

The Effect of the US Safety Net on Material Hardship over the Past Quarter-Century

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Abstract

US safety net programs are often evaluated in isolation, though families typically participate in multiple programs. Our analysis measures the simultaneous effect of three programs and accounts for behavioral responses. We find that participation in TANF, SNAP, or Medicaid/SCHIP reduces the number of hardships low-income families with children experience by 1.23 (on average) and food insufficiency by 18.5 percentage points. Our 14.9 percentage point reduction in unmet medical or dental need is not statistically significant in our conservative standard error estimate. Our models exploit variation in state rules and policies across states and over two decades to identify the effect of program participation on material hardship using monthly data from the Survey of Income and Program Participation and other sources.

Introduction

Over the past 85 years, the United States has developed and modified a series of programs designed to support families as they strive to achieve economic well-being. These have taken the form of both income support programs, which provide cash or in-kind support, and work incentives or work support programs such as tax credits. Other efforts to increase the payoff from working have included setting and raising the minimum wage and increasing the value of the earned income tax credit (EITC) over time. The income support programs have sometimes been referred to as a social “safety net” established to ensure that families that meet the eligibility criteria do not fall below a certain level of well-being.

Over 43 million Americans had incomes below the federal poverty line in 2015, representing 13.5 percent of the U.S. population (U.S. Census Bureau 2015). Nearly 100 million Americans—47.5 million of them living in a working family with children in 2011—have incomes below 200 percent of the federal poverty line (Kaiser Family Foundation 2016; Population Reference Bureau 2013). Income is important in that it allows families to pay for basic needs, but this study finds that nearly half of low-income families with children are not able to cover such needs. Many see this widespread poverty and hardship as evidence that government programs are ineffective. In 1988, Ronald Reagan jested, “My friends, some years ago, the federal government declared war on poverty—and poverty won.” But is this sentiment accurate? In this paper, we report findings from our analysis of the role three safety net programs and two work incentive programs have played in reducing material hardship for families in the United States.

More specifically, our primary research question is:

- How does income-tested program participation in Temporary Assistance to Need Families (TANF), the Supplementary Nutrition Assistance Program (SNAP), or public health insurance (e.g., Medicaid, State Children's Health Insurance

Program [SCHIP]) affect the material hardship of low-income families with children?¹

As part of our analysis, we also answer a second research question:

- How do EITC and minimum wage policies affect material hardship among low-income families with children?

We answer these questions using monthly data from the US Census Bureau's Survey of Income and Program Participation (SIPP) from 1992 to 2011, the most recent year with SIPP data for all three material hardship measures. We supplement the SIPP data with state-level economic and policy data from multiple sources, such as the Urban Institute's Welfare Rules Database and the US Department of Agriculture's SNAP Policy Database.

The variation in policies (and program rules), particularly state-level policies, is key to our research design. To answer our primary research question, we use an instrumental variables (IV) approach that uses the variation in state rules to identify the effect of program participation on material hardship.² Our participation measure captures participation in any of the three programs (TANF, SNAP, or Medicaid/SCHIP) because families use multiple programs (as described below) and the programs likely have an interactive effect that makes them difficult to disentangle. We measure participation using a treatment-on-the-treated estimate with endogenous participation instrumented with policy parameters.

Our results indicate that receiving TANF, SNAP, or public health insurance reduced the number of hardships low-income families with children experienced by 1.23, on average, from June 1992 to July 2011. Number of hardships include a general report of not meeting essential expenses, inability to pay rent or mortgage, eviction, unpaid utility bills, utility service cut, phone service cut, unmet medical or dental need, and food insufficiency.

More specifically, participating in one of these three safety net programs also reduced food insufficiency by 18.5 percentage points among low-income families with children. This effect is large but not inconsistent with earlier studies (Kreider et al. 2012; Ratcliffe,

¹ SNAP and TANF were formerly known as the Food Stamp Program and Aid to Families with Dependent Children, respectively.

² Supplemental Security Income policies do not vary by state, so Supplemental Security Income is not included in this analysis.

McKernan, and Zhang 2011; Shaefer and Gutierrez 2013). We find a 14.9 percentage point reduction in unmet medical or dental need, but this finding is not measured precisely enough to be statistically significant in our conservative standard error adjustment for clustering by state.

We measure the contemporaneous effect of state minimum wage and EITC policies using reduced-form intent-to-treat estimates. This estimate does not capture the effect of a family receiving the minimum wage or EITC but the state's generosity regardless of whether the family receives either benefit. Using this more diffuse measure of state and federal policies instead of direct program participation (which we use to address our primary research question), we find evidence that a \$1 increase in the minimum wage (but not the EITC) reduces material hardship by 1.4–4.9 percentage points among low-income families with children.

Our analysis contributes to the US safety net literature by looking at the simultaneous effect of several programs and accounting for behavioral responses. Furthermore, we focus on the effect of these programs on nonmonetary material hardship measures. It is important to look at multiple hardship measures because safety net programs may not have a uniform effect on different dimensions of material hardship. For example, changes in Medicaid and SCHIP have a direct effect on unmet medical need, but SNAP changes have a less direct effect. This is the first study we are aware of to measure the effect of multiple program receipt on unmet medical or dental need and the total number of hardships experienced—including inability to pay utility bills, rent or mortgage, phone or utility service cut, evicted, and unmet medical or dental need.

There is growing interest in measuring and understanding how people experience material hardship above and beyond income poverty. Hardship indicators represent direct measures of well-being. In contrast, income poverty measures, such as the official US poverty measure, are indicators of whether people have the resources (e.g., money) thought necessary to cover basic needs. There is a moderate correlation between hardship measures and income poverty measures (Mayer and Jencks 1989; Iceland and Bauman 2007; Sullivan, Turner, and Danziger 2008), and there are several reasons why the correlation is not stronger. For one, poverty is based on a flow of income, such as earnings or cash transfers from

government programs, whereas people might have other resources to meet basic needs, such as wealth or access to credit (Meyer and Sullivan 2003). There might also be errors in reported income, as people might not report income from all sources (Czajka and Denmead 2008; Edin and Lein 1997; Mayer and Jencks 1989; Sullivan, Turner, and Danziger 2008). Thus, there are many reasons to analyze the effect of government transfers on material hardship rather than just on the official poverty measure.

The remainder of the paper lays out the background for our study and literature, our conceptual framework and hypotheses, data and sample, empirical model, results, and conclusion.

Background and Literature

The design and implementation of income-tested programs have changed dramatically since the early 1990s, with important and significant changes at the federal and state levels. A primary example is the transition from the Aid to Families with Dependent Children (AFDC) program to the TANF program, which occurred with the passage of the Personal Responsibility and Work Opportunity Reconciliation Act in 1996. This legislation, along with welfare waivers from the federal government to states in the early to mid-1990s, provided states with flexibility in designing their welfare programs that resulted in significant variation in state programs. Starting in the mid- to late 1990s, the federal government also began giving states flexibility to change SNAP rules. These changes culminated in the Farm Security and Rural Investment Act of 2002 (the Farm Bill), which provides even greater flexibility to states to set their own SNAP rules. Additionally, there have been changes to health care for low-income families, such as the introduction of SCHIP in 1997 and health insurance expansions under the 2010 Affordable Care Act.

Other programs and policies aimed at supporting low-income families have changed over time. The federal EITC is a refundable income tax credit, which reduces a person's tax liability and allows refunds in excess of the income tax liability. Thus, a refundable credit can create an incentive to work even for very low-income families that have little or no tax liability. There have been large expansions to the federal EITC since the early 1990s. Some

states supplement the federal EITC with a state EITC, and some of these state EITC benefits are also refundable. Another policy strategy used to boost the earnings of low-wage workers was the establishment of a federal minimum wage as well as a minimum wage in some states. Although the minimum wage has been increased periodically, its real value has eroded when it has remained unchanged over time.

Federal spending on the safety net has shifted away from cash welfare toward the EITC and Medicaid (McKernan, Ratcliffe, and Iceland 2018). In fact, cash welfare payments in the form of AFDC and TANF declined over the past two and a half decades, from \$21 billion in 1990 to just \$6 billion in 2015 (all amounts in 2015 dollars) (McKernan, Ratcliffe, and Iceland 2018). This decline was largely a result of welfare reform in 1996 that brought an end to six decades of federal social policy guaranteeing at least a minimum level of unconditional cash aid to people in poverty. Essentially, welfare reform abolished AFDC and replaced it with a system of fixed block grants to states, which states have used to fund TANF cash assistance and a wide range of other activities. The value of the block grant has fallen because of inflation. During the recession, funds were added through the American Recovery and Reinvestment Act (funding the TANF Emergency Contingency Fund), giving a temporary boost to TANF funding in 2010. States have wide latitude afforded by their block grants. In 2015, only 25 percent of TANF funds went to cash (basic) assistance, 9 percent to work activities, and 19 percent to child care (HHS 2017), suggesting that barely half of the spending sticks where it would be most helpful in paying household bills (Bitler and Hoynes 2016). Federal law sets a five-year lifetime limit on receipt of federal TANF cash assistance, although states can establish shorter time limits or use state funds to support families beyond the five-year federal limit. Hahn et al. (2017) documents state policy choices. As a fixed block grant, federal TANF spending does not respond to changes in need, such as those brought on by the Great Recession. TANF caseloads rose only slightly during the recession and by far less than SNAP caseloads, suggesting that the program is no longer a safety net Americans can count on in tough times.

In contrast, spending on food stamps (now SNAP) declined slightly in the 1990s, from \$27 to \$25 billion, then increased significantly after the Great Recession to \$81 billion (2010) before declining modestly to \$70 billion (2015) (McKernan, Ratcliffe, and Iceland

2018). Unlike TANF, SNAP responded in significant and expected ways during the Great Recession (Bitler and Hoynes 2015; Moffitt 2013).

Spending on the EITC grew rapidly in the 1990s, from \$11 billion in 1990 to \$42 billion in 2000, and this growth continued, albeit more slowly, in the 2000s, reaching \$70 billion in 2015 (McKernan, Ratcliffe, and Iceland 2018). The growth in the 1990s was partly due to the expansion of the program during the Clinton administration. The EITC generally has had broad bipartisan support because it is thought to encourage work, as a household member needs to be working to be eligible.

Finally, spending on Medicaid grew rapidly over the period, from \$75 billion in 1990 to \$162 billion in 2000 and \$350 billion in 2015 (McKernan, Ratcliffe, and Iceland 2018). This was partly fueled by general increases in medical expenses but primarily by expansions in the program itself over time. For example, the Children's Health Insurance Program (CHIP), created in 1997, provides coverage for uninsured children in families with low incomes but above the previous cutoff for Medicaid eligibility.

The literature generally indicates that these programs often reduce hardship, though there is some variability across programs considered and the magnitude of the effect. The most consistent finding is that SNAP reduces food insecurity. Among the studies on this issue, Pilkauskas, Currie, and Garfinkel (2012), using data from the Fragile Families and Child Wellbeing Study, find food hardship during the Great Recession might have increased by twice the amount observed if not for SNAP. Nord and Golla (2009), using Current Population Survey data, likewise find that SNAP reduced the prevalence of very low food security among recent program entrants by about one-third from 2001 to 2006. Among studies that have used SIPP data, Mills and Mykerezzi (2010), Ratcliffe, McKernan, and Zhang (2011), and Schaefer and Gutierrez (2013) all find that food stamps/SNAP substantially reduce food insecurity (see also Kreider et al. 2012, Bitler and Hoynes 2016, Gundersen, Kreider, and Pepper 2017). The effects of the minimum wage and TANF on material hardship appear to be quite small or not significant, though the evidence is mixed (Bitler and Hoynes 2016; Sabia and Nielsen 2012; Schmidt, Shore-Sheppard, and Watson 2016).

Related literature provides some evidence consistent with the hypothesis that safety net programs indirectly or directly reduce unmet medical need. Hoynes, Schanzenbach, and Almond (2016) use the Panel Study of Income Dynamics and the Food Stamp Program rollout in the 1960s and early 1970s to find that access to food stamps in childhood improves health (i.e., reduces metabolic syndrome), which indirectly suggests that food stamps likely reduce unmet medical need. Flores et al. (2017) find descriptive evidence in a prospective observational study of 237 children that eligible children obtaining Medicaid/CHIP coverage were significantly less likely to have unmet medical (13 percent) or dental (18 percent) needs than eligible uninsured children (48 percent unmet medical and 62 percent unmet dental). Wang, Norton, and Rozier's (2007) results indicate that SCHIP/Medicaid-insured children were 8 percentage points less likely to report unmet dental need compared with uninsured children, based on an instrumental variables analysis using the 1997–2002 National Health Interview Survey. McManus, Chi, and Carle (2015), however, find no association between Medicaid eligibility criteria and unmet preventative dental care need among children ages 3 to 17, using the 2009–10 National Survey of Children with Special Health Care Needs.

One important concern with studies that measure the effect of only one program on outcomes is that the effect of participation in one program (e.g., TANF or SNAP) will reflect participation in other programs (e.g., Medicaid/SCHIP) if participants are likely to participate in multiple programs. We find that about 90 percent of recipients of TANF or SNAP participate in another program. To address the concern that the effect of participation in one program reflects participation in other programs, our study measures participation in any of the three programs.

Our review of the literature reveals that no study has directly examined how multiple income-tested programs have affected the total number of hardships experienced or instances of unmet medical or dental need, which, along with food insufficiency, are at the center of this study. Schmidt, Shore-Sheppard, and Watson (2016), have come the closest, highlighting the importance of jointly considering a full range of safety net programs in their study of the effect of safety net programs on food insecurity. Using Current Population Survey data from 2001–09 and an instrumental variables framework, they measure the effect of being eligible for TANF, Supplemental Security Income, EITC, food assistance, and Medicaid and find that

eligibility for \$1,000 in potential benefits reduces low food security by 1.1 percentage points among nonimmigrant, single-parent families with poverty base of 33 percent. We build on this literature by adding a more general measure of nine hardships as well as unmet medical or dental need—a hardship measure we expect Medicaid or SCHIP to have a direct effect on—using a direct measure of participation (instead of eligibility), a detailed set of four state eligibility rules as instrumental variables, and variation over time and across states over two decades (1991–2011) to identify our program impacts.

Conceptual Framework

Below, we discuss the determinants of material hardship and program participation as well as the instrumental variables for TANF, SNAP, and Medicaid/SCHIP participation.

Determinants of Material Hardship

At the macro level, material hardship (like poverty) is shaped by the economy’s performance, demographic factors, and social programs (Danziger and Gottschalk 1995; Iceland 2013). With regards to economic performance, economic growth (often measured in terms of GDP growth per capita) drives changes in average standards of living, and economic inequality affects the distribution of income. Demographic changes—the growth in single-parent families in particular—have also been thought to contribute to the stagnation in progress against poverty since the 1960s (e.g., Eggebeen and Lichter 1991). State and year fixed effects and economic variables are included in our empirical model, as discussed below, to control for macro-level variables.

At the micro level, several factors affect whether households experience hardship. Material hardship is a function of earned income, public and private transfers, and family composition, all of which are potentially endogenous variables. Because our primary focus is on the role that the social safety net and, thus, public transfers play in material hardship, we model material hardship as a function of program participation and the reduced-form determinants of earned income, private transfers, and family composition. The reduced-form determinants and their hypothesized effects are based on human capital theory (Becker 1975)

and Becker's (1991) theory of the demand for children and are derived in detail in Iceland (2013) and McKernan and Ratcliffe (2005b). The reduced-form determinants provide the control variables for our model and include age, race and ethnicity, gender, educational attainment, US citizenship, household structure, and metropolitan status. Briefly, age and educational attainment are proxies for human capital. Human capital increases productivity and makes an individual more attractive to prospective employers. Race, ethnicity, and gender have also been found to be associated with employment and earnings because of a variety of factors, such as labor force discrimination and social capital deficits. Citizenship may similarly affect socioeconomic status, as immigrants may have less human capital and less familiarity with the labor market. Household structure has been linked to poverty, with female-headed families more likely to be poor and have lower earnings because of the greater likelihood of relying on a single earner and contending with child care challenges.

The focus of this paper, however, is on income-tested program participation. Income-tested programs are hypothesized to reduce material hardship, as they are designed to provide families with additional resources to meet their basic needs. TANF provides cash benefits to recipients, SNAP provides resources to buy food, and public health programs such as Medicaid and SCHIP help families meet medical needs and expenses.

While these income-tested programs likely directly reduce material hardship, some of the benefits could be offset through indirect effects. Previous research has generally found some small disincentive effects of welfare benefits on work (Ben-Shalom, Moffitt, and Scholz 2012). Beyond this, an analysis of the Food Stamp Program in the 1960s and early 1970s finds that the program's introduction reduced annual hours worked and employment among single mothers by 183 annual hours (intent-to-treat estimate), 505 annual hours (treatment-on-the-treated), and 24–27 percentage points, respectively. The authors found no significant impacts on earnings, family income, or the overall sample (Hoynes and Schanzenbach 2012). Today's more work-focused safety net (for example, the EITC encourages work) has smaller disincentives than the safety net analyzed by earlier studies (Ben-Shalom, Moffitt, and Scholz 2012).

Overall, we hypothesize that participation in TANF, SNAP, or public health insurance will reduce our material hardship measures: the average number of hardships of

any type experienced, food insufficiency, and unmet medical or dental need. SNAP and Medicaid/SCHIP are focused on specific types of hardship (food insufficiency and unmet medical need, respectively). However, income is fungible. Even though SNAP receipt might not directly provide funds to pay medical bills, it could still reduce unmet medical need by freeing up income that would ordinarily be used to buy food. SNAP and Medicaid/SCHIP improvements could free up cash, which could then be used to reduce other forms of hardship, such as those associated with an inability to pay rent, gas, or phone bills.

In general, we expect that the EITC, which is measured as the maximum credit available for a family with two children (federal and state combined), will decrease hardship by increasing family income. However, because the credit is received in an annual lump sum at tax time, there may not be an appreciable effect on hardship experienced outside of tax filing season. Also, while the literature generally finds that the EITC increases employment (Eissa and Liebman 1996; Grogger 2003; Meyer and Rosenbaum 2001; Nichols and Rothstein 2015) and earnings (Hoynes and Patel 2016), the costs associated with employment (e.g., child care, transportation) can have an offsetting effect on material hardship.

An increase in the minimum wage can decrease material hardship via higher earnings if the earnings increase is not offset by higher prices for goods and services (Gundersen and Ziliak 2018). If a minimum wage increase leads employers to hire fewer workers (or lay off existing workers) or reduce hours for remaining employees, then material hardship can increase. By and large, the literature has found minimum wage increases have no statistically significant effect (or a small negative effect) on employment and earnings, however, the effect is larger for specific subgroups (e.g., teenagers) and in areas where the minimum wage is more binding (i.e., areas with more minimum wage workers) (Acs et al. 2014; Addison, Blackburn, and Cotti 2012; CBO 2014; Dube, Lester, and Reich 2010; Neumark 2017; Neumark and Washer 2007).³ A notable exception is an analysis of Seattle's recent minimum wage increase from \$11 to \$13, which was found to reduce low-wage workers' employment

³ The CBO analysis, for example, finds that a 10 percent increase in the minimum wage is associated with employment declines (for all adults) of roughly 0.33 percent. The analysis finds larger employment declines for some subgroups, such as teenagers.

and their average monthly incomes by \$125 (Jardim et al. 2017).⁴ There is also evidence that the minimum wage leads to larger employment declines in the longer term (Meer and West 2016). Prices can also increase, especially in the restaurant business, where a high portion of workers receive the minimum wage (Aaronson, French, and MacDonald 2008). These price increases can lead to increased food insecurity.

Instrumental Variables for Program Participation

Our estimation approach uses state program rules to identify our instrumental variables (IV) model. A key component of this approach is identifying the instruments—the set of variables that (1) affect program participation but (2) do not affect material hardship conditional on program participation. The instruments we use are state policy variables that govern program eligibility.

We identify four program rules that are predictors of TANF, SNAP, or public health insurance receipt but do not independently affect material hardship:

- the TANF maximum monthly benefit for a family of three
- SNAP outreach spending per person with income less than 150 percent of the federal poverty line
- all legal noncitizen adults eligible for federal SNAP benefits or state-funded food assistance
- the share of children eligible for public health insurance, given the state restrictions in place in a given year and month

A higher TANF maximum monthly benefit for a family of three increases the benefit of participating in TANF and is hypothesized to increase TANF participation. In addition to these TANF program rules, rules of other programs, such as SNAP and Medicaid/SCHIP (discussed below), may affect TANF participation because these programs are often linked.

Higher SNAP outreach spending is hypothesized to increase participation via an increase in the number of SNAP applicants (because of increased knowledge about SNAP),

⁴ Over the years covered in this study, the minimum wage was substantially lower than some of the city ordinances that have more recently taken effect.

and more lenient SNAP immigrant eligibility rules are hypothesized to increase participation among immigrants.

More lenient Medicaid and SCHIP eligibility thresholds are hypothesized to increase coverage and reduce hardship. We follow the approach of Gruber and Simon (2008) in measuring the share of children eligible for public health insurance, given the state restrictions in place in a given year and month. We then match each household in our sample with the share eligible for the youngest child in the household in the given year and month.⁵

Data, Measures, and Sample

To answer our research question and test the hypotheses described above, we use both individual- and state-level data. The individual-level data are from the Survey of Income and Program Participation (SIPP), a longitudinal dataset that follows individuals over time. These data are augmented with information on state-level economic and social program policies and rules from multiple sources, including the Urban Institute’s Welfare Rules Database and the US Department of Agriculture’s SNAP Policy database. This section also describes the hardship measures—the key outcomes—and the study sample.

Data

Individual-Level SIPP Data

Each SIPP panel contains a nationally representative (noninstitutional) sample of households whose members are interviewed at four-month intervals over an approximately two- to four-year period. The panels have sample sizes ranging from approximately 14,000 to 52,000 households. In addition to collecting monthly data, the SIPP includes “topical modules” that ask periodic questions about topics such as material hardship, child care, and wealth. We analyze the 1991, 1992, 1993, 1996, 2001, 2004, and 2008 SIPP panels.

⁵ In general, state eligibility requirements for younger children are more generous than for older children (i.e., highest income-to-poverty level allowed), so our household-level analysis uses the most generous income eligibility measure for the household to receive Medicaid/SCHIP.

The material hardship measures are based on data collected in the SIPP topical module on “adult well-being.”⁶ The adult well-being topical module consists of a series of questions on food insufficiency, ability to meet basic needs such as going to the doctor or dentist, housing problems, and other topics. With the exception of the 2008 panel, this module is administered once over the course of the panel, so we only capture well-being in select years over this period (1992, 1995, 1998, 2003, 2005, 2010, and 2011).⁷ Over these years, TANF, SNAP, Medicaid/SCHIP, EITC, and minimum wage policies were changing. This period also captures both strong and weak economies.

The SIPP also provides monthly data on program participation in TANF, SNAP, or Medicaid/SCHIP—our key explanatory variable. The SIPP includes other economic and demographic characteristics, including age, race and ethnicity, gender, citizenship, educational attainment, and metropolitan status. We match the timing of these variables with the timing of the well-being variables. It is well established that there is underreporting of benefit receipt in survey data, and the SIPP is no exception, although studies have found less underreporting in the SIPP than in other surveys (Bitler, Currie, and Scholz 2003; Cody and Tuttle 2002). A recent study of SNAP found that for the (24-month) period 2009 to 2010, the SIPP captured 92 percent of SNAP receipt (Ratcliffe et al. 2016).

State-Level Policy and Economic Data

State-specific AFDC/TANF program rules come from the Welfare Rules and Transfer Income Model (TRIM3) databases,⁸ together with the *First Annual TANF Report to Congress* (HHS 1998). The Welfare Rules Database provides a detailed, longitudinal account of the changes in AFDC/TANF rules in all 50 states and the District of Columbia. It was built using AFDC State Plans and Waiver Terms and Conditions from before 1997 and caseworker manuals and state regulations from 1997 to the present; state staff verified much

⁶ We begin with the 1991 panel because it was the first to include a set of questions on material hardship outcomes.

⁷ The adult well-being topical module was administered in wave 6 of the 1991 panel, so the material hardship data begin in 1992.

⁸ TRIM3 is a comprehensive static microsimulation model that simulates the major governmental tax transfer and health programs that affect the US population.

of these data. TRIM3 data are used to supplement the Welfare Rules Database where needed. As discussed in the conceptual model, the AFDC/TANF rule included in the analysis is the maximum monthly benefit for a family of three.

State-specific SNAP rules come largely from the US Department of Agriculture's SNAP Policy Database. This database documents state Food Stamp Program rules for each month from January 1996 through December 2011. Federal documentation was used for years before 1996. This database was designed to capture variables hypothesized to affect SNAP participation and includes the SNAP rules discussed in our conceptual model: outreach spending per person with income less than 150 percent of the federal poverty line and all legal noncitizen adults eligible for federal benefits or state-funded food assistance.

Medicaid and SCHIP program rules come from the TRIM3 model. Program rules are available by state dating back to 1988. TRIM3 provides details about states' eligibility rules for adults and children as well as information on reporting periods and interactions with other programs (e.g., automatic Medicaid eligibility for AFDC/TANF recipients). In addition, the annual Maternal and Child Health updates from the National Governors Association provide information on age limits for Medicaid-covered children. Following Gruber and Simon (2008), these variables are combined to create a variable that measures the share of children eligible for public health insurance, given the state restrictions in place in a given year and month.

Our earned income tax credit (EITC) and minimum wage measures capture state and federal policies and not whether a member of the household received the EITC or minimum wage. These are control variables of interest and differ from our key endogenous explanatory variable: program participation in TANF, SNAP, or Medicaid/SCHIP. The EITC measure, which comes from the Urban-Brookings Tax Policy Center, is the maximum refundable credit available for a family with two children (federal and state combined). The minimum wage, which comes from the US Department of Labor and other sources, is captured by two separate variables: the minimum wage for jobs covered by the Fair Labor Standards Act (the "regular" minimum wage) and the wage for those not covered (the "subminimum" wage). Workers in jobs not covered by the regular minimum wage include those in small businesses, in businesses not involving interstate commerce, in seasonal or recreational jobs, and in

fishing operations, as well as executive, administrative, and professional employees.⁹ This is a contribution to a literature that focuses on the “regular” minimum wage. We also measure state-level economic conditions—unemployment rates, employment-population ratio, annual per capita income—and quarterly GDP.

Material Hardship Measures

We examine three material hardship measures: (1) the total number of hardships experienced, (2) food insufficiency, and (3) unmet medical need. The total number of hardships experienced is a multidimensional index of hardship, and as such it is a broader measure of well-being than our other two measures. Food insufficiency and unmet medical need are often considered outcomes of “intrinsic” importance, as they represent the inability to meet basic capabilities, or needs (Heflin 2017; Sen 1999). These two specific measures represent different dimensions of well-being, and while they may be positively correlated with each other, they have different causes and arise under different social and individual circumstances. For example, food insufficiency may result from a short-term income shortfall, such as a job loss, while unmet medical need might result from a catastrophic health crisis not easily addressed with just a little extra money and is affected by other constraints, such as the availability and affordability of insurance in an area (Heflin, Sandberg, and Rafail 2009).

Our food insufficiency measure is based on a single SIPP question that asks, “Which of these statements best describe the food eaten in your household in the last four months: (1) enough of the kinds of food we want; (2) enough but not always the kinds of food we want to eat; (3) sometimes not enough to eat; (4) often not enough to eat.” We classify households as having insufficient food if a household member responds sometimes or often not enough to eat. Our measure of food insufficiency is more basic and stringent than other common measures of food insecurity. For example, the Current Population Survey uses an 18-item food security module. According to the US Department of Agriculture, which uses the Current Population Survey data, 14.5 percent of the population was “food insecure” in 2011,

⁹ “Compliance Assistance - Wages and the Fair Labor Standards Act (FLSA),” US Department of Labor, accessed July 2017, <https://www.dol.gov/whd/flsa/index.htm>.

and 5.7 percent had “very low food security” (USDA 2017). As will be shown below, our measure corresponds more closely to the “very low food security” measure, as 6.1 percent of our study population met our threshold of food insufficiency. We focus on food insufficiency instead of food insecurity because food insecurity is not available in the SIPP data before 1998.¹⁰

We classify a household as having unmet medical or dental need if any household member reports needing to visit a doctor or a dentist in the past 12 months but did not go because of insufficient resources. Finally, we examine a multidimensional deprivation measure that uses information from the above items as well as additional ones. We count the number of times in the past 12 months a household faced any of the following hardships: a general report of not meeting essential expenses, inability to pay rent or mortgage, eviction, unpaid utility bills, utility service cut, phone service cut, unmet medical or dental need, and food insufficiency.¹¹ See the appendix for the survey questions.

Study Sample

Our study population is low-income households with children, defined as households with income below 200 percent of the official poverty threshold. We choose this level because it represents a common delineator of the low-income population (e.g., Boushey et al. 2001) and a common state-level threshold for Medicaid/SCHIP eligibility (though some states allow children in families with income up to 300 percent of the federal poverty level to enroll).

Too broad a population could wash out real effects. Examining the effect of income-tested program participation on the full population could lead one to conclude that programs have little or no effect on material hardship when their effect on the eligible population is actually large.

¹⁰ Food-insufficient households—those that cut back their food consumption because of a lack of money—are more similar to households with “very low food security” than the broader group of food-insecure households (defined by the US Department of Agriculture Economic Research Services). In the years we observe both food insecurity and food insufficiency in the SIPP, we find that low-income households with children are about three times more likely to experience food insufficiency than food insecurity. This is similar to the difference in rates of food insecurity and very low food security over the years covered by this study, which range from 2.6 to 3.4 times higher (Coleman-Jensen et al. 2017).

¹¹ One exception is food insufficiency, which is measured over the previous four months.

Empirical Model

Estimating the relationship between material hardship and program participation is complicated by the observed and unobserved differences between participants and nonparticipants. The two groups differ on factors such as other social policies they face (e.g., state minimum wage), economic conditions (e.g., unemployment rate), unobservable individual characteristics (e.g., taste for social programs or distaste for work), and unobservable state characteristics (e.g., public sentiment toward social program participants). Measuring the causal relationship between material hardship and program participation requires disentangling the effect of program participation on material hardship from these other factors.

We use a two-stage least squares dummy endogenous variable model (Heckman 1978) with instrumental variables and state-level fixed effects. Of course, IV estimates are only as valid as the instruments used to generate them. The ideal instruments will be (1) strongly correlated with program participation and (2) not otherwise related to our outcomes, given the additional covariates for which we control.

The instruments we use are four state policy variables that govern program eligibility, as described in the conceptual framework. These variables are set at the state level and are not controlled by any given sample member. Thus, at a minimum, it is reasonable to believe that the resulting IV estimates will be less biased asymptotically than standard ordinary least squares (OLS) estimates. Moreover, if the policy instruments meet the exclusion restriction (2) discussed above, we are able to estimate program effects consistently.

A concern remains if state policies depend on earlier economic outcomes; for example, if policymakers choose policies to address past material hardship. Qualitative evidence suggests that state policy changes were not implemented in response to changes in material hardship. For example, implementation analyses based on interviews with state agency staff suggest that TANF program rule changes were implemented to meet requirements of the Personal Responsibility and Work Opportunity Reconciliation Act, such as work participation requirements and caseload declines (Holcomb and Martinson 2002),

and more recent analyses suggest that states with similar economic contexts are responding differently in their TANF policy decisionmaking (Hahn et al. 2017).

Even if state policies do respond to lagged economic outcomes, this will not generally lead to overstating the impacts of participation. In particular, if program eligibility rules tend to be loosened, then participation would increase and the effect of participation watered down by participants who need the programs less and are less likely to benefit from them. The estimated effects from our IV model would likely be conservative. In addition, the state fixed effects in our model remove the cross-state source of this endogeneity.

Our empirical model is specified as follows:

$$Y_{ist} = \beta_1 \text{BenefitReceipt}_{ist} + \text{EITC}_{st} \gamma_1 + \text{MinWage}_{st} \gamma_2 + X_{ist} \gamma_3 + S_{st} \gamma_4 + \mu_s + \eta_t + \varepsilon_{ist} \quad (1)$$

The dependent variable Y is material hardship for household i in state s in month t .¹² Material hardship is a vector measuring our three dependent variables: number of hardships (0-9), food insufficiency (0/1), and unmet medical or dental need (0/1). The model is a two-stage model; we define the remaining variables after presenting the first-stage equation.

The first-stage equation is as follows:

$$\text{BenefitReceipt}_{ist}^* = Z_{st} \delta_1^T + X_{ist} \delta_2^T + S_{st} \delta_3^T + \mu_s^T + \eta_t^T + \varepsilon_{ist}^T \quad (2)$$

Our first-stage equation uses the variation across states and in the timing of different state policies to identify the effect of specific program rules on participation. As described above, states implemented different changes to their social programs at different times from 1992 to 2011. We use this variation across states and time to identify the effects of benefit receipt (program participation). A benefit of this 20-year time period is that it captures participation and material hardship during both strong and weak economies, allowing us to control for trends over time. Our analysis includes tests of the significance and validity of the first-stage instrumental variables (e.g., Bound, Jaeger, and Baker 1995).

¹² Our dependent variable (material hardship) is measured annually but for different periods for the four SIPP rotation groups. Aside from the annual EITC and quarterly GDP measures, all other variables are measured monthly and vary by month within year (to the extent policies and economic conditions change over time).

The coefficient on benefit receipt (β_1) captures the total effect of receiving TANF, SNAP, and/or public health insurance (Medicaid/SCHIP), including both the direct effect of participation as well as any indirect effect through changes in labor supply and work-related costs. In other words, our approach accounts for potential behavioral responses to the programs (e.g., working less, though the programs have work requirements). We measure the overall effect after accounting for these costs and responses.

The model assumes a single effect (or roughly the average effect) of these programs on material hardship over the nearly two decades examined. Future research could experiment with allowing the program effect to differ across observable dimensions, such as time. The vector Z_{st} represents the instruments that identify the model and includes the four specific state TANF, SNAP, and public health insurance program eligibility rules.

The remaining explanatory variables in the equations are drawn from the conceptual framework. Unlike benefit receipt, our EITC and minimum wage variables measure state and federal policies and not household participation in or receipt of either benefit. That is, these variables reflect state and federal choice, not household choice. Thus, we control for their endogeneity not with instrumental variables but with state fixed effects and year dummies that enable us to measure the effect of the policies on material hardship within a state over time and across states within year. The EITC and minimum wage variables are included in the model as control variables of interest.

X_{ist} is a vector of variables controlling for individual- and household-level demographic characteristics (age, race and ethnicity, gender, household structure, citizenship, educational attainment, and metropolitan status). To control for changes in the economy not captured by the fixed effects, we include a vector of variables (S) that controls for economic conditions (state unemployment rate, state per capita income, state employment-population ratio, and quarterly GDP). Appendix table A.3 provides summary statistics for the variables.

Finally, μ_s is the state fixed effect controlling for time-invariant unobservable heterogeneity (differences) across states, η_t is the year fixed effect controlling for unobservable heterogeneity across years, and ε_{ist} is the error term, which is assumed to be uncorrelated with the explanatory variables. We weight the models using SIPP weights to help account for attrition, nonresponse, and a complex sample design.

We adjust our standard errors for clustering by state using a conservative adjustment, which reduces the precision of our estimates and thus the statistical significance. Given that our primary treatment is at the household level (participation in program) and that our model includes state fixed effects, we should cluster our standard errors by state if there is heterogeneity in the treatment effect (Abadie et al. 2017). Assuming heterogeneity in our treatment effect, the standard clustering adjustment is conservative.¹³ Assuming no heterogeneity in our treatment effect, we do not need to cluster; our nonclustered robust standard errors and p-values are much smaller. For example, the 14.9 percentage point reduction in unmet medical or dental need as a result of TANF, SNAP, or Medicaid/SCHIP participation is statistically significant at the 5 percent level. (Not shown in results but available upon request.)

Results

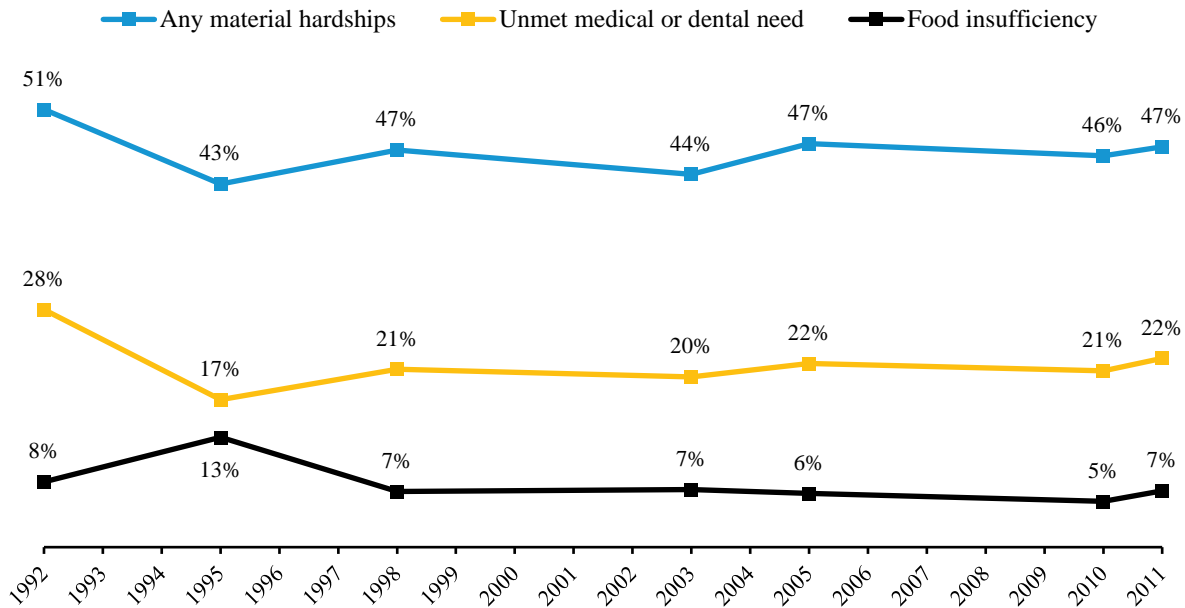
Descriptive Results

How prevalent is material hardship in the United States? The percentage of low-income families with children who experienced at least one hardship was at a high of 51 percent in 1992. It then declined to 43 percent in 1995, during the period when unmet medical need declined, and thereafter fluctuated between 44 and 47 percent. Although not shown in the figure, the average number of hardships our low-income population reported was at a high of 1.6 in 1992 before declining to the 1.2 to 1.3 range in all the following years. Nine was the maximum number of hardships a family reported in a year.

¹³ The standard Liang-Zeger cluster adjustment is conservative assuming heterogeneity in treatment effects because we (1) observe many (49) clusters from a large population of state clusters and (2) do not have a vanishing fraction of units in each sample clustered (Abadie et al. 2017).

Figure 1. Nearly Half of Low-Income Families with Children Experience Material Hardship

The share of low-income families with children experiencing material hardships, 1992–2011



Source: Survey of Income and Program Participation Adult Well-Being Topical Module data for 1992, 1995, 1998, 2003, 2005, 2010, and 2011.

Notes: Low-income households are those with income below 200 percent of the federal poverty level. All percentages are weighted. Any material hardship measure includes general report of not meeting essential expenses, inability to pay rent or mortgage, eviction, unpaid utility bills, utility service cut, phone service cut, unmet medical or dental need, and food insufficiency.

Among low-income families with children, 7 percent experienced food insufficiency in 2011, only slightly fewer than in 1992 (8 percent). It is difficult to definitively say why there has been very little change in food insufficiency during a period characterized by changing economic conditions, including the Great Recession of 2007–09. One possible reason for the flatness is the increased use of program benefits, such as SNAP, during economic downturns. For example, SNAP caseloads increased significantly from 2007 to 2013, during the recession and the period of slow recovery following it, before declining in 2014 and 2015 (Rosenbaum and Keith-Jennings 2016).

For unmet medical need, we see a substantial decline in the first few years of the period, from 28 percent in 1992 to 17 percent in 1995. This could reflect the expansion of Medicaid that was concentrated in the 1990–95 period (Ben-Shalom, Moffitt, and Scholz

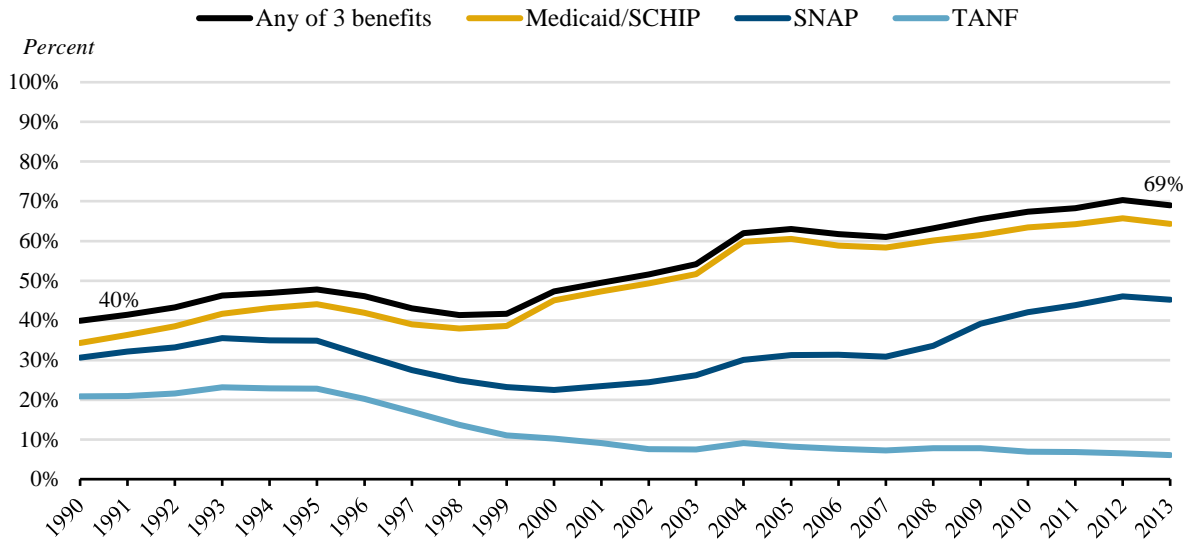
2012). Thereafter, unmet medical need increased modestly to 22 percent in 2011, perhaps reflecting steady increases in out-of-pocket medical care expenses (Centers for Disease Control and Prevention 2015).

A growing share of low-income families with children received assistance from at least one of the three programs (TANF, SNAP, or public health insurance) over time (figure 2a). For example, 69 percent of low-income families with children received benefits from at least one of these three programs in 2013, up from 40 percent in 1990. The growth was propelled mainly by increases in the percentage of people who reported receiving either Medicaid/SCHIP only or SNAP and Medicaid/SCHIP. TANF receipt among low-income families fell dramatically over the period (Center on Budget and Policy Priorities 2017). Figures 2b through 2d provide more detail on the combinations of program receipt. Specifically, figure 2b shows that 93 percent of TANF recipients in 2013 also received SNAP and Medicaid/SCHIP, and 77 percent of SNAP recipients (figure 2c) also received Medicaid/SCHIP but not TANF.¹⁴ The decline in the percentage of SNAP recipients receiving all three benefits is caused by the decline in TANF receipt in particular. Figure 2d shows that in 2013, 36 percent of Medicaid/SCHIP recipients received Medicaid/SCHIP only and 54 percent also received SNAP.

¹⁴ This is consistent with Kosar and Moffitt (2017). Our calculations based on their table 1 indicate their data show that 78 percent of nondisabled, nonelderly families with private income below 50 percent of the federal poverty level receiving SNAP also received Medicaid in 2004.

Figure 2a. Growth in Benefit Receipt Is Driven by Enrollment in Medicaid/SCHIP

Benefit receipt combinations among low-income families with children, 1990–2013

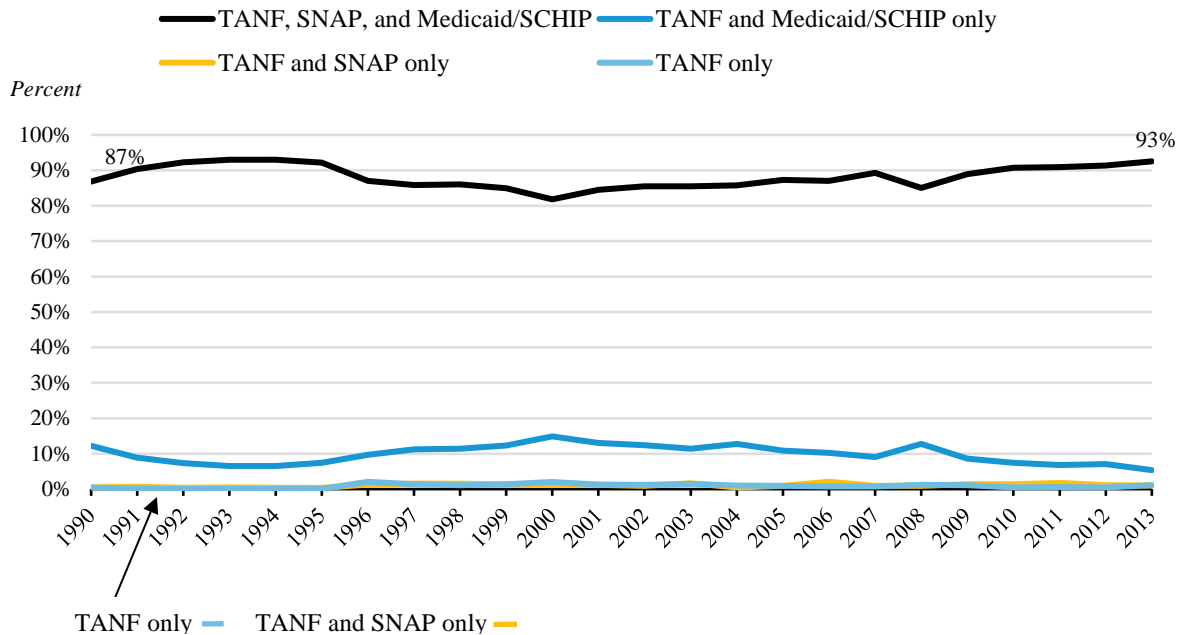


Source: Weighted Survey of Income and Program Participation data for 1990–2013.

Note: Low-income households are those with income below 200 percent of the federal poverty level.

Figure 2b. Most TANF Recipients Also Receive SNAP and Public Health Insurance

Benefit receipt combinations among TANF recipients, 1990–2013

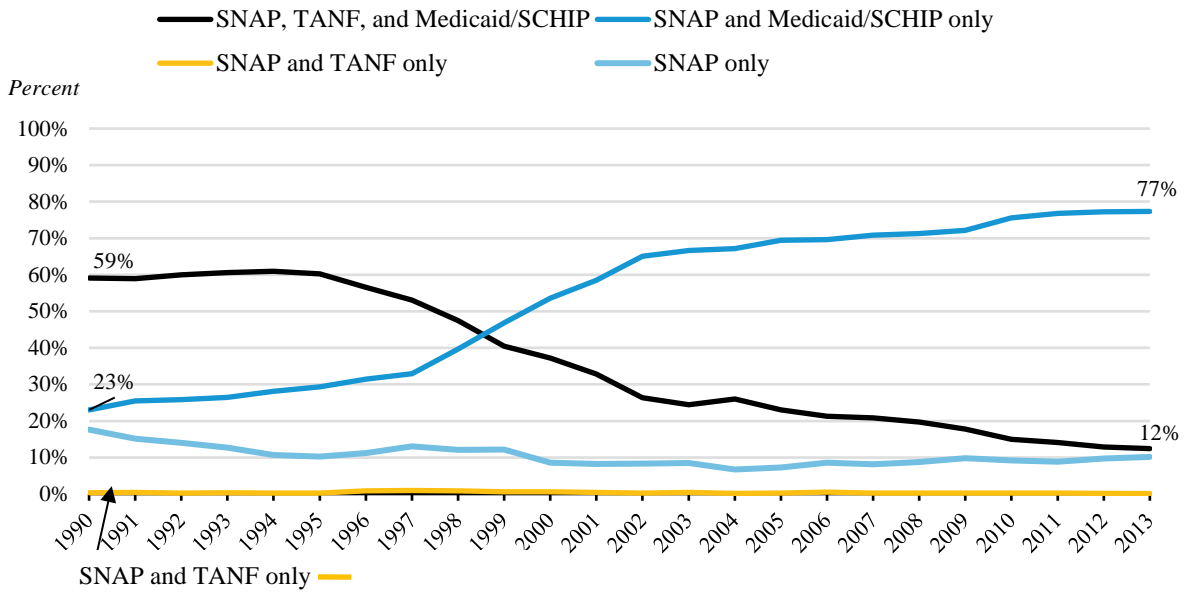


Source: Weighted Survey of Income and Program Participation data for 1990–2013.

Note: Low-income households are those with income below 200 percent of the federal poverty level.

Figure 2c. A Vast Majority of SNAP Recipients Receive Public Health Insurance but Not TANF

Benefit receipt combinations among SNAP recipients, 1990–2013

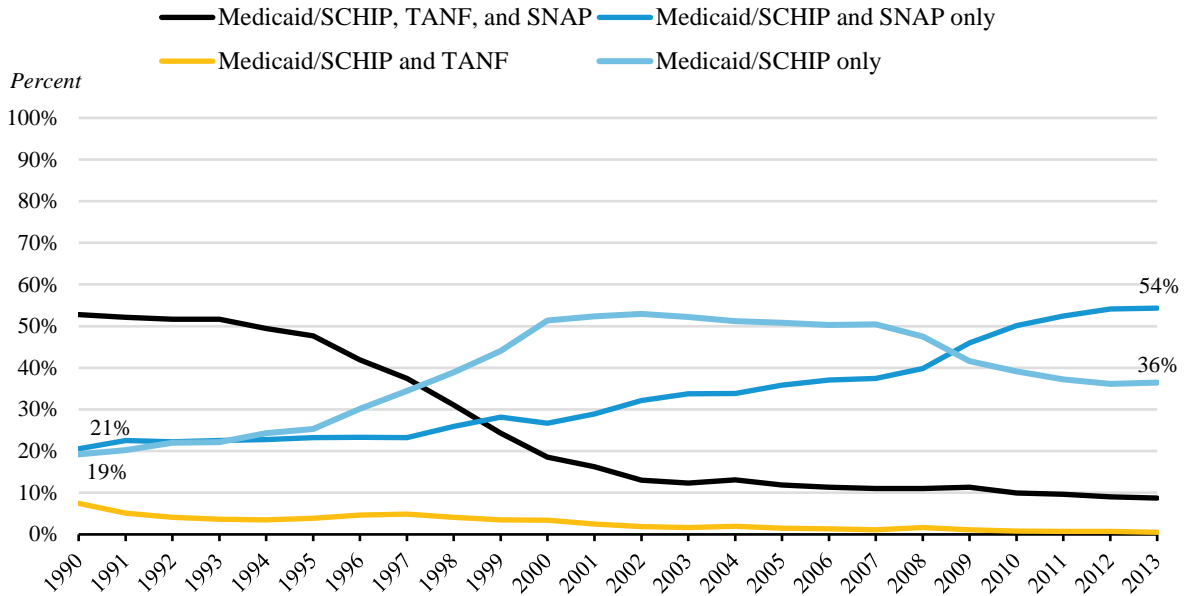


Source: Weighted Survey of Income and Program Participation data for 1990–2013.

Note: Low-income households are those with income below 200 percent of the federal poverty level.

Figure 2d. About Half of Public Health Insurance Recipients Receive Only Public Health Insurance

Benefit receipt combinations among public health insurance recipients, 1990–2013



Source: Weighted Survey of Income and Program Participation data in years for 1990–2013.

Note: Low-income households are those with income below 200 percent of the federal poverty level.

Multivariate Results

Does the safety net help decrease material hardship among low-income families with children? Our results suggest that receiving TANF, SNAP, or public health insurance reduces the number of material hardships (among the nine we measure) by 1.23 and food insufficiency by 18.4 percentage points (table 1). These estimates hold constant minimum wage and EITC policy changes over time. Number of hardships includes general report of not meeting essential expenses, inability to pay rent or mortgage, eviction, unpaid utility bills, utility service cut, phone service cut, unmet medical or dental need, and food insufficiency.

Table 1. Effect of Safety Net Programs on Material Hardship Among Low-Income Households with Children

Key explanatory variables	Number of Hardships			Food Insufficiency			Unmet Medical or Dental Need		
	OLS	2SLS	Change	OLS	2SLS	Change	OLS	2SLS	Change
Household receives TANF, SNAP, or public health insurance	0.629*** [0.055]	-1.226** [0.514]	-48%	0.045*** [0.004]	-0.184* [0.101]	-72%	0.076*** [0.011]	-0.149 [0.148]	-40%
Earned income tax credit (refundable state and federal, \$/100)	-0.001 [0.005]	0.007 [0.006]	1%	-0.002*** [0.001]	-0.001 [0.001]	-1%	-0.001 [0.001]	0.000 [0.001]	0%
Regular minimum wage (\$)	-0.012 [0.044]	-0.009 [0.048]	-1%	-0.008 [0.006]	-0.008 [0.006]	-10%	0.000 [0.011]	0.001 [0.011]	0%
Subminimum wage (\$)	-0.048*** [0.014]	-0.049*** [0.017]	-4%	-0.002 [0.001]	-0.002 [0.002]	-3%	-0.014*** [0.003]	-0.014*** [0.004]	-6%
Observations	92,966	92,966		94,202	94,202		93,930	93,930	

Sources: Weighted Survey of Income and Program Participation, state policy, and economic data for 1992, 1995, 1998, 2003, 2005, 2010, and 2011.

Notes: 2SLS = two-stage least squares, SNAP = Supplemental Nutrition Assistance Program, TANF = Temporary Assistance for Needy Families. Low-income households are those with income below 200 percent of the federal poverty level. Robust standard errors based on a conservative adjustment for clustering by state in brackets. Models also included controls for demographic characteristics (age, age squared, black non-Hispanic, Hispanic, other non-Hispanic, less than high school education, high school diploma only, associate’s degree only, single male-headed household, single female-headed household, some adults are not US citizens, no adults are US citizens, metropolitan area, number of adults in household, number of children in household), economic characteristics (state unemployment rate, state per capita income, employment-to-population ratio, US quarterly GDP), and state and year fixed effects. Instrumental variables in two-stage least squares models are TANF maximum monthly benefit for a family of three, SNAP outreach spending per person with income below 150 percent of the federal poverty line, all legal noncitizen adults eligible for SNAP, and share of children eligible for public health insurance.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

State and federal minimum wage and EITC policies can also have important implications for family well-being and occurrences of hardship. We find evidence that a \$1 increase in the minimum wage (but not the EITC) reduces material hardship by 1.4 to 4.9 percentage points among low-income families with children. This estimate does not capture the effect of a family receiving the minimum wage or EITC but the state’s generosity regardless of whether the family receives either benefit. These are average reductions across the 1992–2011 period; 2011 is the latest year with SIPP data for our three material hardship measures.

TANF, SNAP, and public health insurance participation empirical findings

Overall, we find the direct benefits of participating in the three income-tested programs outweigh any potential indirect negative behavioral effects for our material hardship measures. Participating in one of these three programs reduced the total number of hardships by 1.23 (48 percent) from June 1992 to July 2011. The total number of hardships include a general report of not meeting essential expenses, inability to pay rent or mortgage, eviction, unpaid utility bills, utility service cut, phone service cut, unmet medical or dental need, and food insufficiency. No study we are aware of has estimated the effect of multiple program receipt on these outcomes.

Receiving TANF, SNAP, or public health insurance reduces food insufficiency by 18.4 percentage points (72 percent, table 1).¹⁵ This effect is large, but given the large standard error that accompanies it, we should not put too much emphasis on the magnitude. This result restricts the effect to be the same across low-income households with children. Also, if the program participation classification error is correlated with our state policy instruments, then this reporting error could impact our estimated effect.

Our 18.4 percentage point measured effect is large, but it is consistent with earlier studies that find SNAP receipt alone reduces food insecurity by 12.8–16.8 percentage points (Kreider et al. 2012; Ratcliffe, McKernan, and Zhang 2011; Shaefer and Gutierrez 2013) and food insufficiency by 6–11 percentage points (Gundersen, Kreider, and Pepper 2017). We expect that participation in any of the three programs (our measure) will have a larger effect than participation in one of the programs because of their interactive effects. Though given that families typically participate in more than one program, studies measuring participation in just one program may be picking up the effects of multiple programs.

Schmidt, Shore-Sheppard, and Watson's (2016) smaller estimate that being eligible for \$1,000 in potential TANF, Supplemental Security Income, EITC, food assistance, and Medicaid benefits reduces low food security by 1.1 percentage points is not directly comparable partly because it measures benefit eligibility and not receipt. Many eligible

¹⁵ Our percentage change estimates calculate what material hardship would have been in the absence of the programs.

households do not take up benefits. In the years covered by their study, only 48–72 percent of eligible households participated in SNAP (Gray and Cunnyngham 2014).

Our estimate of a 14.9 percentage point reduction in unmet medical or dental need is not statistically significant in our conservative standard error estimate (Abadie et al. 2017). In interpreting this result, it is important to keep in mind that public health insurance expansions targeted to children might be missed in our models, which capture unmet medical or dental need of both parents and children (i.e., the entire household). That is, significant declines in unmet medical or dental need for children could be obscured because parents, and thus the household, still have unmet needs.

A comparison of the TANF, SNAP, or public health insurance receipt coefficients from the OLS and two-stage least squares models suggests that controlling for selection into the programs is important in disentangling their effect on material hardship (table 1). The OLS model that does not control for the endogeneity of program receipt shows that participation is associated with increased material hardship whether measured by the total number of hardships low-income families with children experience, food insufficiency, or unmet medical or dental needs. The intuition is that the OLS estimates do not control for selection (i.e., who participates) and so are picking up that people who need help and are experiencing higher levels of material hardship are more likely to participate in the programs. In short, the programs are helping households in need. The sign flips in the two-stage least squares model after controlling for this selection of households in need participating in the programs. The two-stage least squares model controls for the fact that the programs are helping people in need and shows that program receipt reduces hardship.

EITC and minimum wage policy effect empirical findings

We find no evidence that the EITC affects the likelihood of experiencing material hardship. This is surprising given that research shows the EITC increases employment (Grogger 2003; Nichols and Rothstein 2015). So why do we find no reduction in hardship? Perhaps hardship is most concentrated among people who are not on the margin of employment. Or perhaps, as mentioned above, costs associated with increased employment, such as paying for child care,

increase hardship.¹⁶ Or perhaps the EITC does not vary enough across states to identify an effect. Even if we do not find positive impacts here, positive impacts elsewhere in the literature (e.g., employment and earnings) suggest more research is needed.

Examining the contemporaneous effect of the minimum wage on material hardship, we find evidence that increases in the minimum wage reduce material hardship. A \$1 increase in the subminimum wage is estimated to decrease the number of hardships experienced by 4 percent and the likelihood of unmet medical or dental need by 6 percent. We find no statistically significant effect on food insufficiency. In their review of the literature, Gundersen and Ziliak (2018) conclude that, at least for one measure of material hardship (food insecurity), the impact of an increase in the minimum wage is unclear. These findings are consistent with several studies that find that increases in the minimum wage reduce poverty (Acs et al. 2014; CBO 2014; Dube 2013), although the finding is not universal, as Neumark and Wascher (2007) find that increases in the minimum wage increase poverty.

As discussed above, the validity of our IV model depends on the quality of the instruments. Using Hansen's *J*-test, we conclude that the instruments are exogenous (we do not reject the null hypothesis that the instruments are exogenous, $p = 0.0093$). Using the Kleibergen-Paap statistic, we test whether the IVs identify the model and reject the null hypothesis that the model is underidentified ($p = 0.0011$). A joint test for significance of the four instruments indicates that they are jointly significant at the 1 percent level ($F(4,48) = 17.46$, $p = 0.000$), though some of the instruments are individually insignificant. All instrumental variables are of the expected sign (i.e., program participation increases with more generous or lenient eligibility rules). See appendix table A.1 for the first-stage regression results.

Many demographic characteristics (but only a few economic characteristics) are important determinants of material hardship after controlling for state and year fixed effects

¹⁶ The once-a-year payout of the EITC may further explain why we find no decline in the likelihood of experiencing material hardship. Changes in how EITC recipients meet their needs (e.g., medical care) and pay their bills throughout the year could lead to unmet need during the year that gets resolved when the tax refund arrives.

(appendix table A.2). For example, households with limited education are more likely to experience hardship than households with four years of college or more. Both single female-headed and, to a lesser extent, single male-headed families are more likely to experience overall hardship and food insufficiency (but not necessarily unmet medical or dental need) than households with two adults. Interestingly, households where some but not all adults are US citizens are less likely to experience overall hardship than households where all adults are US citizens. A stronger economy, as measured by higher state per capita income and US quarterly GDP, reduces food insufficiency.

Conclusion

Our evidence that the US safety net's TANF, SNAP, and public health insurance programs reduced material hardship among low-income families with children by 48 percent over the past quarter century suggests that the basic needs of families would be at risk should these safety net programs be cut. We have not yet eradicated hardship in America. Food insufficiency, unmet medical and dental need, and the inability to pay basic bills hurt families today and tomorrow. That is not to say the programs cannot be improved. For example, see Bitler and Hoynes (2016) for a proposal to make TANF a successful safety net program again that responds to the business cycle and helps families in the most need while preserving its emphasis on encouraging work.

Our study highlights the importance of examining the effect of programs not just on the official poverty measure, as many previous studies have done, but also on indicators of material hardship. After all, many of the programs we analyzed might have a particularly large impact on material hardship because some of them, such as SNAP and public health insurance, are specifically intended to reduce hardships such as food insufficiency and unmet medical need. In addition, the receipt of SNAP, public health insurance, and the EITC are not captured in the official poverty measure, as the indicator of resources in that measure does not include many noncash or near-cash benefits. Indeed, our empirical results confirm the substantial effects of many of these programs on the material hardships experienced by US households.

Safety net programs are not just good for families in tough times; they can also be good for the economy. When program spending increases during a recession and puts money in the hands of low-income families (as well-targeted, automatically stabilizing safety net programs should), people with low incomes are more likely to spend money and stimulate the economy. Evidence from the Great Recession suggests the biggest “bang for the buck” comes first from safety net spending programs such as Medicaid, SNAP, and unemployment insurance (Blinder 2016; Schanzenbach et al. 2016), then from tax cuts to people with low incomes. Tax cuts benefiting businesses had less of an effect.

We find increases in the regular minimum wage had no effect on material hardship, but our results do suggest that increasing the subminimum wage to the regular minimum wage level would reduce the number of hardships and the unmet medical or dental need families experience. We find no evidence that increases in the EITC reduce material hardship. Moving from a system where the EITC is only available once a year to one that makes it easy for taxpayers to access the EITC multiple times throughout the year could improve its ability to reduce hardship. Even with this change, the EITC would not help when work is unavailable or people are sick and unable to work. An improved TANF program could fill these gaps (Bitler and Hoynes 2016).

In short, while many commentators point to the persistence of poverty and hardship as evidence that safety net programs do not work and are a waste of taxpayer dollars, our analysis suggests that hardship would be even more prevalent without such programs. One reason for this is that economic growth has been uneven over the past two and a half decades, and that growth was punctuated by a devastating recession. Income and wealth inequality have risen markedly since the early 1970s (McKernan et al. 2015; Piketty and Saez 2003). This has put additional strain on low-income families whose wages have largely stagnated even as the cost of many basic needs, such as housing and health care, have risen substantially. Thus, efforts to reduce poverty and material hardship are occurring at a time when macroeconomic forces are working against them.

As a first look at the joint effects of multiple safety net programs on multiple measures of material hardship, this research raises additional questions for future research. How have the program effects changed over time as the programs and policies changed? Do

the effects differ according to the time periods measured (e.g., 1990s, 2000s, 2010s)? What are joint programs' effects on poverty, deep poverty, and the poverty gap? And what are the independent effects of the programs? Disentangling the individual program effects is complicated because most households that receive TANF also receive SNAP and health insurance, and most people who receive SNAP also receive public health insurance.

Appendix. Material Hardship and Benefit Receipt Questions from the SIPP Survey

Material Hardship

1. During the past 12 months, has there been a time when you did not meet all of your essential expenses (e.g., mortgage or rent payments, utility bills, or important medical care)? (yes/no)
2. Was there any time in the past 12 months when you did not pay the full amount of the rent or mortgage? (yes/no)
3. In the past 12 months, were you evicted from your home or apartment for not paying the rent or mortgage? (yes/no)
4. Was there a time in the past 12 months when you did not pay the full amount of the gas, oil, or electricity bills? (yes/no)
5. In the past 12 months, did the gas or electric company turn off service or the oil company not deliver oil? (yes/no)
6. Was there a time in the past 12 months when the telephone company disconnected service because payments were not made? (yes/no)
7. In the past 12 months, was there a time you needed to see a doctor or go to the hospital but did not go? (yes/no)
8. In the past 12 months, was there a time you needed to see a dentist but did not go? (yes/no)
9. Getting enough food can also be a problem for some people. Which of these statements best describes the food eaten in your household in the last four months?
 - » Enough of the kinds of food we want
 - » Enough but not always the kinds of food we want to eat
 - » Sometimes not enough to eat
 - » Often not enough to eat

Program Receipt

1. Did you receive any public assistance payments such as AFDC or TANF in this month? (yes/no)
2. Did you receive income from food stamps in this month? (yes/no)
3. Were you covered by Medicaid in this month? (yes/no)
 - » Set as no for people also covered by Medicare or military to isolate Medicaid/SCHIP.

Table A.1. First-Stage Regression: Linear Probability Model Estimates

Explanatory variable	Household Receives Public Health Insurance, SNAP, or TANF (0/1)	
	Coefficient	Robust SE
Instruments: State TANF, SNAP, and public health insurance rules		
Share of children eligible for public health insurance	0.244***	0.031
SNAP outreach spending per person income <150% poverty	0.175**	0.086
SNAP all legal noncitizen adults eligible	0.030	0.019
TANF maximum monthly benefit for family of three (\$/100)	0.012	0.011
Related Policies		
EITC (refundable state and federal, \$/100)	0.004***	0.001
Regular minimum wage (\$)	-0.015	0.015
Subminimum wage (\$)	0.003	0.004
Demographic Characteristics		
Age (years)	-0.024***	0.002
Age (squared)	0.000***	0.000
<i>Race/Ethnicity (Omitted: White, non-Hispanic)</i>		
Black non-Hispanic (0/1)	0.129***	0.011
Hispanic (0/1)	0.067*	0.035
Other non-Hispanic (0/1)	0.079***	0.013
<i>Educational Attainment (Omitted: four Years of college or more)</i>		
Less than high school education (0/1)	0.261***	0.014
High school diploma only (0/1)	0.147***	0.011
Associate's degree/two years' education only (0/1)	0.079***	0.013
<i>Household Structure (Omitted: Two adult-headed household)</i>		
Single male-headed household (0/1)	0.082***	0.014
Single female-headed household (0/1)	0.253***	0.01
<i>Citizenship (Omitted: All adults are US citizens)</i>		
Some but not all adults are US citizens (0/1)	0.002	0.020
No adults are US citizens (0/1)	0.025	0.021
Metropolitan area (0/1)	-0.027**	0.013
Adults in household (#)	0.021***	0.005
Children in household (#)	0.042***	0.004

Economic Characteristics

State unemployment rate	-0.004	0.004
State per capita income (\$/1000)	-0.006*	0.003
State employment-to-population ratio	-0.237	0.451
US quarterly GDP (\$/1000)	-0.01	0.017

Sources: Weighted Survey of Income and Program Participation, state policy, and economic data for 1992, 1995, 1998, 2003, 2005, 2010, and 2011.

Notes: EITC = earned income tax credit, SNAP = Supplemental Nutrition Assistance Program, TANF = Temporary Assistance for Needy Families. Low-income households are those with income below 200 percent of the federal poverty line. Standard errors are adjusted for clustering by state. Model also included controls for state and year fixed effects. A joint test for significance of the four instruments indicates that they are jointly statistically significant at the 1 percent level ($F(4,48) = 17.46, p = 0.000$).

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table A.2. Effect of Safety Net Programs on Material Hardship: Two-Stage Least Squares Estimates

Explanatory variable	Total Number of Hardships		Food Insufficiency		Unmet Medical or Dental Need	
	Coefficient	Robust SE	Coefficient	Robust SE	Coefficient	Robust SE
TANF, SNAP, or public health insurance	-1.226**	0.514	-0.184*	0.101	-0.149	0.148
Related Policies						
EITC (refundable state and federal, \$/100)	0.007	0.006	-0.001	0.001	0.000	0.001
Regular minimum wage (\$)	-0.009	0.048	-0.008	0.006	0.001	0.011
Subminimum wage (\$)	-0.049***	0.017	-0.002	0.002	-0.014***	0.004
Demographic Characteristics						
Age (years)	-0.007	0.015	-0.002	0.003	0.001	0.004
Age (squared)	0.000	0.000	0.000	0.000	0.000	0.000
<i>Race (Omitted: White, non-Hispanic)</i>						
Black non-Hispanic (0/1)	0.208**	0.094	0.023	0.015	-0.038*	0.023
Hispanic (0/1)	0.078	0.063	0.031***	0.008	-0.031***	0.012
Other non-Hispanic (0/1)	-0.048	0.085	0.010	0.01	-0.030*	0.017
<i>Educational Attainment (Omitted: four Years of college or more)</i>						
Less than high school education (0/1)	0.707***	0.146	0.102***	0.029	0.073*	0.041
High school diploma (0/1)	0.459***	0.084	0.055***	0.015	0.047**	0.023
Associate's degree/two years' education (0/1)	0.456***	0.056	0.037***	0.01	0.062***	0.012
<i>Household Structure (Omitted: Two adult-headed household)</i>						
Single male-headed household (0/1)	0.138*	0.073	0.024**	0.012	-0.007	0.015
Single female-headed household (0/1)	0.628***	0.125	0.091***	0.026	0.058	0.036
<i>Citizenship (Omitted: All adults are US citizens)</i>						
Some but not all adults are US citizens (0/1)	-0.221***	0.059	-0.015	0.010	-0.019	0.013
No adults are US citizens (0/1)	-0.181***	0.06	0.005	0.007	0.003	0.013
Metropolitan area (0/1)	0.046	0.056	0.002	0.007	-0.017	0.014
Adults in household (#)	0.042	0.027	0.006	0.004	0.011**	0.005
Children in household (#)	0.106***	0.026	0.012**	0.005	0.007	0.006
Economic Characteristics						
State unemployment rate	0.027	0.022	0.000	0.002	-0.002	0.004
State per capita income (\$/1000)	-0.022	0.019	-0.003**	0.002	-0.007*	0.004
Employment-to-population ratio	0.507	1.846	0.363*	0.196	-0.235	0.516
US GDP (\$/1000)	-0.111	0.085	-0.025**	0.01	-0.027	0.023

Observations

92,966

94,202

93,930

Sources: Survey of Income and Program Participation, state policy, and economic data for 1992, 1995, 1998, 2003, 2005, 2010, and 2011.

Notes: EITC = earned income tax credit, SNAP = Supplemental Nutrition Assistance Program, TANF = Temporary Assistance for Needy Families. Low-income households are those with income below 200 percent of the federal poverty line. Models also included controls for state earned income disregard for benefit computation policy and state and year fixed effects. The unit of observation is a household-month. Standard errors based on a conservative adjustment for clustering by state. Instrumental variables are jointly statistically significant at the 1 percent level ($F=17.46$, $p = 0.00$) and include the TANF maximum monthly benefit for a family of three, SNAP outreach spending per person with income below 150 percent of the federal poverty line, SNAP all legal noncitizen adults eligible, and the share of children eligible for public health insurance. Total number of hardships includes up to nine hardships: (1) general report of not meeting essential expenses, (2) inability to pay rent or mortgage, (3) eviction, (4) unpaid utility bills, (5) utility service cut, (6) phone service cut, (7) unmet medical need, (8) unmet dental need, and (9) food insufficiency.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table A.3. Summary Statistics

Variables	Mean	Std. Dev.	Min	Max
Dependent Variables				
Food insufficiency	0.073	0.260	0	1
Unmet medical or dental needs	0.221	0.415	0	1
Total number of hardships	1.342	1.811	0	9
Key Explanatory Variables				
Household receives TANF, SNAP, or public health insurance (0/1)	0.528	0.499	0	1
EITC (refundable state and federal, \$/100)	46.666	14.122	22.980	75.319
Regular minimum wage (\$)	5.582	1.318	4.250	8.670
Subminimum wage (\$)	3.428	2.785	0.000	8.250
Instruments: state TANF, SNAP, and public health insurance rules				
TANF maximum monthly benefit for family of three (\$/100)	5.323	2.354	1.715	13.192
SNAP outreach spending per person income <150% poverty	0.019	0.050	-0.059	0.500
SNAP all legal noncitizen adults eligible	0.458	0.498	0	1
Share of children eligible for public health insurance	0.399	0.174	0.000	0.819
Demographic Characteristics				
Age (years)	37.732	10.550	16	87
Age (squared)	1535.041	921.261	256	7569
<i>Race/Ethnicity</i>				
(Omitted) White non-Hispanic	0.561	0.496	0	1
Black non-Hispanic (0/1)	0.217	0.412	0	1
Hispanic (0/1)	0.166	0.372	0	1
Other non-Hispanic (0/1)	0.056	0.230	0	1
<i>Educational Attainment</i>				
Less than high school education (0/1)	0.229	0.420	0	1
High school diploma only (0/1)	0.344	0.475	0	1
Associate's degree/two years' education only (0/1)	0.239	0.427	0	1
(Omitted) Four years of college or more	0.187	0.336	0	1
<i>Household Structure</i>				
(Omitted) Two adult-headed household	0.576	0.494	0	1
Single male-headed household (0/1)	0.047	0.212	0	1
Single female-headed household (0/1)	0.376	0.484	0	1
<i>Citizenship</i>				
(Omitted) All adults are US citizens	0.820	0.384	0	1
Some but not all adults are US citizens (0/1)	0.066	0.248	0	1
No adults are US citizens (0/1)	0.114	0.318	0	1
Metropolitan area (0/1)	0.755	0.430	0	1
Adults in household (#)	1.877	0.821	1	9
Children in household (#)	2.182	1.168	1	11
Economic Characteristics				
State unemployment rate	7.072	2.274	2.000	14.500
State per-capita income (\$/1000)	38.927	6.056	24.597	76.741
State employment-to-population ratio	0.463	0.028	0.382	0.559
US quarterly GDP (\$/1000)	13.662	2.010	10.780	16.142

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