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Abstract

The Supplemental Security Income (SSI) program provides federally-funded income support for individuals with disabilities, and has become one of the most important means-tested transfer programs in the United States. In this paper we examine the relationship between economic conditions and adult disabled SSI applications between 1996 and 2010, using data from the Survey of Income and Program Participation (SIPP) linked to Social Security Administration administrative data. Results from hazard models suggest that those who began their unemployment spell in a time of high unemployment are less likely to apply for SSI, consistent with the characteristics of the pool of newly unemployed varying systematically with the business cycle. Higher contemporaneous state unemployment rates have a large, positive effect on the risk of SSI application among jobless individuals. Our findings suggest that recessions can have long term fiscal implications for the SSI program.

Economic Conditions and Supplemental Security Income Applications

Synopsis

In this paper, we examine the relationship between economic conditions and adult disabled SSI applications between 1996 and 2010 using data from the Survey of Income and Program Participation (SIPP) linked to the Social Security Administration's 831 file. We look at both the state-level unemployment rate at the time the unemployment spell began, as well as the contemporaneous state-level unemployment rate.

Abstract

The Supplemental Security Income (SSI) program provides federally-funded income support for individuals with disabilities, and has become one of the most important means-tested transfer programs in the United States. In this paper we examine the relationship between economic conditions and adult disabled SSI applications between 1996 and 2010, using data from the Survey of Income and Program Participation (SIPP) linked to Social Security Administration administrative data. Results from hazard models suggest that those who began their unemployment spell in a time of high unemployment are less likely to apply for SSI, consistent with the characteristics of the pool of newly unemployed varying systematically with the business cycle. Higher contemporaneous state unemployment rates have a large, positive effect on the risk of SSI application among jobless individuals. Our findings suggest that recessions can have long term fiscal implications for growth of the SSI program.

I. Introduction

Over the past thirty years, the Social Security Administration's Supplemental Security Income (SSI) program, which provides federally-funded income support for individuals with disabilities, has become one of the most important means-tested cash aid programs in the United States. As illustrated in Figure 1, SSI has been growing rapidly over recent years. In 2013, SSI provided benefits to 4.9 million low-income adults ages 18-64 who met its disability criteria. These numbers represent an 82% increase in the adult SSI caseload since 1990. In 2009, the Federal government spent $37.7 billion on payments to SSI recipients, representing a 127 percent increase in real dollars since 1990.

Since SSI is a means-tested program, one might expect applications to be countercyclical – decreasing when the economy is expanding and increasing during recessions. Figure 2 graphs SSI applications for 18-64 year olds (left axis) against the unemployment rate (right axis), and shows interesting changes in patterns over time. From 1990 through about 2002, trends in SSI applications followed trends in the national unemployment rate fairly closely. For example, the steady decline in SSI applications in the 1990s began about one year after the unemployment rate began to decline steady, and SSI applications rose as unemployment rates rose in the early 2000s. However, beginning in 2003 the economy began to improve without a corresponding decrease in applications.[1]

A number of previous studies have looked at the effects of economic conditions on growth in disability caseloads. However, much of this work has focused on the Social Security Disability Insurance (SSDI) program, which is limited to those with a sufficient work history, who may be more responsive to economic conditions. Most research focusing specifically on SSI dates from the early 1990s, and found that higher unemployment was associated with increases in both SSI

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[1] See Rutledge and Wu (2014) for a more detailed discussion of these patterns.

applications and caseloads (Rupp and Stapleton 1995; Stapleton et al. 1998; Stapleton et al. 1999).

The relationship between economic conditions and SSI may have evolved significantly since then.

In addition, the welfare reform legislation passed in 1996 had both direct and indirect effects on SSI

participation (Schmidt 2004). Evidence suggests a larger role for SSI as part of the safety net

(Wittenburg et al., 2015), which could mean a change in the composition of potential applicants.

Given the rapid growth in the SSI program, as well as ongoing efforts to reform disability benefits

in the United States, understanding the role that business cycles play in determining SSI

participation has become increasingly important.

In this paper, we examine the relationship between economic conditions and adult disabled

SSI applications between 1996 and 2010 using data from the Survey of Income and Program

Participation (SIPP) linked to the Social Security Administration's 831 file. These restricted access

data allow us to link demographic conditions and detailed information on unemployment spells in

the SIPP with precise data on month of first application for the SSI (and SSDI) program. We

estimate hazard models of SSI application risk among individuals working when first observed in

the SIPP, but subsequently unemployed during their SIPP panel, and find that SSI application risk

increases significantly with higher state unemployment rates. The magnitude of this effect is large

– suggesting that a one-percentage point increase in the state unemployment rate would lead to a 22

percent increase in the risk of applying for SSI. Those who began their unemployment spell in a

time of high unemployment are less likely to apply for SSI, consistent with the characteristics of the

pool of newly unemployed varying systematically with the business cycle. Our results suggest that

female potential applicants are more responsive to economic conditions than males, and that older

potential applicants (ages 45-59) are more responsive to economic conditions than younger

individuals. Once enrolled in SSI, very few recipients leave the rolls. Our findings suggest that

short-run fluctuations in economic conditions may have real long-run effects on program

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participation and expenditures, and that counter-cyclical stimulus spending could have larger impacts over time by deterring disability program applications.

II. Background

A. *The Supplemental Security Income Program*

The SSI program provides means-tested cash assistance to the elderly, blind and individuals with disabilities. It was enacted in 1972, in part to replace a wide range of different programs across states and to standardize income support for these groups (Berkowitz and DeWitt, 2013). The SSI disability determination process is quite complicated and involves five stages through which applicants must progress in order to receive benefits.[2] At the first stage, individuals must show that they are not involved in "substantial, gainful" economic activity. The second and third stages involve medical evaluations. Those with "non-severe" impairments or impairments that are not expected to end in death or last at least 12 months are denied in Stage 2, and those with extremely severe impairments are immediately allowed in Stage 3. Stages 4 and 5 consider capacity to work. Applicants who are able to work in jobs that they held in the past are denied in Stage 4, and applicants who, given their age, education, and work experience, are judged able to work in any type of employment in the economy are denied in Stage 5. As noted by Chen and van der Klaauw (2008), Stage 5 creates discontinuities in eligibility determination by age beginning at the age of 45. Less than half of all SSI applicants are ultimately approved (Nadel et al. 2003/2004). The majority of SSI funding is federal, but many states do supplement benefits with state funds.[3] The maximum individual level federal benefit was $733 in 2015, and benefit levels are adjusted for increases in the cost of living.

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[2] This description draws heavily from Lahiri et al. (1995).
[3] Duggan et al. (2015) note that 45 states currently supplement benefits for some or all of their recipients.

SSI is one of two major U.S. programs targeted at the individuals with disabilities. The Social Security Disability Insurance program (SSDI) provides benefits to individuals with disabilities who are insured by the contributions they made to the Social Security system when they were working. The disability determination process for SSDI is the same as that for SSI. However, benefit eligibility requires a sufficient work history, and benefits are not-means tested but depend on individuals' earnings histories. SSDI is a larger program than SSI, and is growing more rapidly. In 2009, 7.8 million workers with disabilities received SSDI, an increase of 158% since 1990. Primarily because of the work history requirements, SSDI applicants and recipients are less economically disadvantaged than those who apply for and receive SSI benefits. SSDI applicants are older, more highly educated, and have more financial wealth than SSI applicants. They are also more likely to be male, white, non-Hispanic, and married (Bound et al. 2003). Many individuals are eligible for benefits from both SSI and SSDI. These "concurrent" beneficiaries have sufficient work histories to qualify for SSDI, but their benefit levels are low enough that they still qualify for SSI. Of all working-age disabled beneficiaries receiving benefits from the Social Security Administration in 2004, 53% were SSDI only, 31% were SSI only, and 16% were concurrent.

B. Macroeconomic Conditions and SSI Participation

While the disability determination process is stringent, there are a number of reasons to think that SSI participation may depend on macroeconomic conditions. First, the SSI means-testing process examines family income, so if other members of the family face decreases in income due to the business cycle, this could lead to increases in eligibility. In addition, there is evidence that suggests that rates of self-reported disabilities endogenously respond to the relative costs and benefits of disability program participation (Waidmann et al. 1995). As labor market opportunities

decline, a given physical or mental impairment may translate into more of an employment impediment, making SSI participation relatively more attractive.

A number of studies have looked at the effects of economic conditions on growth in disability caseloads. Autor and Duggan (2003) find that shifts in state-level labor demand predict changes in SSDI participation. Black et al. (2002) exploit changes in coal prices as a shock to local earnings growth to examine effects of earnings on disability program participation. They find that both SSDI and SSI participation respond to earnings shocks, but that SSI participation is less responsive than that of SSDI.

Stapleton and co-authors (Rupp and Stapleton 1995; Stapleton et al. 1998; Stapleton et al. 1999) find that increased unemployment rates associated with the recession of the early 1990s played an important role in the growth of SSI applications and awards during the pre-welfare reform years, but that the unemployment rate has a stronger effect on applications than on awards. However, Garrett and Glied (2000), Schmidt and Sevak (2004), Schmidt (2013), and Rutledge and Wu (2014) find that unemployment rates are negatively associated with the stock of state SSI caseloads after controlling for state- and year-fixed effects. One possible explanation for this counterintuitive finding is that the dependent variables used in these analyses represent the stock of individuals on the SSI program, but economic conditions should affect transfer program rolls primarily through the flow of individuals onto and off of the program (for example, see Grogger 2003 and Klerman and Haider 2004). Since for many recipients SSI is an absorbing state, this suggests the importance of looking directly at application rates with longitudinal data.[4] It could also be the case that once national economic conditions are controlled for with year fixed effects, state to state variation over time may be picking up unobservable features of the local labor market.

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[4] Rutledge and Wu (2014) use linked SIPP and SSA data to look directly at the time period in the early 2000s, when SSI applications increased despite a booming economy. They specifically examine the dynamics of program participation, and find that two factors are most helpful in understanding the growth over this time period: a decrease in exits and an increase in entry among those in poor health.

C. SSI Participation and Welfare Reform

Most of the research on SSI participation focuses on the era before passage of major welfare reform in 1996. While the SSI program is quite different from the Aid to Families with Dependent Children (AFDC) program (and its replacement, the Temporary Assistance for Needy Families (TANF)), there are reasons to expect relationships between the two programs. First of all, the populations served by the two programs have similar characteristics. Both programs serve individuals with low levels of education and work experience. In addition, participants in AFDC and TANF exhibit high rates of disabling conditions (Loprest and Acs, 1995; Danziger et al., 2000; Nadel, Wamhoff, and Wiseman, 2003/2004).

Welfare reform increased both individual- and state-level incentives to shift recipients from AFDC/TANF to SSI. From the state's perspective, because SSI is fully federally funded, whereas AFDC was funded by a matching grant, there have always been state-level fiscal incentives for moving recipients from AFDC to SSI. PRWORA strengthened these incentives by replacing AFDC's matching grants with fixed TANF block grants.   At the individual level, monthly SSI benefits were always larger than AFDC benefits in most states. Because TANF benefits have tended to be constant in nominal terms, whereas SSI benefits are indexed each year to the inflation rate, the benefit differential between the two programs has widened. Even without widening financial incentives, SSI is relatively more attractive post welfare-reform, given that TANF has stringent work requirements, time limits, and sanctions for not complying with rules.[5]

Consistent with both the overlap between the two programs as well as the changing relative costs and benefits of participation in the two programs, the existing literature suggests substantial movement of single-parent families to SSI. Kubik (2003) has shown that states undergoing unexpected fiscal distress were more likely to show increases in SSI caseloads relative to their

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[5] There is also evidence that states and third parties have acted as intermediaries to assist individuals with the SSI application process (Bound et al. 1998; Livermore et al. 1998; Pavetti and Kauff 2006).

AFDC population during the 1990s. Stapleton et al. (2001/02) analyze matched data from the SIPP and SSA records, and find that the probability of an SSI application is 2.4 times larger for past AFDC recipients than for other SIPP respondents. Schmidt and Sevak (2004) find that state-level reforms implemented through welfare waivers in the early 1990s led to a 21.6% increase in the probability of SSI participation among single-mother families. The General Accounting Office (1997) examined former AFDC recipients in Iowa, Massachusetts, and Wisconsin who lost their eligibility under new state TANF regulations, and found that 12% of households who lost benefits subsequently began receiving SSI. Wamhoff and Wiseman (2005/06) document that in 2003, 16% of families receiving TANF included a child or adult SSI recipient, and that the monthly incidence of TANF-related SSI awards has gone up. Schmidt (2013) finds that welfare reform significantly increased SSI participation, and that state policies that sanctioned welfare recipients for noncompliance had positive and significant effects on the SSI caseload. In addition, Schmidt (2013) finds that welfare reform appears to have changed the relationship between SSI participation and unemployment rates, as the SSI program has become more countercyclical in response to business cycles in the years following welfare reform for women and children, but not for men.

We contribute to this literature by re-examining the relationship between state-level economic conditions and SSI applications over the late 1990s and 2000s. This allows us to examine whether the relationship between economic conditions and SSI applications has evolved over time and in response to changes in the composition of potential applicants.

III. Methods

A. Data

We use survey data from the Survey of Income and Program Participation (SIPP) matched to administrative data from the Social Security Administration. The SIPP is a nationally

representative longitudinal survey which collects data on a number of topics including employment, demographics, income, and program participation. Because of the focus on program participation, the SIPP oversamples low income households. Monthly data are available for sample members for up to roughly three years. We use data from the 1996, 2001, 2004, and 2008 SIPP panels, which together cover the period from 1996 to 2010. We use SSA administrative data on SIPP sample members for the same time period.

There are several advantages to using the matched SIPP/SSA data. First, the monthly data in the SIPP make it easier to examine dynamics related to employment, unemployment and program receipt. Second, because the 831 file records every application for DI or SSI and most decisions on those applications, we are able to avoid standard concerns about underreporting of program participation in survey data (Meyer, Mok, and Sullivan, 2009). In addition, the data allow us to observe the exact date of application, whereas data in the SIPP alone would only allow us to observe the month of first SSI receipt. This is potentially important, since applicants must remain out of the labor force until their application is resolved. Some applicants may wait 5 months, while others wait many years before receiving benefits. As a result, the date of first receipt of benefits is much less likely to be tied to economic conditions than the date of first application.[6] A third benefit of using the matched SIPP/SSA data is that analysis that relies solely on administrative data is limited by not being able to observe non-applicants, as well as by the limited demographic data available for applicants. Research has shown that using matched administrative records in this fashion provides more accurate estimates of SSI participation and benefit amounts than the self-reported information in SIPP (Huynh, Rupp, and Sears, 2002).

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[6] Similarly, labor market conditions that affect aggregate rates of application also affect the timeliness with which state Disability Determination Services offices process claims, and therefore could affect the average lag from first application to eventual receipt of benefits.

We limit our sample to individuals who were ages 20 to 59 and newly unemployed during the period in which they were observed in the SIPP panel. This allows us to focus our analysis solely on the subpopulation that is more likely to be eligible for SSI and most directly affected by changing economic conditions. However, this population, with recent work history, may be systematically different than the average SSI applicant. In addition, by limiting the sample only to those newly unemployed, we are able to observe all sample members from the first month in which their experience of a change in the labor market is likely to directly affect their eligibility and thus propensity to apply for SSI. While monthly 831 data are available for the entire period we study, we do not include data from it for months beyond a sample member's SIPP panel because we rely on the monthly SIPP data to identify the State in which a sample member resides.

We merge state-level measures to the matched SIPP/SSA data by state and month, including the unemployment rate and a number of policy variables. Policy variables include the maximum TANF benefit for a family of three as well as state-level SSI supplements. These variables determine the relative monetary advantage of participating in one program versus another. We also include indicator variables for whether the state TANF program has strict sanctions, strict time limits, and only limited exemptions from work requirements. Finally, since work by Kubik (2003) has shown that states undergoing unexpected fiscal distress were more likely to show increases in child SSI caseloads relative to their AFDC population during the 1990s, we include a similar fiscal distress measure. Detailed information on the sources of all policy variables can be found in the Data Appendix.

Table 1 provides summary statistics for the individual variables included in the SIPP for our analysis sample. As described above, the sample is drawn from the four SIPP panels, with 20 to 30

percent coming from each panel between 1996 and 2008.[7] Most individual variables are measured

in the month that an individual enters the sample and we report the mean across individuals. As

described above, an individual enters the sample at risk for SSI application in the month they go

from being employed to not employed, as reported in the SIPP. 56 percent of sample members are

female, and half were married in the period that they entered the sample. 13 percent of the sample

is foreign-born. Respondents range in age from 20 to 59 with more at the younger end of this age

range. Roughly three-quarters are non-Hispanic Whites and twelve percent are Black. 91 percent

have graduated from high school and 62 percent attended college. Approximately one third enters

the sample with family income less than twice the federal poverty level. The sample statistics differ

from comparable statistics for a nationally representative sample because of the sample selection

criteria – it includes individuals who are originally observed to be employed and then lose

employment during the SIPP panel.

We report summary statistics for selected time-varying variables across person-month

records. About one out of a thousand apply for SSI and three out of a thousand apply for SSI or DI

in a given month at risk. Our key variable of interest, the monthly state unemployment rate, has a

mean of 5.3 percent.   At the bottom of the table, we report summary statistics for state policy

variables at the state-month level. The mean TANF payment for a family of three was $385 and the

mean State SSI supplement was $28, though both exhibit substantial variation.

B. Model Specification

We examine the relationship between SSI and economic conditions by estimating a series of

discrete time hazard models of SSI application on state-level unemployment rates. We consider the

fact that both current and lagged labor market conditions should be related to one's current

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[7] The sample is not drawn evenly across the years due to variation in both the size of SIPP panels and in employment outflows.

employment status and risk of program application. To address this, we use two measures of the unemployment rate -- the "contemporaneous" state unemployment rate in the observation month and the "baseline" unemployment rate in the month the unemployment spell began.

The contemporaneous measure captures an individual's perception of their chance of gaining employment. The baseline measure (while adjusting for contemporaneous state unemployment rate) captures differential selection into unemployment during periods of high and low unemployment. For example, during a period of very high unemployment, such as the recent "great recession," the pool of unemployed individuals may have a greater number of individuals "higher up" in the employability or skill distribution. These individuals should be less likely to apply for SSI. Because the two unemployment rates are highly correlated with each other, it is important to include both, even if one is only interested in the relationship between the contemporaneous rate and SSI application.

All models control for age in five-year bands, gender, race, educational attainment, as well as indicators for being married and being an immigrant. We also control for whether an individual had low income at the start of the unemployment spell (indicator is equal to one if the respondent's family income was less than twice the federal poverty level). All specifications include state fixed effects.

In our preferred specification, we also control for the duration of unemployment with a measure of the natural log of months of unemployment, and we control for secular shifts with an indicator for the SIPP panel (1996, 2001, 2004, or 2008). We separately estimate the hazard of application for SSI only as well as the hazard of application for either SSI or SSDI. While the focus of this study is to estimate impacts on SSI applications, we estimate the hazard of applying for either SSI or SSDI because many of the applications are joint applications rather than SSI-only

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applications. People may apply for both, and then find out which program they are eligible for (or whether they are eligible for both).

We also examine the heterogeneity of our results by estimating the hazard of SSI application separately by gender and by age group (older or younger than age 45). Finally, we test the robustness of our findings using a number of alternative specifications. These include specifications which control for time using year or month variables; use only the contemporaneous unemployment rate; and estimate the hazard using complementary log-log regression. We also specify the baseline hazard using a variety of functional forms including a specification with duration fixed effects and calendar time fixed effects, and a specification with log duration (in number of months) combined with calendar time fixed effects. All specification checks produce very similar estimates for the main coefficients of interest.

IV. Results

Table 2 presents coefficient estimates and z statistics from two hazard models of application for disability benefits, estimated on the full sample at risk. Column 1 presents results for SSI-only applications, and Column 2 presents results for joint SSI-SSDI applications. Individual characteristics are associated with SSI application risk in expected directions. The risk of application is lower for individuals who are married. There are no significant differences in SSI application risk by either gender or race/ethnicity. Those living in households with foreign-born individuals are significantly less likely to apply for SSI, which is consistent with post-1996 restrictions on immigrant receipt of SSI (Bitler and Hoynes, 2013). The risk of application falls consistently with education level, such that those with some college have the lowest risk, followed by high school graduates. Having baseline family income of less than twice the federal poverty level significantly increases the risk of SSI application.

The coefficient on the state unemployment rate at the beginning of the unemployment spell is negative, consistent with the theory that the pool of individuals unemployed in periods of higher unemployment may be more employable and thus at lower risk of SSI application. It is also consistent with the large negative coefficient on the indicator for respondents in the 2008 SIPP, which suggests that those unemployed during the most recent recession were less likely to apply for SSI than those unemployed in earlier years. However, neither coefficient is statistically different from zero. The coefficient on the log months since unemployed is negative suggesting that the risk of SSI application falls with each additional month.

The coefficient on the contemporaneous state unemployment rate is positive and statistically significant at the 10 percent level, suggesting that in a given month, a higher unemployment rate increases the risk of SSI application. The coefficient estimate implies that controlling for the baseline unemployment rate, a one percentage point increase in the unemployment rate would lead to a 0.202 increase in the natural log of the odds of SSI application. Given the mean monthly application rate of one in a thousand, this translates to a 22 percent increase in the probability of SSI application among those with recent job separations.[8]

The state policy variables largely have no significant effect on the hazard of SSI application. This is true for the variables that measure the relative pecuniary benefit of SSI versus TANF (SSI state supplements and maximum TANF benefits), as well as for other characteristics of state welfare programs like strict TANF time limits, sanctions, and work exemptions. A higher per capita unexpected deficit shock significantly increases the risk of SSI application, consistent with Kubik (2003).

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[8] A logit coefficient of 0.202 translates to an increase in odds of 22.38 percent; the increase in probability is very close for low baseline probabilities but declines to zero as the baseline probability increases. For a baseline probability of one in a thousand, we can convert the coefficient to a marginal effect of a one point increase in unemployment rate on the probability of application, by adding the coefficient estimate (0.202) to the natural log of the baseline odds (-6.09675), then exponentiate the sum to get the revised odds, and back out the revised probability (0.001227), which is 22 percent higher than the baseline probability of 0.001.

Column 2 presents results for SSI or SSDI application. As noted above, many applications are joint applications, and a large share of beneficiaries receives benefits from both programs concurrently. Results follow a similar pattern to the SSI-only application hazard model presented in Column 1. The unemployment rate at the beginning of the unemployment spell is negative and now statistically significant while the contemporaneous unemployment rate is positively and significantly associated with the risk of SSI/SSDI application, and months since unemployed is negative and statistically significant. Together these estimates suggest that those that become unemployed in times of higher unemployment are significantly less likely to apply for SSI/SSDI, which is consistent with them being less likely to have sufficient work history to qualify for SSDI, as well as with previous research on applications (Bound et al. 2003). The estimated effect of low family income is much smaller, which reflects the fact that SSDI, unlike SSI, is not a means-tested program.

Table 3 estimates the hazard of SSI application on subpopulations stratified by gender and age. Column 1 reprints our original results from Column 1 of Table 2. Columns 2 and 3 present results stratified by gender (women in Column 2, men in Column 3), and some interesting differences emerge. First, the effects of economic conditions on SSI application risk are stronger for women than men, as the significant positive coefficient for the overall sample is primarily driven by women. However, the diminishing effect of months since the unemployment spell started is also larger for women. The negative effect of married status on SSI application risk is driven entirely by the women in the sample – marital status has no significant effect on application risk for men. Conversely, the negative effect of foreign-born status on SSI application risk is much larger for the men in the sample than for the women, as is the negative effect of attending college. The hastening effect of low family income is stronger for the men in the sample than for the women.

Columns 4 and 5 stratify by age, where Column 4 presents results for individuals aged 45-59, and Column 5 presents results for those 20-44.[9] The relationship between economic conditions and SSI application risk is larger for the older individuals in our sample than for those in prime working age. As noted above, the disability determination process does introduce discontinuities by age beginning at the age of 45, and Chen and van der Klaauw (2008) have shown these discontinuities to be associated with reduced labor supply. Being married reduces the risk of SSI application by more for the younger individuals than the older individuals, and the effects of low baseline family income are larger for the under 45 age group. However, the educational gradient in SSI risk is much stronger for the older individuals. For both subsample analyses, the effects of the unexpected deficit shock on SSI application risk are similar (between men and women, and between those older and younger than age 45).[10]

In Table 4, we present results from a number of alternate specifications to check the robustness of our findings on SSI application risk. These include controlling for time with year effects or with month effects; excluding the state-level unemployment rate at the start of the individual's unemployment spell from the specification; and using complementary log-log regression. Our results are largely similar in magnitude to the main results presented in Table 2; the results from the logit complementary log-log regression are effectively identical.

The results that stray the farthest from our original specification are in Column 3, where we exclude the baseline unemployment rate (i.e. the state-level unemployment rate at the start of the individual's employment spell). The coefficient on the current unemployment rate in this specification is about half the magnitude of our original specification. This drop-off in effect size is consistent with the possibility that the baseline unemployment rate is picking up unobserved

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[9] Age-stratified results for the SSI/SSDI dependent variable look similar to those presented in Table 3.
[10] Consistent with the results from Table 2, the subsample analyses generally show no significant effects of state policy variables. Results available from authors by request.

variation in the composition of newly unemployed individuals. When it is excluded, the estimated coefficient on the contemporaneous unemployment rate is biased down. This has important implications for other work examining the effects of contemporaneous unemployment rates on disability program participation.

V. Conclusion

Given the continued growth of the SSI program among both disabled adults and children, understanding how economic conditions affect program participation amidst changing SSI program composition has become increasingly important. Using data from the Survey of Income and Program Participation (SIPP) linked to the Social Security Administration's 831 file, we find that those who began their unemployment spell in a time of high unemployment are less likely to apply for SSI, consistent with the idea that the pool of the newly unemployed varies in characteristics with the business cycle. However, SSI application risk among individuals with recent job separations increases significantly with higher state unemployment rates. In addition, omitting the baseline unemployment rate from the analysis leads us to substantially *underestimate* the relationship between contemporaneous economic conditions and SSI applications. Our evidence also suggests that female potential applicants may be more responsive to local economic conditions than men.

Contrary to our expectations, differences in state TANF policies such as the stringency of time limits, work exemptions, or sanctions, did not have statistically significant effects on the likelihood of SSI application risk. Neither did variables that affected the relative financial benefit of participating in SSI versus TANF. However, a measure of state fiscal distress was positively and significantly associated with SSI application risk, suggesting that state cutbacks could drive up SSI applications.

Our findings suggest that recessions can have long term fiscal implications for the SSI program. If the flow of allowances mirrors applications, and if exits from SSI are rare, periods of high unemployment may permanently expand SSI caseloads. This cost should be taken into account when policymakers consider programs to help at-risk or unemployed workers. The Congressional Budget Office (2014) estimates that the 2009 American Recovery and Reinvestment Act (ARRA) reduced the unemployment rate between 0.4 and 2.0 percentage points during the third quarter of 2010. Our results suggest that a reduction in the unemployment rate of one percentage point -- in the middle of the CBO estimated range, reduces SSI applications among the recently unemployed by 22 percent. Taken together with our finding that SSI applications are higher when states experience unexpected deficit shocks, these results suggest that the ARRA dampened potential recession-induced increases in SSI and SSDI applications. If this is the case, the net benefits of federal aid during downturns may be underestimated, since even small changes in SSI and SSDI application rates can produce large budgetary consequences. Lindner and Nichols (2014) suggest that aid tied to labor market attachment may reduce application rates, while increases in unconditional aid may increase application rates. Further research is needed to pinpoint the cyclical determinants of SSI applications, and the nature of impacts of cyclical federal aid exemplified by ARRA or extended unemployment benefits on application risk.
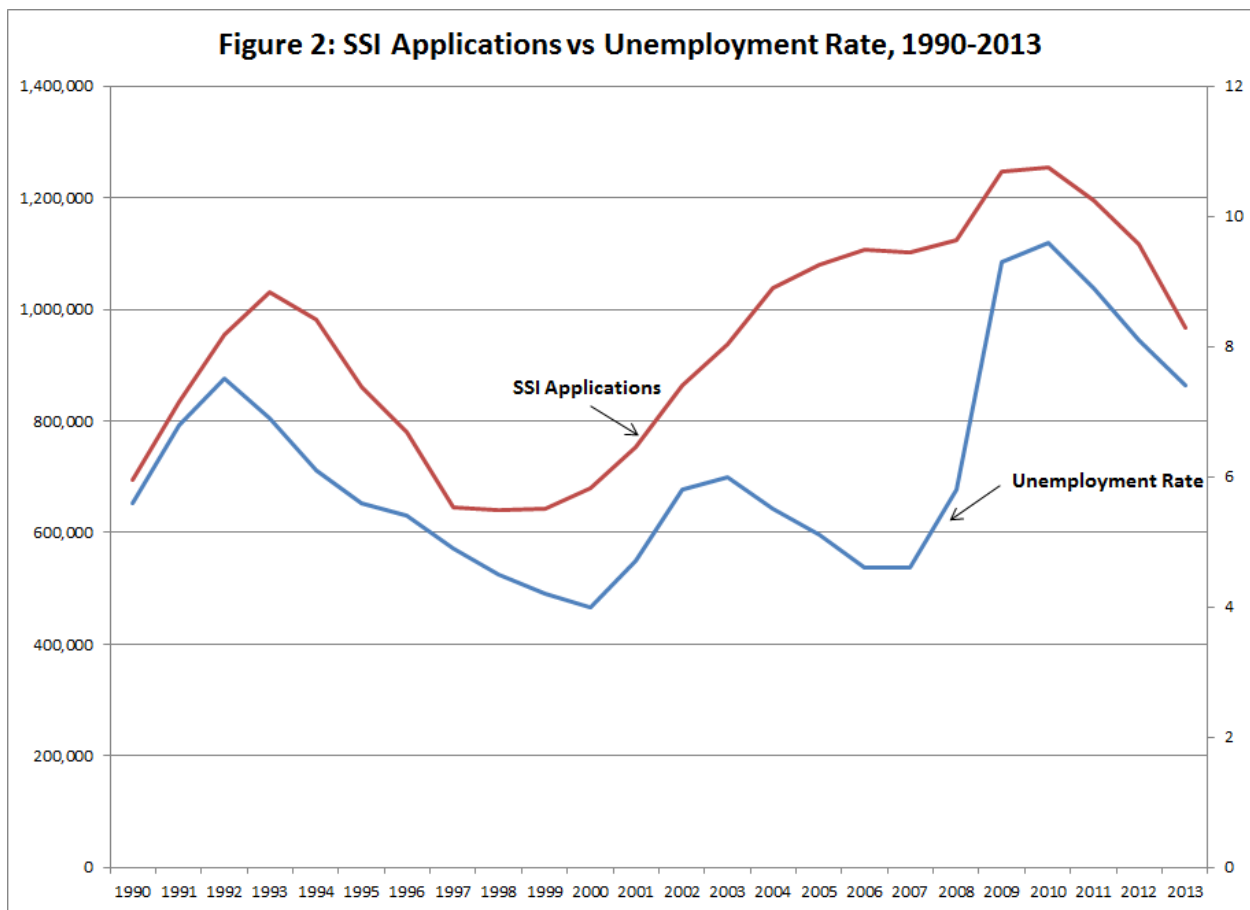
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Figure 1: Supplemental Security Income Adult Disabled Recipients 1974 - 2013
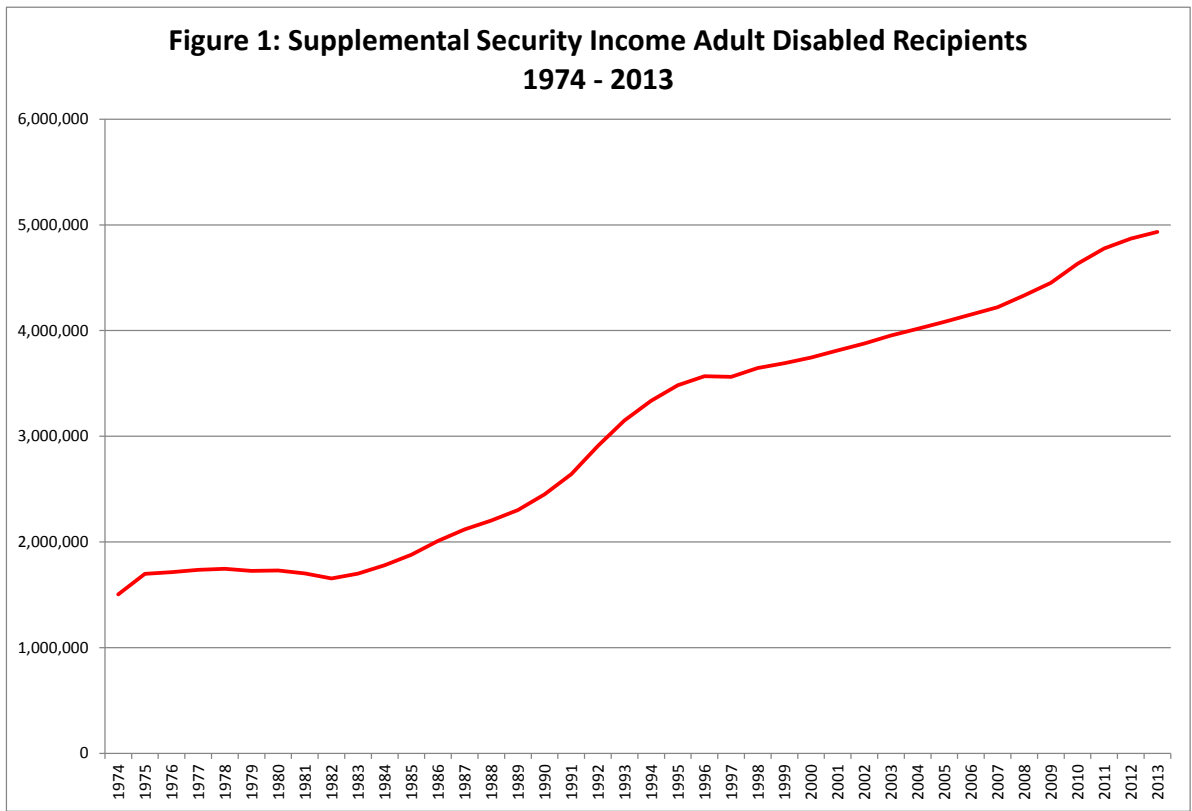
Source: Social Security Bulletin Annual Statistical Supplement, various years

Figure 2: SSI Applications vs Unemployment Rate, 1990-2013

Sources: SSI Applications for 18-64 year olds (left axis) are from the 2013 SSI Annual Statistical Report.
Unemployment Rates (right axis) are from the Bureau of Labor Statistics

Table 1. Characteristics of Sample Members in Month Respondent First Unemployed

	Mean	Std. Dev
Baseline Characteristics (n=26,077 unique persons)		
SIPP 1996 panel	0.274	0.450
SIPP 2001 panel	0.209	0.406
SIPP 2004 panel	0.304	0.460
SIPP 2008 panel	0.213	0.410
Foreign-born	0.131	0.337
Married	0.505	0.500
Female	0.564	0.496
Age 20-24	0.205	0.404
Age 25-29	0.148	0.355
Age 30-34	0.138	0.345
Age 35-39	0.126	0.331
Age 40-44	0.121	0.327
Age 45-49	0.109	0.312
Age 50-54	0.094	0.292
Age 55-59	0.059	0.236
White Non-Hispanic	0.763	0.426
Black	0.124	0.330
High school graduate	0.914	0.281
Attended college	0.625	0.484
Income less than 2*FPL	0.351	0.477
Monthly measures (n= 199,870 person-months)		
Applied for DI or SSI	0.003	0.053
Applied for SSI only	0.001	0.039
Monthly-state level measures (n=9,180 state-months)		
Unemployment rate	5.267	1.893
Maximum TANF benefit, family of 3, divided by 100	3.856	1.495
State SSI supplement, divided by 100	0.2849	0.6148
Per capita unexpected deficit shock, divided by 1000	0.0000	0.0003
Strict TANF time limits	0.3203	0.4669
Strict TANF sanctions	0.3229	0.4679
Strict TANF work exemptions	0.8601	0.3471

	SSI Only		SSI or SSDI	
Baseline state unemployment rate (at start of unemployment)	-0.127		-0.117	**
	(-1.58)		(-2.49)	
Contemporaneous state unemp. rate	0.202	*	0.186	**
	(1.81)		(2.73)	
Log months since employed	-0.348	**	-0.312	**
	(-4.8)		(-5.92)	
Maximum TANF benefit, family of 3, divided by 100	0.219		0.148	
	(0.72)		(0.78)	
State SSI supplement, divided by 100	-0.428		0.356	
	(-0.79)		(0.84)	
Per capita unexpected deficit shock	0.002	**	0.001	**
	(0.00)		(0.00)	
Strict TANF time limits	-0.299		0.058	
	(-0.88)		(0.21)	
Strict TANF sanctions	0.579		0.153	
	(1.42)		(0.55)	
Strict TANF work exemptions	-0.202		-0.241	*
	(-0.75)		(-1.9)	
SIPP 2001 panel	-0.112		-0.085	
	(-0.44)		(-0.42)	
SIPP 2004 panel	-0.183		0.035	
	(-0.69)		(0.19)	
SIPP 2008 panel	-1.064		-0.783	*
	(-1.53)		(-1.85)	
Foreign-born in HH	-1.054	**	-1.010	**
	(-3.96)		(-3.07)	
Married	-0.773	**	-0.291	*
	(-3.83)		(-1.9)	
Female	0.151		-0.189	*
	(0.92)		(-1.83)	
Age 20-24	-1.433	**	-2.529	**
	(-5.56)		(-11.23)	
Age 25-29	-0.363		-1.310	**
	(-0.78)		(-3.23)	
Age 30-34	-0.517	*	-1.319	**
	(-1.68)		(-6.59)	
Age 35-39	-0.171		-0.835	**
	(-0.47)		(-5.01)	
Age 40-44	0.260		-0.458	**
	(0.83)		(-2.62)	
Age 45-49	0.533	*	-0.098	
	(1.69)		(-0.6)	
Age 50-54	0.794	**	0.186	

	(3.88)		(1.42)	
White Non-Hispanic	0.177		-0.193	
	(0.55)		(-1.00)	
Black	0.194		-0.077	
	(0.5)		(-0.32)	
High school graduate	-0.239	*	-0.243	*
	(-1.71)		(-1.66)	
Attended college	-0.476	**	-0.220	*
	(-2.37)		(-1.89)	
Baseline income<2*FPL	1.057	**	0.480	**
	(6.32)		(4.04)	
N	193,450		199,870	

Note: Regressions include state fixed effects and a constant term. Z statistics are in parentheses.
** Denotes statistical significance at the 5% level and * at the 10% level.

Table 3. Logistic Regressions of SSI Application Hazard, by Subpopulation

	All		Women		Men		Age 45-59		Age 20-44	
Baseline state unemployment rate (at start of unemployment)	-0.127 (-1.58)		-0.148 (-1.29)		-0.024 (-0.17)		-0.228 (-1.96)	*	-0.049 (-0.38)	
Contemporaneous state unemp. rate	0.202 (1.81)	*	0.253 (1.74)	*	0.126 (0.84)		0.306 (2.16)	**	0.136 (085)	
Log months since employed	-0.348 (-4.8)	**	-0.380 (-4.06)	**	-0.216 (-2.03)	**	-0.354 (-3.17)	**	-0.307 (-3.65)	**
Foreign-born in HH	-1.054 (-3.96)	**	-0.669 (-2.08)	**	-1.781 (-3)	**	-1.432 (-3.34)	**	-0.795 (-1.71)	*
Married	-0.773 (-3.83)	**	-1.050 (-4.21)	**	-0.383 (-1.61)		-0.581 (-1.94)	*	-1.015 (-3.37)	**
Female	0.151 (0.92)		----		----		0.308 (1.48)		0.016 (0.06)	
White Non-Hispanic	0.177 (0.55)		0.453 (1.31)		0.008 (0.02)		-0.230 (-0.6)		0.539 (1.11)	
Black	0.194 (0.5)		0.455 (1.12)		0.073 (0.16)		-0.118 (-0.21)		0.428 (0.91)	
High school graduate	-0.239 (-1.71)	*	-0.036 (-0.15)		-0.524 (-1.53)		-0.666 (-2.53)	**	0.108 (0.50)	
Attended college	-0.476 (-2.37)	**	-0.574 (-2.18)	**	-0.393 (-1.46)		-0.699 (-3.07)	**	-0.321 (-1.28)	
Baseline income<2*FPL	1.057 (6.32)	**	0.867 (3.7)	**	1.350 (4.37)	**	0.842 (3.53)	**	1.219 (5.92)	**
N	193,450		122,766		63,045		59,245		128,380	

Note: Regressions include state fixed effects, age group fixed effects, SIPP panel fixed effects, and all state policy variables included in Table 2, as well as a constant term. Z statistics are in parentheses.
** Denotes statistical significance at the 5% level and * at the 10% level.

Table 4. Robustness Checks of Logistic Regressions of SSI Application Hazard

	Calendar Year Effects		Baseline Hazard Dummies	Excluding Baseline Unemployment Rate	Complementary Log-Log Regression	
Baseline state unemployment rate (at start of unemployment)	-0.142	*	-0.113	---	-0.127	*
	(-1.71)		(-1.38)		(-1.58)	
Contemporaneous state unemp. rate	0.168		0.186	0.108	0.202	
	(1.61)		(1.6)	(1.14)	(1.81)	
N	193,450		193,450	193,450	193,450	

Note: Regressions include state fixed effects, age group fixed effects, SIPP panel fixed effects, and all state policy variables included in Table 2, as well as a constant term.

Z statistics are in parentheses. ** Denotes statistical significance at the 5% level and * at the 10% level.

Data Appendix

SSI application: This variable is coded using data from SSA's 831 file, which is merged to the SIPP and available for analysis at SSA through restricted access. The 831 file contains a record for all individuals who have ever applied for SSI or SSDI. We use variables noting date of application and type of application to identify whether an individual applies for SSI or SSDI in a given month.

Unemployment rates: Bureau of Labor Statistics

Maximum AFDC/TANF benefit for a family of 3: Data from 1997-2010 come from Urban Institute Welfare Rules Data Base, Table IIA4. When multiple values were given for a state (CA, MA, WI) the highest was used.

Maximum SSI state supplement: Data from 2002-2010 come from *State Assistance Programs for SSI Recipients* and measure the maximum state supplement available to a disabled individual living alone. Data from 1999-2001 come from the 2004 Green Book. Data from 1990-1998 come from the Green Book, various years, collected by the University of Kentucky Center for Poverty Research, converted to 2000$.

Welfare reform variables: Provided by Rebecca Blank and Jordan Matsudaira, later years updated from the Welfare Rules Database at the Urban Institute

Unexpected deficit shock: Calculated as in Kubik (2003). Data on actual state expenditures and revenues (per capita) in year t are obtained from the National Association of State Budget Officers' State Fiscal Survey in year t+1. Forecasted state expenditures and revenues in year t are obtained from State Fiscal Survey in year t-1. Fiscal shock = (actual state expenditure – forecasted state expenditure) – (actual state revenue – forecasted state revenue)