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The Effect of SNAP and the Broader Safety Net on Mental Health and Food Insecurity[⊗]

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Final Grant Report

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Abstract

Previous literature documents a strong relationship between food insecurity and mental health, and also examines the impact of safety net programs on food insecurity. However, little is known about the intersection between mental health, safety net participation, and food insecurity. In this research, we use a multi-program safety net calculator (including cash, food, and health insurance programs) and data from the National Health Interview Survey and the Current Population Survey to examine the effects of safety net generosity on food insecurity and mental health for single mother families. We examine four research questions. First, does state safety net generosity affect self-reported participation in safety net programs? Second, does mental health affect participation in safety net programs, conditional on generosity? Third, does more generous cash and food assistance affect mental health? And finally, how effective is the safety net in reducing food insecurity in the presence of mental health issues? We find that state-level safety net generosity does predict self-reported participation, and that conditional on generosity, those with mental health issues are significantly more likely to participate in safety net programs. More generous cash and food assistance is protective of maternal mental health, but results are somewhat sensitive to the measure of mental health examined. Finally, we find no effect of the safety net on 30-day food insecurity. These results have important implications for the effectiveness of safety net programs for some of the most vulnerable members of society: low-income mothers suffering from mental health challenges and their children.

Executive Summary

Low-income families headed by single mothers face a number of challenges to well-being. These families are significantly more likely to suffer from mental health problems (DeKlyen et al. 2006), and are also significantly more likely to face food insecurity (Schmidt, Shore-Sheppard, and Watson 2016). Previous literature documents a strong relationship between food insecurity and mental health, while another extensive literature examines the impact of public safety net programs, particularly food programs such as the Supplemental Nutrition Assistance Program (SNAP), on reducing food insecurity. However, little is known about the intersection between mental health, safety net participation, and food insecurity.

Furthermore, SNAP is only one part of a broader safety net. Many SNAP recipients receive benefits from other safety net programs that could themselves affect mental health. In addition, these safety net programs interact in important ways. For example, state-level differences in cash welfare generosity affect SNAP benefits. Our previous work has shown the importance of examining SNAP in the context of the broader safety net when examining food insecurity (Schmidt, Shore-Sheppard and Watson 2016).

In this research, we use a multi-program safety net calculator (including cash assistance, food assistance, and public health insurance programs) and data from the National Health Interview Survey (NHIS) and the Current Population Survey (CPS) to examine the effects of safety net generosity on food insecurity, mental health, and the relationship between the two for families headed by single mothers. We examine four primary research questions. First, does predicted state and federal safety net generosity affect participation in safety net programs as reported by respondents in the National Health Interview Survey? Second, does mental health affect participation in safety net programs, conditional on state generosity? Third, does more

generous cash and food assistance affect mental health? And finally, how effective is the safety net in reducing food insecurity in the presence of mental health issues?

We build on the multi-program safety net eligibility and potential benefit calculator developed by Schmidt, Shore-Sheppard, and Watson (2016). This series of programs calculates eligibility and the potential dollar value of benefits for families assuming full take-up of all programs for which a family is eligible. It covers policy years 1998-2015, and includes the most important cash, food, and health care safety net programs available nationally – Temporary Assistance to Needy Families (TANF), Supplemental Security Income (SSI), refundable tax credits including the Earned Income Tax Credit (EITC) and Child Tax Credit (CTC), the Supplemental Nutrition Assistance Program (SNAP), the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), Medicaid, and the Children's Health Insurance Program (CHIP).

We begin with a sample of non-immigrant single mothers with no work-limiting disabilities from the CPS-ASEC, and create a simulated sample for each state and year by removing state and year identifiers from the CPS data and iteratively assigning the national sample for all years to each state in each year. We then run this simulated sample through the multi-program safety net calculator, using the policy rules for each state and each policy year 1998-2016. Once we have calculated predicted eligibility and benefit levels for individuals in the sample based on their simulated state and year, we calculate mean eligibility and mean benefit levels by demographic cells. Safety net generosity is then summarized by the mean cash and food safety net benefits in a state-year-demographic cell. By construction, this generosity measure is only related to state policy differences across cells and over time, and not to local

economic conditions or to the economic circumstances of an individual family. We then merge benefit generosity to the NHIS data by state-year-demographic cell.

Our results suggest first that state-level safety net generosity does predict self-reported participation among NHIS respondents. Each additional $1000 of real cash and food benefits increases the probability of reporting any safety net participation by approximately 2 percentage points, and the effect of food benefits is larger in magnitude than the effect of cash benefits. Second, conditional on safety net generosity, those with those with mental health issues are significantly more likely to participate in safety net programs.

Third, we find that more generous cash assistance is protective of maternal mental health, but results are somewhat sensitive to the measure of mental health examined. Refundable tax credits and SNAP significantly reduce the incidence of moderate/severe psychological distress, while TANF appears to reduce the likelihood of activity limitations due to depression. We also find suggestive evidence of seasonality in effects of benefits. More research is necessary to further understand these differences.

Finally, contrary to our previous work using the CPS (Schmidt, Shore-Sheppard, and Watson 2016), we find no effect of the safety net on food insecurity in the NHIS, regardless of whether we account for mental health issues, although as in past work we find that mental health problems are significantly predictive of food insecurity. One possible explanation for the difference in results is that our work in the CPS used variables that measured food insecurity over the previous year, while the NHIS only includes a 30-day measure of food insecurity. Reestimating our CPS results with the 30-day measure also yields insignificant results. Further research is needed to examine why the impact of safety net generosity appears to be sensitive to the timing of the food security measure.

Overall, our results suggest that a more generous safety net may be protective of maternal mental health among some of society's most vulnerable members—single mothers and their children—and these findings are worthy of further exploration.

I. Introduction

Low-income families headed by single mothers face a number of challenges to well-being. These families are significantly more likely to suffer from mental health problems (DeKlyen et al. 2006), and are also significantly more likely to face food insecurity (Schmidt, Shore-Sheppard, and Watson 2016).

Previous literature documents a strong relationship between food insecurity and mental health (Campbell 1991; Siefert et al. 2001; Leung et al. 2015), although it can be difficult to get at causal pathways in either direction. Heflin, Siefert, and Williams (2005) examine the relationship between changes in food insufficiency and changes in women's mental health among a sample of current and former welfare recipients, and find a strong positive relationship. Heflin and Ziliak 2008 use a similar approach with National Health Interview Survey data, and find consistent results. Noonan et al. (2014) look at the effects of postpartum depression on food insecurity, arguing postpartum depression is likely to be exogenous in cases with severe infant health problems and multiple births, and find that this depression increases food insecurity.

In addition, an extensive literature examines the effects of SNAP on reducing food insecurity (see, e.g. Gregory, Rabbitt, and Ribar 2015). There is some evidence of the effects of SNAP on physical health (Bitler 2015; Gregory and Deb 2015), but much less is known about the effects of SNAP on mental health. One exception is Heflin and Ziliak (2008) who find that the emotional distress associated with food insecurity is higher among food stamp participants than non-participants, conditional on the SNAP benefit level.

Furthermore, SNAP is only one part of a broader safety net. Many SNAP recipients receive benefits from other safety net programs that could themselves affect mental health. For example, Evans and Garthwaite (2014) look at Earned Income Tax Credit expansions that

increased relative benefits for families with two or more children relative to families with one, and find that the expansions were associated with reduced maternal depression among these larger families. Ifcher (2011) and Herbst (2012) examine the impact of welfare reform, and find some effects of welfare reform on measures of life satisfaction, although Herbst (2012) finds no significant effects on mental health.

In addition, these safety net programs interact in important ways. For example, state-level differences in cash welfare generosity affect SNAP benefits. Our previous work has shown the importance of examining SNAP in the context of the broader safety net when examining food insecurity (Schmidt, Shore-Sheppard and Watson 2016). We find that more generous overall safety net packages (taking into account a variety of cash, food, and health insurance programs) reduce food insecurity among low-income single parent families. An additional $1000 annually in cash and/or food benefits reduces low food security by 1.1 percentage points on a base of 33 percent.

In addition, a number of safety net programs have features that may be difficult for those with mental health issues to navigate such as recertification requirements. Moreover, compromised mental health might reduce the ability of recipients to most effectively use the benefits they do receive. These barriers mean that a given level of safety net generosity might protect against food insecurity less well for those with mental health issues.

In this research, we use a multi-program safety net calculator (including cash assistance, food assistance, and public health insurance programs) and data from the National Health Interview Survey (NHIS) and the Current Population Survey (CPS) to examine the effects of safety net generosity on food insecurity, mental health, and the relationship between the two for families headed by single mothers. We seek to answer four primary research questions. First,

does predicted state and federal safety net generosity affect participation in safety net programs as reported by respondents in the National Health Interview Survey? Second, does mental health affect participation in safety net programs, conditional on state generosity? Third, does more generous cash and food assistance affect mental health? And finally, how effective is the safety net in reducing food insecurity in the presence of mental health issues?

II. Research Methods

Our work builds heavily on the multi-program safety net eligibility and potential benefit calculator developed by Schmidt, Shore-Sheppard, and Watson (2016). This series of programs calculates eligibility and the potential dollar value of benefits for families assuming full take-up of all programs for which a family is eligible. It covers policy years 1998-2015, and includes the most important cash, food, and health care safety net programs available nationally. The cash programs include Temporary Assistance to Needy Families (TANF), which provides cash support to low-income families with children with either single parent or unemployed parent, Supplemental Security Income (SSI), which is a means-tested program for individuals with disabilities, the Earned Income Tax Credit (EITC –State & Federal), a refundable federal tax credit for low-income families with earned income, and the Child Tax Credit (CTC), a partially refundable per-child tax credit. The food assistance programs are the Supplemental Nutrition Assistance Program (SNAP) and the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), and the health programs are Medicaid and the Children's Health Insurance Program, which provide health insurance to children and some adults in low-income families.

The safety net calculator incorporates the program rules for each state and year, accounting for all interactions between programs. The first step in the calculator is to estimate the Earned Income Tax Credit and the Child Tax Credit by running family-level survey data through the TAXSIM program at the National Bureau of Economic Research (Feenberg and Coutts 1993). The data with the EITC and CTC estimates attached are then run through a program to estimate SSI eligibility and benefits. Assuming that any individuals who are eligible participate in SSI, the data are then run through a TANF calculator to determine the family's potential TANF benefits. The data are then run through a program to estimate Medicaid and CHIP eligibility for each individual in the family, and are finally run through a Food Assistance calculator, which estimates eligibility and benefits for SNAP and WIC, which are converted into monetary value. Data inputs to the calculator include: family headship type, number and ages of children, earnings of the adults in the family, disability status of adults in the family, employment status of parents, state of residence and year.

We are unable to run data from the National Health Interview Survey directly through our safety net calculator for several reasons. First, the state identifiers for the NHIS are restricted, so all NHIS regressions must be estimated in the Research Data Center (RDC) at the National Center for Health Statistics, and we are unable to access the NBER's TAXSIM from within the RDC. In addition, the income variable available in the NHIS includes unearned income, which would include any transfer income received by the family.

Even if it were possible to run NHIS data through the calculator, one concern is that the imputed benefits that result from our safety net calculator may be endogenously related to our key dependent variables of interest. For example, holding program rules constant, more families would qualify for benefits in an economic downturn, and we might also expect mental health to

worsen with poor economic conditions. To deal with these issues, we use a second data set, the Current Population Survey Annual Social and Economic Supplement (CPS-ASEC), and employ a simulated eligibility technique first used by Currie and Gruber (1996) and used in this context by Schmidt, Shore-Sheppard, and Watson (2016).

To obtain an estimate of benefits available to families in each state and year that is uncorrelated with individual mental health, employment choices, or economic conditions, we create a simulated sample for each state and year by removing state and year identifiers from the 1997-2013 CPS-ASEC data and iteratively assigning the national sample for all years to each state in each year, 1997-2015.[1] We then run this simulated sample through the multi-program safety net calculator, using the policy rules for each state and each policy year 1998-2015. Once we have calculated predicted eligibility and benefit levels for individuals in the sample based on their simulated state and year, we calculate mean eligibility and mean benefit levels by 32 demographic cells, defined by disabled status, whether there was a child under the age of 6, whether there was more than one child, and education in four categories. Safety net generosity is then summarized by the mean cash and food safety net benefits in a state-year-demographic cell. By construction, this generosity measure is only related to state policy differences across cells and over time, and not to local economic conditions or to the economic circumstances of an individual family. We then merge benefit generosity to the NHIS data by state-year-demographic cell.

We first examine whether simulated safety net generosity is associated with reported safety net participation in the NHIS:

[1] We only use CPS data through 2013 due to a redesign of the income questions beginning in 2014. The 2014 survey used a split sample design where respondents received one of two possible sets of survey questions. To have a consistent measure of income throughout the simulated sample, we used years 1997 to 2013 to generate the pool of individuals who were run through the safety net calculator. Additional details on sample construction are found in the Data section below.

$$participation_{icst} = \beta_0 + \beta_1 benefit_{cst} + X_{icst}\alpha + state\_char_{ist}\delta + \theta_s + \gamma_t + \mu_{icst} \quad (1)$$

In this equation *participation* is an indicator of program participation of family *i* in demographic cell *c* in state *s* in year *t*; *benefit* is the mean dollar amount of safety net generosity for demographic cell-state-year, broken out by cash and food benefits, X is a vector of individual level controls that includes age of the mother, the number of children in the household and whether there was a child under the age of 6, urban residence, education in four categories, and race in four categories (non-Hispanic white, non-Hispanic Black, Hispanic, and Asian/Native American/Pacific Islander), as well as interactions between race and all other individual level variables. *State_char* is a vector of state level variables that includes the unemployment rate, the dependent allowance for Unemployment Insurance, dollars spent on child support enforcement per capita, and the number of public housing units and vouchers per capita.[2] The regression also controls for state and year fixed effects, and robust standard errors are clustered at the state level.

After establishing that our safety net generosity measures are predictive of reported safety net participation in the NHIS, we next look at the relationship between mental health and participation in safety net programs, conditional on state generosity:

$$participation_{icst} = \beta_0 + \beta_1 mental\_health_{icst} + \beta_2 benefit_{cst} +$$
$$X_{icst}\alpha + state\_char_{ist}\delta + \theta_s + \gamma_t + \mu_{icst} \quad (2)$$

where *participation* is a measure of whether a family participates in a safety net program, $mental\_health_{ist}$ are measures of the mental health of the mother (primarily a measure of moderate/severe psychological distress generated from a Kessler-6 index, but also a measure of depression, described in detail in the Data section), and *X* and *state_char* are vectors as defined above. We first estimate this equation excluding safety net benefit levels, then add the benefit

[2] Results are robust to a more extensive set of state policy controls that adds the number of weeks of UI extended coverage, the presence of a TANF family cap, TANF asset limits, TANF strict time limits, the state minimum wage, and the share of TANF dollars spent on basic assistance and child care and work activities.

levels to see if adding them changes the estimated relationship between mental health and program participation.[3]

We then examine how food assistance and other benefits affect measured mental health. We estimate the equation:

$$mental\_health_{icst} = \beta_0 + \beta_1 benefit_{cst} + X_{icst}\alpha + state\_char_{ist}\delta + \theta_s + \gamma_t + \mu_{icst} \quad (3)$$

where the set of outcomes are the mental health measures defined above and our main variable of interest is *benefit*, the potential benefits for the various safety net programs for which families in that demographic cell would be imputed to be eligible. The controls are as defined above, and thus the model controls for observable characteristics of families living in states in a given year, all time-invariant state characteristics, time-varying economic conditions, and year-to-year national variation in maternal mental health. Results will tell us to what extent generous safety net benefits ameliorate mental health issues.

Finally, we turn to the issue of food insecurity. In previous work using the Current Population Survey Food Security Supplement (Schmidt, Shore-Sheppard, and Watson 2016), we found that more generous simulated safety net benefits reduce food insecurity. We first see whether we find the same effects using the 2011-2016 NHIS (the years in which the food insecurity information is available), estimating equations of the form:

$$FI_{icst} = \beta_0 + \beta_1 benefit_{cst} + X_{icst}\alpha + state\_char_{ist}\delta + \theta_s + \gamma_t + \mu_{icst} \quad (4)$$

where FI_{icst} represents the food insecurity of family *i* in cell *c* in state *s* in year *t*, and the other variables are as defined above. We then ask whether poor mental health weakens the effectiveness of SNAP and the broader safety net in ameliorating food insecurity. Mental health issues might make it difficult for families to navigate the complicated rules and interactions

[3] We have also estimated specifications where we interact benefit with mental health, but interactive effects were not statistically different from zero, so we do not report them here. Results available from authors by request.

associated with multiple safety net programs and effectively use benefits. To investigate this question, we use the 2011-2016 NHIS and estimate models of the form:

$$FI_{icst} = \beta_0 + \beta_1 mental\_health_{icst} + \beta_2 benefit_{cst} + X_{icst}\alpha + state\_char_{ist}\delta + \theta_s + \gamma_t + \mu_{icst} \quad (5)$$

where the variables are all as defined above.

III. Data

We use individual level data from two primary sources in this project. The first is the National Health Interview Survey from 1999 to 2016. We begin with the sample adult files, and then merge in data from the person, household, and family files. Our sample consists of non-immigrant single mothers without work-limiting disabilities.[4] Summary statistics for our outcomes of interest are presented in Table 1. For any welfare participation, we look at an indicator for whether the family reported receipt of any of the following programs: TANF, SSI, SNAP, WIC, Medicaid, or CHIP. Approximately 35 percent of the single mothers in our sample report receipt of at least one of these programs, with SNAP being the program with the most extensive participation, at 24 percent.

For maternal metal health, we use responses to a series of questions asked by the NHIS to create a Kessler-6 (K6) indicator of psychological distress (Kessler et al. 2010). Respondents are asked six questions about how often in the past 30 days they felt: so sad that nothing could cheer them up; nervous; restless; hopeless; that everything was an effort; and worthless. For each

[4] We also estimated all our models on a sample of non-immigrant single mothers who indicated the presence of a work-limiting disability. However, the presence of a work-limiting disability is indicated by an affirmative answer to a question about whether physical, mental, or emotional problems limit the work an individual can do. As a result, this measure is correlated with our key variable of interest, mental health. In addition, the sample size for the disabled sample is very small. Consequently our results for the disabled sample proved uninformative. Results for this sample are available from the authors upon request.

question, responses include all of the time, most of the time, some of the time, a little of the time, or none of the time. Each all of the time response receives 4 points, most of the time receives 3, some of the time receives 2, a little receives 1 and never receives zero. The points are summed over the six questions to create a K6 index that ranges from 0 to 24. The K6 index is most commonly used to identify severe psychological distress (K6> =13). However, Prochaska et al. (2012) note the importance of identifying more moderate psychological distress (K6>=5 & K6<=12) that would still justify medical intervention. We code individuals as having moderate/severe psychological distress (MSPD) if they exhibit a K6 value greater than or equal to 5, which occurs in 21.6 percent of the sample.

We also create an indicator for whether the mother reports depression. In the NHIS, first a series of questions is asked regarding whether individuals are limited in the activities they can do due to physical, mental, or emotional problems. Among those individuals who answer in the affirmative, a series of questions is asked to determine what kind of physical, mental, or emotional problem causes their limitations. One possible response is "depression/anxiety/emotional problems." We code individuals as having depression if they answer yes, and code individuals with other limitations or with no limitations at all as not having depression. This measure is clearly flawed, in that the depression question is not asked of the entire sample. However, it could be capturing some of the most severe depressive cases. Only 1.8 percent of our sample is classified as depressed based on this definition.

A 10-question, 30-day food security module was asked in the NHIS beginning in 2011. We first generate a food security score from the series of 10 individual food security variables, where each affirmative response receives one point. An individual is coded as being food insecure if this score is greater than or equal to 3. This measure captures both low security and

very low food security.[5] Among the single mothers in our sample, 6.3 percent are classified as food insecure.

Our second primary data set is the Current Population Survey Annual Social and Economic Supplement (CPS-ASEC). The CPS contains key information on demographic characteristics (including marital status, number and age of children, disability status, and so on), and income, which allows us to impute eligibility and benefits for safety net programs. We use this information to assess the likely eligibility and benefits for individuals with a given set of demographic characteristics given the policies in place for each state and year.

As described above, we generate a simulated sample by using all reference persons in the Current Population Survey from 1997-2013 that are unmarried women aged 18-64 with at least one child under 19 living with them. Children older than 23 are not considered part of the family unit. We drop families with no valid income measure, and drop families with any immigrants (non-citizens or naturalized citizens) as the rules for immigrants are complex. We then take this sample for all states and years, strip the state and year identifiers, and replicate the sample many times, assigning a different state and year each time, with simulated years 1998 to 2015. The final simulated sample contains information for a given set of individuals replicated for each state-year. We then use the calculator to impute program eligibility and benefits as described above and collapse this information into demographic cells with eligibility rates and mean benefit levels for each state and year.

We calculate several different safety net benefit variables. We first use an overall measure of total cash and food benefits combined, and then break out cash and food program benefits separately. We also look specifically at individual programs – tax credits (including the CTC and both state and federal EITCs), SSI, TANF, and SNAP. Rather than monetize the value

[5] We are grateful to Christian Gregory at USDA for sharing Stata code with us.

of health insurance, we create a variable that indicates the share of the family that is eligible for Medicaid. Table 2 illustrates the values for the simulated benefit levels (in thousands of real dollars), both for the full sample and separately by year, clearly illustrating the policy variation over time.

Our state level control variables come from a number of different sources. The unemployment rate comes from the Bureau of Labor Statistics. The dependent allowance for Unemployment Insurance comes from the US Department of Labor Employment and Training Administration. Dollars spent on child support enforcement come from the Department of Health and Human Services Office of Child Support Enforcement, and the number of public housing units and vouchers come from the Department of Housing and Urban Development. These last two items are converted to per capita measures by dividing by state level population counts from the US Census Bureau.

IV. Results

We first estimate equation (1), examining the effects of our simulated safety net benefit variables on reported welfare participation in the NHIS, with results reported in Table 3. Column 1 shows that combined cash and food benefits significantly predict self-reported welfare participation. The estimate suggests that each additional $1000 of real cash and food benefit increases the probability of reporting any safety net participation by approximately 2 percentage points. Column 2 breaks out cash benefits from food benefits, and finds that both are significant predictors of participation, but the magnitude of the food benefit is larger (estimated coefficient of 0.048 relative to 0.013). In column 3, we separate cash lump-sum benefits (tax credits) from cash flow benefits (TANF and SSI), and find that both are significantly related to program

participation. Since tax credits are largely realized around tax-filing time, we split the sample into interviews that took place in the first two quarters of the year and interviews that took place in the last two quarters, although the responsiveness of reported participation to simulated benefits does not seem to differ significantly across quarters (columns 4 and 5). Finally, in column 6 we break out individual programs, and find that simulated tax credit benefits and SNAP benefits are positively and significantly associated with participation in any welfare program.

The coefficient on simulated real WIC benefits is also positive and statistically significant, but the magnitude of this effect seems implausibly large to us. A one standard deviation increase in WIC benefits would be approximately $159, and an increase of that size would imply a 4 percentage-point increase on a baseline participation rate of 35 percent. This is a pattern that will be repeated throughout the tables in this report. Our concern is that there is not enough variation in simulated WIC benefits across cells to accurately identify an effect. In particular, since WIC benefits are set at the national level, variation in simulated WIC benefits arises only from changes in the program over time and differences in the number of young children in the family. In addition, since WIC benefits are greater when there are more young children, the WIC coefficients appear to be capturing the impacts of families with more young children being more disadvantaged in unobservable ways. In future research, we will estimate all equations separately without WIC. In the cases where we have been able to do this, removal of WIC does not qualitatively change our other results.

In Appendix Tables 1-4, we reestimate these models using reported receipt of individual programs instead of overall welfare participation as our dependent variable. Appendix Tables 1-3 show results that are consistent with the results in Table 3 and with our simulated benefits

affecting reported participation in ways that would be expected. Simulated TANF benefits predict participation in TANF, simulated SNAP benefits predict participation in SNAP, and a greater fraction of the family being eligible for Medicaid predicts Medicaid receipt (although the estimates are less precise for Medicaid). These tables also demonstrate the importance of accounting for multiple program interactions, as more generous benefits from one program in several cases predict participation in another, particularly SNAP and Medicaid. As a check on our safety net calculators, Appendix Table 4 shows that simulated safety net benefit generosity does not affect participation in SSI in our sample of women without disabilities.

We next examine the relationship between mental health and reported safety net participation. Column 1 in Table 4 shows that even after controlling for a number of individual level and state level characteristics, women with moderate/severe psychological distress are 8.7 percentage points more likely to report participating in any welfare program. In columns 2-7, we add our simulated safety net generosity variables in different specifications. The coefficient on MSPD is largely unchanged, suggesting that the relationship between maternal mental health and welfare participation does not change once the generosity of the safety net is accounted for. In addition, the coefficients on simulated benefits are similar in magnitude to the coefficients in Table 3, indicating that the simulated benefits are uncorrelated with individual mental health, as intended. Table 5 repeats this exercise replacing MSPD with the alternative mental health measure of depression. The results are extremely similar to those presented in Table 4.

We next examine the effects of safety net benefit generosity on mental health, analyzing MSPD in Table 6 and depression in Table 7. For MSPD, we find no evidence that overall safety net benefit generosity is protective of maternal mental health. However, lump-sum cash benefits (i.e. tax credits) appear to significantly reduce MSPD, but only for women interviewed in the

first two quarters of the calendar year. Given that the EITC is received as a refund, usually between the months of February and April, this would be consistent with a protective effect of the EITC on mental health, as has been shown by Evans and Garthwaite (2014). We also find suggestive evidence of an improvement resulting from more generous SNAP benefits, although the overall food benefit result is being affected by the odd results for WIC, which as we discussed above we believe are likely to be spurious. In Table 7, we repeat the same exercise for our measure of maternal depression. Here we find that cash benefits received as a flow, and in particular TANF benefits, significantly reduce maternal depression. The effects of cash-flow benefits also appear to be stronger in the first and second quarters of the year, even though benefits should be received smoothly throughout the year. No EITC effects are found, and no effects of SNAP are found in either specification. More research is necessary to understand why safety net generosity differentially affects these two measures of maternal mental health.

Finally, we turn to an analysis of food insecurity. In our previous work (Schmidt, Shore-Sheppard, and Watson 2016) we found that simulated safety net benefit generosity significantly reduced food insecurity in the Current Population Survey. We regress food insecurity on our simulated safety net benefit generosity measures to see if we find the same relationship in the NHIS. Table 8 shows that we do not. We find no evidence that the simulated benefit measures significantly reduce food insecurity. To the contrary, our overall food benefit measure is marginally positively and significantly associated with food insecurity, although when we break out individual programs, this seems to be largely due to the WIC coefficient, which we believe to be spurious as discussed above.[6] There are a number of possible reasons for the differences in the relationship between the safety net and food insecurity between the two data sets. One is that

[6] The results for Medicaid appear to suffer from similar problems of being associated with more young children in the family, as Medicaid is more generous for young children than for other family members. In future work we plan to try alternative measures of Medicaid eligibility that account for these differences.

since the NHIS did not begin asking the food security module until 2011, we are estimating these regressions on a smaller sample size. Another likely reason is differences in the timing of the food security measure. The NHIS measure asks questions over the past 30 days, while the CPS Food Security Supplement asks questions about the past 30 days and the past year. The results in the previous paper use the one-year measure. To see if the difference in the measures could be a source of the different in results, we went back and reestimated CPS equations from our previous work using the 30-day measure, and found no significant results. The sensitivity of policy effects to the measure of food insecurity being used is worthy of future study.

Finally, we combine measures of safety net generosity with measures of mental health. Our original hope was to examine whether the efficacy of safety net generosity in reducing food insecurity was affected by maternal mental health. Results in Table 9 show that maternal mental health is strongly associated with food insecurity, consistent with a large body of previous work. However, not surprisingly given the results in Table 8, inclusion of safety net benefit generosity has no effect on the relationship between mental health and food insecurity.

V. Discussion and Conclusions

We find that state-level safety net generosity does predict self-reported participation, and that conditional on eligibility, those with mental health issues are significantly more likely to participate in safety net programs. This result holds for both measurements of mental health—moderate/severe psychological distress and self-reported depression. Unfortunately, while our measures of safety net generosity are exogenous by construction, mental health is not, so the observed association between mental health and safety net participation cannot be determined to

be causal. Unobserved factors are likely to affect both maternal mental health and safety net participation, a connection that has proven very difficult to disentangle empirically.

More generous cash assistance is protective of maternal mental health, and since the measures of safety net generosity are exogenous to individuals this estimated relationship is a causal one, but in this case the results are somewhat sensitive to the measure of mental health examined. We find evidence of an improvement in reported moderate/severe psychological distress from cash lump-sum (tax credit) support, although interestingly this improvement appears only for respondents interviewed in the first two quarters of the year, the quarters when tax credits are most likely to be received. This result is suggestive rather than definitive, particularly since we do not find a similar result for the more rare outcome of depression. In the case of depression, our results indicate an improvement associated with more generous cash flow benefits (which are primarily TANF in this non-disabled sample). Again this improvement appears more strongly in interviews done in the first two quarters, raising the question of the role of seasonality of mental health in the effect of the safety net on mental health outcomes. Further research should be undertaken to explore how the timing of benefit receipt affects mental health, accounting for possible seasonality in mental health. In addition, the differences in the results for moderate/severe psychological distress and depression should be explored further by breaking out moderate from severe psychological distress as this would help to pinpoint whether there are differences in impacts for severe mental health challenges versus depression per se.

We also find weak evidence of a beneficial impact of SNAP generosity, although only for the less severe mental health measure of moderate/severe psychological distress. The impacts for food benefits overall appear to be strongly affected by the inclusion of WIC. As discussed above, WIC has limited variation, and the variable appears to be capturing families with more

young children being more disadvantaged in unobservable ways. Further research should model food assistance without including WIC and should also examine whether there are similar seasonal effects for SNAP as were found for cash assistance.

Finally, we find no effect of the safety net on food insecurity. While some of this lack of finding may be attributable to smaller sample size (the NHIS did not begin asking the food security module until 2011), this was an unexpected finding given our past work (Schmidt, Shore-Sheppard, and Watson 2016). However, as discussed above we believe this is likely to be due to differences in the timing of the food security measure, with the NHIS measuring 30-day food security and our results from the CPS Food Security Supplement being based on food security in the past year. Further research should examine why the impact of safety net generosity policy appears to be sensitive to the timing of the food security measure. As with previous research, we find that poor mental health predicts food insecurity, although the observed association between mental health and food insecurity cannot be determined to be causal.

Overall, our results suggest that a stronger safety net may be protective of maternal mental health among some of society's most vulnerable members—single mothers and their children—and these findings are worthy of further exploration.

References

Bitler, M. (2015). "The Health and Nutrition Effects of SNAP: Selection into the Program and a Review of the Literature on its Effects." In *SNAP Matters: How Food Stamps Affect Health and Well Being*. J. Bartfeld, C. Gundersen, T. Smeeding and J. P. Ziliak. Stanford, CA, Stanford University Press: 134-160.

Campbell, C. C. (1991). ''Food Insecurity: A Nutritional Outcome or a Predictor Variable?'' *Journal of Nutrition* 121:408–15.

Currie, J., and J. Gruber. (1996). "Health Insurance Eligibility, Utilization of Medical Care, and Child Health." *Quarterly Journal of Economics* 111(2):431–66.

DeKlyen, M., J. Brooks-Gunn, S. McLanahan, and J. Knab (2006). "The Mental Health of Married, Cohabiting, and Non–Coresident Parents With Infants." *American Journal of Public Health*: 96(10): 1836-1841.

Evans, W. N. and C. L. Garthwaite (2014). "Giving Mom a Break: The Impact of Higher EITC Payments on Maternal Health." *American Economic Journal: Economic Policy* 6(2): 258-290.

Feenberg, D.R. and E. Coutts (1993). "An Introduction to the TAXSIM Model." *Journal of Policy Analysis and Management* 12(1): 189-194.

Gregory, C. A. and P. Deb (2015). "Does SNAP Improve your Health?" *Food Policy* 50: 11-19.

Gregory, C. A., M. P. Rabbitt and D. C. Ribar (2015). "The Supplemental Nutrition Assistance Program and Food Insecurity." In *SNAP Matters: How Food Stamps Affect Health and Well Being*. J. Bartfeld, C. Gundersen, T. Smeeding and J. P. Ziliak, eds. Stanford, CA, Stanford University Press: 74-106.

Heflin, C. M., K. Siefert and D. R. Williams (2005). "Food Insufficiency and Women's Mental Health: Findings from a 3-year Panel of Welfare Recipients." *Social Science & Medicine* 61(9): 1971-1982.

Heflin, C. M. and J. P. Ziliak (2008). "Food Insufficiency, Food Stamp Participation, and Mental Health." *Social Science Quarterly* 89(3): 706-727.

Herbst, C. M. (2013). Welfare Reform and the Subjective Well-Being of Single Mothers. *Journal of Population Economics*, *26*(1), 203-238.

Ifcher, J. (2011). The Happiness of Single Mothers after Welfare Reform. *B.E. Journal of Economic Analysis And Policy: Topics In Economic Analysis And Policy, 11*(1),

Kessler, R. C., J. G. Green, M. J. Gruber, N. A. Sampson, E. Bromet, M. Cuitan, T. A. Furukawa. (2010). "Screening for Serious Mental Illness in the General Population with the K6 Screening Scale: Results from the WHO World Mental Health (WMH) Survey Initiative." *International Journal of Methods in Psychiatric Research* 19(S1): 4-22.

Prochaska, J. J., H-Y. Sung, W. Max, Y. Shi, and M. Ong. (2012). "Validity Study of the K6 Scale as a Measure of Moderate Mental Distress Based on Mental Health Treatment Need and Utilization." *International Journal of Methods in Psychiatric Research* 21(2): 88-97.

Schmidt, L., L. Shore-Sheppard and T. Watson (2016). "The Effect of Safety Net Programs on Food Insecurity." *Journal of Human Resources*.

Siefert, K., C. M. Heflin, M. Corcoran, and D. R. Williams. 2001. ''Food Insufficiency and the Physical and Mental Health of Low-Income Women.'' Women and Health 32:159–77.

Table 1: Summary Statistics of Outcomes for NHIS Sample 1999-2016

	Mean (Standard Deviation)
Any welfare participation	0.349
	(0.477)
TANF	0.0353
	(0.185)
SSI	0.0117
	(0.107)
SNAP	0.240
	(0.427)
WIC	0.162
	(0.368)
Medicaid	0.168
	(0.374)
MSPD	0.216
	(0.411)
Depression	0.0184
	(0.365)
Food Insecure	0.063
	(0.243)
N	54109

Notes: Sample includes non-immigrant single mothers from the NHIS Sample Adult Files from 1999-2016.

Table 2: Simulated Safety Net Generosity, Overall and by Year

Year	Cash and Food	Cash	Food	Tax Credit	SSI	TANF	SNAP	Med elig
Overall	6.865	4.855	2.011	1.933	0.819	2.103	1.813	0.66
1999	6.921	5.049	1.872	1.644	0.773	2.631	1.659	0.501
2000	6.773	4.936	1.838	1.624	0.727	2.585	1.632	0.587
2001	6.567	4.807	1.760	1.588	0.781	2.438	1.565	0.619
2002	6.767	5.036	1.732	1.724	0.878	2.434	1.538	0.655
2003	6.634	4.855	1.779	1.774	0.748	2.333	1.586	0.648
2004	6.771	4.959	1.813	1.814	0.813	2.332	1.613	0.647
2005	6.633	4.865	1.768	1.884	0.783	2.197	1.578	0.649
2006	6.639	4.705	1.933	1.859	0.708	2.138	1.739	0.657
2007	6.658	4.811	1.846	1.832	0.825	2.155	1.645	0.672
2008	6.485	4.697	1.788	1.828	0.85	2.019	1.582	0.671
2009	6.657	4.775	1.881	1.9	0.855	2.02	1.671	0.687
2010	7.296	5.108	2.187	2.282	0.841	1.985	1.976	0.7
2011	7.569	5.024	2.546	2.174	0.89	1.959	2.323	0.69
2012	7.285	4.798	2.487	2.151	0.836	1.811	2.279	0.692
2013	7.072	4.704	2.368	2.14	0.828	1.736	2.175	0.697
2014	7.059	4.738	2.32	2.176	0.842	1.721	2.139	0.701
2015	6.881	4.851	2.029	2.176	0.886	1.789	1.846	0.714
2016	6.553	4.586	1.967	2.137	0.864	1.585	1.813	0.703

Notes: All units are thousands of real dollars, with the exception of Medicaid eligibility, which is fraction of the family imputed to be eligible for Medicaid.

Table 3: Effects of Simulated Safety Net Generosity on Reported Welfare Participation

	(1)	(2)	(3)	(4)	(5)	(6)
	Any welfare Full Year	Any welfare Full Year	Any welfare Full Year	Any welfare Q1/Q2	Any welfare Q3/Q4	Any welfare Full Year
Real cash and food benefits (1000s)	0.0198**					
	(0.004)					
Real cash benefits (1000s)		0.0132**				
		(0.003)				
Real food benefits (1000s)		0.0476**	0.0479**	0.0437**	0.0516**	
		(0.006)	(0.006)	(0.007)	(0.009)	
Real cash lump-sum benefits (1000s)			0.0208*	0.0151	0.0291**	
			(0.008)	(0.010)	(0.011)	
Real cash flow benefits (1000s)			0.0122**	0.0078+	0.0172**	
			(0.004)	(0.004)	(0.005)	
Real tax credits (1000s)						0.0424**
						(0.01)
Real TANF benefits (1000s)						0.0031
						(0.004)
Real SNAP benefits (1000s)						0.0207+
						(0.012)
Real WIC benefits (1000s)						0.2569**
						(0.059)
Simulated fraction of family Medicaid-eligible	0.1373**	0.1752**	0.1682**	0.1299*	0.2027**	0.1641**
	(0.042)	(0.043)	(0.043)	(0.056)	(0.052)	(0.042)
Observations	53619	53619	53619	26430	27189	53619
R-squared	0.282	0.283	0.283	0.295	0.278	0.284

Notes: Dependent variable is an indicator for whether the family reported participation in any of the following welfare programs: TANF, SSI, SNAP, WIC, Medicaid, or CHIP. Standard errors clustered at the state level are in parentheses. +, *, and ** indicate statistical significance at the 10, 5, and 1 percent levels respectively. All regressions include controls for age of mother, number of children in household and presence of a child under 6, urban residence, education, race and interactions between race and all other individual level variables, unemployment rate, UI dependent allowance, child support dollars per capita, and public housing/voucher units per capita, as well as state and year fixed effects.

Table 4: Relationship between Moderate/Severe Psychological Distress and Welfare Participation, Conditional on Safety Net Generosity

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Any welfare	Any welfare	Any welfare	Any welfare	Any welfare	Any welfare	Any welfare
	Full Year	Full Year	Full Year	Full Year	Q1/Q2	Q3/Q4	Full Year
MSPD	0.0873**	0.0872**	0.0871**	0.0872**	0.0957**	0.0789**	0.0869**
	(0.007)	(0.007)	(0.007)	(0.007)	(0.010)	(0.010)	(0.007)
Real cash and food benefits (1000s)		0.0198**					
		(0.004)					
Real cash benefits (1000s)			0.0132**				
			(0.003)				
Real food benefits (1000s)			0.0475**	0.0478**	0.0438**	0.0514**	
			(0.006)	(0.006)	(0.007)	(0.009)	
Real cash lump-sum benefits (1000s)				0.0217**	0.0180+	0.0283*	
				(0.008)	(0.010)	(0.011)	
Real cash flow benefits (1000s)				0.0120**	0.0078+	0.0169**	
				(0.004)	(0.005)	(0.005)	
Real tax credits (1000s)							0.0422**
							(0.010)
Real TANF benefits (1000s)							0.0034
							(0.004)
Real SNAP benefits (1000s)							0.0221+
							(0.012)
Real WIC benefits (1000s)							0.2459**
							(0.058)
Simulated Medicaid eligibility		0.1339**	0.1718**	0.1639**	0.1246*	0.1993**	0.1600**
		(0.041)	(0.043)	(0.042)	(0.054)	(0.052)	(0.042)
Observations	53,619	53,619	53,619	53,619	26,430	27,189	53,619
R-squared	0.287	0.288	0.289	0.289	0.302	0.282	0.289

See notes for Table 3.

Table 5: Relationship between Depression and Welfare Participation, Conditional on Safety Net Generosity

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Any welfare Full Year	Any welfare Full Year	Any welfare Full Year	Any welfare Full Year	Any welfare Q1/Q2	Any welfare Q3/Q4	Any welfare Full Year
Depression	0.1150**	0.1159**	0.1149**	0.1147**	0.1030**	0.1268**	0.1141**
	-0.017	-0.017	(0.017)	(0.017)	(0.026)	(0.017)	(0.017)
Real cash and food benefits (1000s)		0.0203**					
		-0.004					
Real cash benefits (1000s)			0.0132**				
			(0.003)				
Real food benefits (1000s)			0.0475**	0.0478**	0.0439**	0.0522**	
			(0.006)	(0.006)	(0.007)	(0.009)	
Real cash lump-sum benefits (1000s)				0.0204*	0.0148	0.0283**	
				(0.008)	(0.010)	(0.011)	
Real cash flow benefits (1000s)				0.0128**	0.0085+	0.0177**	
				(0.004)	(0.004)	(0.005)	
Real tax credits (1000s)							0.0425**
							(0.010)
Real TANF benefits (1000s)							0.0035
							(0.004)
Real SNAP benefits (1000s)							0.0204+
							(0.012)
Real WIC benefits (1000s)							0.2628**
							(0.057)
Simulated Medicaid eligibility		0.1326**	0.1705**	0.1643**	0.1211*	0.2046**	0.1600**
		-0.042	(0.043)	(0.042)	(0.055)	(0.053)	(0.042)
Observations	53,372	53,372	53,372	53,372	26,298	27,074	53,372
R-squared	0.282	0.283	0.284	0.284	0.296	0.279	0.285

See notes for Table 3.

Table 6: Effects of Safety Net Generosity on Moderate/Severe Psychological Distress

	(1) MSPD Full Year	(2) MSPD Full Year	(3) MSPD Full Year	(4) MSPD Q1/Q2	(5) MSPD Q1/Q2	(6) MSPD Full Year
Real cash and food benefits (1000s)	0.001					
	(0.003)					
Real cash benefits (1000s)		0.0006				
		(0.003)				
Real food benefits (1000s)		0.0026	0.0022	0.0004	0.0033	
		(0.006)	(0.006)	(0.009)	(0.009)	
Real cash lump-sum benefits (1000s)			-0.0099	-0.0299**	0.0109	
			(0.008)	(0.010)	(0.012)	
Real cash flow benefits (1000s)			0.0019	0.0003	0.0031	
			(0.003)	(0.004)	(0.005)	
Real tax credits (1000s)						0.0032
						(0.009)
Real TANF benefits (1000s)						-0.0036
						(0.004)
Real SNAP benefits (1000s)						-0.0142+
						(0.008)
Real WIC benefits (1000s)						0.1288*
						(0.048)
Simulated Medicaid eligibility	0.0347	0.037	0.0466	0.0574	0.0369	0.0441
	(0.050)	(0.052)	(0.051)	(0.050)	(0.068)	(0.052)
Observations	53,619	53,619	53,619	26,430	27,189	53,619
R-squared	0.017	0.017	0.017	0.019	0.023	0.017

Notes: Dependent variable is an indicator for whether the mother exhibits moderate and or severe psychological distress. Statistical significance and control variables the same as in Table 3.

Table 7: Effects of Safety Net Generosity on Depression

	(1) Depression Full Year	(2) Depression Full Year	(3) Depression Full Year	(4) Depression Q1/Q2	(5) Depression Q3/Q4	(6) Depression Full Year
Real cash and food benefits (1000s)	-0.0015					
	(0.001)					
Real cash benefits (1000s)		-0.0023*				
		(0.001)				
Real food benefits (1000s)		0.0015	0.0016	0.0018	0.0017	
		(0.002)	(0.002)	(0.003)	(0.003)	
Real cash lump-sum benefits (1000s)			0.0004	-0.0023	0.0033	
			(0.003)	(0.004)	(0.004)	
Real cash flow benefits (1000s)			-0.0026**	-0.0044**	-0.0007	
			(0.001)	(0.001)	(0.001)	
Real tax credits (1000s)						0.0032
						(0.003)
Real TANF benefits (1000s)						-0.0038**
						(0.001)
Real SNAP benefits (1000s)						-0.002
						(0.004)
Real WIC benefits (1000s)						0.0293+
						(0.017)
Simulated Medicaid eligibility	-0.0033	0.0008	-0.0016	0.0096	-0.011	-0.0022
	(0.012)	(0.012)	(0.012)	(0.017)	(0.014)	(0.012)
Observations	53,372	53,372	53,372	26,298	27,074	53,372
R-squared	0.008	0.008	0.008	0.011	0.01	0.008

Notes: Dependent variable is an indicator for whether the mother is limited in her activities due to depression. Statistical significance and control variables the same as in Table 3.

Table 8: Effect of Safety Net Generosity on Food Insecurity

	(1) Food Insecurity Full Year	(2) Food Insecurity Full Year	(3) Food Insecurity Full Year	(4) Food Insecurity Q1/Q2	(5) Food Insecurity Q3/Q4	(6) Food Insecurity Q3/Q4
Real cash and food benefits (1000s)	0.0035					
	(0.004)					
Real cash benefits (1000s)		0.0001				
		(0.006)				
Real food benefits (1000s)		0.0118+	0.0128+	-0.0009	0.0264**	
		(0.007)	(0.006)	(0.010)	(0.008)	
Real cash lump-sum benefits (1000s)			0.0106	0.0111	0.0101	
			(0.0120)	(0.0140)	(0.0160)	
Real cash flow benefits (1000s)			-0.0027	-0.004	-0.0007	
			(0.006)	(0.008)	(0.007)	
Real tax credits (1000s)						0.0142
						(0.014)
Real TANF benefits (1000s)						-0.0043
						(0.006)
Real SNAP benefits (1000s)						0.008
						(0.013)
Real WIC benefits (1000s)						0.0508
						(0.071)
Simulated Medicaid eligibility	0.1295+	0.1438*	0.1182+	0.0783	0.1615	0.1195+
	(0.070)	(0.065)	(0.070)	(0.084)	(0.102)	(0.069)
Observations	19,221	19,221	19221	9898	9323	19221
R-squared	0.04	0.04	0.04	0.042	0.053	0.04

Notes: Dependent variable is an indicator for family food insecurity. Statistical significance and control variables the same as in Table 3.

Table 9: Relationship between Moderate/Severe Psychological Distress and Food Insecurity, Conditional on Safety Net Generosity

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Food Insecurity Full Year	Food Insecurity Full Year	Food Insecurity Full Year	Food Insecurity Full Year	Food Insecurity Q1/Q2	Food Insecurity Q3/Q4	Food Insecurity Full Year
MSPD	0.1343**	0.1341**	0.1342**	0.1342**	0.1162**	0.1551**	0.1342**
	(0.007)	(0.007)	(0.007)	(0.007)	(0.017)	(0.011)	(0.007)
Real cash and food benefits (1000s)		0.003					
		(0.004)					
Real cash benefits (1000s)			-0.0006				
			(0.006)				
Real food benefits (1000s)			0.0116	0.0128+	-0.0014	0.0274**	
			(0.007)	(0.007)	(0.010)	(0.008)	
Real cash lump-sum benefits (1000s)				0.0112	0.0171	0.0035	
				(0.0120)	(0.0150)	(0.0180)	
Real cash flow benefits (1000s)				-0.0038	-0.0046	-0.0023	
				(0.005)	(0.007)	(0.006)	
Real tax credits (1000s)							0.0133
							(0.014)
Real TANF benefits (1000s)							-0.0046
							(0.006)
Real SNAP benefits (1000s)							0.0101
							(0.013)
Real WIC benefits (1000s)							0.0341
							(0.073)
Simulated Medicaid eligibility		0.1159+	0.1308*	0.1018	0.0394	0.1785+	0.1026
		(0.067)	(0.063)	(0.070)	(0.083)	(0.098)	(0.069)
Observations	19221	19,221	19,221	19221	9898	9323	19221
R-squared	0.061	0.062	0.062	0.062	0.058	0.083	0.062

See notes for Table 8.

Appendix Table 1: Effects of Safety Net Generosity on Reported Receipt of TANF

	(1) TANF Full year	(2) TANF Full year	(3) TANF Full year	(4) TANF Q1/Q2	(5) TANF Q3/Q4	(6) TANF Full year
Real cash and food benefits (1000s)	0.0142**					
	(0.002)					
Real cash benefits (1000s)		0.0172**				
		(0.002)				
Real food benefits (1000s)		0.0014	0.0006	-0.0018	0.003	
		(0.003)	(0.003)	(0.004)	(0.004)	
Real cash lump-sum benefits (1000s)			-0.0049	-0.0056	-0.004	
			(0.003)	(0.004)	(0.005)	
Real cash flow benefits (1000s)			0.0202**	0.0206**	0.0199**	
			(0.002)	(0.003)	(0.003)	
Real tax credits (1000s)						0.0004
						(0.004)
Real TANF benefits (1000s)						0.0179**
						(0.002)
Real SNAP benefits (1000s)						-0.0062
						(0.004)
Real WIC benefits (1000s)						0.0523**
						(0.019)
Simulated Medicaid eligibility	0.0328	0.0153	0.0355	0.0222	0.0485	0.0345
	(0.023)	(0.022)	(0.024)	(0.027)	(0.030)	(0.024)
Observations	53437	53437	53437	26341	27096	53437
R-squared	0.055	0.056	0.057	0.058	0.062	0.058

Notes: Dependent variable is an indicator for whether the family reports receipt of TANF. Statistical significance and control variables the same as in Table 3.

Appendix Table 2: Effects of Safety Net Generosity on Reported Receipt of SNAP

	(1) FS/SNAP Full year	(2) FS/SNAP Full year	(3) FS/SNAP Full year	(4) FS/SNAP Q1/Q2	(5) FS/SNAP Q3/Q4	(6) FS/SNAP Full year
Real cash and food benefits (1000s)	0.0234**					
	(0.004)					
Real cash benefits (1000s)		0.0129**				
		(0.003)				
Real food benefits (1000s)		0.0673**	0.0673**	0.0624**	0.0716**	
		(0.006)	(0.006)	(0.008)	(0.008)	
Real cash lump-sum benefits (1000s)			0.0144*	0.0051	0.0255**	
			(0.007)	(0.009)	(0.009)	
Real cash flow benefits (1000s)			0.0127**	0.0078+	0.0180**	
			(0.003)	(0.004)	(0.003)	
Real tax credits (1000s)						0.0312**
						(0.011)
Real TANF benefits (1000s)						0.0056
						(0.004)
Real SNAP benefits (1000s)						0.0462**
						(0.011)
Real WIC benefits (1000s)						0.2296**
						(0.062)
Simulated Medicaid eligibility	-0.0397	0.0201	0.0187	0.0097	0.0228	0.0154
	(0.043)	(0.035)	(0.036)	(0.050)	(0.047)	(0.036)
Observations	53455	53455	53455	26357	27098	53455
R-squared	0.202	0.205	0.205	0.215	0.2	0.205

Notes: Dependent variable is an indicator for whether the family reports receipt of Food Stamps/SNAP. Statistical significance and control variables the same as in Table 3.

Appendix Table 3: Effects of Safety Net Generosity on Reported Receipt of Medicaid

	(1) Medicaid Full year	(2) Medicaid Full year	(3) Medicaid Full year	(4) Medicaid Q1/Q2	(5) Medicaid Q3/Q4	(6) Medicaid Full year
Real cash and food benefits (1000s)	0.0236**					
	(0.005)					
Real cash benefits (1000s)		0.0227**				
		(0.006)				
Real food benefits (1000s)		0.0275**	0.0276**	0.0291**	0.0272**	
		(0.005)	(0.005)	(0.006)	(0.007)	
Real cash lump-sum benefits (1000s)			0.0255**	0.0127	0.0388**	
			(0.009)	(0.010)	(0.012)	
Real cash flow benefits (1000s)			0.0223**	0.0225**	0.0221**	
			(0.006)	(0.007)	(0.007)	
Real tax credits (1000s)						0.0423**
						(0.010)
Real TANF benefits (1000s)						0.0153*
						(0.007)
Real SNAP benefits (1000s)						0.0065
						(0.007)
Real WIC benefits (1000s)						0.1902**
						(0.046)
Simulated Medicaid eligibility	0.0968*	0.1022*	0.0997*	0.0742	0.1253*	0.0965*
	(0.047)	(0.049)	(0.045)	(0.063)	(0.049)	(0.046)
Observations	53283	53283	53283	26276	27007	53283
R-squared	0.142	0.142	0.142	0.144	0.145	0.142

Notes: Dependent variable is an indicator for whether the family reports receipt of Medicaid. Statistical significance and control variables the same as in Table 3.

Appendix Table 4: Effects of Safety Net Generosity on Reported Receipt of SSI

	(1) SSI Full year	(2) SSI Full year	(3) SSI Full year	(4) SSI Q1/Q2	(5) SSI Q3/Q4	(6) SSI Full year
Real cash and food benefits (1000s)	0.000					
	(0.001)					
Real cash benefits (1000s)		0.000				
		(0.001)				
Real food benefits (1000s)		-0.0002	-0.0001	-0.0014	0.0012	
		(0.001)	(0.001)	(0.002)	(0.002)	
Real cash lump-sum benefits (1000s)			0.0021	-0.0015	0.0058	
			(0.003)	(0.003)	(0.005)	
Real cash flow benefits (1000s)			-0.0003	-0.0011	0.0004	
			(0.001)	(0.001)	(0.002)	
Real tax credits (1000s)						0.0022
						(0.003)
Real TANF benefits (1000s)						-0.0003
						(0.001)
Real SNAP benefits (1000s)						-0.0002
						(0.003)
Real WIC benefits (1000s)						0.0006
						(0.015)
Simulated Medicaid eligibility	-0.0073	-0.0075	-0.0094	-0.0141	-0.0077	-0.0094
	(0.009)	(0.009)	(0.008)	(0.013)	(0.010)	(0.008)
Observations	53451	53451	53451	26343	27108	53451
R-squared	0.024	0.024	0.024	0.025	0.027	0.024

Notes: Dependent variable is an indicator for whether the family reports receipt of SSI. Statistical significance and control variables the same as in Table 3.