefit exhaustion (week 0). Note that there are noticeable upturns in the hazards just before the exhaustion of benefits.

Although the hazards for the three groups shown in Table 9 are similar in a general way, closer comparison of the three hazard functions shows some differences. Mainly, the workers who are eligible for 30 weeks of benefits appear to have higher

[16] It is also possible that these workers left Washington State, in which case it is impossible be know their labor force status. In either case, treating these cases as incomplete or censored spells of joblessness is appropriate.

reemployment hazards early in their unemployment spells than do workers eligible for 19 to 21 weeks or 24 to 26 weeks. This has implications for the unemployment durations experienced by the three groups.

The bottom rows of Table 9 shows two estimates of the expected duration of unemployment that is implied by each of the three unadjusted hazard functions. Estimator 1 of the expected durations is defined as:

(5.1) $d_1 = 2\,(f_1 1 + f_2 2 + f_3 3 + \ldots + f_t t + \ldots)$

where

(5.2) $f_t = (1-h_1)(1-h_2)\ldots(1-h_{t-1})(h_t)$.

Equation (5.2) gives the unconditional probability of experiencing t two-week periods of unemployment (calculated as the product of the probabilities of not finding a job in each of the first t-1 periods, times h_t, the conditional probability of finding a job in period t).

Estimator 2 of the expected durations is defined as:

(5.3) $d_2 = \{(U_1)(h_1)(1) + (U_2)(h_2)(2) + (U_3)(h_3)(3) + \ldots + (U_t)(h_t)(t) + \ldots\} / U_1$

where U_t denotes the number of workers in the risk set at the beginning of period t before benefit exhaustion.

These alternative estimators make different assumptions about whether the labor market is in equilibrium. Estimator 1 assumes that the market is in equilibrium and tends to yield higher estimates of the expected duration of unemployment. Estimator 2 does not make such an assumption and is, in effect, a "mechanical" way of estimating the expected duration. In both estimators, it is assumed that workers who have exhausted benefits have a constant reemployment hazard equal to h_e (the hazard in the period in which benefits were exhausted) in perpetuity; for example, h_e = 0.3485 for workers eligible for 19 to 21 weeks of benefits in Table 9.

Table 9 shows that the expected duration for workers eligible for 19 to 21 weeks of benefits was between 14.5 weeks (estimator 1) and 16.6 weeks (estimator 2). For workers eligible for 24 to 26 weeks of benefits, expected duration was between 14.1 weeks and 18.0 weeks; and for workers eligible for 30 weeks of benefits, expected duration was between 14.0 weeks and 18.4 weeks.

These estimated expected durations of unemployment can be used to obtain a direct estimate of how additional weeks of potential benefit duration can be expected to affect the duration of a worker's unemployment. Estimator 1 suggests that there may be some impact of extending benefits -- the 5-week increase in potential duration between 19-21 weeks and 24-26 weeks is associated with an increase of about 1.5 in the duration of unemployment, or .29 week per additional week of benefit eligibility. However, the 5-week increase in potential duration between 24-26 weeks and 30 weeks is associated with only a very small increase in unemployment duration -- about .33 week, or .07 week per additional week of benefit eligibility. By the same sort of reasoning, estimator 2 suggests no impact -- or possibly even a negative impact -- of extending benefits.

An important caveat regarding the estimates shown in Table 9 is that they are not adjusted for observable characteristics of the workers that may in turn be associated with unemployment duration. This is important, since the apparent negative impact of additional weeks of benefits implied by estimator 2 could simply result from the fact that workers who are eligible for more weeks of benefits are more likely to return to work quickly, rather than the separate effect of additional weeks of benefits. It is possible to adjust for worker characteristics, but this is left for future work.

B. The Impact of Federal Supplemental Compensation (FSC) in Illinois

As already noted, the Illinois data that were used above span the expiration of one of the the emergency UI benefit extensions -- the Federal Supplemental Compensation program (FSC). Workers eligible for Phase IV of FSC in Illinois had a total potential duration of benefits of 38 weeks -- 26 weeks of regular state benefit, plus 12 weeks of FSC. In this section, the natural experiment presented by the expiration of FSC is used to obtain estimates of the additional 12 weeks of benefit eligibility. It is important to repeat that FSC did not "trigger off" as the standing Extended Benefits program would have done. Rather, FSC was ended by Congressional fiat in response to the impression that labor market conditions nationwide -- not just in Illinois -- no longer required a Federal emergency benefit program.

Table 10 displays estimates of four Weibull duration models of unemployment; that is, parametric models of time to reemployment that estimate equation (4.1) under the assumption that the disturbance term u has the Weibull distribution. The interpretation of the Weibull model's coefficients is straightforward: Each coefficient gives the approximate proportional change in unemployment duration that is attributable to a unit change in the explanatory variable. As already discussed, these are the most defensible of the duration models that are available, although the hazard models presented below arguably yield more convincing estimates.

The four models shown in Table 10 use different specifications of the incentives facing UI recipients. Specifications 1 and 2 include the replacement rate (based either on base period earnings or high-quarter earnings), specification 3 includes the weekly benefit amount and the base period earnings, and specification 3 uses the Welch-Classen variables described above. The main finding of the results in Table 10 is that the impact of FSC-eligibility on unemployment duration is insensitive to these

variations in specification. The impact of the additional 12 weeks of potential benefit duration provided by FSC is estimated to be a 19 percent increase in unemployment duration.[17] This translates into an increase of 4 weeks in unemployment duration, or .34 week per additional week of benefit eligibility. This estimate is higher than most of the estimates obtained using the Washington State data -- that is, the estimates that were based on variability across individuals that resulted from differing base period work histories.

Table 11 displays estimates of the conditional reemployment probabilities for two groups of workers in Illinois: those who were eligible for FSC and those who were ineligible for FSC. These hazards are constructed in an identical manner to those presented in Table 9, which examined UI recipients in Washington State. That is, they show the conditional probability of reemployment at various times before exhaustion of benefits. The patterns of the two hazard functions shown in Table 11 are similar to each other (and also to the Washington State hazards). Both have an early spike, then fall gradually to a flat segment, turn up just before exhaustion of benefits, and then show a large spike at the time of benefit exhaustion (week 0).

There are also some differences between the hazards for FSC-eligibles and FSC-ineligibles. Mainly, the FSC-eligibles appear to have higher reemployment hazards early in their unemployment spells (weeks 38 through 30 before exhaustion), but lower reemployment hazards later (weeks 26 through 4 prior to exhaustion).

The implications of the hazard functions for unemployment duration are displayed at the bottom of Table 11. As in Table 9, two estimates of the expected duration of unemployment are shown. Estimator 1 suggests that the FSC-eligible workers experienced about 2.8 more weeks of unemployment than did the FSC-ineligibles, or about .23 week per additional week of benefit eligibility. Estimator 2, on the other hand, suggests that the FSC-eligible workers experienced 1.3 weeks *less*

[17] The estimate is obtained by dividing the coefficient of FSC-eligibility by the Weibull shape parameter.

unemployment than did the FSC-ineligibles, or about .11 week less for each additional week of benefit eligibility. This rather unlikely result could suggest a need to adjust for observable characteristics of the workers, which could differ between the FSC-eligible and FSC-ineligible workers.

VI. Summary and Conclusions

The main goals of this paper have been to review the sources of variation in the potential duration of unemployment benefits (sections I and II), to review critically existing estimates of the extent to which increasing potential benefit duration affects the duration of unemployment (section IV), and to explore the effect of variation in potential duration on the expected duration of unemployment of UI recipients (section V). In particular, data from two states were examined in an effort to understand the extent to which estimates of the effects of extended benefits are sensitive to differences in model specification, estimating technique, and the source of variation in potential benefit duration.

Two conclusions can be drawn from the discussion of sources of variation in potential benefit duration and the review of existing estimates in sections I, II, and IV. First, differences in the effects of emergency benefit extensions, the Extended Benefits program, and within-state variation in states have variable benefit duration have never been systematically analyzed. This is an important omission because the impact of an emergency extension may be quite different from adding to the potential duration of benefits in a variable duration state. The existing estimates, summarized in Table 5, have not sorted out the extent to which differences in estimated impacts result from differences in the underlying source of variation in potential benefit duration.

Second, few of the existing studies have examined the extent to which their estimates are sensitive to estimating technique and model specification. This has made it difficult to know whether the behavioral impacts being estimated are real or simply an accident of the data. Section IV reviewed some of the problems inherent in estimating the disincentive effects of increasing the potential duration of benefits, and it seems fair to say that they are unusually daunting and make the estimates less

convincing than most econometric estimates that are based on cross-sectional or panel data. Accordingly, the importance of sensitivity analysis seem especially important in regard to this question, but sensitivity analyses have rarely been pursued.

The exercises presented in section V can be viewed as an attempt to provide such a sensitivity analysis on two data sets. The main conclusions of this exercise are as follows. First, estimates of the impact of an additional week of potential benefit duration that are derived from a variable duration state such as Washington State are quite fragile, although they do suggest that there may be some increase in the duration of unemployment that results from increased potential duration. The largest estimates of the impact of increased potential duration derive from parametric models of the time to reemployment that account for censoring and assume the underlying distribution of unemployment spell conforms to the Weibull distribution. These models yield suggest that an added week of potential benefit duration adds .45 week to the duration of unemployment of workers who are not recalled to their pre-layoff employer. This estimate is not especially sensitive to model specification. Also, using a simulated potential duration variable in a uniform duration state (Illinois) yields results that increase confidence that there is a real impact of additional weeks of potential duration.

Interestingly, though, estimates of the impact of an additional week of potential benefit duration that are based on a reemployment hazard function suggest a smaller impact of increasing the potential duration of benefits by one week. Those estimates suggest that adding a week to the potential duration of benefits adds at most .29 week to the expected duration of unemployment, and may have no impact at all. Clearly, then, the estimates, although relatively insensitive to model specification, are quite sensitive to modeling technique.

Second, estimates of the impact of an additional week of potential benefit

duration that come from the expiration of the Federal Supplemental Compensation program are also sensitive to estimating technique. A Weibull model of the duration of joblessness suggests that the availability of FSC increased the expected duration of a worker's jobless spell by roughly 4 weeks, or by .34 week per additional week of benefit eligibility. This estimate is actually somewhat lower than the estimate derived from Washington State using a Weibull model (that estimate was .45 week per additional week of benefit eligibility).

But a hazard model of the conditional probability of becoming reemployed again yields lower estimates of the influence of extended benefits on jobless duration. Specifically, the hazard estimates suggest that FSC eligibility increased the duration of unemployment by at most .23 week per additional week of eligibility, and may have had no impact at all.

Given the fragility of the estimates, it seems sensible to be rather modest in making claims about our knowledge of the disincentive effects of extended unemployment benefits. Although the evidence does suggests that additional weeks of benefits may increase the duration of unemployment, it is clear that the impact is difficult to estimate and especially sensitive to estimating technique. In particular, the findings presented suggest that two avenues of further work could be especially fruitful. First, examining the robustness of estimates from the hazard models would seem to be especially important, given that the hazard model is most appealing a priori and has the potential to provide results that are most convincing. Second, though, it seems important to explore further the variation in disincentives that arise from different sources of variation in the potential duration of benefits -- emergency benefit programs, the Extended Benefit program, or within-state variation in potential benefit duration. This will require additional data, particularly data that cover an extended period of time and a variety of potential duration "regimes." Only with

additional work that includes careful sensitivity testing can we expect to improve understanding of the disincentives of extended benefits.

References

Advisory Council on Unemployment Compensation. *Report and Recommendations*. Washington, D.C.: Advisory Council on Unemployment Compensation, February 1994.

Advisory Council on Unemployment Compensation. *Unemployment Insurance in the United States: Benefits, Financing, Coverage*. Washington, D.C.: Advisory Council on Unemployment Compensation, 1995.

Akerlof, George A. and Brian G. M. Main. "Unemployment Spells and Unemployment Experience." *American Economic Review* 70 (December 1980): 885–893.

Allison, Paul D. "Discrete–Time Methods for the Analysis of Event Histories." In *Sociological Methodology 1982*, edited by Samuel Lienhardt. San Francisco: Jossey–Bass, 1982. Pp. 61–98.

Allison, Paul D. *Event History Analysis*. Beverly Hills: Sage Publications, 1984.

Blaustein, Saul J. with Wilbur J. Cohen and William Haber. *Unemployment Insurance in the United States*. Kalamazoo, Michigan: W.E. Upjohn Institute for Employment Research, 1983.

Burgess, Paul L. and Jerry L. Kingston. "Labor Market Experiences of Unemployment Insurance Exhaustees. Unemployment Insurance Occasional Paper 79–3. Washington, D.C.: U.S. Department of Labor, Education and Training Administration, Unemployment Insurance Service, 1979.

Clark, Kim B. and Lawrence H. Summers. "Labor Market Dynamics and Unemployment: A Reconsideration." *Brookings Papers on Economic Activity* 1979 (1): 13–60.

Classen, Kathleen P. "Unemployment Insurance and Job Search." In *Studies in the Economics of Search*, edited by S.A. Lippman and J.J. McCall. Amsterdam: North–Holland, 1979. Pp. 191–219.

Corson, Walter and Mark Dynarski. "A Study of Unemployment Insurance Recipients and Exhaustees: Findings from a National Survey." Unemployment Insurance Occasional Paper 90–3. Washington, D.C.: U.S. Department of Labor, Education and Training Administration, Unemployment Insurance Service, 1990.

Corson, Walter, Jean Grossman, and Walter Nicholson. "An Evaluation of the Federal Supplemental Compensation Program." Unemployment Insurance Occasional Paper 86–3. Washington, D.C.: U.S. Department of Labor, Education and Training Administration, Unemployment Insurance Service, 1986.

Corson, Walter, David Long, and Walter Nicholson. "An Analysis of the 1981–82 Changes in the Extended Benefit Program." Unemployment Insurance Occasional Paper 85–1. Washington, D.C.: U.S. Department of Labor, Education and Training Administration, Unemployment Insurance Service, 1985.

Corson, Walter, David Long, and Walter Nicholson. "Evaluation of the Charleston Claimant Placement and Work Test Demonstration." Unemployment Insurance Occasional Paper 85–2. Washington, D.C.: U.S. Department of Labor, Education and Training Administration, Unemployment Insurance Service, 1985.

Corson, Walter and Walter Nicholson. *The Federal Supplemental Benefits Program*. Kalamazoo, Michigan: W.E. Upjohn Institute for Employment Research, 1982.

Cox, D. R. "Regression Models and Life Tables." *Journal of the Royal Statistical Society* (Series B) 34 (Number 2, 1972): 187–220.

Davidson, Carl and Stephen A. Woodbury. "Optimal Unemployment Insurance." Paper prepared for the Advisory Council on Unemployment Compensation, April 1995.

Davidson, Carl and Stephen A. Woodbury. "Unemployment Insurance and Unemployment: Implications of the Reemployment Bonus Experiments." Paper prepared for the Advisory Council on Unemployment Compensation, February 1995.

Davidson, Carl and Stephen A. Woodbury. "The Displacement Effect of Reemployment Bonus Programs." *Journal of Labor Economics* 11 (October 1993): 575-605.

Davidson, Carl and Stephen A. Woodbury. "Effects of a Reemployment Bonus under Differing Benefit Entitlements, or, Why the Illinois Experiment Worked." Manuscript, Michigan State University and W.E. Upjohn Institute for Employment Research, March 1991.

Dynarski, Mark and Steven M. Sheffrin. "New Evidence on the Cyclical Behavior of Unemployment Durations." In *Unemployment and the Structure of Labor Markets*, edited by Kevin Lang and Jonathan S. Leonard. New York: Basil Blackwell, 1987. Pp. 164–185.

Ehrenberg, Ronald G. and Ronald L. Oaxaca. "Unemployment Insurance, Duration of Unemployment, and Subsequent Wage Gain." *American Economic Review* 66 (December 1976): 754–766.

Felder, Henry E. and Richard W. West. "The Federal Supplemental Benefits Program: National Experience and the Impact of P.L. 95–19." Washington, D.C.: U.S. Department of Labor, Education and Training Administration, Unemployment Insurance Service, 1978.

Grossman, Jean Baldwin. "The Work Disincentive Effect of Extended Unemployment Compensation: Recent Evidence." *Review of Economics and Statistics* 71 (February 1989): 159–164.

Haber, William and Merrill G. Murray. *Unemployment Insurance in the American Economy.* Homewood, Illinois: Richard D. Irwin, 1966.

Hall, Robert E. "Turnover in the Labor Force." *Brookings Papers on Economic Activity* 1972 (3): 709–756.

Ham, John C. and Samuel A. Rea, Jr. "Unemployment Insurance and Male Unemployment Duration in Canada." *Journal of Labor Economics* 5 (July 1987): 325–353.

Hamermesh, Daniel S. *Jobless Pay and the Economy.* Baltimore, Maryland: Johns Hopkins University Press, 1977.

Han, Aaron and Jerry A. Hausman. "Flexible Parametric Estimation of Duration and Competing Risk Models. *Journal of Applied Econometrics* 5 (January-March 1990): 1-28.

Hansen, W. Lee and James F. Byers. "Unemployment Compensation and Training: Can a Closer Link Be Forged?" In *Unemployment Compensation: The Second Half–Century,* edited by W. Lee Hansen and James F. Byers. Madison, Wisconsin: University of Wisconsin Press, 1990. Pp. 267–301.

Hight, Joseph. "Insured Unemployment Rates, Extended Benefits, and Unemployment Insurance Exhaustions." In *Proceedings of the Twenty–Eighth Annual Winter Meeting of the Industrial Relations Research Association,* edited by James L. Stern and Barbara D. Dennis. Madison, WI: IRRA, 1976. Pp. 242–249.

Holen, Arlene. "Effects of Unemployment Insurance Entitlement on Duration and Job Search Outcome." *Industrial and Labor Relations Review* 30 (July 1977): 445–450.

Jacobson, Louis S. "The Ability of Trade Adjustment Assistance's Wage-Subsidy and Generous Benefits to Offset Dislocated Workers' Earnings Losses." Manuscript, Westat, Inc., September 1994.

Jacobson, Louis, Robert LaLonde, and Daniel Sullivan. *The Costs of Worker Dislocation.* Kalamazoo, MI: W.E. Upjohn Institute, 1993a.

Jacobson, Louis, Robert LaLonde, and Daniel Sullivan. "Earnings Losses of Displace Workers." *American Economic Review* 83 (September 1993b): 685–709.

Jacobson, Louis, Robert LaLonde, and Daniel Sullivan. "Long–Term Earnings Losses

of High–Seniority Displaced Workers." *Federal Reserve Bank of Chicago Economic Perspectives* 17 (November/December 1993c): 2–20.

Johnson, Terry R. and Daniel R. Klepinger. "Evaluation of the Impacts of the Washington Alternative Work Search Experiment." Unemployment Insurance Occasional Paper 91–4. Washington, D.C.: U.S. Department of Labor, Education and Training Administration, Unemployment Insurance Service, 1991.

Katz, Arnold and Jack Ochs. "Implications of Potential Duration Policies." In *Unemployment Compensation: Studies and Research*, Volume I. Washington, D.C.: National Commission on Unemployment Compenastion, July 1980. Pp. 111–126.

Katz, Lawrence F. and Bruce D. Meyer. "The Impact of the Potential Duration of Unemployment Benefits on the Durationof Unemployment." *Journal of Public Economics* 41 (February 1990): 45–72.

Kiefer, Nicholas M. "Economic Duration Data and Hazard Functions." *Journal of Economic Literature* 26 (June 1988): 646–679.

Lancaster, Tony. "Econometric Methods for the Duration of Unemployment." *Econometrica* 47 (July 1979): 939–956.

Leigh, Duane E. *Assisting Displaced Workers: Do the States Have a Better Idea?* Kalamazoo, Michigan: W.E. Upjohn Institute for Employment Research, 1989.

Leigh, Duane E. *Does Training Work for Displaced Workers?* Kalamazoo, Michigan: W.E. Upjohn Institute for Employment Research, 1990.

Mathematica Policy Research. "A Longitudinal Study of Unemployment Insurance Exhaustees: Waves I and II." Report prepared for the Employment and Training Administration, U.S. Department of Labor, January 1976.

Moffitt, Robert. "Unemployment Insurance and the Distribution of Unemployment Spells." *Journal of Econometrics* 28 (April 1985a): 85–101.

Moffitt, Robert. "The Effect of the Duration of Unemployment Benefits on Work Incentives: An Analysis of Four Data Sets." Unemployment Insurance Service Occasional Paper 85–4. Washington, D.C.: U.S. Department of Labor, Education and Training Administration, Unemployment Insurance Service, 1985b.

Moffitt, Robert and Walter Nicholson. "The Effect of Unemployment Insurance on Unemployment: The Case of Federal Supplemental Benefits." *Review of Economics and Statistics* 64 (February 1982): 1–11.

Mortensen, Dale T. "Job Search and Labor Market Analysis." In *Handbook of Labor*

Economics, Volume II, edited by Orley Ashenfelter and Richard Layard. Amsterdam: North–Holland, 1986. Pp. 849–919.

Murray, Merrill G. *The Duration of Unemployment Benefits.* Kalamazoo, Michigan: W.E. Upjohn Institute for Employment Research, 1974.

Newton, Floyd C. and Harvey S. Rosen. "Unemployment Insurance, Income Taxation, and Duration of Unemployment: Evidence from Georgia." *Southern Economic Journal* 45 (January 1979): 773–784.

Nicholson, Walter and Walter Corson. "A Longitudinal Study of Unemployment Insurance Exhaustees: Waves I and II." Report prepared for the Employment and Training Administration, U.S. Department of Labor, January 1976.

Perry, George. "Unemployment Flows in the U.S. Labor Market." *Brookings Papers on Economic Activity* 1972 (2): 245–278.

Rubin, Murray. *Federal–State Relations in Unemployment Insurance: A Balance of Power.* Kalamazoo, Michigan: W.E. Upjohn Institute for Employment Research, 1983.

Rubin, Murray. "State–Federal Relations in Unemployment Insurance." In *Unemployment Compensation: The Second Half–Century*, edited by W. Lee Hansen and James F. Byers. Madison, Wisconsin: University of Wisconsin Press, 1990. Pp. 207–243.

Solon, Gary. "Work Incentive Effects of Taxing Unemployment Benefits." *Econometrica* 53 (March 1985): 295–306.

Steinberg, Danny, and Frank A. Monforte. "Estimating the Effects of Job Search Assistance of the Unemployment Durations of Displaced Workers." In *Unemployment and the Structure of Labor Markets*, edited by Kevin Lang and Jonathan S. Leonard. New York: Basil Blackwell, 1987. Pp. 186–206.

Storey, James R. and Gene Falk. "Unemployment Compensation: The Emergency Unemployment Compensation (EUC) Program." Washington, D.C.: The Library of Congress, Congressional Research Service, 93–367 EPW, March 1993.

Sueyoshi, Glenn T. "Semiparametric Proportional Hazards Estimation of Competing Risks Models with Time-Varying Covariates." *Journal of Econometrics* 51 (January/February 1992): 25-58.

Woodbury, Stephen A. and Robert G. Spiegelman. "Bonuses to Workers and Employers to Reduce Unemployment: Randomized Trials in Illinois." *American Economic Review* 77 (September 1987): 513–530.

Woodbury, Stephen A. and Murray Rubin. "The Duration of Benefits." Draft prepared for a conference on "Unemployment Insurance in the United States: Analysis of Policy Issues," W.E. Upjohn Institute, Kalamazoo, Michigan, June 1995.

Table 1
Federal Extended Unemployment Benefit Programs,
1958 to 1995

Program and Enabling Legislation	Effective Dates and Extensions	Potential Duration of Extended Benefits Provided	Financing	Notes
Temporary Unemployment Compensation Act, P.L. 85-441	6/58 - 7/59	50% of regular state duration, up to 13 weeks.	Interest-free loans to 17 participating states	State participation voluntary.
Temporary Extended Unemployment Compensation Act (TEUC), P.L. 87-6	4/61 - 6/62	50% of regular state duration, up to 13 weeks.	Temporary increases in Federal Unemployment Tax (.4% in 1962, .25% in 1963)	
Extended Unemployment Compensation Act of 1970 (EB), P.L. 91-373, with major amendments in P.L. 96-364, P.L. 96-499, P.L. 97-35, P.L. 102-318	8/70 to present	50% of regular state duration, up to 13 weeks	One-half from Federal Unemployment Tax revenues paid to Extended Unemployment Compensation Account (EUCA); one-half from state UI reserves.	EB activated in a state by an insured unemployment rate (IUR) trigger, 8/70 to present; EB could be activated in all states by a national IUR trigger, 8/70-8/81. Starting 1980, EB denied to claimants refusing to seek or accept suitable work, and to claimants who had quit or been discharged. State triggers were made more restrictive, 8/81. Eligibility for EB made more restrictive, 8/81. States permitted to adopt a total unemployment rate (TUR) trigger, 3/93.
Emergency Unemployment Compensation Act, P.L. 92-224 and P.L. 92-329	1/72 - 9/72, extended to 3/73	50% of regular state durations, up to 13 weeks.	Extended Unemployment Compensation Account (EUCA)	State-level triggers (different from EB triggers) used to activate program.

Table 1
(Continued)

Program and Enabling Legislation	Effective Dates and Extensions	Potential Duration of Extended Benefits Provided	Financing	Notes
Federal Supplemental Benefits (FSB), P.L. 93-572, P.L. 94-12, P.L. 94-45, P.L. 95-19	1/75 - 12/76, extended to 1/78	50% of regular state duration, up to 13 weeks (1/75-2/75 and 5/77-1/78); additional 50% of regular state duration, up to 13 weeks provided 3/75-4/77 (that is, up to 26 weeks of FSC total).	Repayable advances to EUCA from general revenues; general revenues after 3/77	EB program was activated in all states, so total potential benefit duration was 65 for those exhausting EB between 3/75 and 4/77. State-level triggers applied starting 1/76. Uniform Federal eligibility and disqualification standards implemented 4/77 (P.L. 95-19).
Federal Supplemental Compensation (FSC), P.L. 97-248, P.L. 97-424, P.L. 98-21, P.L. 98-135	9/82 - 3/83, extended to 9/93 and 3/85	FSC-I (9/82-1/83): 50% of regular state duration, up to 6 to 10 weeks. FSC-II (1/83-3/83): 65% of regular state duration, up to 8 to 16 weeks. FSC-III (4/83-9/83): 55% of regular state duration, up to 8 to 14 weeks. FSC-IV (10/83-3/85): Same as FSC III, except entitlement did not vary once established.	General revenues	Potential duration varied with state's EB status and separate FSC triggers. Except in FSC-IV, potential duration would vary when EB and FSC status changed. FSC-I and FSC-II exhaustees could collect FSC-III benefits, but not FSC-IV benefits. EB eligibility criteria applied to all phases of FSC. Available regular state benefits and EB (if activated) had to be exhausted to receive FSC.

Table 1
(Continued)

Program and Enabling Legislation	Effective Dates and Extensions	Potential Duration of Extended Benefits Provided	Financing	Notes
Emergency Unemployment Compensation Act of 1991 (EUC), P.L. 102-164, P.L. 102-182, P.L. 102-244, P.L. 102-318, P.L. 103-6, P.L. 103-152	11/91 - 6/92, extended to 7/92, 3/93, 10/93, and 2/94	EUC-I (11/91-2/92): Lesser of 100% of regular benefits, or 13 or 20 weeks. EUC-II (2/92-7/92): Lesser of 130% of regular benefits, or 26 or 33 weeks. EUC-III (7/92-3/93): Lesser of 100% of regular benefits, or 20 or 26 weeks. EUC-IV (3/93-10/93): Lesser of 60% of regular benefits, or 10 or 15 weeks EUC-V (10/93-2/94): Lesser of 50% of regular benefits, or 7 or 13 weeks	Extended Unemployment Compensation Account (EUCA) until 7/92, general revenues thereafter	Potential duration determined at time of filing for EUC, and depended on state's classification as high- or low-unemployment. EUC entitlement could be increased if state moved from low to high status, or if program became more generous; EUC entitlement could not be decreased. Claimants exhausting benefits between 3/91 and 11/91 could receive benefits under "reach-back" provisions (but no retroactive benefits paid). EB eligibility criteria applied to all phases of ECU. Once EUC was exhausted, a claimant needed to regain regular UI eligibility to receive additional EUC.

Table 2
Potential Duration of Unemployment Insurance Benefits: Summary of State Practices

State	Potential Duration (weeks)		Minimum requirement for 26 weeks					State Minimum Weekly Benefit Amount
	Minimum	Maximum	Base Period Earnings ($)	High-Quarter Earnings ($)	*a*	*b*	*g*	
Alabama	15	26	1716	516	0.33	4.17%	7.91	22
Alaska	16	26	1000	250-286	1.31	17.60%	7.44	44
Arizona	12	26	3120	1000	0.33	4.00%	8.25	40
Arkansas	9	26	3588	897-1183	0.33	3.85%	8.57	46
California	14	26	2080	900-920	0.50	4.35%	11.49	40
Colorado	13	26	1950	488-649	0.33	3.85%	8.57	25
Connecticut	26	26	600	150	0.65	3.85%	16.88	15
Delaware	23	26	2184	966	0.50	4.35%	11.49	21
District of Columbia	20	26	2600	1300	0.50	3.85%	12.99	50
Florida	10	26	1040	260	0.25	3.85%	6.49	10
Georgia	9	26	3848	962	0.25	4.00%	6.25	37
Hawaii	26	26	130	32.5-105	1.00	4.76%	21.00	5
Idaho	10	26	3690	1144	0.31	3.85%	8.05	44
Illinois	26	26	1600	400-1160	0.83	3.77%	22.02	51
Indiana	14	26	18757	4800	0.28	5.00%	5.60	50
Iowa	11	26	2496	740	0.33	4.34%	7.60	32
Kansas	10	26	4914	1229-1482	0.33	4.25%	7.76	63
Kentucky	15	26	1857	750	0.33	4.74%	6.96	22

State	Potential Duration (weeks)		Minimum requirement for 26 weeks					State Minimum Weekly Benefit Amount
	Minimum	Maximum	Base Period Earnings ($)	High-Quarter Earnings ($)	*a*	*b*	*g*	
Louisiana	8	26	3081	800	0.27	4.00%	6.75	10
Maine	21	26	2730	683	0.33	4.55%	7.25	35
Maryland	26	26	900	576	0.72	4.17%	17.27	25
Massachusetts	10	30	2000	500	0.36	3.85%	9.35	14
Michigan	15	26	2100	525-781	0.52	5.38%	9.67	42
Minnesota	10	26	2999	1000	0.33	3.85%	8.57	38
Mississippi	13	26	2340	780	0.33	3.85%	8.57	30
Missouri	11	26	3510	1000	0.33	4.50%	7.33	45
Montana	8	26	4469	1117-1375	0.32	4.00%	8.00	55
Nebraska	20	26	1575	394-400	0.33	5.00%	6.60	20
Nevada	12	26	1248	400	0.33	4.00%	8.25	16
New Hampshire	26	26	2800	1200	0.30	4.40%	6.82	32
New Jersey	15	26	4375	1094-1623	0.45	4.62%	9.74	75
New Mexico	19	26	1777	1068	0.60	3.85%	15.58	41
New York	26	26	1600	400	0.65	3.85%	16.88	40
North Carolina	13	26	2603	651-868	0.33	3.85%	8.57	25
North Dakota	12	26	3572	1118	0.32	3.85%	8.31	43
Ohio	20	26	6864	1716	0.25	3.85%	6.49	66
Oklahoma	20	26			0.40	4.00%	10.00	16
Oregon	4	26	5304	1326-1360	0.33	5.00%	6.60	68

State	Potential Duration (weeks)		Minimum requirement for 26 weeks					State Minimum Weekly Benefit Amount
	Minimum	Maximum	Base Period Earnings ($)	High-Quarter Earnings ($)	*a*	*b*	*g*	
Pennsylvania	16	26	1357	900	0.69	4.00%	17.25	35
Puerto Rico	26	26	280	75	0.58	9.30%	6.24	7
Rhode Island	15	26	2961	890	0.36	4.62%	7.79	41
South Carolina	15	26	1560	540	0.33	3.85%	8.57	20
South Dakota	15	26	2183	728	0.33	3.85%	8.57	28
Tennessee	12	26	3120	780	0.25	3.85%	6.49	30
Texas	9	26	4044	1011-1050	0.27	4.00%	6.75	42
Utah	10	26	1800	450-486	0.27	3.85%	7.01	17
Vermont	26	26	1628	1163	0.42	4.44%	9.46	25
Virgin Islands	13	26	2574	858	0.33	3.85%	8.57	33
Virginia	12	26	6760	1625	0.25	4.00%	6.25	65
Washington	16	30	5694	1825	0.33	4.00%	8.25	73
West Virginia	26	26	2200	550-600	0.28	4.00%	7.00	24
Wisconsin	12	26	3250	1250	0.40	4.00%	10.00	50
Wyoming	12	26	3467	1000	0.30	4.00%	7.50	16

Source: *Comparison of State Unemployment Insurance Laws*, U.S. Department of Labor, Employment and Training Administration; and authors' calculations.

Notes: Parameter *a* is the maximum proportion of base period earnings that can be paid in UI benefit during a given benefit year (see equation 3 in the text).
Parameter *b* is the proportion of high-quarter earnings paid as the weekly benefit amount (see equation 4 in the text).
Parameter $g = a/b$ and is an index of the state's potential duration generosity.

Table 3

Classification of Workers by Weeks of
UI Benefits Claimed and
Subsequent Labor Force Status

Case	Number of Weeks of UI Benefits Claimed	Labor Force Status after Benefit Termination	Number Observed in Illinois Data (proportion)	
A	Maximum Potential	In Covered Employment	283	(0.13)
B	Maximum Potential	Out of Covered Employment	434	(0.20)
C	Fewer than Potential	In Covered Employment	1040	(0.48)
D	Fewer than Potential	Out of Covered Employment	405	(0.19)

Notes: Cases B and C are correctly characterized by usual censoring conventions; Cases A and D are misspecified by the usual conventions.

Table 4

Mean Insured Unemployment Durations for Men
by Monetary and Temporal Eligibility for
Federal Supplemental Compensation (FSC)

(Standard Errors in Parentheses)

Temporal Eligibility for FSC	Monetary Eligibility for FSC	
	Eligible	Ineligible
Eligible	21.387 (0.402) (N=1131)	16.532 (1.144) (N=79)
Ineligible	17.864 (0.318) (N=866)	20.058 (0.957) (N=86)
Difference	3.524 (0.513)	-3.527 (1.979)

Notes: In order to be monetarily eligible for FSC, a claimant needed to have total base period earnings equal to at least 1.5 times high-earnings quarter of the base period. To be Temporally Eligible for FSC, a claimant needed to file an initial claim for UI benefits before September 30, 1984. Insured unemployment duration refers to the total number of weeks of benefits (both state regular and FSC) received in the claimant's full benefit year.

Table 5

Selected Estimates of the Impact of Increased Potential Duration of UI Benefits

Study	Data	Change in weeks of unemployment from 1 added week of potential UI	Remarks
Holen (1977)	UI claimants in San Francisco, Boston, Phoenix, Seattle, Minneapolis, 1969-70	.77-.81	OLS linear duration estimates
Classen (1979)	UI claimants in Arizona and Pennsylvania, 1967-69	0-.12	Tobit duration estimates
Newton and Rosen (1979)	UI recipients in Georgia, 1974-76	.6	Tobit duration estimates
Katz and Ochs (1980)	Current Population Survey, individuals in 26 states, 1968-70 and 1973-77	.17-.23	Maximum likelihood duration estimates
Moffitt and Nicholson (1982)	Recipients of EB and FSC, 15 states, 1975-77	.1	Labor supply model, maximum likelihood estimates
Moffitt (1985a)	Continuous Wage and Benefit History, 1978-83	.15	UI exit rate estimates
Moffitt (1985b)	Continuous Wage and Benefit History, 1978-83:		UI exit rate estimates
	White men	.17	
	White women	.10	
	FSC and EB recipients in 15 states, 1975-78:		Maximum likelihood duration estimates
	Men	.45	
	Women	.28	
	UI recipients in Georgia, 1974-76:		Maximum likelihood duration estimates
	Men	.17	
	Women	.37	
Solon (1985)	UI claimants in Georgia, 1978-79	.36	Maximum likelihood duration estimates
Ham and Rea (1987)	Canadian men, 1975-80	.26-.35	UI exit rate estimates
Grossman (1989)	Continuous Wage and Benefit History, individuals in 3 states, 1981-84	.9	UI exit rate estimates of FSC impacts
Katz and Meyer (1990)	Continuous Wage and Benefit History, men in 12 states, 1978-83	.16-.20	UI exit rate estimates
Davidson and Woodbury (1995)	UI recipients in:		Translation of reemployment bonus impacts using equilibrium search model
	Illinois 1984-85	.2	
	Pennsylvania 1988-89	0-.2	
	Washington 1988-89	0-.2	

Table 6

Transformation of Data on Claimants into Data on Claimant-Weeks

Panel A: Claimant Records

Claimant	Weeks of Insured Unemployment	Reemployed	Weekly Benefit	Eligible for FSC
1	4	1	$149	0
2	38	0	$161	1
3	0	1	$128	0

Panel B: Claimant-Week Records

Claimant	Weeks of Since Initial Claim	Reemployed	Weekly Benefit	Eligible for FSC
1	0	0	$149	0
1	1	0	$149	0
1	2	0	$149	0
1	3	0	$149	0
1	4	0	$149	0
1	5	1	$149	0
2	0	0	$161	1
2	1	0	$161	1
2	2	0	$161	1
2	3	0	$161	1
.	.	.	.	.
.	.	.	.	.
.	.	.	.	.
2	37	0	$161	1
2	38	0	$161	1
3	0	0	$128	0
3	1	1	$128	0

Notes: The claimant is the unit of observation in the alternative models of employment duration. The claimant-week is the unit of observation in the reemployment hazard models.

Table 7A

Potential Duration of Benefits, Benefits, and Unemployment Duration: Alternative Specifications for Washington State
[Dependent Variable: ln (weeks of benefits paid)]

Explanatory Variable	Mean (Std. Dev.)	1	2	3	4	5	6	7	8	9	10
D_{pot}	26.86 (4.17)	.028 (.004)	.013 (.003)	.028 (.004)	.018 (.003)	.009 (.003)	--	.013 (.003)	.007 (.003)	--	.012 (.003)
D_{pot} * Recall	2.93 (8.49)	-.060 (.007)	-.060 (.007)	-.059 (.007)	-.060 (.007)	-.058 (.007)	--	-.057 (.007)	-.058 (.007)	--	-.057 (.007)
Recall	.110 (.312)	.679 (.195)	.677 (.195)	.635 (.198)	.639 (.198)	.620 (.194)	-.975 (.039)	.569 (.198)	.625 (.194)	-.977 (.039)	.573 (.198)
Earnings Variability ($1,000s)[1]	1,401 (1,901)	--	--	.017 (.006)	.028 (.006)	--	.016 (.006)	.021 (.006)	--	.021 (.008)	.028 (.008)
Earnings Variability * Recall ($1,000s)[1]	154 (762)	--	--	.017 (.016)	.016 (.016)	--	.030 (.016)	.021 (.016)	--	.031 (.016)	.012 (.016)
Replacement Rate (Base period)	.618 (.208)	.400 (.109)	--	.375 (.109)	--	--	--	--	--	--	--
Replacement Rate (High quarter)	.464 (.104)	--	.627 (.165)	--	.849 (.172)	--	--	--	--	--	--
Base Period Earnings ($10,000s)[1]	15,594 (10,786)	.070 (.016)	.082 (.018)	.046 (.018)	.068 (.018)	-.040 (.014)	-.055 (.014)	-.066 (.016)	--	--	--
Weekly Benefit Amount ($100s)[1]	151.86 (52.12)	--	--	--	--	.272 (.030)	.294 (.029)	.276 (.030)	--	--	--
Two High-Quarters Earnings ($10,000s)[1]	9,768 (6,662)	--	--	--	--	--	-	--	.447 (.051)	.460 (.047)	.410 (.052)
Two High-Quarters >Maximum ($100s)[1]	80.42 (197.23)	--	--	--	--	--	--	--	-.122 (.015)	-.144 (.016)	-.134 (.016)
R^2 (adjusted)	--	.134	.134	.135	.140	.140	.136	.141	.139	.135	.140
F	--	35.4	35.4	34.2	34.5	37.2	35.8	36.0	36.9	35.5	35.7

Notes: Mean weeks of benefits paid in the sample = 16.13 (std. dev. = 10.87). Mean of the dependent variable (ln of week of benefits paid) = 2.41 (std. dev. = 1.03).
Estimates derived from a sample of 9,982 unemployment insurance claimants who filed valid claims in Washington State during 1988-89. All equations estimated include the following explanatory variables in addition to those displayed: age (4 dummies), gender, ethnicity (4 dummies), number of job referrals received from the Employment Service, number of employers during the base period, geographic location (20 dummies), and industry of employment before job loss (10 dummies).
[1] Scaling applies to regression coefficients only; not to descriptive statistics.

Table 7B

Potential Duration of Benefits, Benefits, and Unemployment Duration: Alternative Estimating Techniques for Washington State

Explanatory Variable	Mean (Std. Dev.)	1 OLS Linear	2 OLS Linear	3 OLS Semi-log	4 OLS Semi-log	5 Weibull	6 Weibull
D_{pot}	26.86 (4.17)	.284 (.034)	.274 (.033)	.013 (.003)	.012 (.003)	.027 (.005)	.026 (.005)
D_{pot} * Recall	2.93 (8.49)	-.623 (.077)	-.624 (.077)	-.057 (.007)	-.057 (.007)	-.049 (.008)	-.050 (.008)
Recall	.110 (.312)	8.217 (2.114)	8.227 (2.114)	.569 (.198)	.573 (.198)	-.357 (.227)	-.349 (.227)
Earnings Variability ($1,000s)[1]	1,401 (1,901)	.160 (.066)	.209 (.088)	.021 (.006)	.028 (.008)	.064 (.014)	.072 (.016)
Earnings Variability * Recall ($1,000s)[1]	154 (762)	.095 (.175)	.100 (.175)	.021 (.016)	.021 (.016)	-.051 (.020)	-.052 (.020)
Base Period Earnings ($10,000s)[1]	15,594 (10,786)	.481 (.167)	–	-.066 (.016)	–	-.067 (.022)	–
Weekly Benefit Amount ($100s)[1]	151.86 (52.12)	2.156 (0.319)	–	.276 (.030)	–	.225 (.046)	–
Two High-Quarters Earnings ($10,000s)[1]	9,768 (6,662)	–	3.390 (0.555)	–	.410 (.052)	–	.281 (.080)
Two High-Quarters >Maximum ($100s)[1]	80.42 (197.23)	–	-1.092 (0.170)	–	-.135 (.016)	–	-.098 (.024)
Weibull Shape parameter	–	–	–	–	–	.953 (.012)	.959 (.012)
R^2 (adjusted)	–	.124	.124	.141	.140	–	–
F	–	31.1	31.0	36.0	35.7	–	–
ln likelihood for Weibull	–	–	–	–	–	-9,975	-9,979

Notes: See notes to Table 7A. The dependent variable in the linear OLS models is the weeks of benefits paid. In the semi-log and Weibull models, the dependent variable is the natural logarithm of weeks of beneits paid.

Table 8

Simulated Potential Duration of Benefits, Benefits, and Unemployment Duration: Alternative Specifications for Illinois Using Weibull Duration Model

	FSC - Eligible Workers				FSC - Ineligible Workers			
Variable	Mean (Std. Dev.)	1	2	3	Mean (Std. Dev.)	4	5	6
Simulated D_{pot}	22.07 (6.67)	-.012 (.006)	--	-.011 (.007)	21.53 (7.00)	-.007 (.005)	--	-.007 (.006)
Simulated D_{pot} * Recall	5.15 (10.00)	.015 (.007)	--	.014 (.007)	6.88 (10.59)	.005 (.005)	--	.005 (.005)
Recall	.229 (.420)	-.388 (.165)	-.127 (.070)	-.450 (.172)	.310 (.463)	-.093 (.123)	-.052 (.055)	-.173 (.131)
Earnings Variability ($1,000s)[1]	954 (949)	--	.0003 (.022)	-.011 (.024)	1,017 (992)	--	.010 (.023)	.020 (.025)
Earnings Variability * Recall ($1,000s)[1]	228 (574)	--	.082 (.054)	.075 (.054)	341 (728)	--	.071 (.040)	.073 (.040)
Weekly Benefit Amount ($100s)[1]	121.48 (39.54)	.190 (.091)	.100 (.072)	.183 (.100)	121.01 (40.54)	.047 (.079)	-.025 (.063)	-.035 (.091)
Base Period Earnings ($10,000s)[1]	13,398 (9,069)	-.094 (.033)	-.117 (.029)	-.093 (.035)	13,135 (9,564)	-.058 (.027)	-.066 (.024)	-.053 (.028)
Weeks of Benefits Paid	22.28 (13.79)	--	--	--	19.09 (9.44)	--	--	--
ln (Weeks of Benefits Paid)	2.72 (1.09)	--	--	--	2.69 (.904)	--	--	--
Weibull Shape parameter	--	.962 (.017)	.963 (.017)	.962 (.017)	--	.718 (.015)	.718 (.015)	.718 (.015)
ln likelihood for Weibull	--	-5,845	-5,847	-5,844	--	-3,586	-3,586	-3,584

Notes: Estimates derived from samples of 4,367 FSC - Eligible UI claimants and 3,076 FSC - Ineligible UI claimants who filed valid claims in Illinois during 1984. All equations estimated include the following explanatory variables in addition to those displayed: age (3 dummies), gender, ethnicity (4 dummies), number of job referrals received from the Employment Service, number of employers during the base period, whether a dependants' allowance was received, the length of time between job loss and filing the UI claim, the labor market in which the worker was seeking a job (5 dummies), and industry of employment before job loss (10 dummies).

[1] Scaling applies to regression coefficients only; not to descriptive statistics.

Table 9

Conditional Reemployment Probabilities (Discrete Hazards), Washington State

Weeks until Exhaustion of Benefits	Potential Duration of Benefits: 19-21 weeks Risk Set	19-21 weeks Adjusted Hazard	24-26 weeks Risk Set	24-26 weeks Adjusted Hazard	30 weeks Risk Set	30 weeks Adjusted Hazard
30	--	--	--	--	5,085	.0810
28	--	--	--	--	4,593	.0664
26	--	--	--	--	4,147	.0511
24	--	--	1,210	.0893	3,733	.0447
22	--	--	1,075	.0409	3,374	.0341
20	877	.0889	1,003	.0469	3,081	.0305
18	775	.0555	921	.0347	2,806	.0328
16	718	.0460	847	.0307	2,553	.0239
14	660	.0273	786	.0255	2,349	.0234
12	619	.0216	714	.0336	2,159	.0278
10	580	.0224	648	.0232	1,993	.0211
8	544	.0184	595	.0219	1,845	.0222
6	511	.0313	527	.0209	1,706	.0258
4	468	.0235	484	.0227	1,571	.0216
2	434	.0346	439	.0296	1,460	.0336
0	373	.3485	384	.2318	1,317	.3144
Expected duration of unemployment						
Estimator 1	16.55		18.02		18.35	
Estimator 2	14.46		14.06		13.95	

Table 10

Potential Duration of Benefits, Benefits, and Unemployment Duration: Alternative Specifications for Federal Supplemental Compensation (FSC) in Illinois Using Weibull Duration Model

Explanatory Variable	Mean (Std. Dev.)	1	2	3	4
FSC-eligible	.587 (.492)	.167 (.031)	.167 (.031)	.167 (.031)	.167 (.031)
FSC-eligible * Recall	.134 (.341)	-.045 (.060)	-.045 (.060)	-.045 (.060)	-.046 (.060)
Recall	.262 (.440)	.007 (.044)	.007 (.044)	.006 (.044)	.006 (.044)
Earnings Variability ($1,000s)[1]	980 (967)	.017 (.015)	.013 (.015)	.013 (.015)	.041 (.016)
Replacement Rate (Base period)[1]	.600 (.234)	-.020 (.093)	–	–	
Replacement Rate (High-quarter)[1]	.449 (.111)	–	-.103 (.197)	–	
Base Period Earnings ($10,000s)[1]	13,289 (9,277)	-.092 (.023)	-.096 (.022)	-.099 (.019)	–
Weekly Benefit Amount ($100s)[1]	121.29 (39.96)	–	–	.046 (.049)	–
Two High Quarter Earnings ($10,000s)[1]	8,059 (5,085)	–	–	–	-.105 (.070)
Two High Quarter > Maximum ($100s)[1]	59.79 (143.06)	–	–	–	-.025 (.022)
Weibull Shape parameter	–	.868 (.011)	.868 (.011)	.868 (.011)	.868 (.011)
ln likelihood for Weibull	–	-9,517	-9,517	-9,517	-9,518

Notes: Mean weeks of benefits paid in the sample = 20.96 (std. dev. = 12.28). Mean of the dependent variable (ln of weeks of benefits paid) = 2.71 (std. dev. = 1.02). Estimates derived from a sample of 7,443 UI claimants who filed valid claims in Illinois during 1984. All equations estimated include the following explanatory variables in addition to those displayed: age (3 dummies), gender, ethnicity (4 dummies), number of job referrals received from the Employment Service, number of employers during the base period, whether a dependents' allowance was received, the length of time between job loss and filing the UI claim, the labor market in which the worker was seeking a job (5 dummies), and industry of employment before job loss (10 dummies).

[1] Scaling applies to regression coefficients only; not to descriptive statistics.

Table 11

Conditional Reemployment Probabilities (Discrete Hazards), Illinois

Weeks until Exhaustion of Benefits	Ineligible for FSC		Eligible for FSC	
	Risk Set	Hazard	Risk Set	Hazard
38	--	--	2,105	.0912
36	--	--	1,909	.0602
34	--	--	1,782	.0466
32	--	--	1,686	.0463
30	--	--	1,593	.0439
28	--	--	1,508	.0345
26	1,600	.0688	1,445	.0291
24	1,488	.0477	1,384	.0275
22	1,405	.0349	1,333	.0315
20	1,348	.0423	1,265	.0269
18	1,278	.0376	1,214	.0264
16	1,217	.0394	1,165	.0309
14	1,160	.0474	1,105	.0443
12	1,086	.0359	1,042	.1008
10	1,028	.0418	738	.0203
8	968	.0382	706	.0255
6	923	.0563	670	.0239
4	862	.0360	644	.0230
2	807	.0682	605	.0430
0	731	.3926	553	.3816

Expected Duration of Unemployment		
Estimator 1	21.29	24.08
Estimator 2	21.31	19.99