

Heterogeneity in the Adverse Incentive Effect of Unemployment Insurance

Caroline Scott Hanson¹

Seminar Instructor: Professor Kent Kimbrough

Faculty Advisor: Professor V. Joseph Hotz

Honors thesis submitted in partial fulfillment of the requirements for Graduation with
Distinction in Economics in Trinity College of Duke University

Duke University
Durham, North Carolina
2010

¹ Questions and comments may be directed to Caroline Hanson at carolinescott88@gmail.com. Miss Hanson graduated from Duke University in May 2010 and is currently working as a Research Associate for Economists Incorporated in Washington, D.C.

Acknowledgments

This paper would not have been possible without the guidance and support of my adviser, Dr. V. Joseph Hotz, Professor of Economics. The advice and constructive criticism of Dr. Kent Kimbrough, instructor of my year-long research seminar, was also invaluable throughout the research process. I also extend my thanks to Dr. Julie Berry Cullen of the University of California at San Diego for sharing her benefit simulation program, and her other guidance on constructing a data sample using the Survey of Income and Program Participation. I also thank Kofi Acquah, economics intern in the Data and GIS Lab at Duke University. This research would not have been possible without his help resolving several data issues. Finally, thanks to my fellow students in Econ 198S and 199S; their thoughtful feedback on my research proposal and various drafts over the past year has been very helpful.

Abstract

The purpose of this research is to apply the research on women in the labor supply to the case of unemployment insurance. It considers the effect of gender, marital status, secondary earner status, number of children, and family income on the disincentive effect of unemployment insurance. Data comes from several panels of the Survey of Income and Program Participation, covering a period from 1984 to 1993. Interactions between gender and weekly benefit levels demonstrate that the disincentive effect is greater for women, a result that is consistent and significant throughout all models. The disincentive effect is also shown to be higher for married women; however, this result is insignificant when secondary earner status is included, suggesting that the high proportion of married women who are secondary earners drives that result.

Section I: Introduction

One of the most well-known empirical results in labor economics is the spike in the exit rate from unemployment at the point of unemployment benefits exhaustion. The conventional wisdom surrounding this result is that the receipt of unemployment benefits negatively affects the job search process. As with most forms of insurance, there is a moral hazard problem associated with unemployment insurance (UI); it distorts incentives by subsidizing unproductive leisure. The receipt of unemployment insurance introduces a kink in an individual's budget constraint at the point where benefits are exhausted, changing the tradeoff between labor and leisure. Ultimately at issue is whether the receipt of benefits causes recipients to alter their behavior so that their period of unemployment, and therefore the duration of benefit receipt, is lengthened. From a macroeconomic perspective, unemployment insurance has been shown to raise overall unemployment rates. Indeed, much research has focused on the contribution of the very generous UI program in many European countries to their significantly higher unemployment rates.

This question has been given substantial attention in the literature. Krueger and Mueller (2008) directly address the adverse impact on job search by examining time use data. Studies have also shown a positive impact on the escape rate from unemployment when job search activity is verified (Klepinger et al, 2002). Of more direct interest to my research, there are numerous studies examining the length and distribution of unemployment for UI recipients. Estimates on the effect of potential duration of benefits on duration of unemployment spell vary. Moffitt (1985) finds that a one week increase in potential duration of benefits increases duration of unemployment by .15 weeks; Katz and Meyer (1988) similarly find that duration of unemployment increases by .16 to .20 weeks. Chetty (2008)

divides the analysis into liquidity-constrained and non-constrained subgroups and finds a much higher impact on duration of unemployment for the constrained group. There is ambiguity in the literature on whether benefit levels or duration of benefits is more significant to duration of unemployment. Cullen and Gruber (2000) find that UI receipt has a significant, negative effect on spousal labor supply.

This research distinguishes itself by focusing on heterogeneity in the response of unemployment durations to unemployment insurance, with an emphasis on gender. First, is the behavior of males and females in response to unemployment insurance receipt different? Does unemployment insurance increase the duration of unemployment spells more for one group than another? Second, how do marital status, number of children, secondary earner status, and family income contribute to the duration of unemployment for women, compared to men? Though several studies have mentioned that women appear to experience longer unemployment in response to UI receipt than men, to my knowledge this difference has not been formally studied; moreover, the way that other factors—family structure and income—operate on unemployment through UI by gender has not been considered.

Empirical studies on the labor supply of women suggest that such a difference may exist. They are known to be more responsive to wages, to enter and exit the labor market more frequently than men, and to work fewer hours per week. They are also more likely to be ‘marginally attached,’ only engaging in market work under certain circumstances. As recipients of unemployment insurance, women therefore might be expected to delay their re-entry into the labor force for a longer period of time. These differences are driven by the fact that women are more likely to be secondary earners than men, and devote more of their time to household production. Marital status is important because the presence of a (working)

spouse provides a safety net. The number of children may be important because the presence of children implies greater household work obligations, as well as the opportunity for more family leisure activities. On the other hand, an increase in the number of children also increases the financial burden, which may counteract that effect. Finally, family income, which includes earnings as well as other forms of income, affects the ability to smooth consumption during an unemployment spell.

Ultimately, this research finds that gender and family structure do impact the disincentive effect of unemployment insurance. Women experience longer spells of unemployment in response to increases in benefit generosity. The effect of marital status differs by gender; being a married woman increases the unemployment spell, while being a married man decreases the unemployment spell. However, this result is insignificant when secondary earner status is included in the regression; this suggests that it is not actually gender that drives that result, but rather the high correlation between gender and secondary earner status. The number of children is not significant; and while family income affects the duration of unemployment, it does not affect the signs or magnitudes of the other variables of interest.

Section II: Institutional Background

The unemployment insurance system in the US aims to sustain consumption for workers and their families and to help recipients make efficient job choices in the midst of financial stress. In 2004, \$34 billion in benefits were paid to workers. The average weekly benefit was \$262.50 over 16.1 weeks, for total average benefits per recipients of \$4,115.61. Over the course of the unemployment insurance program's existence the duration of collecting benefits for those who receive benefits has increased. Moreover, the share of those receiving benefits who exhaust those benefits before taking a new job during periods of strong labor markets has increased from less than 30% to nearly 35% since the 1980s (Nicholson and Needels, 2006).

Each state administers its own system, subject to federal guidelines. All states have a minimum earnings and duration of employment requirement in order to be eligible for benefits, though the specifics of these requirements differ by state. Recipients are also required to actively seek work, though enforcement of this requirement is highly variable. Additionally, each state establishes its own benefits level; the average state replaces 50% of the recipient's weekly income, up to the state average. Duration of benefit levels during non-emergency times range from as little as 1 week to as many as 30 weeks; during times of economic hardship the federal government can enact supplemental federal benefits.²

States finance UI benefits with payroll taxes paid by employers into state trust funds maintained at the U.S. Treasury. UI taxes are in part "experience rated"; firms whose previous employees have received more benefits are taxed at higher rates. The UI program

² See Appendix A for a snapshot of the variability in benefit generosity across states.

affects the employment and unemployment experiences of workers through the experience rating by changing the layoff rates of firms, though this research will not address this effect.

Before considering the effect of UI receipt on unemployment spells, it is also important to understand the demographics of the population that receives unemployment insurance. Approximately 97% of wage and salary workers are covered by the UI system, though fewer than 40% have collected benefits in recent years. People who are not covered by the unemployment insurance system include the self-employed, employees of small farmers, and employees whose earnings are below the threshold requirement (Krueger and Meyer, 2002). Due to the lack of information on people who choose not to apply for UI, it is unknown exactly why the take-up rate of unemployment insurance is so low.

A study of what factors determine receipt of UI by the US Government Accountability Office (2007) indicates that low-wage and part-time workers experience low rates of receipt relative to higher-wage and full-time workers. Low-wage workers are defined as receiving a low-wage for at least half of the six previous months of employment. “Low-wage” was defined as an hourly wage less than that required for a full-time worker to earn the Census poverty threshold for a family of four- less than \$8.97 per hour in 2003. The GAO found that low-wage workers were half as likely to receive UI benefits, despite the fact that they were almost two-and-one-half times more likely to be out of work. This was true even when the job tenure (duration of previous employment) was similar. The largest reason therefore appears to be the assumption that the individual will be ineligible due to previous earnings and work history. Other significant reasons are the expectation of recall, or the expectation that a new job will be found quickly, and the availability of private forms of insurance such as a working partner and assets. Due to this variation, no systematic

conclusions can be drawn about the skills and wealth of people who receive unemployment insurance, relative to those who choose not to apply for benefits.

To further motivate the research question, it is also useful to mention the demographics of the population that exhausts their benefits. Table 1 describes the findings from a 1990 paper by the Employment and Training Administration of the U.S. Department of Labor.

Table 1: The demographic and economic characteristics of exhaustees and non-exhaustees			
Characteristics		Exhaustees (percent)	Non-Exhaustees (percent)
Gender	Male	55.1	60.4
	Female	44.9	39.6
Family Structure	Married/Living Together (at Layoff)	58.7	62.4
	Dependent Children Under Age 18	42.2	47.4
Education	Less than High-School	22.6	20.9
	High School/GED	51.2	55.9
	Vocational/Technical/Associate's	13.4	13.5
	Bachelor's degree or more	12.8	9.7
Income	Less than \$10,000	21.2	14.5
	\$10,000-\$50,000	72	80.3
	\$50,000 or More	6.9	5.3

One notable result is that exhaustees were more likely to be female than non-exhaustees were. Exhaustees were less likely to be married and to have dependents. However, the presence of a spouse led to a lower probability of exhaustion for men but not for women.³ Another interesting observation is the bimodal exhaustion of benefits in education: Exhaustees were more likely to have less than a high school diploma and more likely to have a bachelor's degree or more. Similar results were found when household

³ Note that this finding isn't reported in the table. The report makes a note of this difference, but doesn't provide any statistics (p.16)

income was considered; benefit exhaustion is more likely for those with household incomes of less than \$10,000 and for those with incomes of greater than \$50,000. These results suggest the impact of gender, family structure, and education on the unemployment experiences of UI recipients. This research sheds greater light on these factors.

The paper will proceed as follows: Section III reviews the literature. Section IV describes the relevant theory. Section V presents the data. Section VI describes the empirical specification. Section VII presents and discusses the results. Section VIII concludes briefly.

Section III: Literature Review

There is ample literature on both women in the labor supply and on the effect of unemployment insurance on the duration of unemployment spells. This section highlights key research in the two areas.

Women and the Labor Supply

There are several reasons to believe that the response to UI receipt may differ by gender. There is an ample literature on the labor supply of women that indicates that women enter and exit the labor market more frequently than men, and have a higher elasticity in duration of unemployment. Blundell and MaCurdy (1999) report that the median own wage labor supply elasticities estimated by many different studies is .08 for men and .78 for married women. For cross-wage elasticities, Killingsworth (1983) reports a median spouse wage elasticity of .13 for married men's labor supply and -.08 for married women's labor supply. Women's labor supply, then, is much more sensitive to wages; the conventional explanation for this sensitivity is that women are seen to substitute among labor market work, home production, and leisure while men substitute primarily between labor market work and leisure (Blau and Kahn, 2005). It is reasonable to believe that women's labor supply will also be more sensitive to unemployment benefits. Research has also shown a 'child penalty': lower labor force participation of women with young children (Boushey, 2005).

Related research on home production—based on data from 1979-1987—shows that even when both spouses are employed, men spend an average of 7 hours a week on housework, while women spend an average of 20 hours on housework. When children are present, the housework time of employed wives increases by over 5 hours, while the

housework time of husbands increases by less than one hour (Hersch and Stratton, 1994).

Other research shows that in the United States, the average married man allocates 5.2 hours to the labor market on a typical day, compared to 3.3 hours for married women (Burda et al, 2006). Women allocate 4.5 hours a day to the household, compared to 2.7 hours for men. In total, then, both groups “work” about 7.9 hours a day; what differs is how that time is allocated.

For the same reasons that women have lower labor force participation, we might expect them to delay their re-entrance into employment when they receive unemployment insurance. Focusing on the different responses by gender, and the factors that affect these differences by gender, will shed light on the family context in which work decisions are made. Note that this research will use data from 1984 to 1993. However, there are several reasons to believe that the findings will still be relevant today. First, the labor force participation of women has been relatively static since 1990; some have argued that women have reached their “natural rate” of unemployment, suggesting that this research will still have implications for the current behavior of women (Goldin, 2006). Second, this research has tried to break down the gender difference into factors that may be driving it. Even if the labor supply of women changes, and even as their earning power increases, the effect of these factors is likely to hold.

Moral Hazard and Unemployment Insurance

The question of the moral hazard response to unemployment insurance receipt has been approached in several ways. Recently, the direct effect of UI on job search activity has been examined using time-use data. Krueger and Mueller (2008) use the American Time

Use Survey to show that job search is inversely associated with generosity of unemployment benefits; estimates of elasticity range from -1.6 to -2.2. Additionally, job search intensity increases prior to benefit exhaustion for those eligible for UI, but remains constant over time for those ineligible for UI.

There is also a body of research that examines the effect of work search experiments on unemployment duration. Work search requirements reduce the duration of unemployment in two ways. First, they increase job search intensity by requiring claimants to make more job contacts. Second, they raise the non-monetary cost of UI receipt by lowering the utility of leisure. Klepinger et al (2002) analyze the Maryland UI Work-Search Demonstration experiment, in which claimants were randomly assigned to 4 groups, each of which represented a different work-search policy. They find that a job-search workshop requirement reduced UI receipt by half a week and \$75 per claimants without reducing the reservation wage.

Most relevant to my research is the literature that analyzes the impact of generosity of benefit levels across states and over time. In one of the earlier papers on this topic, Moffitt and Nicholson (1982) look at the effect of federal supplemental benefits—a 26 week extension—on unemployment spells. They find that the availability of extended benefits extended the average unemployment spell by 2 ½ weeks.

Moffitt (1985) uses a non-parametric proportional hazards model to find that a one percent increase in the UI benefit increases the average length of unemployment by .36 percent. Calculated at the means of the variables, this implies that a \$10 (non-adjusted) per week increase in the UI benefit lengthens the unemployment spell by half a week. A one

week increase in potential duration lengthens the unemployment spell by about .15 weeks, an elasticity of .16. As expected, he finds that the disincentive effect of raising potential duration of unemployment benefits is smaller when the unemployment rate is higher.

Ham and Rea (1987) analyze the effect of UI in Canada on unemployment duration using a discrete-time-duration model. They examine duration dependence—how the probability of leaving unemployment changes with the current length of the spell. They identify two sources of duration dependence. First, the number of weeks of benefit eligibility falls as the duration of the spell increases. Over time, a worker's reservation wage falls and the cost of rejecting an offer rises as the probability of facing a period of uncompensated unemployment increases. The second source of duration dependence is individually observable factors, holding week eligibility constant. These factors may include the downward adjustment of their perception of the wage offer distribution; the falling value of leisure as assets fall; and the falling rate of job offers as prospective employers view the extended unemployment of the individual as a signal. The sample is limited to those whose periods of unemployment began after the observation period began. Given this construction of the sample, there are two types of unemployment spells that they consider in forming the likelihood function; in some cases, the duration is observed, while in others the expected duration is calculated. Their specification contains entitlement (remaining weeks of eligibility), entitlement squared, benefits, previous wages, provincial unemployment rate, US industrial unemployment rate, age dummies, and seasonal dummy variables. Ultimately they find that unemployment insurance entitlement has a significant effect on unemployment duration even for those who do not exhaust benefits.

Katz and Meyer (1988) examine the impact of the potential duration of UI benefits on the duration of unemployment and the time pattern of the escape rate from unemployment for recipients and non-recipients. They note that there has been less research on potential duration of UI benefits on unemployment than on benefit levels. They use data from the Panel Study of Income Dynamics so that they can look at spell distributions for recipients and non-recipients and the time-pattern of recalls and job acceptances. A notable aspect of this research is that they separately analyze the escape rate for employment spells that end in recall and that end in new job acceptances. They find sharp increases in recall and job finding rates at the point when benefits are likely to expire, while no such increase is evidence in the escape rate from unemployment for non-recipients. They also use data from the Continuous Wage and Benefit History data set (extracted by Moffitt, 1985). They use Kaplan-Meier empirical hazards. Ultimately they find that both the potential duration of unemployment insurance and the level of benefits affect duration, but that potential duration increases the mean duration of unemployment by more than policies with the same predicted impact on the total UI budget that raise benefits levels while holding potential duration constant. They also find that a one week increase in potential benefit duration increases the average duration of unemployment for UI recipients by .16 to .20 weeks.

This study is unique because the researchers use data that allows them to compare the duration of unemployment of UI recipients and non-recipients; other researchers have focused on the duration of unemployment for recipients, with generosity varying by state and time. However, the CWBH dataset only includes information on compensated unemployment; there are no observations on employment status after benefit exhaustion. A related weakness is that individuals who remained unemployed but did not pick up their final

benefits check would be counted as unemployed. Because states cap benefit payments, the payment for the final week may be much smaller than for previous weeks. Other potential causes of the spike at benefit exhaustion have been studied by Card et al (2007), who conclude based on research on job seekers in Austria that most job seekers do not wait to return to work until their benefits are exhausted; rather, they leave the unemployment registry once their benefits end.

Gritz and MaCurdy (1997) examine the effects of unemployment insurance on three aspects of non-employment spells: the length of non-employment spells, the classification of these spells as non-employment, and the impact of the generosity of benefits on the likelihood that individuals collect benefits. Using data from the National Longitudinal Survey- Youth Cohort, they are able to examine both recipients and non-recipients of unemployment insurance. They use a standard hazard model to estimate $f(U|B,Z)$, where U is duration of unemployment, B is a benefits variable, and Z includes work history, demographic characteristics, and macroeconomic controls. Included demographic characteristics are age, education, and race. Macroeconomic controls are the natural log of the average weekly earnings in manufacturing by state and the unemployment rate. A unique aspect of their research is that they also include an unemployment insurance tax variable, the difference between the maximum and the minimum tax rate charged to firms to finance UI in the state of residence. The inclusion of this variable attempts to account for the taxation structure of UI systems in the financing of programs and to control for shifts in tax schedules. They find that weekly benefit amounts have essentially no effect on the durations of non-employment spells, but the number of weeks of UI eligibility does have a significant impact

on spell lengths for recipients. They also find that the likelihood of returning to employment increases as weeks of eligibility run out, indicating the existence of exhaustion effects.

Card and Levine (1998) examine the effect of a temporary policy change in New Jersey that provided up to 13 additional weeks of benefits for UI recipients who had exhausted their regular benefits. This policy change is notable because, unlike most benefit extensions, it occurred during stable macroeconomic conditions; it therefore provides an ideal way of measuring the impact of increases in UI generosity on unemployment spells. They find that the program raised the fraction of recipients who exhausted regular benefits by 1-3 percentage points; this is a very modest effect. However, they estimate that if the policy change had been implemented at the beginning of everyone's unemployment spell, the fraction of recipients exhausting regular benefits would have risen by 7 percentage points. They find that the hazard profile shifted down by 17% in each week after the onset of the extended benefit program.

Chetty (2008) examines the effects of both moral hazard and liquidity constraints on the duration of unemployment benefits receipt. He shows that unemployment duration is lengthened through unemployment insurance differently depending on the recipient's access to liquidity. For a recipient who can access liquidity and smooth consumption, there is a pure moral hazard at work. However, for an agent who is liquidity-constrained and cannot smooth consumption, unemployment insurance lengthens duration by decreasing pressure on the worker; there is therefore both a liquidity effect and a moral hazard effect. He argues that the liquidity effect is a socially beneficial response. He uses data from the Survey of Income and Program Participation. Using asset holdings, single/dual-earner status, and mortgage status, he proxies for the ability to smooth consumption. For the liquidity-constrained group, a 10%

increase in UI benefits raises unemployment durations by 7-10%; the result is much smaller for non-constrained groups. He finds that 60% of the increase in unemployment durations caused by UI benefits is due to the liquidity effect.

Chetty's research transitions into another important area of research: the extent to which unemployment insurance crowds out other, private forms of insurance. These studies, by examining the welfare effects of unemployment insurance, suggest ways to isolate moral hazard. Gruber (1999) examines the wealth holdings of the unemployed and the extent to which they can finance their unemployment and smooth consumption by spending down their assets. He finds that for the median worker, savings is largely adequate to finance most of the income loss from a single unemployment spell. The average worker has assets that can replace 73% of their income loss from unemployment. When more illiquid assets (such as housing wealth) are included, asset holdings are much greater than income loss. However, almost 1/3 of workers cannot replace 10% of their income loss. He also finds evidence that individuals who are eligible for more generous unemployment insurance spend down their assets more slowly during an unemployment spell. Gruber (1997) finds that consumption rises by only 27 cents for every dollar of UI eligibility.

Cullen and Gruber (2000) also examine the way that unemployment insurance crowds out private forms of insurance by analyzing the effect of receiving unemployment benefits on the earnings of wives. They find that for each dollar of UI receipt wives earn as much as \$.73 less; put differently, in the absence of unemployment insurance, wives' work hours would increase by 30%. The gender focus of their research also in part motivates this research.

In summary, the receipt of unemployment insurance has been shown to decrease the amount of time per week dedicated to job search activity. Job-search workshop components to state UI programs decrease the duration of benefit receipt. Numerous studies on the duration of unemployment as a response to increases in either weekly benefit amounts or weeks of eligibility have found an adverse effect. An increase in the number of weeks of eligibility also increases the probability of benefit exhaustion. It has also been shown that unemployment insurance crowds out spousal labor supply.

Section IV: Theoretical Considerations

The topic of this research is how unemployment insurance contributes to unemployment spells for men compared to women. The theory must therefore explain two things: why unemployment insurance increases unemployment spells, and why unemployment insurance might increase unemployment duration differentially for men and women, as a function of family structure.

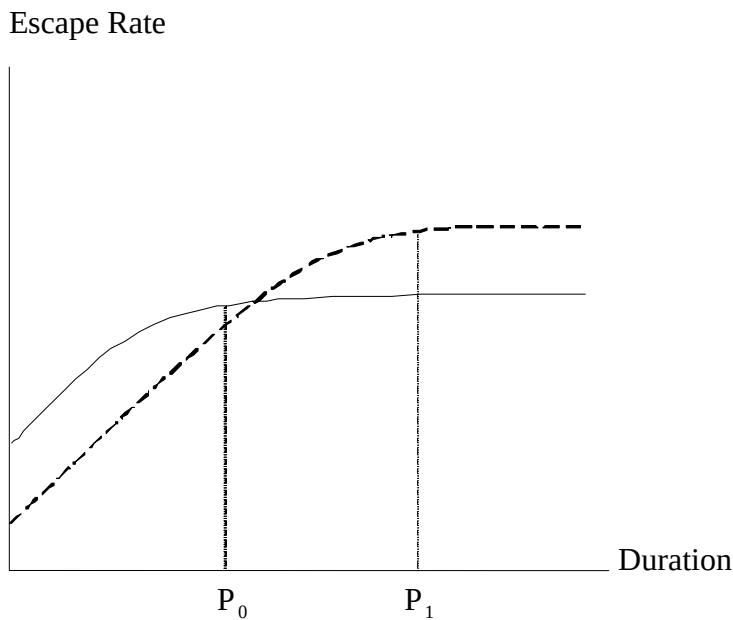
Job Search in the Presence of Unemployment Insurance

The canonical model of unemployment insurance and the escape rate from unemployment is Mortensen's static job search model (1977). An individual has two choice variables—search effort and reservation wage. Given search effort, an individual faces a distribution of potential offers. When an individual receives an offer, he must choose to either accept or reject the offer. The offer will be accepted if the wage equals or exceeds the individual's reservation wage. The reservation wage is chosen so that the expected utility from accepting the offer equals the expected utility of remaining unemployed, which includes both unemployment insurance benefits and value obtained from leisure time.

The model predicts that search effort decreases as the benefit duration and the benefit level increase; as search effort decreases, duration of unemployment increases. Job search effort is expected to increase as benefits are exhausted; once the point of exhaustion is reached, job search effort should remain constant. In the last two weeks before benefits are exhausted, the reservation wage is expected to fall. This implies that the escape rate should increase up until the point of benefit exhaustion and then remain constant. This is depicted by the solid line in Figure 1. Another important prediction of the model is the entitlement

effect. For the unemployed who are ineligible for UI, or for those who have exhausted their benefits, search effort increases with benefit level. Higher benefits raise the value of being unemployed in the future, and so raise the value of obtaining a job, which increases the escape rate for unemployment. This is depicted by the dotted line in Figure 1; the more generous benefits have a greater disincentive effect and cause a lower initial escape rate from unemployment. However, as the point of benefit exhaustion nears, the escape rate is higher because of the entitlement effect and increased job search.

Figure 1: Effect of duration of benefits on duration of unemployment

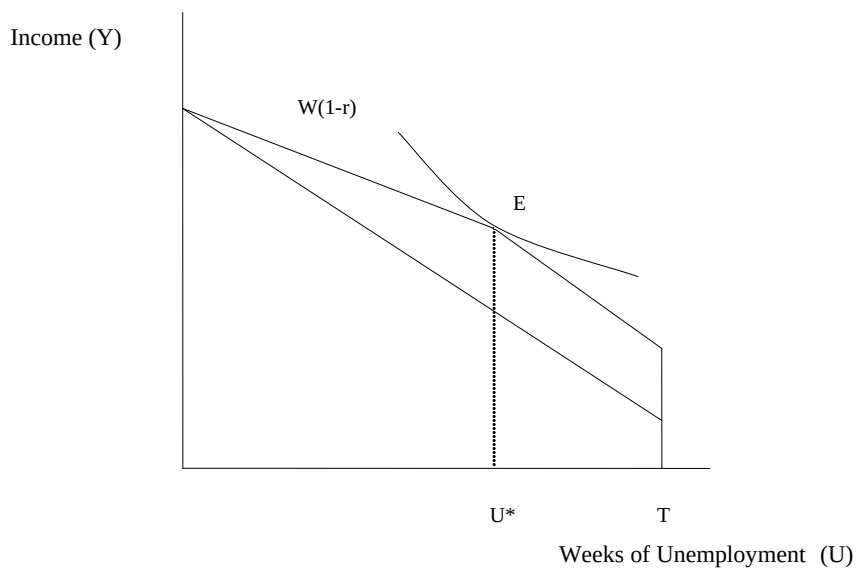


The solid line depicts the escape rate from unemployment until and after benefits are exhausted. When potential duration increases from P_0 to P_1 , the escape rate initially falls and then rises due to the entitlement effect.

Another simple model for predicting the effect of unemployment insurance receipt on unemployment spells is a static labor-leisure choice model (Moffitt and Nicholson, 1982). Unemployment increases utility for two reasons; first, it provides leisure and second, it provides time for productive job search. Unemployment insurance introduces a convex kink

at the week of UI exhaustion, as shown in Figure 2, because unemployment ceases to be subsidized at this point. Up until the point of benefit exhaustion, the slope of the budget constraint is wages less replaced wages (benefits). After the point of benefit exhaustion, the slope is simply wages. If tastes are continuously distributed, then utility for many people will be maximized by returning to work the week benefits are exhausted. The key prediction is that the escape rate from unemployment should be relatively high near the point of benefit exhaustion. Increasing the level or length of benefits translates into a negative effect on the hazard rate.

Figure 2: Budget constraint of a benefit recipient



A non-recipient faces the usual budget constraint. However, a recipient experiences a kink in his/her budget constraint at the week of benefit exhaustion, E. This suggests an unemployment spell of U^* .

Labor Supply Decisions within Families

Also relevant to this research is the theory on how home production is allocated, and how labor supply decisions are made within a family context. The theory on how time is allocating among the household and market sectors was first developed by Gary Becker

(1965). It is not necessary to develop the model here, but it is important to note the results.

His model implies that household members who are relatively more efficient at market activities would dedicate less of their time to household activities. If husbands have a higher wage, they have an incentive to specialize in the market sector. Even if the husband and wife are equally skilled at household production, the individual with the higher market earning power would devote more time to the market sector.⁴ His model was expanded on by Gronau (1977). An increase in the number of children is associated with a transfer of time to child-related activities; home production and home consumption (leisure) increase. This research examines whether these predictions can be applied to the response to the receipt of unemployment insurance.

⁴ Note that this model doesn't imply that the wife should specialize in household production, rather that the person with the lower wage should specialize in household production. The empirical analysis will look at secondary-earner status in addition to gender.

Section V: Data

There are two broad categories of data that have been used in the literature to examine this topic. The first is program usage information from state unemployment insurance officers, and the second is nationally representative survey data. The first option only provides data on insured unemployment; unemployment is no longer measured when benefits are no longer received, so the duration variable is truncated. Therefore, this research will use survey data.

A strong data source must meet several criteria. First and foremost, it must track employment and utilization of benefits over the time period; weekly data is preferred to monthly data. It must include enough information on an individual's employment history for potential unemployment insurance benefits to be inferred; this has been a weakness of survey data in the past. Based on the variables of interest in this research, it should also have sufficient information on education and family size and structure. It should draw from a sample sufficiently large that inferences can be drawn about the entire US population.

Given these criteria, the strongest data source is the Survey of Income and Program Participation. The SIPP is administrated by the U.S. Census Bureau in order to track income and program participation of individuals and households in the US and identify their determinants. It collects information on income, labor force participation, program participation and eligibility, and demographic characteristics. The survey consists of a continuous series of national panels, with the duration of each panel varying from 2 ½ to 4

years. Respondents are interviewed every four months and answer respective questions about their income and labor force behavior over the previous four months.⁵

Though the SIPP is a very strong data source, there are several weaknesses. First, the SIPP does not have information on actual benefits received; benefits must be estimated using employment history. Second, the SIPP only records number of children, not their age; while both are likely to be important, the effect of the age of children may be more important. However, this effect is likely to be captured by the age of the parent, as children's age and parent's age are likely to be highly correlated. Third, as Katz and Meyer (1988) point out, response biases for retrospective information on individual unemployment spells can be severe. Another weakness is that the data on the reason for job separation is unreliable; therefore job losers and job leavers must be considered together, though the impact of benefit receipt on a planned non-employment spell might be quite different.

As previously noted, the UI benefits variable was constructed based on individual employment history. Cullen and Gruber provided access to their simulation program for calculating unemployment benefits. It models each state program from 1983-1993; for this reason, this research will limit itself to that period. However, the program does not calculate the potential duration of benefit receipt. This is a significant weakness, as the number of weeks of eligibility has been shown to be important. Despite these weaknesses, this program has been used in several studies on unemployment insurance, including Chetty (2008) and Cullen and Gruber (2000); the researcher therefore feels confident using the program for this research.

⁵ Further information on the survey design and questions can be found at:
<http://www.census.gov/sipp/index.html>

The final source of data is macroeconomic information from the Bureau of Labor Statistics. Monthly state unemployment rates came from the Local Area Unemployment Statistics program. Mean wages by industry came from Establishment Data. The Consumer Price Index was also used to adjust benefits and earnings.

To create the sample for this research, the SIPP data was first limited to those who experienced an unemployment spell after employment has been observed; it is necessary to observe employment before an unemployment spell because past earnings are used to calculate benefits. The sample was restricted to those who received unemployment insurance over the period. To avoid the effects of labor force participation over the life-cycle, the sample was restricted to those aged 25-54; this allows the research to focus on duration of unemployment without school enrollment and retirement. A dummy variable for secondary earner status, which is defined as an individual contributing less than 50% to the household earnings, was constructed. Marital status, race, industry and occupation were all converted from categorical to dummy variables. Using Cullen and Gruber's simulation program, a benefits variable was assigned to each respondent. Macroeconomic variables were also assigned to each respondent.⁶ The following table describes the data:

⁶ See Appendix 2 for a more thorough explanation of the data extraction and construction process.

Table 2: Summary Statistics			
		Men	Women
Observations		3198	2007
Demographic	Age	36.6 (8.14)	36.7 (8.02)
	Education	12.2 (2.83)	12.3 (2.60)
	Married	.69 (.461)	.59 (.491)
	Secondary Earner	.207 (.405)	.50 (.500)
	Kids under 18	1.02 (1.23)	1.03 (1.18)
Economic	Weekly wage	384.18 (269.51)	231.64 (184.24)
	Monthly Family Income	2771.93 (2003.96)	2608.37(1868.85)
Policy Variables	Duration of Unemployment	16.52 (13.42)	18.48 (16.64)
	Weekly Benefit	185.29 (91.86)	139.10 (83.21)

*Values reported are means, standard errors are in parenthesis.

The sample consists of about 38.6% women. The disproportionate number of men is probably due to the requirements to receive unemployment insurance. The work history requirements differ by state, but generally require at least a quarter of uninterrupted work. As women are more likely to be marginally attached, they are less likely to be eligible for benefits, which may explain the fact that more men received benefits during the period. It also may be true that women, who are more likely to be secondary earners, are less likely to be dependent on benefits during an unemployment spell.

The average age and education level for men and women were roughly equal, at about 37 years and slightly above high-school. The average duration of unemployment was about 2 weeks longer for women, 18.5 compared to 16.5. Benefit levels, however, differed significantly. Women received \$139.10 a week compared to \$185.29 for men. This is due to the lower weekly wages— \$231.64 compared to \$384.18— which were used to calculate benefit levels.

Section V: Empirical Specification

The usual empirical analysis for measuring the impact of UI programs on unemployment duration includes the following variables:

U = weeks of unemployment

B = UI benefit or entitlement variables

H = work history and occupation dummies

D = Demographic characteristics

S = State characteristics reflecting labor-market conditions

For this research, the measure of benefit generosity was weekly benefits, adjusted for inflation. As previously noted, benefits were imputed based on work and earnings history using the UI simulation calculator. The level of UI receipt depends on three factors—state programs, individual characteristics, and state and local economic conditions. To ensure that variation in the UI-benefit variables accurately predict responses to shifts in UI policy regimes, variation in B must reflect purely programmatic changes. With respect to work history, there is an identification problem, where people with specific work histories are eligible for greater or lesser benefit levels, which is also correlated with their duration of unemployment. H is a vector of variables that describe work history, including weekly earnings, industry, and occupation; the inclusion of this variable is necessary to ensure that variation in the generosity of different state programs is isolated from variations in potential benefits due to different work history. D includes sex, age, race, and education; this research

will also include and focus on marital status, number of children, and secondary earner status.

S includes the state unemployment rate at the beginning of the spell of unemployment and the natural log of average weekly earnings by industry at the beginning of the unemployment spell. These variables are particularly important in order to control for endogenous policy formation. Benefits may be increased at the state or federal level during periods of high unemployment. Additionally, there is an expected increase in unemployment duration during periods of high unemployment, as the likelihood of finding a job falls even with high job-search activity. Note that most research on unemployment insurance and moral hazard also includes year and state fixed effects to control for these issues. However, because the focus of this research is demographic variables that are time-invariant, a fixed effects model is not appropriate. Macroeconomic controls are included to avoid as much policy endogeneity as possible, given that fixed effects cannot be used. It must be acknowledged, however, that this is a weakness of this research. For this reason, the focus will be on significance of results rather than magnitude.

This research uses a standard duration dependence function. There are several reasons to use the survival/duration analysis method. The first is that duration analysis takes into account that the probability of leaving unemployment changes with the duration of the spell; the theory suggests that the relationship is not linear. The second is a right-censoring issue, where there is no data point for unemployment and re-employment experiences after the survey period. Therefore, the duration of unemployment for people who remain unemployed at the end of the observation period is not observed; if survival analysis is not used, duration of unemployment is biased downward. Note that left-censoring is not an issue

because only unemployment spells that occur after 3 months of employment are considered; this is due to the need to observe work history in order to estimate benefits.

The hazard rate is the conditional probability of leaving unemployment at time t , provided the individual has remained unemployed up to and including that time period. It is defined as:

$$(1) \quad h(t) = \lim_{\Delta t \rightarrow 0} \left(\frac{\Pr(t + \Delta t > T > t \mid T > t)}{\Delta t} \right)$$

Note that the only difference between the hazard function and the probability density function is the time conditionality of the hazard function.

Following Chetty (2008), Katz and Meyer (1988), Moffitt (1985) and others, this research will use the Cox Proportional Hazards Model, which can be used to determine what factors increase or decrease the hazard rate. The model is semi-parametric. It makes no assumptions about the distribution about the duration of unemployment spells. Because the baseline hazard rate is not estimated, the Cox model is very instructive about the relative effect of different factors on the duration of unemployment, but not absolute effects. The hazard form is:

$$(2) \quad \lambda_{it} = \bar{\lambda}_t \exp(Z_{it}\beta),$$

where $\bar{\lambda}_t$ is the baseline hazard rate, Z_{it} is a vector of explanatory variables for individual i at time t and β is a vector of their coefficients.

The empirical procedure involves estimating several versions of the general model presented in equation (2). Model 1 simply regresses survival time on demographic and economic characteristics in order to determine what factors increase or decrease the hazard ratio. This model essentially recreates work done by other researchers.

$$(3) \lambda_{it} = \bar{\lambda}_t \exp(\beta_1 P_{1st} + \beta_2 S_{st} + \beta_3 D_i + \beta_4 H_i + \varepsilon)$$

P_1 is the policy term that describes the weekly benefit level; the theory suggests that the coefficient on this term should be negative; higher benefits should lower the hazard ratio, or the escape rate from unemployment.

Model 2 estimates the different effect on unemployment insurance on the duration of unemployment for men and women by incorporating an interaction term.

$$(4) \lambda_{it} = \bar{\lambda}_t \exp(\beta_1 P_{st} + \beta_2 P_{st} F_i + \beta_3 S_{st} + \beta_4 D_i + \beta_5 H_i + \varepsilon)$$

In this regression, the policy term is interacted with a gender variable. It is expected that the coefficient on the gender/benefit interactions terms be negative; females are expected to be more selective in their decision to re-enter employment and therefore have a lower hazard rate.

In Model 3, marital status is introduced as an explanatory variable, and interaction terms between marital status and benefits, and marital status, gender and benefits are included.

$$(5) \lambda_{it} = \bar{\lambda}_t \exp(\beta_1 P_{st} + \beta_2 P_{st} F_i + \beta_3 P_{st} M_i + \beta_4 P_{st} F_i M_i + \beta_5 S_{st} + \beta_6 D_i + \beta_7 H_i + \varepsilon)$$

Model 4 attempts to explain the variation observed in Models 2 and 3. In Model 4, secondary earner status, income, and number of children were introduced as controls. The existence of a secondary income allows more flexibility in the decision to re-enter the workforce, while number of children constrains behavior. Higher-income people also have more flexibility than lower-income people.

VI. Results

The following table specifies the hazard function for the four models:

Table 3: Regression Results: Hazard ratios				
	1	2	3	4
Weekly benefits	.998*** (.00019)	.998*** (.000210)	.998*** (.000335)	.997*** (.000367)
Female	.834*** (.02725)	1.043 (.064805)	1.047 (.065430)	1.092 (.069951)
Benefits/Female	-----	.998*** (.000363)	.999** (.000427)	.999*** (.000437)
Married	1.042 (.037336)	-----	1.051 (.069316)	1.028 (.071821)
Benefits/Married	-----	-----	1.000285 (.000360)	1.000481 (.000377)
Benefits/Married/Female	-----	-----	.999** (.000396)	.999 (.000405)
Age	.998 (.001939)	.998 (.001899)	.997 (.001940)	.997 (.001952)
Non-white	.841*** (.037488)	.834*** (.036944)	.836*** (.037308)	.838*** (.037402)
Education	1.015** (.006216)	1.013** (.006148)	1.013** (.006149)	1.014** (.006230)
Number of Kids	1.017 (.013771)	-----	-----	1.008 (.013820)
Secondary Earner	-----	-----	-----	.810*** (.033176)
Income under \$10,000	.827*** (.044988)	-----	-----	.740*** (.042866)
Income over \$50,000	.891** (.040356)	-----	-----	.970 (.046790)
Unemployment Rate	1.00 (.008023)	1.00 (.007999)	1.002 (.0087994)	.999 (.008001)
Industry= Business, Finance, Professional Services	.930** (.029790)	.932** (.029867)	.933** (.029913)	.940* (.030102)
Occupation= Professional	1.020 (.048847)	1.013 (.048479)	1.009 (.048340)	1.010 (.048497)

*significance at the 90% level, **significance at the 95% level, ***significance at the 99% level
Note that hazard ratios are reported, not regression coefficients. Standard errors are in parenthesis

As previously defined, the hazard is the conditional probability of leaving unemployment at time t , provided the individual has remained unemployed up to and

including that time period. A hazard ratio greater than one indicates that the conditional probability of leaving unemployment at that time period is higher than for the reference group. This implies that the coefficient on that variable is positive. A hazard ratio lower than one indicates that the likelihood of exiting unemployment—decreasing the duration of unemployment—is lower than for the reference group. This implies a negative coefficient on that variable.

Model 1 simply regresses survival time on key demographic and economic variables. It identifies the factors that increase or decrease the hazard ratio, the likelihood of exiting unemployment, without focusing on the response to changes in benefits. As expected, an increase in weekly benefits decreases the hazard ratio; higher benefits imply longer unemployment spells. Females have a lower hazard ratio, implying that they experience longer unemployment. Marital status, age, and number of kids are all insignificant. While this research does not focus on race, the effect of being non-white is significant and large in magnitude. It is unexpected that the unemployment rate does not have a greater effect on the hazard ratio. Recall that the 1990 paper by the Department of Labor found a bimodal exhaustion of benefits in income, where people with incomes over \$50,000 and with incomes under \$10,000 were more likely to exhaust benefits. This research supports this finding; relative to middle-incomes (\$10,000-\$50,000), high-income and low-income households are less likely to exit unemployment. While this research will not seek to explain this result, the consistency between the two studies does lend credibility to the findings of this research.

Model 2 introduces an interaction between gender and sex to the regression, while excluding certain explanatory variables. The interaction between gender and sex, which is significant at the 99% level, implies that women exit unemployment slower than men in

response to an increase in benefits. The interaction term absorbs the effect of gender, as the hazard ratio of being female becomes insignificant.

Model 3 adds marital status, an interaction term between marital status and benefits, and an interaction between marital status, gender, and benefits to the regression. While the overall effect of being married is insignificant, being a married woman decreases the hazard rate. This result is also extremely significant. The hazards by subgroup, moving from highest to lowest, (and implying shortest to longest unemployment spell) are as follows: married men, unmarried men, unmarried women, married women.

Model 4 introduces as explanatory variables the number of kids, secondary earner status, and income in order to determine what happens to the sign and magnitude of the interaction terms. While the number of kids is insignificant, secondary earner status is extremely significant. Secondary earners are 19% less likely to exit unemployment at time t . Interestingly, the inclusion of secondary earner status caused the interaction between benefits, marital status and gender to become insignificant. When secondary-earner status was controlled for, married women were no less likely to exit unemployment than everyone else. Note that this was true even when income was excluded from the regression.

The following table demonstrates the effect of increasing benefits from \$96.98 (25th percentile for the sample) to \$220.26 (75th percentile) by gender and marital status.⁷ At the 25th percentile, the hazards are much higher for all groups. Married men exit unemployment the fastest, while married women exit the slowest. At the 75th percentile, the difference between the hazards for unmarried men and unmarried women is negligible. The increase in

⁷ Note that the Cox model doesn't assume anything about the distribution of unemployment; it can therefore only be used to demonstrate the relative effect that different factors have on the duration of unemployment spells.

benefits causes the hazards to change by a much higher percentage for women than men.

This captures the variation in the disincentive effect. Also note that the percent change is virtually equal for married women and unmarried women when secondary earner status is controlled for.

Table 4: Effect of benefit level on hazards			
	Hazard at 25 th percentile of benefits (\$96.98)	Hazard at 75 th percentile of benefits (\$220.26)	Percent change
Married Men	0.9694	0.7098	-36.6%
Unmarried Men	0.7751	0.5675	-36.6%
Married Women	0.6408	0.3926	-63.2%
Unmarried Women	0.7503	0.4605	-62.9%

*Hazards are calculated for non-professional industries and occupations, middle incomes, and at the means for other variables

Ultimately, this research has concluded that gender and family structure do affect the response to the receipt of unemployment insurance. Females are significantly less likely to escape unemployment as benefits increase; this is true even when marital status and other factors are controlled for. However, the result that married women have a lower exit rate in response to benefit increases disappears when secondary earner status is controlled for. This implies that the negative coefficient on benefits/married/female seems to be driven by the existence of a higher-earning spouse.

Section VII: Conclusion

There are two broad findings of this research. The first is that the disincentive effect of unemployment insurance is greater for women than men, even controlling for education, work history, household income, marital status, and secondary earner status. These findings are consistent with the differences in own-wage labor supply elasticities for men compared to women: .08 compared to .78. Just as women are more responsive to wages, they are more responsive to benefit levels. The persistence of the impact of gender throughout all stages of analysis suggests, perhaps, a difference in preferences. However, it is outside of the scope of this research to explain such a difference.

The second broad result is that while marital status is overall insignificant, the hazards for married women are significantly lower. However, this appears to be driven by secondary earner status, as that result is insignificant when secondary earner status is controlled for. In this sample, 72% of married women were secondary earners, compared to 22% of married men. Recall that research by the Department of Labor (1990) found that the presence of a spouse lowered the probability of benefit exhaustion for men but not women. It is first worth noting the consistency between those findings and the results of this research; they both find that the effect of marital status depends on gender. Second, this research suggests that the findings by the DOL are due to the high proportion of married women who are secondary earners compared to men. This is particularly true given the similar time-frame of the DOL paper and the sample used in this research.

Also recall the cross-wage elasticities reported by Killingsworth (1983): -.08 for married women compared to .13 for married men. The different signs on these elasticities—

men increase their labor supply with an increase in their spouse's wages, while women decrease their labor supply—are also consistent with the findings of this research. Again, this research suggests that the divergent effect of marital status on labor supply can be explained by the high percentage of married women who contribute less than 50% to their household's income.

A final implication is that as the percentage of women who contribute more than 50% to their household income increases, it is likely that a divergent effect of marital status by gender will no longer be observed.

References

- Becker, Gary. 1965. "A theory of the allocation of time." *The Economic Journal* 75(299) 493-517.
- Blau, Francine and Lawrence Kahn. 2005. "Changes in the labor supply behavior of married women: 1980-2000." Working Paper 11230 (March), NBER, Cambridge, MA.
- Blundel, Richard and Thomas MaCurdy. 1999. "Labor supply: A review of alternative approaches." *Handbook of Labor Economics*. 1(3) 1559-1695.
- Boushey, Heather. 2005. "Are women opting out? Debunking the myth." Center for Economic and Policy Research, Briefing Paper.
- Burda, Michael, Daniel Hamermesh and Philippe Weil. 2006. "The distribution of total work hours in the EU and US." Discussion Paper 2270, Institute for the Study of Labor (IZA), Bonn, Germany.
- Card, David, Raj Chetty and Andrea Weber. 2007. "The spike at benefit exhaustion: Leaving the unemployment system or starting a new job?" *AEA Papers and Proceedings* 97 (2) 113-117.
- Card, David and Philip Levine. 1998. "Extended benefits and the duration of UI spells: Evidence from the New Jersey extended benefits program." Working Paper 6714 (August), NBER, Cambridge, MA.
- Chetty, Raj. 2008. "Moral hazard versus liquidity and optimal unemployment insurance." *J.P.E.* 116 (2) 173- 234.
- Cullen, Julie Berry and Jonathan Gruber. 2000. "Does unemployment insurance crowd out spousal labor supply?" *J. Labor Econ.* 18 (3) 546- 572.
- Goldin, Claudia. 2006. "The quiet revolution that transformed women's employment, education, and family." *AER* 96 (May) 1-21.
- Gritz, R Mark and Thomas MaCurdy. 1997. "Measuring the influence of unemployment insurance on unemployment experiences." *J. Business and Economic Statistics*. 15 (April) 130-152.
- Groneau, Reuben. 1977. "Leisure, home production, and work- the theory of the allocation of time revisited." *J.P.E.* 85(6) 1099-1123.
- Gruber, Jonathan. 1997. "The consumption smoothing benefits of unemployment insurance." *AER* 87 (March) 192-205.
- Gruber, Jonathan. 1999. "The wealth of the unemployed: Adequacy and implications for unemployment insurance." Working Paper 7348 (September), NBER, Cambridge, Ma.

- Ham, John and Samuel Rea. 1987. "Unemployment insurance and male unemployment duration in Canada." *Journal of Labor Economics*. 5(3) 325-353.
- Hersch, Joni and Leslie Stratton. 1994. "Housework, wages, and the division of housework time for employed spouses." *The American Economic Review* 84 (2) 120-125.
- Katz, Lawrence and Bruce Meyer. 1988. "The impact of the potential duration of unemployment benefits on the duration of unemployment." Working Paper 2741 (October), NBER, Cambridge, MA.
- Killingsworth, Mark. 1983. *Labor Supply*. New York, NY: Cambridge University Press.
- Klepinger, Daniel, Terry Johnson and Jutta Joesch. 2002. "Effects of unemployment insurance work-search requirements: The Maryland experiment." *Industrial and Labor Relations Review*. 56 (Oct) 2-33.
- Krueger, Alan and Bruce Meyer. 2002. "Labor supply effects of social insurance." Working Paper 9014 (June), NBER, Cambridge, MA.
- Krueger, Alan and Andreas Mueller. 2008. "Job search and unemployment insurance: New evidence from time use data." Discussion Paper 3667 (August), The Institute for the Study of Labor, Bonn, Germany.
- Moffitt, Robert. 1985. "Unemployment insurance and the distribution of unemployment spells." *Journal of Econometrics*. 28 85-101.
- Moffitt, Robert and Walter Nicholson. 1982. "The effect of unemployment insurance on unemployment: The case of federal supplemental benefits." *Review of Economics and Statistics*. 64(1) 1-11.
- Mortensen, Dale. 1977. "Unemployment insurance and job search decisions." *Industrial and Labor Relations Review*. 30 (July) 505-517.
- Nicholson, Walter and Karen Needels. 2006. "Unemployment insurance: Strengthening the relationship between theory and policy." *J. Econ Principles*. 20 (Summer) 47-70.
- "A study of unemployment insurance recipients and exhaustees: Findings from a National Survey." 1990. Unemployment Insurance Occasional Paper 90-3, Employment and Training Administration, United States Department of Labor.
- "Unemployment insurance: Low-wage and part-time workers continue to experience low rates of receipt." 2007. Report to the Chairman, Subcommittee on Income Security and Family Support, Committee on Ways and Means, House of Representatives. United States Government Accountability Office. (September).

Appendix A: Characteristics of State Programs⁸

State	Weekly Benefit Amount		Duration of Benefits
	Minimum	Maximum	
Alabama	\$45	\$235	15-26
Alaska	\$44-\$68	\$248-\$320	16-26
Arizona	\$60	\$240	12-26
Arkansas	\$73	\$409	9-26
California	\$40	\$450	14-26
Colorado	\$25	\$413/\$455	13-26
Connecticut	\$15-\$30	\$501-\$576	26
Delaware	\$20	\$330	24-26
DC	\$50	\$359	19-26
Florida	\$32	\$275	9-26
Georgia	\$44	\$320	6-26
Hawaii	\$5	\$523	26
Idaho	\$58	\$364	10-26
Illinois	\$51-\$70	\$369-\$511	26
Indiana	\$50	\$390	8-26
Iowa	\$51-\$62	\$347-\$426	9-26
Kansas	\$101	\$407	10-26
Kentucky	\$39	\$415	15-26
Louisiana	\$10	\$258	21-26
Maine	\$57-\$85	\$331-\$496	14-26
Maryland	\$25-\$65	\$380	26
Massachusetts	\$32-\$48	\$600-\$900	10-30
Michigan	\$113-\$143	\$362	14-26
Minnesota	\$38	\$351/\$538	10-26
Mississippi	\$30	\$210	13-26
Missouri	\$35	\$320	8-26
Montana	\$114	\$386	8-28
Nebraska	\$30	\$298	14-26
Nevada	\$16	\$362	12-26
New Hampshire	\$32	\$427	26
New Jersey	\$85-\$97	\$560	1-26
New Mexico	\$66-\$99	\$355-\$455	1-26
New York	\$40	\$405	26
North Carolina	\$41	\$476	13-26
North Dakota	\$43	\$385	12-26
Ohio	\$103	\$365-\$493	20-26
Oklahoma	\$16	\$391	18-26

⁸ This chart describes monetary entitlement for 2009. It is based on information from the Employment and Training Administration of the Department of Labor.

Oregon	\$108	\$463	3-26
Pennsylvania	\$35-\$43	\$539-\$547	16/26
Rhode Island	\$7	\$133	8-26
South Carolina	\$20	\$326	15-26
South Dakota	\$28	\$285	15-26
Tennessee	\$30	\$275	13-26
Texas	\$57	\$378	10-26
Utah	\$26	\$427	10-26
Vermont	\$61	\$409	26
Virginia	\$54	\$363	12-26
Washington	\$122	\$515	1-26
West Virginia	\$24	\$408	26
Wisconsin	\$53	\$355	12-26

Appendix B: Data Construction

The data was extracted using SIPP Utilities, a program developed by Unicon Research Corporation and funded by a grant from the National Institute of Child Health and Human Development. The 1984, 1985, 1986, 1987, 1988, 1990, and 1991 panels were used in this research, covering a period of from 1984-1993.

Each respondent is assigned an ID to identify the respondent across all waves of a panel.

Unemployment insurance receipt is identified by “R05”; UI is the 5th type of income recorded by the SIPP. Supplemental benefits are identified by “R06”; these are the 6th type of income recorded by the SIPP. The responses to these two variables were combined to create one indicator of UI receipt. Those who did not receive benefits over the panel were discarded.

The marital status dummy variable was constructed from the 6 possible responses to the marital status question; “married” (MS=1) is defined as married, spouse present or absent. Unmarried (MS=0) is defined as widowed, divorced, separated, or never married.

The education variable was constructed by combining a response about the highest grade attended and a response about whether or not that grade was completed.

The age variable describes the age at the time of interview. To avoid the effect of college education and early retirement, the sample is restricted to those aged 25-54.

The state variable omits Idaho, New Mexico, South Dakota, Wyoming, Mississippi, and West Virginia. Because of their size, these states were not assigned unique codes in the survey. In order to use Cullen’s simulation program, the state variable had to be recoded to match.

The categorical race variable was recoded as a dummy variable, white or non-white.

The number of children variable is straightforward; it identifies the total number of own children under 18 in family.

The secondary earner status variable was constructed by dividing the individual’s earnings by the household earnings. Those who contribute less than 50% to the household earnings are categorized as secondary earners.

The duration of unemployment is calculated by summing the number of consecutive weeks that employment status is with a job but without pay or on layoff, looking for a job, or without a job and not looking.

The SIPP records industry, earning, and occupations from 2 jobs. If the earnings from Job 2 were greater than Job 1, Job 2 was taken as the primary work and industry and occupation controls were for that job. Otherwise, industry, occupation, and wages were from Job 1.

Other variables from the SIPP are total earnings for the month, total family income, and occupation and industry. Occupation and industry, which were categorical variables, were

recoded into dummy variables. These job controls are based on the period before a given unemployment spell and are held constant for the duration of the spell.

The simulation program to estimate benefit eligibility constructs 'base period earnings' based on the earned income for the 4 months prior to the unemployment spell. Annual earnings are defined as 3 times the base period earnings. Those variables had to be constructed before running the program. As previously mentioned, states had to be recoded.

Macroeconomic variables came from the Bureau of Labor Statistics. Mean wages were assigned by industry. Unemployment rates were assigned by state and month. Inflation (CPI) was assigned by month, and benefits and income/earnings variables were adjusted.