Do Minimum Wage Increases Really Reduce Public Assistance Receipt?*

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Abstract

Advocates of minimum wage increases claim that an unintended benefit of such hikes is a reduction in means-tested public program participation. Using three decades of data from the Current Population Survey, the Survey of Income and Program Participation (SIPP), and the National Income and Product Accounts (NIPA), this study comprehensively examines the effect of minimum wage increases on five large means-tested public programs. We conclude that recent evidence in support of minimum wage-induced declines in public assistance is based on empirical models that conflate minimum wage effects with effects of the state business cycle and fail falsification tests. Results from more credible specifications show that minimum wage increases are largely ineffective at reducing net program participation. Our findings are more consistent with minimum wage-induced income redistribution whereby minimum wages decrease the probability of welfare take-up for some low-skilled individuals, but decreases the probability of welfare exit for others.

Keywords: minimum wage; welfare expenditures; means-tested public assistance

I. Introduction

> "There are so many very low-wage workers, and we pay for huge social welfare programs for them. [Raising the minimum wage] would save something on the order of tens of billions of dollars. Doesn't it make more sense for employers to pay their workers than the government?" -Republican Senatorial Candidate Ron Unz, *New York Times* (2013)

Policymakers advocating higher minimum wages have long touted their potential to reduce poverty (Roosevelt 1937; Clinton 1996; Obama 2013), but in an attempt to broaden political support to include economic conservatives, advocates now claim that higher minimum wages will reduce low-skilled individuals' participation in and taxpayers' spending on means-tested public assistance programs (Sanders 2016; Courtney 2014; McGovern 2014). In addition, minimum wage-induced reductions in government spending could result in fewer distortionary taxes, which would provide an efficiency rationale for minimum wage increases.

The effect of minimum wage increases on means-tested program participation is theoretically ambiguous. If minimum wage hikes increase the earnings of individuals living in poor or near-poor families (Congressional Budget Office 2014; Dube 2013; Neumark and Wascher 2002), earnings gains may render these individuals ineligible for means-tested public programs. In addition, earnings gains among public assistance recipients could reduce benefits received during the phase-out portion of income eligibility. On the other hand, if minimum wage increases induce adverse labor demand effects (Thompson 2009; Neumark and Wascher 2008; Neumark et al. 2014; Sabia et al. 2016; Clemens and Wither 2016), then some low-skilled individuals will be eligible for means-tested programs, increasing participation rates. On net, minimum wages may simply redistribute program participation among eligible and near-eligible individuals.

Moreover, the effects of minimum wage increases on means-tested programs may differ across (i) programs with heterogeneous eligibility requirements (both income eligibility thresholds and work requirements), (ii) states with heterogeneous policy rules, and (iii) across time as policy reforms change eligibility requirement rules or the business cycle impacts job opportunities.

Two recent highly influential studies by West and Reich (2014; 2015) find that minimum wage increases are associated with reductions in participation in the Supplemental Nutrition Assistance Program (SNAP) and Medicaid, with estimated program participation elasticities with respect to the minimum wage ranging from -0.2 to -0.4. However, the identification strategies employed in these studies – identifying state minimum wage changes off of a state-specific linear time trend or using control states within the same census division – have received substantial criticism in the minimum wage-employment literature. Neumark et al. (2014a,b) argue that this approach eliminates potentially valid sources of identifying variation, leaving "contaminated" variation that obscures adverse employment effects of minimum wages. Masking employment effects could negatively bias program participation elasticities.

Using survey and administrative data over three decades, we comprehensively evaluate the effectiveness of the minimum wage as a welfare reform policy across several means-tested public programs including the Supplemental Nutrition Assistance Program (SNAP), Medicaid, Housing Assistance programs (e.g. Section 8 housing), Temporary Assistance for Needy Families (TANF/AFDC), and the Special Supplemental Nutrition Program for Women, Infants and Children (WIC).

We highlight three major findings. First, while we can replicate the findings of West and Reich (2015; 2014) showing that minimum wage increases are associated with a reduction in program participation, we also show that the models upon which these results are based fail a

number of falsification tests. Results from more credible specifications show that minimum wage increases are largely ineffective at reducing net program participation. Second, an examination of longitudinal data shows evidence of minimum wage-induced income redistribution caused by adverse employment effects, whereby some welfare recipients who see income gains are more likely to exit the welfare rolls, but other non-recipients who lose their jobs are more likely to join the rolls due to a reduction in job opportunities. Finally, we find little evidence that minimum wage hikes reduce welfare caseloads or public expenditures on needs-based public programs, and appear least effective during economic downturns. We conclude that the most convincing evidence points to little evidence that minimum wage increases are an ineffective welfare reform policy.

II. Prior Literature on Minimum Wages and Program Participation

The effectiveness of higher minimum wages in reducing means-tested program participation depends on the distribution of earnings and employment effects of minimum wages as well as how well targeted minimum wages are to those who qualify for assistance. The prior literature on this topic is much thinner than the extensive (and controversial) minimum wage-employment literature (Card and Krueger 1995; Neumark and Wascher 2008; Sabia 2008; Dube et al. 2010; Allegretto et al. 2011; Neumark et al. 2014a,b; Meer and West 2013; Clemens and Wither 2016), and the findings do not reach a consensus.

One set of studies uses survey data from the Survey of Income and Program Participation (SIPP), and nearly all focus on the Temporary Assistance for Needy Families/Aid to Families with Dependent Children (TANF/AFDC) program. Using data from the 1986 to 1988 SIPP panels and a difference-in-difference approach, Brandon (1995) finds that higher minimum wages are associated with a reduction in the probability of exit from AFDC, consistent with

adverse labor demand effects. An update using data from the 1996 to 2004 SIPP produces a similar pattern of results (Brandon 2008). However, SIPP-based results from shorter panels reach different conclusions. Using data from the 1990 and 1991 panels of the SIPP, Turner (1999) find that minimum wage increases are associated with an increase in the probability of welfare exit. And, in a study of the Great Recession period, Clemens (2015) finds little evidence that minimum wage increases affect social insurance payments. Together findings underscore potential heterogeneous effects of minimum wages in relatively short panels (Baker et al. 1999; Page et al. 2005), which may suggest that minimum wages have different effects (i) at different phases of the business cycle (Sabia 2014a), and (ii) due to changes in program eligibility that may affect the likelihood that minimum wages bind for welfare recipients (Sabia and Nielsen 2015).

A second set of studies has used aggregate state-level administrative data to estimate the effect of minimum wage increases on welfare use, again tending to focus on TANF/AFDC. Using data from 1976 to 1998 and a difference-in-difference approach, a Council of Economic Advisers (1999) study finds that minimum wage increases were associated with a reduction in AFDC caseloads. However, using data from 1983 to 1996, Page et al. (2005) reach the opposite result: a 10 percent increase in the minimum wage is associated with a 1 to 2 percent increase in welfare caseloads. The authors show that (i) the treatment of state-specific time trends and (ii) the time period chosen for the analysis, explain differences in their findings from that of the Council of Economic Advisers.[1,2]

[1] Consistent with Neumark et al. (2014a; 2014b), the pattern of findings suggests that controls for state-specific linear time trends may conflate minimum wage effects with effects of the state business cycle.
[2] While not specifically exploring the effects of minimum wage increases on welfare caseloads, Grogger (2003) uses the minimum wage as a control variable in estimating the effects of other policies on welfare caseloads. Grogger finds a statistically insignificant positive effect.

The final set of studies are based largely on survey data from the Current Population Survey (CPS). These studies have focused on Medicaid and the Supplemental Nutrition Assistance Program (SNAP, formerly known as food stamps). Using data from the 1990 to 2012 March CPS, West and Reich (2015) estimate a difference-in-difference model fully saturated with controls for state-specific linear time trends and census division-specific year effects. They obtain SNAP participation elasticities with respect to the minimum wage of -0.24 and -0.32. Then, drawing data from the National Income and Product Accounts (NIPA) and an identical identification strategy, they estimate a SNAP expenditure elasticity with respect to the minimum wage of -0.19. West and Reich (2014) find a similar pattern of results when estimating the effect of minimum wage hikes on Medicaid participation using an identical identification strategy.

The findings by West and Reich (2014; 2015) have been extremely influential in recent policy debates over the minimum wage as an effective welfare reform. But the specifications upon which these studies reached their conclusion been the subject of substantial empirical criticism in the minimum wage-employment literature. Neumark et al. (2014a; 2014b) argues that the inclusion of controls for state-specific linear time trends not only "throws the baby out with the bathwater" in terms of the amount of identifying variation, but also isolates identifying variation that is "contaminated" in such a way as to conflate estimated minimum wage effects with effects of the state business cycle. These authors also show that states within census divisions do not uniformly serve as better counterfactuals for "treatment states" that increase their minimum wages. Neumark et al. (2014a,b) show convincingly that the chief consequence of specification preferred by West and Reich (2015; 2014) is to obscure negative employment effects of minimum wage increases.[3] Obscuring adverse employment effects could explain why

[3] Using an alternate form of identification, a new working paper by Clemens and Wither (2016) exploits changes in the 2008-2009 Federal minimum wage and initial (2008) state minimum wage levels to identify the effect of minimum wage increases on low-skilled employment. They find that the 30 percent increase in the average minimum wage was associated with a 0.7 percentage-point reduction in the employment-to-population ratio.

West and Reich (2015; 2014) find such large reductions in program participation and public expenditures following minimum wage increases.

Taken together, differences in findings across prior studies can be explained, in part, by differences in the (i) sources of identifying variation, (ii) particular time periods examined (often short windows), (iii) specific public program examined, and (iv) datasets employed. The current study contributes to the above literature by comprehensively examining the effects of minimum wage increases on means-tested program participation across public programs, data sources, identification strategies, and phases of the business cycle. We hold the findings by West and Reich (2014; 2015) up to falsification tests by examining whether their specification produces evidence of minimum wage-induced reductions in welfare use among households that could not have been plausibly affected by minimum wages. Finally, we examine whether minimum wage increases affect net government spending on means-tested public programs.

III. Means-Tested Programs

One of the distinguishing features of this study is that we explore a wide breadth of means-tested public benefit programs. Because eligibility standards differ across programs, as well as across states and over time, we evaluate possible heterogeneous impacts of minimum wages across these dimensions.

The SNAP program, administered by the United States Department of Agriculture (USDA), is the largest nutrition assistance program in the U.S. In 2014, 46.5 million Americans received SNAP benefits, with an average per month benefit level of $125.35 (USDA 2015a). Federal eligibility requires gross monthly household income to be below 130 percent of the Federal poverty threshold (FTP) and permits households to have no more than $2,250 in "countable resources." Other means-tested benefits such as TANF/AFDC or Supplemental

Security Income (SSI) are not counted against household income.[4] In prior decades, many states included vehicle assets against asset limits, but in April 2015, these limits were eliminated via Federal rule changes.[5] The link between SNAP participation and employment strengthened considerably following the passage of the 1996 Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA), which required individuals ages 18 to 60 without disabilities to be employed or actively seeking work in order to receive benefits (Social Security Administrations 2012). Together, (i) expansions in program eligibility rules to higher-asset households that are more likely to include workers, and (ii) stronger work requirements, increase the likelihood that minimum wage increases will affect SNAP recipients' earnings (either through wage gains or employment losses) and program participation.

Medicaid, administered jointly by Federal and state governments, offers free or low-cost health coverage to low-income families. States must provide coverage for "categorically needy" individuals, including SSI recipients, families with dependent children receiving cash assistance, poor pregnant women and children, and certain low-income Medicare beneficiaries (Center for Medicaid and CHIP Services 2015). In addition, states can offer coverage for medically needy persons, disabled individuals, and pregnant women whose incomes are above income eligibility limits for mandatory coverage. Medicaid has gone through various expansions over the last three decades. Between 1979 and 2014, 44 states obtained demonstration waivers from the Federal government—usually waivers granted under Section 1115 of the Social Security Act—often to expand Medicaid eligibility to near poor families and low-income adults without children. Federal legislation in the late 1980s expanded Medicaid coverage for low-income mothers and dependent children by increasing earnings and child age limits. Beginning in January 2014, the Patient Protection and Affordable Care Act required states that joined Federal

[4] However, there is some heterogeneity across states in age of eligibility and eligibility of those with disabilities.
[5] For instance, in 2014, 39 states excluded vehicles from asset tests (US Department of Agriculture 2014).

health care exchanges to increase Medicaid coverage to individuals and families whose income is at or below 138 percent of the Federal poverty line (Kaiser Family Foundation 2015). Because there is a much weaker link between employment and program participation for Medicaid relative to SNAP, minimum wage hikes may be more likely to affect SNAP participation than Medicaid use.[6]

Subsidized rental housing programs provide subsidies to very low-income families, the elderly, and the disabled to help them rent housing in the private market. The largest of these programs is the Housing Choice Voucher program, commonly known as the Section 8 voucher program.[7] Eligibility is based on a family's annual gross income, family composition and citizenship. In order to qualify for rental subsidies, families must have total incomes less than 80 percent of the median county income, with most subsidies going to very low income families with incomes less than 50 percent of the median county income. These eligibility rules generate substantial heterogeneity in eligibility across geographic locations and time, as income limit and maximum subsidies are updated annually. Relative to Medicaid and SNAP, housing program participants are more likely to be employed and affected by minimum wages.

TANF/AFDC provides temporary cash assistance to poor families with children. In order to qualify for TANF/AFDC, recipients must meet state-set family structure, income, and asset criteria. Under PRWORA, states gained flexibility in designing their own TANF programs within certain federally-set standards, including the enforcement of strict work requirements to qualify for federal aid, and a 60-month lifetime federally-funded benefit limit. Nonetheless,

[6] While not specifically studying the effect of minimum wage increases on Medicaid receipt, McCarrier et al. (2011) used data from the Behavioral Risk Factor Surveillance System from 1996 to 2007 and found that minimum wage increases were associated with a lower probability of unmet medical needs, but no change in the probability of having insurance.

[7] In addition to the Housing Choice Voucher Program, low-income renters may also receive housing assistance via such programs as the Section 8 New Construction and the Substantial Rehabilitation and Loan Management Set-Aside programs.

there are differences across states in the strictness of enforcement of these work requirements. For instance, most states require TANF applicants to search for jobs or register to work as quickly as possible (Falk 2012). As of July 2014, 19 states mandate job search activities before or at the time of application (Huber et al. 2015). Current TANF recipients are also subject to sanction if they fail to comply with work requirements, which range from partial reduction of benefits for the first noncompliance to a more severe penalty such as lifetime ineligibility for multiple violations (Falk 2012).

While the link between TANF and employment was strengthened in the 1990s, during the Great Recession, TANF recipients found it more difficult to meet work requirements. In fiscal year 2009, the average overall work participation rate for all TANF families was 29.4 percent (USDHHS Office of Family Assistance 2011). In response, many states provided benefits for vulnerable families through state-funded programs outside of TANF (Hahn et al. 2012). In addition, states have the flexibility to grant benefit eligibility extensions to certain TANF families when they reach their time limits (Huber et al. 2015). These eligibility criteria include (i) inability to find employment, (ii) provision of care for ill or disabled persons, (iii) provision of child care, (iv) pregnancy, (v) old age, and (vi) domestic violence victimization.[8]

Finally, the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) offers short-term food supplements and nutrition education for low-income women (pregnant, postpartum with a child 6 months or less, or breastfeeding with an infant between 6 and 12 months), infants and children up to age five. To be eligible to receive WIC benefits, applicants must (i) have household income below 185 percent of the FPT, or (ii) receive Medicaid, AFDC/TANF or SNAP/food stamps, and (iii) be nutritionally at risk based on the

[8] See Huber et al. (2015) for a complete list of state's time limit extensions eligibility requirements.

federal guidelines for the program (USDA 2015).[9] While the income criteria are similar across states, different states have different requirements for proof of income as well as different nutritional standards (Bitler et al. 2003). In 2014, almost 8.3 million people received WIC program benefits, with an average monthly per-person food voucher of $43.65 (USDA 2015).

In summary, differing eligibility standards related to family income, work requirements, and asset exemptions across states and over time suggest that minimum wages may affect different means-tested public program participation differently. While some programs, such as SNAP, are more closely linked to employment requirements, other programs—such as Medicaid, and subsidized rental housing—often lack strong employment requirements and target families that are less likely to be affected by minimum wage increases. Moreover, relatively higher income eligibility standards—such as exist for WIC (up to 185 percent of the FPT)—may increase the likelihood that more minimum wage workers are affected by them.

IV. Data and Measures

Current Population Survey. We begin by using repeated cross-sections of the March Current Population Survey (CPS) from 1980 to 2014 (corresponding to calendar years 1979 to 2013). The March CPS, which has been the workhorse of the minimum wage-poverty literature in the United States (see Burkhauser and Sabia 2007; Sabia and Burkhauser 2010; Sabia, Burkhauser, and Nguyen 2015), allows us to measure participation in several forms of public assistance receipt, including (1) SNAP, (2) Medicaid, (3) subsidized rental housing, (4) TANF/AFDC, and (5) WIC).[10]

[9]According to the United States Department of Agriculture, "two major types of nutritional risk are recognized for WIC eligibility: (1) medically-based risks (designated as "high priority") such as anemia, underweight, maternal age, history of pregnancy complications, or poor pregnancy outcomes, and (2) Diet-based risks such as inadequate dietary pattern." (USDA 2010).

[10] The relevant questions in the CPS related to these programs are:

For public programs (1) through (3), we focus on working-age individuals ages 16-to-64, following the poverty literature (Sabia and Burkhauser 2010; Sabia and Nielsen 2015). For programs (4) and (5), we follow Moffitt (1999) and Schoeni and Blank (2000), and examine females ages 16-to-54. We then examine lower-skilled, less-educated individuals who are more likely to receive public assistance and be affected by minimum wage policy: non-whites, younger individuals ages 16-to-29 without a high school diploma, and less-educated (less than high school) single mothers ages 16-to-45 with young children (under age 18).

In Panel I of Table 1A, we show weighted means of program participation rates at the individual and household levels using CPS data from 1979 to 2013.[11] As expected, SNAP and Medicaid have the highest relative program participation rates (column 1), and participation is lower among workers (column 2) as compared to non-workers (column 3).[12] An examination of participation rates among less-educated populations most likely to receive means-tested public assistance (columns 4 through 6) suggests participation rates that are 2 to 11 times larger among less-educated single mothers, non-whites, and younger high school dropouts relative to the full sample (column 1).

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(1) SNAP/FSP: "Did (you/anyone in this household) get SNAP (Supplemental Nutrition Assistance Program), food stamps or a food stamp benefit card at any time during [previous year]?"
(2) Medicaid: "At any time in [previous year], was … covered by Medicaid?"
(3) Subsidized rental housing: "Are you paying lower rent because the Federal, State, or local government is paying part of the cost?"
(4) AFDC/TANF: "At any time during [previous year], even for one month, did … receive any CASH assistance from a state or county welfare program such as (State Program Name)?"
(5) WIC: "At any time during [previous year], was… on WIC, the Women, Infants, and Children Nutrition Program for themselves or on behalf of a child?"

Information on WIC receipt was added to the March CPS starting in 2001 (Bitler et al. 2003). Respondents are queried about SNAP receipt, and housing assistance receipt for any individuals in their households. Information about Medicaid, TANF, and WIC receipt is collected for each individual within the household.

[11] For data measured at the household-level, "Working Age" households are defined as households with at least one working-age individual residing in the household. A household with a "Worker" is defined as a household with at least one working-age individual who is a worker and a "Non-Worker" household is defined as a household without any workers. A household with "Less Educated Single Mothers," "Non-Whites," and "Younger High School Dropouts" is defined as one that includes one such individual in the household.

[12] For data measured at the household level, "Workers" is defined as having at least one worker in the household, while "Non-Workers" refers to there being no workers in the household.

While the March CPS is widely used to study poverty, an important disadvantage of this data source is severe underreporting of means-tested program participation (Wheaton 2008; Wheaton and Giannarelli 2000). For instance, in 2002, self-reported SNAP participation in the March CPS was 39 percent lower than administrative data shows, Medicaid participation was 29 percent lower, and TANF receipt was 46 percent lower (Wheaton 2008). While such measurement error should not produce biased estimates in the effect of minimum wages on program participation—unless such error is unexpectedly associated with minimum wage changes—we next turn to alternative data sources, which have been documented to more accurately capture public program participation.

Survey of Income and Program Participation. The SIPP is a nationally-representative longitudinal survey of the non-institutionalized, civilian population conducted by the U.S. Census Bureau. We draw data from the 1996-1999, 2001-2003, 2004-2007, and 2008-2013 panels, which correspond to calendar years 1996 to 2013.[13] One important advantage of the SIPP is the relatively short recall period (four months) for respondents to report household composition, income, program participation, and health insurance. This makes the SIPP less prone to error relative to other federal surveys where respondents are required to recall information from as long as a full year prior to the interview. There is also evidence that the SIPP measures true program participation with less error. Compared to the March CPS, the underreporting rate is 22 percent lower for SNAP participation, 9 percent lower for Medicaid participation and 5 percent lower for TANF participation (Wheaton 2008). Another key advantage of the SIPP is that its longitudinal data allow us to (i) explore individual-specific transitions into and out of poverty as well as onto and off of the welfare rolls, and (ii) estimate

[13] Following Sabia and Nielsen (2015), we drop data in the 2000 calendar year, for neither the 1996 panel nor the 2001 panel provides adequate overlap in this calendar year.

models that include individual fixed effects. Means of program participation among individuals and households using the SIPP are shown in Panel II of Table 1A.

Aggregate Welfare Caseloads. In addition to the two microdata sources, we also obtain administrative data on means-tested welfare caseloads between 1980 and 2013. SNAP caseloads are obtained from the Census Bureau-Small Area Income and Poverty Estimates[14], Medicaid caseloads from the Statistical Abstract (Social Insurance and Human Services, and Health and Nutrition, respectively)[15], and AFDC/TANF caseloads from the Office of Family Assistance (DHHS). [16,17] Consistent state-by-year caseload data on WIC participation and housing subsidy receipt are not available during the 1980 to 2013 period. In Panel I of Table 1B, we show weighted means of state welfare caseloads per 1,000 individual state residents. Medicaid caseloads are the highest (159.7 per 1,000), followed by SNAP (91.1 per 1,000) and AFDC/TANF (31.2 per 1,000).

Public Program Expenditures. Finally, we draw aggregate state-by-year data on means-tested program expenditures from the National Income and Product Accounts (NIPA). The NIPA data are collected by the Bureau of Economic Analysis and have been used by a number of scholars to study public welfare spending (Aschauer 1989; Hanson 2010; West and Reich 2015). We draw data from 1980 to 2013 and construct real (in 2013 dollars) per capita expenditures on four programs: SNAP, Medicaid, AFDC/TANF and WIC/Other[18] In Panel II of Table 1B, we show means of real (2013 dollars) means-tested expenditures per capita. Per-capita spending is

[14] SNAP/food stamp caseloads are available between 1981 and 2012.
[15] We obtain consistent Medicaid caseload data for all states between 1983 and 2013.
[16] AFDC/TANF caseloads are missing in 1984.
[17] Medicaid caseloads are collected for the fiscal year.
[18] Data on expenditures on housing subsidies over the 1980-2013 period are not available from the NIPA. In the NIPA, WIC expenditures are grouped with expenditures on General Assistance Foster care and adoption assistance, Child Tax Credits, Economic Stimulus Act of 2008 rebates, American Recovery and Reinvestment Act of 2009 (ARRA) Making Work Pay tax credits, Government Retiree tax credits, Adoptive tax credits and Energy Assistance benefits. Estimation excluding WIC benefits in our measure of total expenditures produced a similar pattern of results.

highest for Medicaid program ($928.5), followed by SNAP ($126.5), WIC/Other ($112.7) and AFDC/TANF ($104.8).[19]

V. Empirical Approach

We begin by pooling repeated cross-sectional data from the March 1980 to March 2014 CPS and estimating the canonical difference-in-difference model used in the minimum wage literature, estimating the below regression equation at the individual and household levels:

$$Program_{ist} = \beta_0 + \beta_1 MW_{st} + \beta_2' \mathbf{X}_{st} + \beta_3' \mathbf{Z}_{it} + \alpha_s + \tau_t + \varepsilon_{st}, \quad (1a)$$

where $Program_{ist}$ is an indicator for whether respondent *i* (or household *i*) residing in state *s* in year *t* received a particular form of means-tested public benefit; MW_{st} is the natural log of the higher of the state or federal minimum wage; $\mathbf{X}_{st}$ is a vector of state-specific, time-varying controls including the prime-age adult wage rate, prime-age unemployment rate, per capita state GDP, the state refundable EITC credit, and key state welfare policies, including whether the state program exempts some or all vehicles from the asset test for SNAP eligibility, the presence of at least one Medicaid Section 1115 demonstration waiver, Medicaid expansions to low-income childless adults[20], the presence of binding work requirements and time limits for TANF receipt, excluding owned home value from asset tests for TANF, and maximum TANF benefit level for a family of three; $\mathbf{Z}_{it}$ is a vector of individual controls including race/ethnicity, marital status, educational attainment, age, family size, and number of children under age 18 living in the household[21]; α_s is a time-invariant state effect; and τ_t is a state-invariant year effects. We

[19] Trends in program participation and program expenditures across all four data sources are available in Figures 1 through 4 of Sabia and Nguyen (2016).
[20] Prior to the Affordable Care Act, a number of states—including Arizona, Minnesota, Pennsylvania, Tennessee and Washington–expanded Medicaid coverage to low-income childless adults without the use of a Section 1115 waiver through the use of exclusively state-funded programs.
[21] When we estimate household-level regressions, the controls of **Z** are measured for the head of households, following West and Reich (2015).

estimate equation (1) via probit, but also experiment with linear probability models, with a generally similar pattern of results.

The key parameter of interest in equation (1a), β_1, is the effect of the minimum wage on means-tested program participation. Identification of β_1 comes from within-state variation in minimum wages. Of the 1,734 state-by-year cells observed from 1980 to 2013, there were over 500 minimum wage increases initiated by state legislatures. In addition, there were four Federal minimum wage increases (1979-81, 1990-91, 1996-97, and 2007-09), which also generate some state-level minimum wage variation because of heterogeneous state minimum wage levels at the time of Federal hikes.

Next, following West and Reich (2014; 2015), we experiment with their preferred specification that adds controls for geographic-specific time-varying unobserved heterogeneity:

$$Program_{ist} = \beta_0 + \beta_1 MW_{st} + \beta_2' \mathbf{X}_{st} + \beta_3' \mathbf{Z}_{it} + \alpha_s + \tau_t + \alpha_s * t + c_d * \tau_t + \varepsilon_{st}, \quad (1b)$$

where $\alpha_s * t$ is a state-specific linear time trend and $c_d * \tau_t$ is a census division-specific year effect.

We next turn to the SIPP and estimate a model similar to equation (1a) except that we exploit the longitudinal nature of the data to estimate transitions onto and off of the welfare rolls, and include both month and individual fixed effects as additional controls:

$$Program_{ismt} = \beta_0 + \beta_1 MW_{smt} + \beta_2' \mathbf{X}_{st} + \beta_3' \mathbf{Z}_{it} + \alpha_s + \pi_m + \tau_t + \theta_i + \varepsilon_{ismt}, \quad (2)$$

where π_m is a vector of month fixed effects and θ_i is a vector of individual fixed effects. The inclusion of individual fixed effects allows us to examine the effects of minimum wages on individual-specific net transitions off of and onto means-tested benefit programs.[22]

[22] We estimate equation (2) via linear probability model. In SIPP public-release data, respondents in Maine and Vermont are grouped together and respondents in North Dakota, South Dakota, and Wyoming are grouped together in the 1996 and 2001 panels, prohibiting assignment of state policies and economic data. Therefore, respondents in these states are excluded from all SIPP analyses. In the SIPP regressions, we control for individuals' time-varying demographic characteristics (excluding gender and race), state-specific time-varying controls and program policies used in equation (1), and an indicator for the fourth month of the reference period.

In addition, following Sabia and Nielsen (2015), we disaggregate transitions. We condition the sample on those initially receiving (or not receiving) some form of public assistance in the first month of interview of year *t* and estimate the effect of minimum wage increases on transitions onto (or off of) public assistance over that calendar year:

$$Transition_{ist} = \beta_0 + \beta_1 MW_{st} + \beta_2' \mathbf{X}_{st} + \beta_3' \mathbf{Z}_{it} + \alpha_s + \tau_t + \theta_i + \varepsilon_{ismt}, \quad (3)$$

where $Transition_{ist}$ is an indicator variable equal to one (1) if the respondent *i* makes a transition from his or her initial state at any point during the remainder of that calendar year and equal to 0 otherwise. In equation (3), MW_{st} is then the higher of federal or state minimum wage that persists over calendar year *t* in state *s* (and a weighted average of that minimum wage over the year if the minimum wage changes mid-year). Again, we explore the sensitivity of estimates to controls for spatial heterogeneity.

In addition, we explore the sensitivity of our SIPP estimates to an alternate identification strategy advanced by Clemens and Wither (2016). This approach uses a Federal minimum wage increase rather than a state minimum wage increase to identify program participation effects, with the argument that state-specific minimum wage changes driven by Federal changes might be more exogenous to low-skilled individuals' economic well-being than are state legislative changes. Following Clemens and Wither (2016), we exploit heterogeneity in the bindingness of the 2008-2009 Federal minimum wage changes across states (27 of which were bound by the Federal minimum wage change based on initial state minimum wage levels) and across workers (some of whom earned wages such that they were bound by the minimum wage change) to identify minimum wage effects.

Finally, we draw aggregate state-level data to estimate the effect of minimum wage increases on per-capita state expenditures and caseloads:

$$E_{st} = \beta_0 + \beta_1 MW_{st} + \beta_2' \mathbf{X}_{st} + \alpha_s + \tau_t + \varepsilon_{st}, \quad (4)$$

where E_{st} measures the natural log of (i) per capita expenditures, (ii) expenditures per enrollee and (iii) caseloads per 1,000 individuals.[23]

VI. Results

Our main results are shown in Tables 2 through 8 and focus on program participation (or expenditure) elasticities with respect to the minimum wage, derived from estimates of β_1. Standard errors corrected for clustering at the state-level and all regressions are weighted.

Main Findings: CPS

Table 2 shows estimates from the canonical model described in equation (1a). The first three columns present results for the working-age population, with Panel I showing results at the individual-level and Panel II at the household-level. Column (1) includes exogenous demographic controls (age, race/ethinicity, gender), column (2) adds potentially endogenous individual controls (marital status, educational attainment, age, family size, and number of children under age 18 living in the household), and column (3) includes all state-level controls. Across specifications, the magnitude of the estimated minimum wage effect is relatively stable, providing some support for the hypothesis that minimum wage changes are exogenous to program participation.

Together, estimates using the canonical model provide little support for the hypothesis that minimum wage increases are effective at reducing means-tested program participation

[23] In equation (4), we control for the state-by-year share of male individuals, racial composition, average age and state population using data drawn from the Surveillance, Epidemiology and End Results (SEER) database between 1980 and 2013. State-by-year marriage rates, educational attainment, average household size and average number of children under age 18 in households are obtained using data from the CPS March between 1980 and 2014. Other state-specific time-varying controls and state public program policies are remained the same with those used in equation (1).

presents results for the working-age population (see column 3).[24] We find no evidence that minimum wage increases are associated with reductions in SNAP/Food stamp use, housing assistance receipt, TANF/AFDC use, or WIC receipt, whether measured at the individual- or household-level. Moreover, when individual-level Medicaid use is examined (Panel I), we find no evidence that minimum wage increases reduce Medicaid receipt.[25] Only when measured at the household-level (Panel II) is there some evidence of minimum wage-induced reductions in Medicaid use, though this effect is not seen when examining those households with at least one worker (Panel II, column 4), those most likely to be helped by minimum wage increases. The most consistent evidence we find in Table 2 is that minimum wage increases are associated with an increase in receipt of housing subsidies, with an estimated elasticity of 0.231 to 0.300. The finding in column (5) suggests that the increase in housing subsidy receipt may be driven by those who are laid off in response to minimum wage hikes. Across all programs, when we condition the sample on workers to give the minimum wage its best chance to reduce program participation, we find no evidence that minimum wage increases reduce net program use.

In Panel III, we estimate the effect of minimum wage increases on participation in *Any Program*, measured at the household-level.[26] Our results uniformly point to statistically insignificant and economically small minimum wage effects. The precision of our estimate in column (3) of Panel III is such that we can, with 95 percent confidence, rule out estimates program elasticities with respect to the minimum wage less than –0.170 and greater than 0.134.[27]

[24] Examining participation at the individual-level, the precision of our estimates is such that we can rule out negative elasticities smaller than -0.397 for SNAP/food stamp, -0.322 for Medicaid, -0.139 for AFDC/TANF, and -0.157 for WIC. We can also rule out positive elasticities larger than 0.163 for SNAP/food stamp, 0.348 for Medicaid, 0.197 for AFDC/TANF, and 0.021 for WIC.

[25] In Appendix Table 1, we generate estimates using linear probability models. With one exception (TANF/AFDC), the pattern of results is similar to what is shown in Table 2.

[26] WIC is excluded from our *Any Program* measure, as WIC is only measured from 2001 to 2014. Results including WIC, available upon request, are qualitatively similar.

[27] When we control for minimum wage leads to ensure that estimates are not contaminated by pre-trends and minimum wage lags to allow for longer-run policy impacts (Appendix Tables 2A and B), we continue to find no evidence that minimum wage increases affect program participation using the canonical model.

The results in Table 2 diverge sharply from West and Reich (2014; 2015), who identify minimum wage effects off of a state-specific linear time trend within census divisions. In Table 3, we show results from equation (1b), the preferred specification of West and Reich (2014; 2015). The first five columns show results measuring program participation at the individual-level and the final four columns at the household-level. Estimated minimum wage elasticities in column (1) of Table 3 are starkly different from those obtained in column (3) of Table 2, which uses the canonical model (equation 1a). Consistent with West and Reich, we find that minimum wage increases are associated with sharp reductions in SNAP participation, subsidized housing receipt (row 3, column 1), AFDC receipt (row 4, column 1) and WIC receipt (row 5, column 1). Estimated elasticities of program participation with respect to the minimum wage range from -0.091 to -0.400.

Which policy conclusion is correct – the null findings of Table 2 or the large, negative program participation effects in Table 3? There are important reasons to be skeptical of the results generated using the West-Reich model. Neumark et al. (2014a,b) warn that including controls for state-specific linear time trends and census division-specific year effects may conflate minimum wage variation with the state business cycle. Moreover, when we restrict the sample to employed individuals (Table 3, column 2)—giving the minimum wage its best chance to reduce program participation—we find that the estimated elasticities are uniformly smaller (in absolute magnitude) than for the full working-age sample (column 2 vs. column 1) and are nearly always statistically indistinguishable from zero. Instead, we find that minimum wage increases are associated with large reductions in public program participation for *non-workers* (column 3).

Minimum wage increases could only reduce public program participation among *non-workers* if other individuals living in their household are workers who see earnings gains from minimum wage increases, thus increasing household income and reducing program participation

among other household members. But in column (4), when we restrict the sample to non-workers living in households *with only one working-age adult age 18 or older*, we find that in the West and Reich-preferred specification, minimum wage increases are associated with very large declines in means-tested program participation. This result suggests that the West and Reich-preferred specification fails an important falsification test and likely overstates minimum wage-induced reductions in program participation. The result in column (4) could only be explained by sample selection, wherein minimum wage increases induce employers to substitute workers who receive welfare for workers who do not, a finding that (i) has not been documented in the literature, and (ii) is at odds with evidence that welfare participation is linked to characteristics associated with higher unobserved marginal productivity (Irving and Loveless 2015; Moffitt et al. 2002). In contrast, results from the canonical model in column (5) pass this falsification test.

Further isolating the West-Reich finding, when we allow state-specific time trends to reach the 4^{th} or 5^{th} order polynomial (see Appendix Table 3), we find little evidence that minimum wage increases affect net welfare participation. This result is consistent with Neumark et al. (2014a), who find that controlling for higher-order polynomial state trends, in contrast to linear time trends, diminishes the degree to which negative employment effects of the minimum wage are confounded by the business cycle.

Columns (6) through (9) of Table 3 repeat this analysis using program participation measured at the household-level. The West-Reich model shows that minimum wage increases reduce program participation among households without any workers (column 8), while the canonical model shows no such effect (column 9). We also repeat this analysis using program participation measured at the family- as compared to household-level (see Appendix Table 4) and we uncover the same pattern of results.

In a study subsequent to West and Reich (2014; 2015), Allegretto et al. (Forthcoming) argue against choosing between the canonical model and the West and Reich-preferred model by using the post-least absolute shrinkage and selection operator (LASSO) regression method advanced by Belloni et al. (2014). This is a "data-driven" approach that chooses the set of right-hand side controls based on their importance in predicting program participation or state minimum wages. We allow all the individual- and state-level controls, including state-specific linear time trends and census division-specific year effects, to be included in the pool of the potential controls. The estimates using the post-LASSO double-selection method are presented in Table 4. This approach, like the West and Reich (2014; 2015) model, continues to fail falsification tests, showing that minimum wage hikes reduce program participation among households without workers (columns 4 and 7).

Together, the findings from Tables 2 through 4 suggests that the canonical model performs favorably relative to the West and Reich (2014; 2015) specification and the post-LASSO double selection model, passing falsification tests that the other models fail. Both the West and Reich and LASSO models appear to conflate minimum wage effects with effects of the state business cycle, consistent with Neumark et al. (2014a). Results from the most credible specification suggests that minimum wage increases have little effect on net public program participation.

Low-Skilled Sub-Populations

In Panel I of Table 5, we use our preferred specification from equation (1a) and examine low-skilled sub-populations that have been commonly examined in the minimum wage-poverty literature: non-whites (columns 1), individuals ages 16-to-29 without a high school diploma (columns 2), and single less-educated female heads of households ages 16-to-45 with children

under age 18 (columns 3). There is little evidence that minimum wage hikes reduce program participation among these lower-skilled sub-groups. Only for SNAP is there some evidence of a reduction in program participation among less-educated single mothers (row 1, column 3).[28]

To examine whether the null findings of Table 2 can be explained by adverse labor demand effects among low-skilled individuals, in Panel II of Table 5, we use March 1980 to March 2014 CPS data to estimate the effects of minimum wage increases on employment, weeks, hours worked, and earnings among our low-skilled samples. We find no evidence that minimum wage increases are associated with net increases in unconditional earnings (row 1). For non-whites and younger less-educated individuals, this result appears to be explained by adverse employment (row 2), and conditional hours (row 3) and weeks (row 4) effects. Thus, the adverse labor demand effects of minimum wage increases appear to result in earnings redistribution that does not generate net declines in means-tested program participation.[29]

SIPP Findings

Table 6 shows results from the canonical model using SIPP data. The findings in columns (1) through (3), provide little evidence that minimum wages are associated with a reduction in the probability of SNAP, Medicaid, TANF, or WIC receipt.[30,31] Consistent with CPS-based results, we continue to find that minimum wage hikes are associated with an increase in subsidized housing receipt (row 3).[32] The remaining columns (columns 4 through 6) show

[28] In unreported results that are available upon request, we show estimates separately for workers and non-workers for these low-skilled sub-groups. The results continue to suggest little evidence that higher minimum wages are effective at reducing program participation, even among the low-skilled workers.
[29] Evidence for adverse labor demand effects of the minimum wage in Panel II of Table 4 stands in stark contrast to the West and Reich (2015)-preferred specification shown in column (1) through (3) of Appendix Table 5, which obscures these adverse employment effects (Neumark et al. 2014a 2014b).
[30] The precision of our estimates in column (1) is such that we can rule out negative elasticities smaller than -0.180 for SNAP, -0.166 for Medicaid, -0.571 for TANF, and -0.068 for WIC. Moreover, we can rule out positive elasticities larger than 0.140 for SNAP, 0.098 for Medicaid, 0.255 for TANF, and 0.282 for WIC.
[31] In the SIPP, employment is defined as having a paid job in at least one week of the reference month.
[32] When we restrict CPS data to the SIPP states and years, our results are qualitatively similar.

findings for low-skilled sub-groups. Our results point to little evidence that minimum wage increases reduce means-tested public program receipt, with a few exceptions. We find some evidence that minimum wage increases are associated with a reduction in SNAP participation for 16-to-29 year-olds without a high school diploma (row 1, column 5). However, at the same time, we find that for non-whites (column 4), minimum wage increases are associated with an increase in housing assistance (row 3) and WIC receipt (row 5). There is also evidence of an overall increase in program receipt for less-educated single mothers (column 6, row 5). Together, these findings are consistent with redistributive effects of minimum wage increases across low-skilled sub-groups and across public programs. In results available upon request, we find a similar pattern of redistribution when examining participation data at the household-level.

In Table 7, we present estimates from equation (3) to allow heterogeneous effects of minimum wages on transitions onto or off of public assistance. Column (1) presents results for working age individuals; column (2) presents results for those who report employment in each month; [33] and the remaining columns show results for less-skilled sub-groups. The pattern of findings suggests some evidence of redistributive effects of minimum wage increases. For instance, we find that among workers, minimum wage increases are associated with a reduction in the probability that non-Medicaid recipients begin receiving Medicaid. On the other hand, minimum wage increases are associated with a reduction in the probability that less-educated 16-to-29 year-old Medicaid recipients leave the program. To take another example, minimum wage increases are associated with a reduction in the probability that 16-to-29 year-old non-food stamp recipients begin participating in SNAP, but also with a decline in the probability that non-white SNAP recipients exit the program. These results are consistent with the hypothesis that

[33] We examine the effects of higher minimum wages on the transitions onto or off of public assistance for those who are employed *in the first month* of a calendar year and find similar results to those reported below.

minimum wage increases redistribute earnings among low-skilled individuals via adverse labor demand effects, for which we find evidence in columns (4) through (6) of Appendix Table 5.

Using the 2008-2009 Federal Minimum Wage Increases for Identification

One critique of the above identification strategies is that they rely chiefly on state legislative changes in minimum wages to identify program participation effects. In Table 8, we follow the approach of Clemens and Wither (2016), and explore the effect of the Federal minimum wage increases from $5.85 to $6.55 in July 2008 and from $6.55 to $7.25 in July 2009 using data between August 2008 and July 2012. We first exploit heterogeneity in bindingness of the minimum wage across states given differential state-specific minimum wage levels in January 2008. Our analysis uses data drawn from the 2008 panel of the SIPP to match longitudinal analysis in Clemens and Wither (2016).[34] Consistent with our findings in Table 6, we find little evidence that minimum wage increases are associated with a reduction in public program participation in either the 12-month period between August 2009 and July 2010 (Post 1) or the 24-month period between August 2010 and July 2012 (Post 2) relative to the baseline period (August 2008 to July 2009). Only for less-educated single mothers is there some evidence of minimum wage-induced reductions in housing assistance receipt.

We also exploit heterogeneity in bindingness of the minimum wage by workers' initial wages, again following Clemens and Wither (2016). We condition the sample on those who work at least one month between August 2008 and July 2009 and earning a wage below $7.50 (fully binding), a wage between $7.50 and $8.50 (partially binding), and a wage between $8.50 and $10.10 (non-binding). The results, presented in the final three columns of Table 8, provide no evidence that the 2008-2009 Federal minimum wage increases reduced program participation.

[34] We cannot measure program participation monthly in the CPS, which prevents us from measuring program participation following the 2008-2009 Federal minimum wage increases, as in Clemens and Wither (2016).

Caseloads and Expenditures

In Table 9, we turn to administrative data and present estimates of equation (4) for welfare caseloads per 1,000 individuals (Panel I), program expenditures per capita (Panels II) and program expenditures per enrollee (Panel III). We find very little evidence that minimum wage increases are associated with changes in Medicaid, or AFDC/TANF caseloads. For expenditures, the findings also point to little evidence that minimum wage increases are associated with significant reductions in government spending on SNAP/Food stamp, AFDC/TANF, Medicaid, or WIC, though the magnitude of the effect is largest for Medicaid spending. Again, these results are consistent with redistributive effects of minimum wage increases that do not reduce net participation in or spending on public programs.

VII. Heterogeneity in Effects of Minimum Wages over the State Business Cycle

Given recent work showing that adverse labor demand effects of minimum wage increases may be larger (in absolute magnitude) during economic recessions (Addison et al. 2013; Sabia 2014a), we explore the heterogeneity in the effects of minimum wages on public program participation over the state business cycle. In Table 10, we follow Sabia (2014a) and interact the minimum wage with three phases of the state business cycle: (1) recessions, measured by negative real state GDP growth, (2) weak to moderate growth, measured by positive growth of less than 2.5 percent, and (3) stronger growth, measured by growth greater than 2.5 percent. The results suggest that minimum wage increases are associated with increases in subsidized housing receipt (column 3 in Panels I and II) during economic recessions (row 1, Panel I), a time when recent research suggest that the adverse employment effects of minimum wages are larger (Addison et al. 2013; Sabia 2014a). However, minimum wage-induced

increases in some program participation are smaller during economic expansions, and may become negative, consistent with evidence that the employment effects of minimum wages are much smaller during times of stronger economic growth. We see this result particularly in the SIPP sample for Medicaid, where reductions in program participation appear are larger during economic expansions.

In Table 11, we repeat the exercise in Table 10 using administrative data on welfare caseloads and expenditures. Panel I presents results on caseloads per 1,000 individuals, Panel II on expenditures per capita, and Panel III on expenditures per enrollee. Our results in Table 11 provide relatively little evidence that minimum wage increases reduce welfare caseloads or expenditures across the business cycle. Only for SNAP caseloads is there any evidence of beneficial effects of minimum wage increases and these effects appear concentrated in non-recessionary times.

VIII. Conclusions

While reducing poverty has long been a central talking point for policymakers advocating minimum wage increases, proponents have recently advanced the claim that higher minimum wages may reduce welfare spending. This study provides the most comprehensive study to date on the effect of minimum wage increases on means-tested public programs. Using data from multiple government sources, including the CPS, SIPP, and NIPA from over three decades, we evaluate the minimum wage as a tool of welfare reform. Our preferred specifications show that minimum wage increases are largely ineffective at reducing net participation in public assistance programs or in reducing expenditures on means tested public assistance. We further find that evidence for minimum wage induced-declines in public program participation produced by West and Reich (2014; 2015) are based on specifications that fail important falsification tests.

Our null findings are true across public programs, time periods examined, and data sources. Only for the SNAP program is there some (inconsistent) evidence that higher minimum wages reduce program participation. Rather, the findings we obtain (i) across low-skilled groups and (ii) using longitudinal data more clearly point to evidence that minimum wage increases redistribute income among low-skilled individuals, leading to welfare exit for some, but greater welfare use for others.

Adverse labor demand effects of minimum wage effects are one important reason why minimum wage hikes are ineffective at reducing net means-tested program participation. Poor target efficiency may be another (MaCurdy 2015; Sabia 2014b; Sabia and Burkhauser 2010; Lundstrom 2014; Stigler 1946). A substantial share of individuals receiving public assistance do not work. For example, in 2013, 35 percent of AFDC/TANF recipients, 49 percent of SNAP recipients, and 59 percent of WIC recipients were employed. But even among workers, minimum wages may be poorly targeted to those receiving public assistance. When we evaluate Senator Harkin and Congressman Miller's plan to raise the federal minimum wage from $7.25 to $10.10 per hour, Senator Patty Murray's proposal to raise the minimum wage to $12.00 per hour, and Senator Bernie Sanders's proposal to raise the minimum wage to $15.00 per hour, we find that each is not well targeted to welfare recipients. Only 16.0 percent of those who would be affected by a $10.10 Federal minimum wage are SNAP recipients and just 13.1 percent are Medicaid recipients. The targeting of minimum wage increases to welfare recipients becomes worse at $12.00 and $15.00 minimum wage levels. We conclude that minimum wages are an ineffective and blunt tool for welfare reform.

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Table 1A. Summary Statistics of Program Participation, CPS and SIPP

	Working Ages	Workers	Non-Workers	Non-White	Ages 16-29 without HS	Single Mothers without HS Ages 16-45
	(1)	(2)	(3)	(4)	(5)	(6)
Panel I: March CPS 1979-2013						
Individual-Level						
SNAP/Food Stamp	0.077 (0.267)	0.050 (0.217)	0.171 (0.376)	0.148 (0.355)	0.174 (0.379)	0.611 (0.488)
	[3,798,071]	[2,943,160]	[854,911]	[1,128,449]	[352,576]	[30,316]
Medicaid	0.076 (0.265)	0.038 (0.192)	0.204 (0.403)	0.135 (0.342)	0.183 (0.387)	0.545 (0.498)
	[3,798,071]	[2,943,160]	[854,911]	[1,128,449]	[352,576]	[30,316]
Housing assistance	0.010 (0.1)	0.006 (0.08)	0.023 (0.150)	0.021 (0.144)	0.02 (0.14)	0.097 (0.295)
	[3,798,071]	[2,943,160]	[854,911]	[1,128,449]	[352,576]	[30,316]
AFDC/TANF[a]	0.035 (0.183)	0.018 (0.134)	0.081 (0.272)	0.069 (0.253)	0.075 (0.263)	0.406 (0.491)
	[1,679,508]	[1,231,641]	[447,867]	[527,660]	[168,183]	[30,316]
WIC[ab]	0.044 (0.204)	0.034 (0.180)	0.070 (0.255)	0.072 (0.258)	0.089 (0.285)	0.237 (0.425)
	[777,444]	[566,271]	[211,173]	[285,331]	[80,817]	[12,628]
Household-Level						
SNAP/Food Stamp	0.084 (0.278)	0.059 (0.236)	0.311 (0.463)	0.158 (0.365)	0.166 (0.372)	0.607 (0.488)
	[1,880,539]	[1,705,863]	[174,676]	[598,058]	[296,056]	[30,316]
Medicaid	0.142 (0.349)	0.112 (0.316)	0.413 (0.492)	0.253 (0.435)	0.263 (0.440)	0.689 (0.463)
	[1,880,539]	[1,705,863]	[174,676]	[598,058]	[296,056]	[30,316]
Housing assistance	0.013 (0.115)	0.009 (0.092)	0.058 (0.234)	0.026 (0.160)	0.020 (0.141)	0.096 (0.294)
	[1,880,539]	[1,705,863]	[174,676]	[598,058]	[296,056]	[30,316]
AFDC/TANF[a]	0.044 (0.206)	0.029 (0.167)	0.296 (0.456)	0.082 (0.275)	0.116 (0.302)	0.423 (0.494)
	[1,384,842]	[1,306,571]	[78,271]	[473,920]	[158,153]	[30,316]
WIC[ab]	0.052 (0.222)	0.049 (0.215)	0.100 (0.301)	0.066 (0.248)	0.082 (0.274)	0.261 (0.439)
	[639,142]	[603,435]	[35,707]	[334,549]	[145,062]	[12,759]
Any Program[c]	0.168 (0.374)	0.134(0.341)	0.476 (0.499)	0.296 (0.457)	0.304 (0.460)	0.764 (0.425)
	[1,880,539]	[1,705,863]	[174,676]	[598,058]	[296,056]	[30,316]
Panel II: SIPP 1996-2013						
Public Assistance Measures						
SNAP/Food Stamp	0.049 (0.217)	0.024 (0.152)	0.115 (0.319)	0.087 (0.282)	0.057 (0.231)	0.575 (0.494)
	[9,551,775]	[6,779,707]	[2,772,068]	[2,893,801]	[762,746]	[65,559]
Medicaid	0.089 (0.285)	0.039 (0.193)	0.218 (0.413)	0.151 (0.358)	0.229 (0.42)	0.539 (0.498)
	[9,551,775]	[6,779,707]	[2,772,068]	[2,893,801]	[762,746]	[65,559]
Housing assistance	0.010 (0.101)	0.006 (0.078)	0.021 (0.145)	0.021 (0.143)	0.022 (0.148)	0.089 (0.284)
	[9,551,775]	[6,779,707]	[2,772,068]	[2,893,801]	[762,746]	[65,559]

	Working Ages	Workers	Non-Workers	Non-White	Ages 16-29 without HS	Single Mothers without HS Ages 16-45
	(1)	(2)	(3)	(4)	(5)	(6)
AFDC/TANF[a]	0.019 (0.135)	0.007 (0.082)	0.044 (0.205)	0.037 (0.189)	0.039 (0.193)	0.231 (0.422)
	[4,133,931]	[2,802,407]	[1,331,524]	[1,356,214]	[361,122]	[65,559]
WIC[a]	0.056 (0.230)	0.035 (0.184)	0.101 (0.302)	0.102 (0.302)	0.129 (0.336)	0.252 (0.434)
	[4,133,931]	[2,802,407]	[1,331,524]	[1,356,214]	[361,122]	[65,559]
Any Program[c]	0.185 (0.389)	0.151 (0.358)	0.440 (0.496)	0.327 (0.469)	0.353 (0.478)	0.800 (0.400)
	[4,827,050]	[4,189,074]	[637,976]	[1,525,164]	[654,001]	[65,559]
Transition onto Public Assistance						
SNAP/Food Stamp	0.020 (0.142)	0.013 (0.112)	0.042 (0.202)	0.034 (0.182)	0.029 (0.168)	0.227 (0.419)
	[974,035]	[763,275]	[351,210]	[289,181]	[99,294]	[3,788]
Medicaid	0.038 (0.191)	0.022 (0.147)	0.087 (0.282)	0.066 (0.249)	0.1 (0.3)	0.255 (0.436)
	[926,640]	[746,544]	[312,529]	[265,727]	[79,420]	[3,820]
Housing assistance	0.005 (0.068)	0.003 (0.057)	0.009 (0.092)	0.009 (0.094)	0.009 (0.094)	0.036 (0.187)
	[1,016,134]	[781,545]	[386,963]	[310,704]	[101,995]	[7,399]
AFDC/TANF[a]	0.009 (0.095)	0.005 (0.068)	0.02 (0.139)	0.017 (0.129)	0.022 (0.147)	0.094 (0.291)
	[438,113]	[329,319]	[179,729]	[143,420]	[47,906]	[6,290]
WIC[a]	0.022 (0.147)	0.015 (0.122)	0.039 (0.194)	0.039 (0.195)	0.059 (0.235)	0.096 (0.294)
	[422,850]	[319,512]	[170,616]	[135,060]	[44,212]	[6,062]
Any Program	0.044 (0.205)	0.028 (0.166)	0.094 (0.291)	0.076 (0.265)	0.107 (0.309)	0.264 (0.441)
	[892,921]	[725,942]	[294,989]	[247,077]	[75,340]	[2,345]
Transition off of Public Assistance						
SNAP/Food Stamp	0.300 (0.458)	0.408 (0.492)	0.237 (0.425)	0.284 (0.451)	0.325 (0.468)	0.192 (0.394)
	[54,178]	[24,472]	[40,817]	[28,957]	[5,135]	[4,260]
Medicaid	0.337 (0.473)	0.456 (0.498)	0.279 (0.448)	0.337 (0.473)	0.34 (0.474)	0.246 (0.431)
	[101,573]	[41,203]	[79,498]	[52,411]	[25,009]	[4,228]
Housing assistance	0.389 (0.487)	0.408 (0.492)	0.396 (0.489)	0.387 (0.487)	0.406 (0.491)	0.424 (0.495)
	[12,079]	[6,202]	[8,352]	[7,434]	[2,434]	[649]
AFDC/TANF[a]	0.449 (0.497)	0.611 (0.487)	0.38 (0.485)	0.418 (0.493)	0.438 (0.496)	0.338 (0.473)
	[9,392]	[3,999]	[7,913]	[6,040]	[1,704]	[1,758]
WIC[a]	0.349 (0.477)	0.393 (0.488)	0.313 (0.464)	0.33 (0.47)	0.332 (0.471)	0.345 (0.475)
	[24,655]	[13,806]	[17,026]	[14,400]	[5,398]	[1,986]
Any Program	0.275 (0.446)	0.371 (0.483)	0.218 (0.413)	0.262 (0.740)	0.284 (0.451)	0.133 (0.339)
	[135,292]	[61,805]	[100,325]	[71,061]	[29,089]	[5,703]

Notes: Weighted means are obtained from data drawn from the Current Population Survey March Supplements between 1980 and 2014, and the Survey of Income and Program Participation between 1996 and 2013. Standard deviations are in parentheses and number of observations in brackets.

[a] Sample in columns (1) through (3) is restricted to women ages 16 to 54.

[b] Data are only available the Current Population Survey March Supplements between 2001 and 2014.

[c] Housing assistance receipt is estimated using retrospective minimum wage from the previous year. WIC is excluded because it is only available in the 2001-2014 March CPS.

Table 1B. Summary Statistics of per Capita Caseloads and Expenditures

	Mean	Std. Dev	N
Panel I: Caseloads per 1,000 individuals			
SNAP/Food Stamp	91.098	34.306	1,632
Medicaid[a]	159.700	118.078	1,469
AFDC/TANF[b]	31.169	20.286	1,683
Panel II: Expenditures per capita (2013$)			
SNAP/Food Stamp	126.456	63.379	1,734
Medicaid[c]	928.481	507.117	1,581
AFDC/TANF	104.826	78.606	1,734
WIC & other[d]	112.721	82.510	1,734
Total of above programs	1,158.131	547.678	1,581

Notes: Weighted means are obtained from data drawn from the Census Bureau—Small Area Income and Poverty Estimates between 1981 and 2012 (SNAP/Food stamp), the Statistical Abstract—Health and Nutrition between 1980 and 2011 (Medicaid), the Office of Family Assistance between 1980 and 2013 (AFDC/TANF), and the National Income and Product Accounts (expenditures) between 1980 and 2013.

[a] Medicaid caseloads are missing for Arizona between 1983 and 1990, and Hawaii in 1997 and 1999.

[b] AFDC/TANF caseloads are missing for 1984.

[c] Data are consistently available for all states and years between 1983 and 2013.

[d] WIC expenditures are grouped with expenditures on General Assistance Foster care and adoption assistance, Child Tax Credits, Economic stimulus Act of 2008 rebates, American Recovery and Reinvestment Act of 2009 (ARRA) Making Work Pay tax credits, Government Retiree tax credits, Adoptive tax credits and Energy Assistance benefits.

Table 2. Estimates of the Relationship between Minimum Wage Increases and Public Assistance Receipt, CPS, 1979-2013

	Working age			Workers	Non-workers
	(1)	(2)	(3)	(4)	(5)
	Panel I: Individual Level				
SNAP/Food stamp	-0.017	-0.013	-0.009	-0.002	-0.029
	(0.017)	(0.013)	(0.011)	(0.006)	(0.027)
N	3,798,071	3,798,071	3,798,071	2,943,160	854,911
Medicaid	-0.001	-0.000	0.001	0.010	-0.038
	(0.016)	(0.014)	(0.013)	(0.008)	(0.038)
N	3,798,071	3,798,071	3,798,071	2,943,160	854,911
Housing assistance	0.003***	0.003***	0.003**	0.001	0.010***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.003)
N	3,798,071	3,798,071	3,798,071	2,943,160	854,911
AFDC/TANF[a]	-0.002	0.001	0.001	0.001	0.007
	(0.007)	(0.003)	(0.003)	(0.001)	(0.009)
N	1,679,508	1,679,508	1,679,508	1,231,641	447,867
WIC[ab]	-0.003	-0.001	-0.003	-0.001	-0.010
	(0.004)	(0.002)	(0.002)	(0.002)	(0.006)
N	777,444	777,444	777,444	566,271	211,173
	Panel II: Household-Level				
SNAP/Food stamp	-0.019	-0.018	-0.014	-0.005	-0.055
	(0.018)	(0.014)	(0.012)	(0.008)	(0.066)
N	1,880,539	1,880,539	1,880,539	1,705,863	174,676
Medicaid	-0.026	-0.035*	-0.036*	-0.020	-0.095
	(0.019)	(0.020)	(0.022)	(0.018)	(0.074)
N	1,880,539	1,880,539	1,880,539	1,705,863	174,676
Housing assistance	0.003*	0.003**	0.003*	0.002	0.030**
	(0.002)	(0.001)	(0.002)	(0.001)	(0.013)
N	1,880,539	1,880,539	1,880,539	1,705,863	174,676
AFDC/TANF[a]	0.003	0.000	0.000	-0.001	0.099
	(0.008)	(0.004)	(0.004)	(0.003)	(0.079)
N	1,384,842	1,384,842	1,384,842	1,306,571	78,271
WIC[ab]	-0.007	-0.003	-0.006	-0.007	0.024
	(0.007)	(0.006)	(0.006)	(0.005)	(0.030)
N	639,142	639,142	639,142	603,435	35,707
	Panel III: Overall Program Participation				
Any Program[c]	0.015	0.002	0.003	0.018	-0.043
	(0.014)	(0.015)	(0.013)	(0.011)	(0.063)
N	1,880,539	1,880,539	1,880,539	1,705,863	174,676
Exogenous controls?	Yes	Yes	Yes	Yes	Yes
Additional controls?	No	Yes	Yes	Yes	Yes
State-level controls?	No	No	Yes	Yes	Yes

*** significant at 1% level ** significant at 5% level * significant at 10% level

Notes: Marginal effects from weighted probit estimates are obtained using data drawn from the Current Population Survey March Supplements between 1980 and 2014. The dependent variable is an indicator for receipt of the public assistance program listed in the left column. Exogenous controls include age, gender, race/ethnicity, state dummies, and year dummies. Additional controls include marital status, educational attainment, household size, and number of children under age 18 in households. State level controls include the prime-age adult wage rate, prime-age unemployment rate, per capita state GDP, the state refundable EITC credit rate, and state welfare policies for SNAP/food stamp (indicators for vehicle exemptions per household for eligibility), Medicaid (the presence of at least one Section 1115 waiver or childless adult coverage expansions), and AFDC/TANF (the presence of binding work requirements for welfare receipt and time limits for benefits, state limitations on non-home real and personal property, maximum benefits for family of three with no income). Standard errors corrected for clustering on the state are in parentheses.

[a] Sample is restricted to women ages 16 to 54.

[b] Data are only available the Current Population Survey March Supplements between 2001 and 2014.

[c] Housing assistance receipt is estimated using retrospective minimum wage from the previous year. WIC is excluded because it is only available in the 2001-2014 March CPS.

Table 3. Robustness of Estimates of Relationship between Minimum Wage Increases and Public Assistance Receipt to Controls for Geographic-Specific Time Trends, CPS, 1979-2013

	Individual Level					*Household Level*			
	Working age	**Workers**	**Non-workers**	**Non-workers (HH Adult=1[d])**	**Non-workers (HH Adult=1[d])**	**Working age**	**Workers**	**Non-workers**	**Non-workers**
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
SNAP/Food stamp	-0.021***	-0.006	-0.076***	-0.227**	-0.067	-0.024***	-0.007	-0.212***	-0.055
	(0.008)	(0.005)	(0.021)	(0.095)	(0.063)	(0.007)	(0.005)	(0.054)	(0.066)
N	3,798,071	2,943,160	854,911	110,365	110,365	1,880,539	1,705,863	174,676	174,676
Medicaid	-0.008	-0.000	-0.030	-0.206**	-0.086	-0.013	0.002	-0.123*	-0.095
	(0.009)	(0.005)	(0.024)	(0.087)	(0.071)	(0.013)	(0.011)	(0.072)	(0.074)
N	3,798,071	2,943,160	854,911	110,365	110,365	1,880,539	1,705,863	174,676	174,676
Housing assistance	-0.004**	-0.003*	-0.007	-0.050	0.032	-0.004**	-0.003	-0.021	0.030**
	(0.002)	(0.001)	(0.005)	(0.033)	(0.031)	(0.002)	(0.002)	(0.019)	(0.013)
N	3,798,071	2,943,160	854,911	110,365	110,365	1,880,539	1,705,863	174,676	174,676
AFDC/TANF[a]	-0.008***	-0.003*	-0.017*	-0.258**	0.037	-0.010***	-0.006**	-0.137**	0.099
	(0.003)	(0.002)	(0.009)	(0.123)	(0.116)	(0.003)	(0.002)	(0.070)	(0.079)
N	1,679,508	1,231,641	447,867	51,793	51,793	1,384,842	1,306,571	78,271	78,271
WIC[ab]	-0.004*	0.001	-0.030***	-0.021	0.009	-0.006	-0.004	-0.031	0.024
	(0.002)	(0.002)	(0.008)	(0.018)	(0.014)	(0.006)	(0.005)	(0.028)	(0.030)
N	777,444	566,271	211,173	23,872	23,872	639,142	603,435	35,707	35,707
Any Program[c]	-0.021*	0.001	-0.060**	-0.147*	-0.040	-0.018	0.003	-0.189***	-0.043
	(0.011)	(0.009)	(0.023)	(0.075)	(0.051)	(0.013)	(0.011)	(0.066)	(0.063)
N	3,798,071	2,943,160	854,911	110,365	110,365	1,880,539	1,705,863	174,676	174,676
State linear time trend?	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	No
Division FE*Year FE?	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	No

*** significant at 1% level ** significant at 5% level * significant at 10% level

Notes: Marginal effects from weighted probit estimates are obtained using data drawn from the Current Population Survey March Supplements between 1980 and 2014. The dependent variable is an indicator for receipt of the public assistance program listed in the left column. Each regression includes a set of controls identical to those noted in Table 2. Standard errors corrected for clustering on the state are in parentheses.

[a] Sample is restricted to women ages 16 to 54.

[b] Data are only available the Current Population Survey March Supplements between 2001 and 2014.

[c] Housing assistance receipt is estimated using retrospective minimum wage from the previous year. WIC is excluded because it is only available in the 2001-2014 March CPS.

[d] Sample is restricted to households with only one working-age adult age 18 or older.

Table 4. Double Selection Post-LASSO Estimates of Relationship between Minimum Wage Increases and Public Assistance Receipt, CPS, 1979-2013

	Individual Level				*Household Level*		
	Working age	**Workers**	**Non-workers**	**Non-workers (HH Adult=1[d])**	**Working age**	**Workers**	**Non-workers**
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
SNAP/Food stamp	-0.020**	-0.005	-0.071***	-0.235**	-0.024***	-0.007	-0.208***
	(0.008)	(0.005)	(0.023)	(0.097)	(0.008)	(0.005)	(0.058)
N	3,798,071	2,943,160	854,911	110,365	1,880,539	1,705,863	174,676
Medicaid	-0.009	-0.001	-0.029	-0.254***	-0.014	0.001	-0.117
	(0.009)	(0.005)	(0.025)	(0.094)	(0.013)	(0.011)	(0.073)
N	3,798,071	2,943,160	854,911	110,365	1,880,539	1,705,863	174,676
Housing assistance	-0.004**	-0.003**	-0.007	-0.044	-0.004**	-0.003*	-0.022
	(0.002)	(0.002)	(0.006)	(0.039)	(0.002)	(0.002)	(0.020)
N	3,798,071	2,943,160	854,911	110,365	1,880,539	1,705,863	174,676
AFDC/TANF[a]	-0.008**	-0.003	-0.015	-0.232*	-0.011***	-0.006*	-0.117
	(0.003)	(0.002)	(0.010)	(0.123)	(0.004)	(0.003)	(0.073)
N	1,679,508	1,231,641	447,867	51,793	1,384,842	1,306,571	78,271
WIC[ab]	-0.011*	0.003	-0.058***	-0.038	-0.006	-0.005	-0.034
	(0.006)	(0.004)	(0.014)	(0.042)	(0.006)	(0.006)	(0.033)
N	777,444	566,271	211,173	23,872	639,142	603,435	35,707
Any Program[c]	-0.009	0.005	-0.050*	-0.232**	-0.018	0.003	-0.185***
	(0.011)	(0.008)	(0.027)	(0.099)	(0.013)	(0.011)	(0.070)
N	3,798,071	2,943,160	854,911	110,365	1,880,539	1,705,863	174,676

*** significant at 1% level ** significant at 5% level * significant at 10% level

Notes: Marginal effects from weighted probit estimates are obtained using data drawn from the Current Population Survey March Supplements between 1980 and 2014. The dependent variable is an indicator for receipt of the public assistance program listed in the left column. Each regression includes a set of controls identical to those noted in Table 2. Standard errors corrected for clustering on the state are in parentheses.

[a] Sample is restricted to women ages 16 to 54.

[b] Data are only available the Current Population Survey March Supplements between 2001 and 2014.

[c] Housing assistance receipt is estimated using retrospective minimum wage from the previous year. WIC is excluded because it is only available in the 2001-2014 March CPS.

[d] Sample is restricted to households with only one working-age adult age 18 or older.

Table 5. Estimates of the Relationship between Minimum Wage Increases by Low-Skilled Sub-Groups, CPS, 1979-2013

	Non-White	Ages 16-29 without HS	Single Mothers without HS, Ages 16-45
	(1)	(2)	(3)
	Panel I: Public Assistance Receipt		
SNAP/Food stamp	0.001	0.017	-0.193**
	(0.013)	(0.017)	(0.080)
N	1,128,449	352,576	30,316
Medicaid	0.028	-0.038	-0.023
	(0.021)	(0.026)	(0.066)
N	1,128,449	352,576	30,316
Housing assistance	0.003	0.005	0.042
	(0.003)	(0.004)	(0.038)
N	1,128,449	352,576	30,316
AFDC/TANF[a]	0.008	0.002	0.008
	(0.010)	(0.008)	(0.138)
N	527,660	168,183	30,316
WIC[ab]	0.003	0.013	-0.104
	(0.006)	(0.016)	(0.089)
N	285,331	80,817	12,628
Any program[c]	0.097***	0.022	-0.056
	(0.022)	(0.029)	(0.052)
N	598,058	296,056	30,316
	Panel II: Labor Market Outcomes[d]		
Ln(Earnings)	0.075	-0.630***	1.203
	(0.140)	(0.202)	(0.746)
N	1,080,091	347,330	29,759
	[23,146.710]	[5,236.063]	[7,944.093]
Employed	0.024	-0.085***	0.151
	(0.018)	(0.032)	(0.092)
N	1,080,091	347,330	29,759
	[0.692]	[0.486]	[0.522]
Ln(Hours) | Employed=1	-0.046**	-0.214***	0.011
	(0.018)	(0.046)	(0.072)
N	750,173	170,024	15,523
	[38.33]	[29.002]	[35.424]
Ln(Weeks) | Employed=1	-0.044***	-0.058*	0.076
	(0.013)	(0.032)	(0.129)
N	750,173	170,024	15,523
	[4.288]	[4.161]	[4.217]

*** significant at 1% level ** significant at 5% level * significant at 10% level

Notes: Marginal effects from weighted probit estimates in Panel I and row 2 of Panel II as well as weighted OLS estimates in rows 1, 3 and 4 of Panel II are obtained using data drawn from the Current Population Survey March Supplements between 1980 and 2014. The dependent variable in Panel I is an indicator for receipt of the public assistance program listed in the left column. Each regression includes a set of controls identical to those noted in Table 2.

[a] Sample is restricted to women ages 16 to 54. Standard errors corrected for clustering on the state are in parentheses and means in brackets.

[b] Data are only available the Current Population Survey March Supplements between 2001 and 2014.

[c] Housing assistance receipt is estimated using retrospective minimum wage from the previous year. WIC is excluded because it is only available in the 2001-2014 March CPS.

[d] Earnings are unconditional and measured as annual earnings; hours as weekly hours, and weeks as annual weeks. We take the natural log of 1 for individuals who report zero earnings.

Table 6. Estimates of the Relationship between Minimum Wage Increases and Public Assistance Receipt, SIPP, 1996-2013

	Working age	Workers	Non-workers	Non-White	Ages 16-29 without HS	Single Mothers without HS Ages 16-45
	(1)	(2)	(3)	(4)	(5)	(6)
SNAP/Food stamp	-0.001	-0.004	0.006	0.006	-0.045***	-0.027
	(0.004)	(0.002)	(0.009)	(0.007)	(0.013)	(0.098)
N	9,551,775	6,779,707	2,772,068	2,893,801	762,746	65,559
Medicaid	-0.003	-0.005	0.013	-0.008	0.009	0.090
	(0.006)	(0.005)	(0.013)	(0.015)	(0.036)	(0.070)
N	9,551,775	6,779,707	2,772,068	2,893,801	762,746	65,559
Housing assistance	0.006***	0.002	0.016**	0.016***	0.006	-0.004
	(0.002)	(0.002)	(0.007)	(0.005)	(0.009)	(0.053)
N	9,551,775	6,779,707	2,772,068	2,893,801	762,746	65,559
AFDC/TANF[a]	-0.003	-0.000	-0.003	0.001	0.005	0.037
	(0.004)	(0.003)	(0.010)	(0.009)	(0.021)	(0.074)
N	4,133,931	2,802,407	1,331,524	1,356,214	361,122	65,559
WIC[a]	0.006	0.009*	0.004	0.022*	-0.017	-0.023
	(0.005)	(0.005)	(0.011)	(0.011)	(0.043)	(0.074)
N	4,133,931	2,802,407	1,331,524	1,356,214	361,122	65,559
Any program	0.005	0.000	0.024*	0.012	0.013	0.131*
	(0.007)	(0.007)	(0.013)	(0.017)	(0.034)	(0.066)
	9,551,775	6,779,707	2,772,068	2,893,801	762,746	65,559

*** significant at 1% level ** significant at 5% level * significant at 10% level

Notes: Weighted OLS estimates are obtained using data drawn from the Survey of Income and Program Participation between 1996 and 2013. The dependent variable is an indicator for receipt of the public assistance program listed in the left column. Time-variant individual controls include marital status, educational attainment, age (linear and squared), household size, and number of children under age 18 in households. State level controls include the prime-age adult wage rate, prime-age unemployment rate, per capita state GDP, the state refundable EITC credit rate, and state welfare policies for SNAP/food stamp (indicators for vehicle exemptions per household for eligibility), Medicaid (the presence of at least one Section 1115 waiver or childless adult coverage expansions), and AFDC/TANF (the presence of binding work requirements for welfare receipt and time limits for benefits, state limitations on non-home real and personal property, maximum benefits for family of three with no income). All regressions include controls for state effects, year fixed effects, month fixed effects, and individual fixed effects. Standard errors corrected for clustering on the state are in parentheses.

[a] Sample is restricted to women ages 16 to 54 in columns (1) through (4), and women of stated ages in columns (5) and (6).

Table 7. Estimates of the Relationship between Minimum Wage Increases and Transition onto and off of Public Assistance, SIPP, 1996-2013

	Working Age		Workers		Non-White		Ages 16-29 without HS		Single Mothers Without HS Ages 16-45	
	Transition onto	*Transition off of*	*Transition onto*	*Transition off of*	*Transition onto*	*Transition off of*	*Transition onto*	*Transition off of*	*Transition onto*	*Transition off of*
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
SNAP/Food stamp	0.007	-0.127	-0.002	-0.041	0.016	-0.184*	-0.081***	0.333	-0.111	-0.059
	(0.008)	(0.086)	(0.008)	(0.230)	(0.012)	(0.113)	(0.030)	(0.602)	(0.481)	(0.373)
N	974,035	54,178	763,275	24,472	289,181	28,957	99,294	5,135	3,788	4,260
Medicaid	-0.010	-0.191**	-0.025**	-0.268	-0.012	-0.153	-0.007	-0.471**	-0.420	-0.555
	(0.012)	(0.082)	(0.011)	(0.208)	(0.032)	(0.115)	(0.091)	(0.202)	(0.304)	(0.482)
N	926,640	101,573	746,544	41,203	265,727	52,411	79,420	25,009	3,820	4,228
Housing assistance	-0.001	-0.499	-0.004	-0.735	-0.007	-0.495	-0.030*	-1.421**	0.003	-1.257
	(0.005)	(0.366)	(0.006)	(0.735)	(0.010)	(0.463)	(0.017)	(0.652)	(0.110)	(1.864)
N	1,016,134	12,079	781,545	6,202	310,704	7,434	101,995	2,434	7,399	649
AFDC/TANF[a]	-0.001	-0.045	-0.003	-0.462	0.000	-0.136	0.020	-0.844	0.014	-0.255
	(0.007)	(0.512)	(0.005)	(0.967)	(0.018)	(0.458)	(0.049)	(1.117)	(0.154)	(0.663)
N	438,113	9,392	329,319	3,999	143,420	6,040	47,906	1,704	6,290	1,758
WIC[a]	-0.006	-0.160	-0.007	-0.250	-0.016	-0.292	0.035	-0.237	0.033	0.158
	(0.009)	(0.203)	(0.008)	(0.411)	(0.024)	(0.247)	(0.102)	(0.538)	(0.122)	(0.828)
N	422,850	24,655	319,512	13,806	135,060	14,400	44,212	5,398	6,062	1,986
Any program	-0.007	-0.167**	-0.019*	-0.311	-0.014	-0.191*	-0.074	-0.131	-0.433	-0.039
	(0.010)	(0.067)	(0.010)	(0.216)	(0.037)	(0.098)	(0.080)	(0.378)	(0.563)	(0.172)
N	892,921	54,178	725,942	24,472	247,077	28,957	75,340	5,135	2,345	4,260

*** significant at 1% level ** significant at 5% level * significant at 10% level

Notes: Weighted OLS estimates are obtained using individual-by-year data drawn from the Survey of Income and Program Participation between 1996 and 2013. The dependent variable is an indicator for receipt of the public assistance program listed in the left column. Each regression includes a set of controls identical to those noted in Table 6. Standard errors corrected for clustering on the state are in parentheses.

[a] Sample is restricted to women ages 16 to 54 in columns (1) through (6), and women of stated ages in columns (7) through (10).

Table 8. Estimates of the Relationship between the Bindingness of Federal Minimum Wage Increases and Public Assistance Receipt Using Clemens and Wither's (2016) Model, SIPP, 2008-2012

		Working age	Workers	Non-workers	Non-White	Ages 16-29 without HS	Single Mothers without HS Ages 16-45	Baseline Wages		
								Under $7.50	$7.50-$8.49	$8.50-$10.10
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
SNAP/Food stamp:	Bound*Post 1	0.000	-0.000	-0.000	0.003	-0.004	-0.002	0.001	-0.001	0.007
		(0.002)	(0.001)	(0.005)	(0.004)	(0.005)	(0.032)	(0.009)	(0.009)	(0.005)
	Bound*Post 2	-0.001	-0.000	-0.004	-0.003	-0.015	-0.023	-0.003	0.002	-0.000
		(0.003)	(0.002)	(0.007)	(0.006)	(0.014)	(0.034)	(0.010)	(0.008)	(0.008)
N		1,966,918	1,385,862	581,056	625,021	88,199	10,121	113,537	103,781	150,954
Medicaid:	Bound*Post 1	-0.002	-0.001	-0.003	-0.002	-0.008	0.019	0.004	-0.006	0.001
		(0.003)	(0.002)	(0.006)	(0.007)	(0.011)	(0.029)	(0.011)	(0.009)	(0.009)
	Bound*Post 2	-0.005	-0.002	-0.010	-0.011	-0.045***	0.020	-0.016	0.015	-0.005
		(0.004)	(0.003)	(0.009)	(0.011)	(0.015)	(0.037)	(0.014)	(0.009)	(0.010)
N		1,966,918	1,385,862	581,056	625,021	88,199	10,121	113,537	103,781	150,954
Housing assistance:	Bound*Post 1	-0.001	-0.001	-0.001	-0.001	0.001	-0.058*	-0.002	0.002	-0.000
		(0.001)	(0.001)	(0.003)	(0.004)	(0.008)	(0.031)	(0.004)	(0.004)	(0.003)
	Bound*Post 2	-0.002	-0.001	-0.002	-0.002	0.002	-0.081**	-0.001	-0.000	-0.001
		(0.001)	(0.001)	(0.003)	(0.004)	(0.009)	(0.037)	(0.004)	(0.005)	(0.003)
N		1,966,918	1,385,862	581,056	625,021	88,199	10,121	113,537	103,781	150,954
AFDC/TANF[a]:	Bound*Post 1	0.001	-0.001	0.006*	0.001	0.009	0.005	-0.011*	0.003	-0.003
		(0.001)	(0.001)	(0.003)	(0.003)	(0.006)	(0.026)	(0.006)	(0.004)	(0.005)
	Bound*Post 2	-0.001	0.001	-0.003	-0.001	-0.009	0.026	-0.011**	0.006	-0.001
		(0.001)	(0.001)	(0.003)	(0.003)	(0.011)	(0.031)	(0.004)	(0.008)	(0.006)
N		817,453	548,521	268,932	286,572	43,002	10,121	64,417	56,705	75,069
WIC[a]:	Bound*Post 1	-0.000	0.002	-0.005	-0.004	-0.003	-0.007	-0.006	-0.004	-0.012
		(0.003)	(0.002)	(0.005)	(0.006)	(0.013)	(0.037)	(0.009)	(0.013)	(0.010)
	Bound*Post 2	-0.003	-0.002	-0.004	-0.008	-0.014	0.024	-0.004	-0.003	-0.022*
		(0.004)	(0.003)	(0.007)	(0.006)	(0.026)	(0.043)	(0.013)	(0.015)	(0.013)
N		817,453	548,521	268,932	286,572	43,002	10,121	64,417	56,705	75,069
Any program:	Bound*Post 1	-0.000	-0.000	-0.003	0.001	-0.015	0.021	-0.005	0.008	0.012
		(0.003)	(0.002)	(0.006)	(0.010)	(0.016)	(0.034)	(0.010)	(0.011)	(0.009)
	Bound*Post 2	-0.003	-0.000	-0.011	-0.011	-0.018	0.045	-0.007	0.012	0.009
		(0.004)	(0.003)	(0.008)	(0.015)	(0.024)	(0.040)	(0.010)	(0.014)	(0.011)
N		1,966,918	1,385,862	581,056	286,572	43,002	10,121	113,537	103,781	150,954

*** significant at 1% level ** significant at 5% level * significant at 10% level

Notes: Weighted OLS estimates are obtained using data drawn from the Survey of Income and Program Participation between 1996 and 2013. The dependent variable is an indicator for receipt of the public assistance program listed in the left column. Each regression includes a set of controls identical to those noted in Table 5. Standard errors corrected for clustering on the state are in parentheses.

[a] Sample is restricted to women ages 16 to 54 in columns (1) through (4), and women of stated ages in columns (5) and (6).

Table 9. Estimates of the Relationship between Minimum Wage Increases and Welfare Caseloads and Expenditures, 1980-2013

	Panel I: Caseloads per 1,000 individuals		
	SNAP /Food stamp	*Medicaid*[a]	*AFDC /TANF*[b]
	(1)	(2)	(3)
Ln(MW)	-0.191	0.021	-0.275
	(0.125)	(0.258)	(0.443)
N	1,632	1,469	1,683

	Panel II: Expenditures per Capita				
	SNAP /Food stamp	*Medicaid*[c]	*AFDC /TANF*	*WIC & other*[d]	*All programs*
	(1)	(2)	(3)	(4)	(5)
Ln(MW)	-0.168	-0.117	0.041	-0.166	-0.158
	(0.122)	(0.141)	(0.176)	(0.277)	(0.098)
N	1,734	1,581	1,734	1,734	1,581

	Panel III: Expenditures per Enrollee[e]			
	SNAP /Food stamp	*Medicaid*[c]	*AFDC /TANF*	*All programs*
	(1)	(2)	(3)	(4)
Ln(MW)	0.024	-0.064	0.310	0.081
	(0.075)	(0.256)	(0.452)	(0.110)
N	1,632	1,469	1,683	1,419

*** significant at 1% level ** significant at 5% level * significant at 10% level

Notes: Weighted OLS estimates using data drawn from the Census Bureau—Small Area Income and Poverty Estimates (SNAP/food stamp caseloads) between 1981 and 2012, the Survey of Income and Program Participation between 1996 and 2013, the Statistical Abstract—Health and Nutrition (Medicaid caseloads) between 1980 and 2011, the Office of Family Assistance (AFDC/TANF caseloads) between 1980 and 2013, and the National Income and Product Accounts (expenditures) between 1980 and 2013. The dependent variables in Panel I, II and III are the natural log of caseloads per 1,000 individuals, per capita expenditures, and expenditures per enrollee for the public assistance program listed in the column title respectively. Controls include the prime-age adult wage rate, prime-age unemployment rate, per capita state GDP, the state refundable EITC credit rate, gender, racial composition, marriage rates, educational attainment, average age, household size, and average number of children under age 18 in households, the prime-age adult wage rate, prime-age unemployment rate, per capita state GDP, the state refundable EITC credit rate, and state welfare policies for SNAP/food stamp (indicators for vehicle exemptions per household for eligibility), Medicaid (Section 1115 waivers, including childless adult coverage expansion), and AFDC/TANF (the presence of binding work requirements for welfare receipt and time limits for benefits, state limitations on non-home real and personal property, maximum benefits for family of three with no income). Standard errors corrected for clustering on the state are in parentheses.

[a] Medicaid caseloads are missing for Arizona between 1983 and 1990, and Hawaii in 1997 and 1999.

[b] AFDC/TANF caseloads are missing for 1984.

[c] Medicaid caseloads and expenditures are collected between 1983 and 2013.

[d] WIC expenditures are grouped with expenditures on General Assistance Foster care and adoption assistance, Child Tax Credits, Economic stimulus Act of 2008 rebates, American Recovery and Reinvestment Act of 2009 (ARRA) Making Work Pay tax credits, Government Retiree tax credits, Adoptive tax credits and Energy Assistance benefits.

[e] Expenditures per enrollee excludes WIC program because data on WIC caseloads are not available over the sample period.

Table 10. Estimates of the Relationship between Minimum Wage Increases and Public Assistance Receipt over the Business Cycle, CPS and SIPP

	SNAP /Food stamp	Medicaid	Housing assistance	AFDC /TANF[a]	WIC[ab]	Any program[c]
	(1)	(2)	(3)	(4)	(5)	(6)
			Panel I: CPS			
MW	-0.012	-0.001	0.003**	0.001	-0.001	0.001
	(0.011)	(0.013)	(0.001)	(0.003)	(0.002)	(0.012)
MW*GDP growth of 0-2.49%	0.000	0.002	0.000	0.001	0.001	0.002
	(0.002)	(0.003)	(0.001)	(0.001)	(0.001)	(0.004)
MW*GDP growth of ≥2.50%	-0.002	0.001	0.000	-0.001	-0.002	0.005
	(0.003)	(0.004)	(0.001)	(0.001)	(0.002)	(0.005)
N	3,798,071	3,798,071	3,798,071	1,679,508	777,444	1,880,539
			Panel II: SIPP			
MW	0.004	0.005	0.005*	-0.005	0.006	0.009
	(0.005)	(0.008)	(0.002)	(0.004)	(0.006)	(0.084)
MW*GDP growth of 0-2.49%	-0.007	-0.013**	0.000	0.001	0.002	-0.041**
	(0.005)	(0.005)	(0.001)	(0.002)	(0.004)	(0.016)
MW*GDP growth of ≥2.50%	-0.007	-0.013**	0.001	0.004	-0.002	-0.048**
	(0.004)	(0.006)	(0.002)	(0.004)	(0.006)	(0.019)
N	9,551,775	9,551,775	9,551,775	4,133,931	4,133,931	4,827,050

*** significant at 1% level ** significant at 5% level * significant at 10% level

Notes: Marginal effects in Panel I are obtained from weighted probit regressions using data drawn from the Current Population Survey March Supplements between 1980 and 2014. Weighted OLS estimates in Panel II are obtained using data drawn from the Survey of Income and Program Participation between 1996 and 2013. The dependent variable is an indicator for receipt of the public assistance program listed in the column title. For the CPS estimates, each regression includes a set of controls identical to those noted in Table 2. For the SIPP estimates, each regression includes a set of controls identical to those noted in Table 6. Standard errors corrected for clustering on the state are in parentheses.

[a] Sample is restricted to women ages 16 to 54.

[b] Data are only available for the Current Population Survey March Supplements between 2001 and 2014.

[c] In the CPS estimates, housing assistance receipt is estimated using retrospective minimum wage from the previous year. WIC is excluded because it is only available in the 2001-2014 March CPS.

Table 11. Estimates of the Relationship between Minimum Wage Increases and Welfare Caseloads and Expenditures over the Business Cycle

	Panel I: Caseloads per 1,000 individuals		
	SNAP/Food stamp	*Medicaid*[a]	*AFDC/TANF*[b]
	(1)	(2)	(3)
MW	-0.168	0.085	0.070
	(0.126)	(0.248)	(0.057)
MW*GDP growth of 0-2.49%	-0.063*	-0.017	0.013
	(0.032)	(0.107)	(0.016)
MW*GDP growth of ≥2.50%	-0.024	-0.167	-0.022
	(0.040)	(0.117)	(0.028)
N	1,632	1,469	1,275

	Panel II: Expenditures per Capita				
	SNAP /Food stamp	*Medicaid*[c]	*AFDC /TANF*	*WIC & other*[d]	*All programs*
	(1)	(2)	(3)	(4)	(5)
MW	-0.164	-0.127	0.067	-0.266	-0.137
	(0.130)	(0.156)	(0.169)	(0.265)	(0.105)
MW*GDP growth of 0-2.49%	-0.043	0.047	-0.026	0.054	-0.019
	(0.031)	(0.064)	(0.057)	(0.064)	(0.038)
MW*GDP growth of ≥2.50%	0.003	-0.023	-0.050	0.233***	-0.020
	(0.046)	(0.054)	(0.081)	(0.063)	(0.037)
N	1,734	1,581	1,734	1,734	1,581

	Panel III: Expenditures per Enrollee[e]			
	SNAP /Food stamp	*Medicaid*[c]	*AFDC /TANF*	*All programs*
	(1)	(2)	(3)	(4)
MW	0.017	0.013	0.588	0.166
	(0.072)	(0.272)	(0.514)	(0.131)
MW*GDP growth of 0-2.49%	0.016	-0.050	-0.244	-0.036
	(0.024)	(0.090)	(0.165)	(0.073)
MW*GDP growth of ≥2.50%	0.009	-0.091	-0.319	-0.098
	(0.026)	(0.110)	(0.210)	(0.090)
N	1,632	1,469	1,683	1,419

*** significant at 1% level ** significant at 5% level * significant at 10% level

Notes: Weighted OLS estimates using data drawn from the Census Bureau—Small Area Income and Poverty Estimates (SNAP/food stamp caseloads) between 1981 and 2012, the Survey of Income and Program Participation between 1996 and 2013, the Statistical Abstract—Health and Nutrition (Medicaid caseloads) between 1980 and 2011, the Office of Family Assistance (AFDC/TANF caseloads) between 1980 and 2013, and the National Income and Product Accounts (expenditures) between 1980 and 2013. The dependent variables in Panel I, II and III are the natural log of caseloads per 1,000 individuals, per capita expenditures, and expenditures per enrollee for the public assistance program listed in the column title respectively. Each regression includes a set of controls identical to those noted in Table 7. Standard errors corrected for clustering on the state are in parentheses.

[a] Medicaid caseloads are missing for Arizona between 1983 and 1990, and Hawaii in 1997 and 1999.

[b] AFDC/TANF caseloads are missing for 1984.

[c] Medicaid caseloads and expenditures are collected between 1983 and 2013.

[d] WIC expenditures are grouped with expenditures on General Assistance Foster care and adoption assistance, Child Tax Credits, Economic stimulus Act of 2008 rebates, American Recovery and Reinvestment Act of 2009 (ARRA) Making Work Pay tax credits, Government Retiree tax credits, Adoptive tax credits and Energy Assistance benefits.

[e] Expenditures per enrollee excludes WIC program because data on WIC caseloads are not available over the sample period.

Appendix Table 1. OLS Estimates of the Relationship between Minimum Wage Increases and Public Assistance Receipt, CPS, 1979-2013

	Working age	Workers	Non-workers
	(1)	(2)	(3)
	Panel I: Individual Level		
SNAP/Food stamp	-0.006	0.001	-0.018
	(0.013)	(0.009)	(0.023)
N	3,798,071	2,943,160	854,911
Medicaid	0.011	0.027**	-0.026
	(0.016)	(0.012)	(0.034)
N	3,798,071	2,943,160	854,911
Housing assistance	0.005**	0.002	0.017***
	(0.002)	(0.002)	(0.005)
N	3,798,071	2,943,160	854,911
AFDC/TANF[a]	-0.021***	-0.007	-0.046***
	(0.007)	(0.004)	(0.016)
N	1,679,508	1,231,641	447,867
WIC[ab]	-0.008	-0.003	-0.020
	(0.007)	(0.005)	(0.014)
N	777,444	566,271	211,173
	Panel II: Household-Level		
SNAP/Food stamp	-0.016	-0.004	-0.027
	(0.012)	(0.010)	(0.036)
N	1,880,539	1,705,863	174,676
Medicaid	-0.027	-0.010	-0.068
	(0.020)	(0.017)	(0.056)
N	1,880,539	1,705,863	174,676
Housing assistance	0.005	0.003	0.047**
	(0.004)	(0.002)	(0.018)
N	1,880,539	1,705,863	174,676
AFDC/TANF[a]	-0.030***	-0.019***	-0.020
	(0.009)	(0.007)	(0.058)
N	1,384,842	1,306,571	78,271
WIC[ab]	-0.010	-0.010	0.032
	(0.009)	(0.007)	(0.042)
N	639,142	603,435	35,707
	Panel III: Overall Program Participation		
Any Program[c]	0.004	0.021	-0.033
	(0.013)	(0.011)	(0.047)
N	1,880,539	1,705,863	174,676

*** significant at 1% level ** significant at 5% level

Notes: Marginal effects from weighted probit estimates are obtained using data drawn from the Current Population Survey March Supplements between 1980 and 2014. The dependent variable is an indicator for receipt of the public assistance program listed in the left column. Each regression includes a set of controls identical to those noted in Table 2. Standard errors corrected for clustering on the state are in parentheses.

[a] Sample is restricted to women ages 16 to 54.

[b] Data are only available the Current Population Survey March Supplements between 2001 and 2014.

[c] Housing assistance receipt is estimated using retrospective minimum wage from the previous year. WIC is excluded because it is only available in the 2001-2014 March CPS.

Appendix Table 2A. Robustness of Estimates of the Relationship between Minimum Wage Increases and Public Assistance Receipt Controlling for Three Years of Leads, CPS, 1979-2013

	Working age	Workers	Non-workers	Non-White	Ages 16-29 without HS	Single Mothers without HS Ages 16-45
	(1)	(2)	(3)	(4)	(5)	(6)
SNAP/Food stamp	-0.014	-0.004	-0.044	-0.016	-0.000	-0.233**
	(0.014)	(0.009)	(0.040)	(0.032)	(0.035)	(0.111)
N	3,709,428	2,878,046	831,382	1,095,016	344,908	29,760
Medicaid	0.008	0.015*	-0.016	0.064**	-0.057	-0.036
	(0.014)	(0.008)	(0.042)	(0.026)	(0.034)	(0.134)
N	3,709,428	2,878,046	831,382	1,095,016	344,908	29,760
Housing assistance	-0.001	-0.001	0.001	0.001	0.004	0.050
	(0.002)	(0.001)	(0.005)	(0.005)	(0.006)	(0.063)
	3,580,372	2,783,136	797,236	1,044,699	333,594	28,981
AFDC/TANF[a]	0.004	0.001	0.016	0.014	-0.015	-0.062
	(0.003)	(0.002)	(0.010)	(0.010)	(0.015)	(0.140)
N	1,641,990	1,205,513	436,477	512,827	164,597	29,760
WIC	-0.001	0.001	-0.008	0.010	0.020	-0.243
	(0.003)	(0.002)	(0.008)	(0.010)	(0.023)	(0.169)
N	739,926	540,143	199,783	270,498	77,231	12,072
Any program	0.016	0.027*	-0.034	0.136***	0.024	-0.009
	(0.018)	(0.015)	(0.087)	(0.037)	(0.039)	(0.083)
N	1,836,857	1,666,982	169,875	580,146	289,440	30,068

*** significant at 1% level ** significant at 5% level * significant at 10% level

Notes: Marginal effects from weighted probit estimates are obtained using data drawn from the Current Population Survey March Supplements between 1980 and 2014. The dependent variable is an indicator for receipt of the public assistance program listed in the left column. Each regression includes a set of controls identical to those noted in Table 2. Standard errors corrected for clustering on the state are in parentheses.

[a] Sample is restricted to women ages 16 to 54 in columns (1) through (4), and women of stated ages in columns (5) through (6).

[b] Data are only available the Current Population Survey March Supplements between 2001 and 2014.

[c] Housing assistance receipt is estimated using retrospective minimum wage from the previous year. WIC is excluded because it is only available in the 2001-2014 March CPS.

Appendix Table 2B. Estimates of the Long-Run Relationship between Minimum Wage Increases and Public Assistance Receipt, CPS, 1979-2013

		Working age	Workers	Non-workers
		(1)	(2)	(3)
SNAP/Food stamp:	Ln(MW)	-0.009	-0.000	-0.037
		(0.008)	(0.005)	(0.021)
	$Ln(MW_{t-1})$	0.003	-0.002	0.026
		(0.010)	(0.007)	(0.028)
	$Ln(MW_{t-2})$	-0.006	-0.001	-0.024
		(0.014)	(0.008)	(0.040)
χ^2 test $\beta_t + \beta_{t-1} + \beta_{t-2} = 0$ (p-value)		0.55 (0.45)	0.11 (0.74)	0.69 (0.40)
N		3,798,071	2,943,160	854,911
Medicaid:	Ln(MW)	-0.004	0.005	-0.041
		(0.009)	(0.006)	(0.029)
	$Ln(MW_{t-1})$	-0.001	-0.003	0.011
		(0.008)	(0.006)	(0.023)
	$Ln(MW_{t-2})$	0.011	0.014*	-0.010
		(0.014)	(0.007)	(0.038)
χ^2 test $\beta_t + \beta_{t-1} + \beta_{t-2} = 0$ (p-value)		0.10 (0.75)	2.07 (0.15)	0.62 (0.43)
N		3,798,071	2,943,160	854,911
Housing assistance:	Ln(MW)	0.005**	0.002	0.015**
		(0.002)	(0.001)	(0.006)
	$Ln(MW_{t-1})$	-0.006**	-0.005**	-0.012
		(0.003)	(0.002)	(0.008)
	$Ln(MW_{t-2})$	0.006**	0.005**	0.008
		(0.003)	(0.002)	(0.007)
χ^2 test $\beta_t + \beta_{t-1} + \beta_{t-2} = 0$ (p-value)		5.55 (0.02)	4.58 (0.03)	6.16 (0.01)
N		3,798,071	2,943,160	854,911
AFDC/TANF[a]:	Ln(MW)	-0.002	-0.000	-0.006
		(0.003)	(0.002)	(0.013)
	$Ln(MW_{t-1})$	0.005	0.001	0.016
		(0.003)	(0.003)	(0.017)
	$Ln(MW_{t-2})$	-0.001	-0.001	0.001
		(0.003)	(0.002)	(0.014)
χ^2 test $\beta_t + \beta_{t-1} + \beta_{t-2} = 0$ (p-value)		0.27 (0.60)	0.10 (0.75)	0.69 (0.41)
N		1,679,508	1,231,641	447,867
WIC[ab]:	Ln(MW)	-0.003	0.001	-0.019*
		(0.003)	(0.002)	(0.010)
	$Ln(MW_{t-1})$	-0.000	-0.005	0.017
		(0.004)	(0.003)	(0.013)
	$Ln(MW_{t-2})$	0.002	0.003	-0.009
		(0.003)	(0.003)	(0.010)
χ^2 test $\beta_t + \beta_{t-1} + \beta_{t-2} = 0$ (p-value)		0.30 (0.59)	0.01 (0.93)	1.34 (0.25)
N		777,444	566,271	211,173
Any program[c]:	Ln(MW)	-0.010	0.007	-0.075
		(0.011)	(0.011)	(0.063)
	$Ln(MW_{t-1})$	-0.002	-0.006	0.051
		(0.016)	(0.014)	(0.076)
	$Ln(MW_{t-2})$	0.027	0.030**	-0.018
		(0.019)	(0.014)	(0.085)
χ^2 test $\beta_t + \beta_{t-1} + \beta_{t-2} = 0$ (p-value)		0.59 (0.44)	3.63 (0.06)	0.22 (0.64)
N		1,880,539	1,705,863	174,676

*** significant at 1% level ** significant at 5% level * significant at 10% level

Notes: Marginal effects from weighted probit estimates are obtained using data drawn from the Current Population Survey March Supplements between 1980 and 2014. The dependent variable is an indicator for receipt of the public assistance program listed in the left column. Each regression includes a set of controls identical to those noted in Table 2. Standard errors corrected for clustering on the state are in parentheses.

[a] Sample is restricted to women ages 16 to 54.

[b] Data are only available the Current Population Survey March Supplements between 2001 and 2014.

[c] Housing assistance receipt is estimated using retrospective minimum wage from the previous year. WIC is excluded because it is only available in the 2001-2014 March CPS.

Appendix Table 3. Robustness of Estimates of the Relationship between Minimum Wage Increases and Public Assistance Receipt Controlling for Higher-Order Polynomials for State-Specific Trends, CPS, 1979-2013

	State 4th-order polynomial time trends				State 5th-order polynomial time trends			
	Working age	*Workers*	*Non-workers*	*Non-workers (HH Adult=1[d])*	*Working age*	*Workers*	*Non-workers*	*Non-workers (HH Adult=1[d])*
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
SNAP/Food stamp	-0.009	-0.003	-0.019	-0.026	-0.010	-0.002	-0.026	-0.036
	(0.007)	(0.007)	(0.017)	(0.072)	(0.007)	(0.007)	(0.017)	(0.077)
N	3,798,071	2,943,160	854,911	110,365	3,798,071	2,943,160	854,911	110,365
Medicaid	-0.010	-0.006	0.004	-0.021	-0.010	-0.007	0.003	-0.026
	(0.010)	(0.008)	(0.019)	(0.059)	(0.009)	(0.007)	(0.019)	(0.054)
N	3,798,071	2,943,160	854,911	110,365	3,798,071	2,943,160	854,911	110,365
Housing assistance	0.000	-0.002	0.010	0.003	0.001	-0.002	0.012	-0.001
	(0.003)	(0.002)	(0.007)	(0.036)	(0.003)	(0.003)	(0.008)	(0.040)
N	3,798,071	2,943,160	854,911	110,365	3,798,071	2,943,160	854,911	110,365
AFDC/TANF[b]	-0.009	-0.004	-0.013	-0.023	-0.012**	-0.005	-0.024*	-0.069
	(0.006)	(0.006)	(0.012)	(0.069)	(0.003)	(0.006)	(0.012)	(0.074)
N	1,679,508	1,231,641	447,867	51,793	1,679,508	1,231,641	447,867	51,793
WIC[bc]	-0.006	0.002	-0.024	0.035	-0.007	0.001	-0.030	0.035
	(0.009)	(0.010)	(0.019)	(0.047)	(0.009)	(0.009)	(0.019)	(0.050)
N	777,444	566,271	211,173	23,872	777,444	566,271	211,173	23,872
Any program[c]	-0.014	-0.007	-0.023	-0.011	-0.014	-0.005	-0.047	-0.036
	(0.013)	(0.013)	(0.045)	(0.064)	(0.011)	(0.011)	(0.048)	(0.067)
N	1,880,539	1,705,863	174,676	88,952	1,880,539	1,705,863	174,676	88,952

*** significant at 1% level ** significant at 5% level * significant at 10% level

Notes: Weighted OLS estimates are obtained using data drawn from the Current Population Survey March Supplements between 1980 and 2014. The dependent variable is an indicator for receipt of the public assistance program listed in the left column. Each regression includes a set of controls identical to those noted in Table 2. Standard errors corrected for clustering on the state are in parentheses. Results are estimated via OLS because probit models fail to converge in most cases.

[a] Sample is restricted to women ages 16 to 54.

[b] Data are only available the Current Population Survey March Supplements between 2001 and 2014.

[c] Housing assistance receipt is estimated using retrospective minimum wage from the previous year. WIC is excluded because it is only available in the 2001-2014 March CPS.

Appendix Table 4. Minimum Wages and Family-Level Program Participation, CPS, 1979-2013

	Working age	Workers	Non-workers	Working age	Workers	Non-workers
	(1)	(2)	(3)	(4)	(5)	(6)
SNAP/Food stamp	-0.015	-0.006	-0.066	-0.028***	-0.009	-0.213***
	(0.013)	(0.008)	(0.050)	(0.008)	(0.006)	(0.043)
N	2,062,848	1,837,779	225,069	2,062,848	1,837,779	225,069
Medicaid	-0.036	-0.021	-0.084	-0.011	-0.001	-0.066
	(0.024)	(0.019)	(0.064)	(0.014)	(0.011)	(0.062)
N	2,062,848	1,837,779	225,069	2,062,848	1,837,779	225,069
Housing assistance	0.004**	0.002	0.030***	-0.004*	-0.003*	-0.017
	(0.002)	(0.001)	(0.011)	(0.002)	(0.002)	(0.018)
N	2,062,848	1,837,779	225,069	2,062,848	1,837,779	225,069
AFDC/TANF[a]	0.001	-0.000	0.050	-0.011***	-0.005**	-0.158***
	(0.004)	(0.002)	(0.067)	(0.003)	(0.002)	(0.055)
N	1,395,698	1,294,134	101,564	1,395,698	1,294,134	101,564
WIC[ab]	-0.006	-0.007	0.026	-0.005	-0.005	0.002
	(0.006)	(0.005)	(0.027)	(0.006)	(0.005)	(0.027)
N	642,611	592,567	50,044	642,611	592,567	50,044
Any program[c]	0.004	0.017	-0.039	-0.019	-0.002	-0.138**
	(0.014)	(0.012)	(0.052)	(0.013)	(0.011)	(0.061)
N	2,062,848	1,837,779	225,069	2,062,848	1,837,779	225,069
State linear time trend?	No	No	No	Yes	Yes	Yes
Division FE*Year FE?	No	No	No	Yes	Yes	Yes

*** significant at 1% level ** significant at 5% level * significant at 10% level

Notes: Marginal effects from weighted probit estimates are obtained using data drawn from the Current Population Survey March Supplements between 1980 and 2014. The dependent variable is an indicator for receipt of the public assistance program listed in the left column. Each regression includes a set of controls identical to those noted in Table 2. Standard errors corrected for clustering on the state are in parentheses.

[a] Sample is restricted to women ages 16 to 54.

[b] Data are only available the Current Population Survey March Supplements between 2001 and 2014.[c] Housing assistance receipt is estimated using retrospective minimum wage from the previous year. WIC is excluded because it is only available in the 2001-2014 March CPS.

[d] Sample is restricted to households with only one working-age adult age 18 or older.

Appendix Table 5. Robustness of Estimates of the Relationship between Minimum Wage Increases and Labor Force Participation, CPS and SIPP

	CPS (1979-2013)			SIPP (1996-2013)		
	Non-White	*Ages 16-29 without HS*	*Single Mothers without HS Ages 16-45*	*Non-White*	*Ages 16-29 without HS*	*Single Mothers without HS Ages 16-45*
	(1)	(2)	(3)	(4)	(5)	(6)
Ln(Earnings)[a]	0.136	0.366	1.887	-0.072	-0.410	0.107
	(0.247)	(0.301)	(1.166)	(0.117)	(0.247)	(0.726)
N	1,080,091	347,330	29,759	2,798,979	755,827	64,300
	[23,146.710]	[5,236.063]	[7,944.093]	[1,820.492]	[421.132]	[680.942]
Employed	0.014	0.038	0.241*	-0.018	-0.075*	0.015
	(0.029)	(0.046)	(0.135)	(0.014)	(0.041)	(0.110)
N	1,080,091	347,330	29,759	2,798,979	755,827	64,300
	[0.692]	[0.486]	[0.522]	[0.642]	[0.360]	[0.503]
Ln(Hours) | Employed=1	-0.002	-0.002	-0.173	-0.008	-0.250***	0.003
	(0.033)	(0.085)	(0.138)	(0.013)	(0.061)	(0.099)
N	750,173	170,024	15,523	1,594,349	241,956	29,479
	[38.330]	[29.002]	[35.424]	[38.331]	[29.081]	[35.038]
Ln(Weeks) | Employed=1	-0.005	-0.013	0.292	0.056***	0.046	0.054
	(0.019)	(0.052)	(0.220)	(0.020)	(0.033)	(0.052)
N	750,173	170,024	15,523	1,751,881	267,124	31,950
	[44.828]	[31.975]	[38.677]	[4.288]	[4.161]	[4.217]
State & year FE?	Yes	Yes	Yes	Yes	Yes	Yes
Month & individual FE?	No	No	No	Yes	Yes	Yes
Ind. & state controls?	Yes	Yes	Yes	Yes	Yes	Yes
State linear time trend?	Yes	Yes	Yes	No	No	No
Division FE*Year FE?	Yes	Yes	Yes	No	No	No

*** significant at 1% level ** significant at 5% level * significant at 10% level

Notes: Weighted OLS estimates in rows 1, 3 and 4, and marginal effects from weighted probit estimates in row 2 of columns (1) through (3) are obtained using data drawn from the Current Population Survey March Supplements between 1980 and 2014. Weighted OLS estimates in columns (4) through (6) are obtained using data drawn from the Survey of Income and Program Participation between 1996 and 2013. For the CPS estimates, each regression includes a set of controls identical to those noted in Table 2.

For the SIPP estimates, each regression includes a set of controls identical to those noted in Table 6. Standard errors corrected for clustering on the state are in parentheses and means in brackets.

In the CPS, earnings are measured as annual earnings; hours as weekly hours, and weeks as annual weeks. In the SIPP, earnings are measured as monthly earnings; hours as weekly hours, and weeks as monthly weeks.

[a] We take the natural log of 1 for individuals who report zero earnings.