The Transformation of the Supplemental Nutrition Assistance Program

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Abstract

Between 2000 and 2005, the Supplemental Nutrition Assistance Program (SNAP, until recently, the Food Stamp Program) caseload increased by half. As the Great Recession unfolded, the SNAP caseload grew even more rapidly. Further, over the past two decades the composition of the caseload has shifted sharply away from families combining food and cash assistance and toward families receiving food assistance in the absence of any other major, means-tested income support. By analyzing components of the caseload separately, we provide new and more insightful estimates of the effects of food and cash assistance policies and the economy on both the change in the composition of the caseload and the large caseload swings over the 1990s and 2000s. We find that the economy can explain a portion of caseload changes, but not compositional shifts. Food and cash assistance policies help to explain both changes. In total, the combination of SNAP and welfare policy changes account for about half of the sharp increase since 1994 in the share of SNAP households receiving food, but not cash, assistance. © 2011 by the Association for Public Policy Analysis and Management.

INTRODUCTION

The Supplemental Nutrition Assistance Program (SNAP), which offers a monthly benefit to low-income households to buy food, has taken on a new prominence in the U.S. social safety net.[1] The SNAP caseload grew by 140 percent from mid-2000 to mid-2010, such that at the end of that period over one in eight U.S. residents was a recipient of SNAP benefits. Clearly, the Great Recession and the 2009 federal stimulus-created benefit increases caused some of this growth. However, from 2000 to mid-2005—well before the start of the Great Recession—the total number of SNAP recipients grew by 50 percent. In contrast, over this same period the Temporary Assistance for Needy Families (TANF) caseload—the main cash assistance program for families with children—shrank.

Eligibility for SNAP is broader than for most other U.S. social safety net programs. Nevertheless, through the early 1990s SNAP was largely an adjunct to means-tested, cash-based programs. Specifically, most SNAP recipients simultaneously participated in TANF, Supplemental Security Income (SSI), or, to a much

[1] Called the Food Stamp Program from its nationwide launch in 1974 until 2008, the program was renamed SNAP (Supplemental Nutrition Assistance Program) in October 2008. The new name reflects the program's mission not only to provide food assistance, but also to improve the nutrition of low-income people. While we use the program's current name in this article, it was known as the Food Stamp Program throughout most of the time period we analyze.

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lesser extent, General Assistance (GA).[2] This has changed. By the fall of 2009, less than a quarter of SNAP recipients lived in families containing children with income from one or more of the three major cash assistance programs.

A broad shift in the emphasis of the U.S. social safety net over the past two decades could plausibly have driven a portion of these changes in the size and composition of the SNAP caseload. Occurring over a decade of policymaking and across several federal agencies that serve low-income families, a number of policy changes refocused safety net programs away from aiding the nonworking poor and toward motivating low-income families to work and supporting them when they did so. The shift began with the widespread use of the federal waiver authority to grant states leeway in reshaping their Aid to Families with Dependent Children (AFDC) policies in the early 1990s. It continued with the passage of the Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA) in 1996, which replaced AFDC with TANF and gave states incentives to time limit cash assistance and to require work of adults (Weaver, 2000).

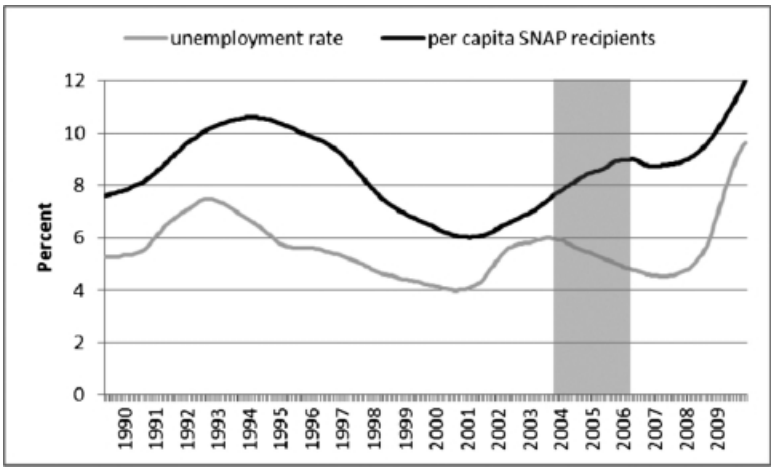
Complementing these changes in welfare programs were parallel changes in SNAP (Super, 2004). These changes in SNAP—beginning with PRWORA (and clarified by several rounds of federal regulations), then expanded in the 2002 and later Farm Bills—transformed what had been a nearly uniform national program into a program with considerable state discretion. Over the 2000s and to varying degrees, states used these changes to reorient their SNAP programs toward the support of working families.

Taken together, these policy changes have plausibly increased access to SNAP and restricted access to TANF. In combination with the recent Great Recession, these policy changes might explain the massive caseload increase concentrated in the portion of the SNAP caseload *not* combining food with cash assistance. The recent literature, which we review below, has considered aspects of these changes. This article extends that earlier literature, attempting to explain the roles of these policy changes and the economy in both the level of the SNAP caseload and its composition. Crucially, given the recent and ongoing changes in both policies and the economy, our data covers the period through September 2009—past the implementation of the mid-2000s reforms and into the start of the Great Recession. Those additional years of data support more precise estimates and more robust interpretation.

While it is plausible that these factors—SNAP policy, welfare policy, the economy—have altered the way that families make use of income support programs, empirical estimates are needed to gauge the quantitative importance of these conjectures. This article assesses the magnitudes of such impacts by estimating separate econometric models for caseload components defined by the presence or absence of cash assistance in the household. Our empirical estimates confirm that these three factors affect different components of the caseload in different and plausible ways. We then use simulation to understand the ability of the estimated models to explain the large changes over time in both the size of the caseload and its composition.

The balance of this article proceeds as follows. The next section briefly describes recent trends in the SNAP caseload, trends in the economy, and major policy changes. The third section reviews the previous literature, the fourth section discusses our data, and the fifth section describes our econometric methods. The sixth section presents our empirical results and sensitivity analyses, and the seventh section presents simulations that explore the effect of the measured economic and policy changes on the level and composition of the caseload. The final section considers the implications of these results for the aggregate SNAP caseload and discusses directions for future work.

[2] Congress established TANF in August 1996. Before that time, the main cash assistance program for families with children was Aid to Families with Dependent Children (AFDC).



Sources: Bureau of Labor Statistics; Bureau of the Census; Food and Nutrition Service, U.S. Department of Agriculture (FNS-388).

Figure 1. SNAP caseload and the economy. Both rates are centered moving averages, summing across 13 months and giving half weights to the first and thirteenth months. FSP/SNAP caseloads presented in the figure include recipients of disaster assistance. The shaded area (2004 to 2006) is the period when the tight relationship between the unemployment rate and the SNAP caseload appears to break down. The econometric analysis attempts to explain this anomaly.

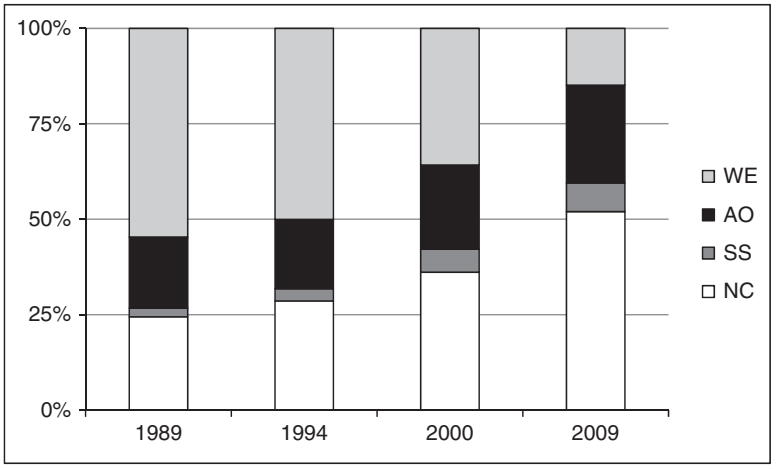
RECENT TRENDS

We begin with the two key stylized facts that motivate this article: the striking changes in the level and the composition of the SNAP caseload. Figure 1 presents the path of the aggregate SNAP caseload from fiscal year 1989 through 2009. As of the end of fiscal year 2009 (the end of our analysis time period), the caseload as a whole had passed its earlier, mid-1990s high point. U.S. Department of Agriculture program data indicate that the caseload has continued to increase since then.[3]

Over this same time period (1989 to 2009), it has become far less common for individuals in households receiving SNAP to conform to the traditional safety net model of combining food with cash assistance. To elucidate this shift, we define four mutually exclusive caseload components:

1. AO (adult only): Adults living in SNAP households that contain no children;[4]
2. WE (welfare cash assistance): Individuals living in SNAP households containing children that are receiving any cash benefits from AFDC, TANF, state-funded assistance, or GA;[5]

[3] FNS updates SNAP program data monthly at http://www.fns.usda.gov/pd/snapmain.htm. These data are approximately a year more current than the individual-level QC data we use in our econometric models.
[4] We consider the AO subcaseload separately because safety net program changes over the past two decades were focused first and foremost on families with children.
[5] This is not the definition used in form FNS-388A that states file biannually with FNS. The pair of definitions used in this form splits the caseload by whether or not *all* members are receiving AFDC/TANF, General Assistance (GA), or SSI. Our definition records whether *any* household member is receiving means-tested cash assistance. We adopt our definition because we assume that households share resources: Those who are not members of a cash assistance unit still benefit from the check that other household members receive.



Source: Authors' calculations from the SNAP quality control samples.

Figure 2. SNAP caseload composition. See the body of the article for definitions of NC, WE, SS, and AO. Caseloads are defined as mean number of persons over each federal fiscal year.

3. SS (SSI cash assistance): Individuals living in SNAP households containing children that are receiving cash benefits from SSI;[6]
4. NC (no cash): Individuals living in SNAP households containing children that are not receiving cash assistance. Such households may have earnings or unearned income from sources such as child support, but they sometimes have no reported gross income.

Henceforth, we use the abbreviations just defined to refer to the analysis caseloads. Figure 2 shows that these four components shifted sharply in importance between 1989 and 2009. Across each of the four subcaseloads, the number of recipients grew approximately in parallel through the mid-1990s. Thereafter, the number of WE recipients dropped sharply and then more gradually, the number of SS recipients stayed roughly constant and then rose very sharply, and the number of recipients NC and AO dropped somewhat and then began to rise sharply.

The net result of these diverging trends in the subcaseloads is a sharp change in the composition of the total caseload (Figure 2). The WE group plummeted from 55 percent of the total caseload in 1989 to 15 percent of the total caseload in 2009. In contrast, the NC subcaseload increased from 25 percent to 52 percent of all SNAP recipients between 1989 and 2009. This is a striking change. Over two decades, the SNAP caseload that had been predominantly welfare recipients is now no longer so.

What might have caused these changes in both the size and composition of the SNAP caseload? The economic theory of program participation is a useful starting point (e.g., Grogger, Karoly, & Klerman, 2002; Keane & Moffitt, 1998). It posits that families choose a bundle of work and program participation to maximize their utility (consumption of goods, leisure, compliance burden, and stigma from program participation), subject to program rules and available labor market options. This perspective has several implications. First, SNAP benefits are relatively small—on

[6] We classify those living in households receiving both AFDC/TANF and SSI cash assistance as part of the AFDC/TANF caseload. Of all SNAP recipients living in households with income from AFDC/TANF or SSI cash assistance, 11 percent had income from both sources between 1989 and 2009.

average about $227 per household per month in fiscal year 2008—and the administrative burden for recipients of enrolling and remaining enrolled is nontrivial (Bartlett & Burstein, 2004; Government Accountability Office [GAO], 1999).[7] We would therefore expect anything that lowers the burden of compliance for SNAP recipients to increase the SNAP caseload.

Second, consider the effect of a welfare policy change that makes cash assistance less attractive without changing the attractiveness of SNAP alone. Given that welfare recipients are usually automatically enrolled in SNAP, such a policy change would be expected to lower the WE subcaseload. Some, but probably not all, of those who would have been on welfare under the old rules, but not under the new, will nevertheless be part of the NC subcaseload. We can think of such cases as having "converted" from welfare to SNAP only. The language is imprecise—some people will literally convert: They are on welfare and SNAP in one month and SNAP alone in the next month. However, others would have gone onto welfare but instead join the NC subcaseload. In addition, some of those who would have shifted (at some point) from the NC to the WE subcaseload will not do so.

Third, when the economy is good, earnings are higher and fewer families are eligible for SNAP. Even those families that are eligible for SNAP are on average eligible for only a smaller benefit and would therefore be less likely to apply or keep their paperwork current. We would therefore expect the total caseload to be countercyclical. A similar argument implies that the WE subcaseload should be countercyclical. The implied impact on the NC subcaseload is therefore theoretically ambiguous. Considered alone, we would expect a better economy to cut the NC subcaseload. However, it is possible that movements from WE to NC dominate movements from NC to off SNAP altogether.

The time path of the aggregate SNAP caseload is consistent with this theoretical perspective. First, the sharp decline in the WE subcaseload is coincident with major welfare reform (PRWORA) and the waiver-based reforms that immediately preceded it. Further, the sharp increase in the NC subcaseload follows the expansion of state SNAP policy options intended to curtail eligibility requirements and lower the burden of participation (discussed in more detail in the Data section).

Finally, Figure 1, using the unemployment rate to proxy for the economy, shows that the SNAP caseload is broadly countercyclical. However, there is a striking puzzle highlighted in the shaded portion of the figure: The caseload increased strongly in the early 2000s even when the economy was improving. The preceding discussion supplies a possible explanation: Policy changes might have more than counteracted any influence of economic factors. We use simulation to investigate this possible explanation in the following section.

The theoretical perspective is plausible and consistent with aggregate patterns. We use difference-in-difference models estimated on SNAP quality control (QC) data to provide more formal and quantitative estimates of the importance of these factors and their ability to explain both the striking caseload increase of the 2000s and the equally striking compositional change over the 1990s and 2000s.

PREVIOUS LITERATURE

Two strands of the previous literature consider aspects of our main research questions. First, a growing literature has addressed the role of the economy in SNAP caseload changes and the question of whether SNAP policy changes have increased participation in the program (Currie & Grogger, 2001; Hanratty, 2006; Kabbani &

[7] Benefit levels are set by federal law and grow with inflation. With the exception of Alaska and Hawaii, they are uniform across the states. The 2009 American Recovery and Reinvestment Act (ARRA) sharply raised SNAP benefits—by 13.6 percent—starting in spring 2009. ARRA also suspended the inflation adjustment until real benefits return to their 2008 level.

Wilde, 2003; Kornfeld, 2002; Mabli, Martin, & Castner, 2009; Ratcliffe, McKernan, & Finegold, 2008). The core SNAP policies that this literature has considered are reductions in the paperwork burden for participants (in the form of adopting simplified reporting and lengthening recertification periods) and paring down eligibility requirements (by excluding vehicles from the asset test).[8] A second form of easing asset tests, known as expanding categorical eligibility, has received less attention in the literature—a point to which we will return later.[9]

Most of these analyses have considered both the entire caseload and subsets of participants, making the plausible argument that we should expect to see SNAP policies affect distinct groups differently. Across studies, the groups considered are often defined by demographic characteristics—the marital status of the household head and the presence of a child or elderly person in the household. However, definitions vary across studies, making it difficult to draw overall conclusions about effect sizes for subgroups. This literature finds a robust, positive impact of lengthening certification periods for the entire caseload and for most subgroups, but mixed evidence that impacts vary across subgroups. Evidence that the entire caseload, or any portion of it, responds to the introduction of simplified reporting and the elimination, or partial elimination, of vehicle asset tests is very mixed.[10]

A second, smaller literature explicitly considers cross-program effects of welfare policy changes. Most closely related to the approach we adopt is Wallace and Blank (1999). They estimate the impact of the adoption of waivers to federal AFDC rules on three caseloads: per capita SNAP recipients, per capita AFDC recipients, and a residual caseload defined by taking the difference between the two. They include an indicator variable measuring the implementation of an AFDC waiver, finding evidence that welfare waivers pushed the AFDC caseload down and the residual SNAP caseload up.[11] Several studies have also assessed whether the switch from AFDC to TANF caused the SSI caseload to rise, finding evidence that it did (Nadel, Wamhoff, & Wiseman, 2003/2004; Schmidt & Sevak, 2004; Wamhoff & Wiseman, 2005/2006).

We bring together these two strands of the literature. Drawing on the first strand, we consider specific policy changes that may have altered participation decisions among potential participants, and we define subgroups of the entire SNAP caseload that plausibly vary in their sensitivity to these policy changes. Incorporating the second strand, we define the subgroups by their engagement with other major safety net programs and explicitly consider cross-program effects.[12] With this approach, we aim to elucidate the extent to which the de facto and de jure decoupling of

[8] The early research—which had available data through the end of the 1990s—focused on the length of certification periods because other policy changes had not yet occurred.

[9] Households are deemed categorically eligible for SNAP benefits when all members included in the SNAP benefit calculation are simultaneously recipients of a means-tested cash assistance program (GA, SSI, or TANF). Asset tests are waived for such categorically eligible households. In other words, the federal government allows states to simplify the application process for SNAP for such households because all household members have already been found to be eligible for one or several cash assistance programs. When states expand categorical eligibility, they waive asset tests for broader groups of applicants. See Appendix A for further details. All appendices are available at the end of this article as it appears in JPAM online. See the complete article at wileyonlinelibrary.com.

[10] Mabli, Martin, and Castner (2009) is unique in considering the entire SNAP caseload instead of segments of the caseload (the report also considers policy effects on the estimated number eligible in the population, and the ratio of the two—the take-up rate). The estimates presented in the report indicate that simplified reporting increases the number of participants. However, their analysis does not control for the length of certification periods. Because states tended to lengthen certification periods to correspond to a multiple of six months when they adopted simplified reporting, it is possible that their variable is capturing the effect of lengthening certification periods.

[11] A robust literature on the effects of welfare reform finds strong evidence that welfare policy changes pushed the AFDC/TANF caseload down. This literature is reviewed in Blank (2002) and Grogger, Karoly, and Klerman (2002) and is updated in Danielson and Klerman (2008).

[12] Both strands of the literature have relied on a difference-in-differences methodology, which we adopt as well—the Methods section describes this approach.

welfare and food assistance that occurred in the wake of the welfare overhaul of the 1990s reshaped the SNAP caseload and its role in the U.S. social safety net.

DATA

Following one strand of the literature on the determinants of the SNAP caseload, we model per capita SNAP recipients using FSP/SNAP QC data.[13] Federal statute requires states to participate in an ongoing quality control review program to assess payment accuracy.[14] Under this program, state auditors draw stratified random samples of SNAP units. In our data, sample sizes range between 293 and 3,648 cases for each state and fiscal year. We use the supplied weights to compute monthly, state-level caseloads of persons on SNAP, stratifying to obtain AO, WE, NC, and SS groups.[15] When we analyze total caseloads, we construct recipients from monthly reports that states file with the Food and Nutrition Service (FNS) within the U.S. Department of Agriculture. These reports are called the FNS-388.

The quality control (QC) data provide high-quality information about participation in SNAP for large samples, including oversamples of smaller states. All three of these features compare favorably with survey data. Program participation is known to be substantially underreported in survey data, and SNAP is no exception (Meyer, Mok, & Sullivan, 2009; Wheaton, 2007). Such underreporting is not an issue in the QC data. In addition, per capita SNAP participation is relatively low (over our time period, between about 6 and 12 percent of the population), so general population surveys contain comparatively few participants. The resulting small number of surveyed individuals on SNAP limit the statistical precision of estimates. In contrast, the QC files have large numbers of SNAP participants—roughly 45,000 to 65,000 households per year, and more than 100,000 individuals.

Finally, most surveys allocate samples to states approximately in proportion to each state's population. That is the optimal strategy when the primary goal is national estimates, as is usually the case. However, that strategy implies small samples for smaller states, and therefore difficulty tracing out the effect of policy changes in such smaller states. In contrast, the primary purpose of the QC data is to generate estimates of state-specific error rates. To achieve that goal, the QC data oversample small states relative to their population. Since our empirical approach exploits interstate variation, this sampling design is attractive.

Both of these data sources include information only about those receiving SNAP benefits. Construction of our dependent variable—recipients per capita—requires external information on an appropriately defined population. Some of the literature has defined this population to be those eligible—more and less precisely so—for the program (e.g., Mabli, Martin, & Castner, 2009; Ratcliffe, McKernan, & Finegold, 2008). Because we seek to understand caseload changes, we do not try to restrict the population to an estimate of eligibles. Instead, we use state-level population estimates from U.S. Census Bureau as our denominator. These data are annual; we linearly interpolate to obtain monthly estimates.

[13] Analyses using this approach include Gleason et al. (2001), Kabbani and Wilde (2003), and Kornfeld (2002). A complementary approach is to use survey data—the CPS (Currie & Grogger, 2001) or the SIPP (Hanratty, 2006; Ratcliffe, McKernan, & Finegold, 2008). The reader should note that we are modeling participation per person. Some SNAP literature models participation per *eligible* person. In many U.S. Department of Agriculture reports, the term "participation rate" is used to describe participation per member of the estimated eligible population (see, e.g., Kornfeld, 2002). We use the term "per capita participation" to refer to participants per member of the population to avoid confusion.

[14] For additional detail about the QC program, see GAO (2001), Leftin et al. (2010), and Rosenbaum (2000).

[15] We have complete data for federal fiscal years 1989 to 2009 for all 50 states and the District of Columbia, with the exception of 15 months for which no QC reviews appear to have been performed: four months in the District of Columbia, four in Mississippi, and seven in Louisiana. Further details on the construction of the analysis file are given in Appendix A. All appendices are available at the end of this article as it appears in JPAM online. See the complete article at wileyonlinelibrary.com.

Our interest in determinants of the SNAP caseload implies that we require proxies for important SNAP and welfare policy changes and for the state of the macroeconomy. Table 1 summarizes the prevalence of key welfare and SNAP policies over the 1990s and 2000s and notes the national unemployment rate. The table makes clear that most welfare policy changes occurred in the 1990s, while the major shifts in SNAP policies occurred during the 2000s. Appendix A provides additional description and detailed sources for these variables.[16]

Much of the interstate variability in SNAP policies arose from increased state discretion in the implementation of SNAP, which was put in place largely during the 2000s (Danielson et al., 2011; Super, 2004). Federal law mandated the replacement of paper food stamps with debit-like EBT cards in 1996; states made the change over a period of more than a decade. Broadly speaking, major SNAP policy changes can usefully be classified into those that reduce the compliance burden for participants (simplified reporting and length of certification periods) and those that ease eligibility rules (vehicle exclusions and categorical eligibility expansions). As shown in Table 1, we include narrower and broader variants of vehicle exclusions, expanded categorical eligibility, and simplified reporting. We also compute the share of the caseload with three-month or shorter certification periods for each of the subcaseloads. We used a combination of existing published sources and direct contact with federal and state administrators to construct the SNAP policy variables.[17]

Our second set of variables listed in Table 1 captures welfare policy changes that occurred during the 1990s and continued into the 2000s: welfare time limits, diversion programs, sanction policies, and benefit levels. We derived this set of policy variables from the Welfare Rules Database (Urban Institute, n.d.). We also include the state-level minimum wage, using the federal minimum wage if a state's minimum wage is equal to or lower than the federal minimum wage. We deflate all dollar amounts using the Consumer Price Index for All Urban Consumers (CPI-U) constructed by the Bureau of Labor Statistics.

Our third set of variables describes the state of the economy. As is standard in the literature, we use state-level unemployment rates drawn from the U.S. Bureau of Labor Statistics's Local Area Unemployment Series (e.g., Hanratty, 2006; Kabbani & Wilde, 2003).[18]

METHODS

We estimate the effects of SNAP policy, welfare policy, and the economy on the previously mentioned SNAP caseload and subcaseloads, using a difference-in-differences approach. Specifically, we regress the log of aggregate per capita participation at the state–month level directly on the forcing variables (SNAP policies, welfare policies, and the economy). In addition, we include dummy variables for state, calendar year and month, and state-specific linear time trends to control for unobserved time invariant state-level factors and national time-varying factors:

$$\log[y_{g,s,t}] = \log\left[\frac{M_{g,s,t}}{N_{s,t}}\right] = \alpha_g + X_{s,t}\boldsymbol{\beta}_g + \mu_{g,s} + f[t,\theta_g] + \gamma_{g,s}t + \varepsilon_{g,s,t} \quad (1)$$

[16] All appendices are available at the end of this article as it appears in JPAM online. See the complete article at wileyonlinelibrary.com.

[17] National policy changes—for example, the benefit increases included in the 2009 American Recovery and Reinvestment Act—may well also have driven a portion of both the 2000s caseload increase and its compositional change. Our identification strategy, presented in the next section, does not permit estimation of such effects.

[18] The Bureau of Labor Statistics produces model-based estimates that combine data from the Current Population Survey, the Current Employment Statistics program, and state unemployment insurance systems.

Table 1. Policies and the economy.

	Description	1994	2000	2009
A. SNAP policies (percent of caseload subject to policy)				
EBT issuance	Percent of benefits issued through Electronic Benefits Transfer	2%	73%	100%
Some vehicles excluded	Other program rules used to exempt some household vehicles from the asset test	0%	0%	25%
All vehicles excluded	Other program rules used to exempt all household vehicles from the asset test	0%	0%	51%
Expanded categorical eligibility: Narrow	Exemption from asset and often income tests for households participating in noncash benefit program	0%	12%	24%
Expanded categorical eligibility: Broad	Exemption from asset and often income tests for households receiving informational brochure	0%	0%	52%
Simplified reporting	Reduced reporting requirements for households with earned income	0%	0%	14%
Expanded simplified reporting	Reduced reporting requirements for earned income and some or all other households	0%	0%	78%
Short recertification periods	Percent of households with recertification periods of three months or less	5%	19%	1%
B. Welfare policies (percent of caseload subject to policy, except where noted as dollar amounts)				
Diversion	Program exists to provide short-term, nonrecurring benefits in case of one-time need in lieu of TANF	0%	51%	75%
Sanctions: Gradual	Violation of work-related program rules eventually results in elimination of welfare grant	1%	36%	34%
Sanctions: Immediate	Violation of work-related program rules results immediately in elimination of welfare grant	0%	26%	47%
Time limits	Cash assistance is time limited for adults or for entire family	0%	96%	99%
Maximum cash grant	Maximum monthly grant for family of 3 (2009$, caseload-weighted mean)	$552	$488	$410
Combining welfare and work	Earnings at which grant for family of 3 would be zero, in month 13 of benefit receipt (2009$, caseload-weighted mean)	$886	$1,081	$865
TANF implemented	AFDC program replaced with TANF	0%	100%	100%
State-level minimum wage*	Monthly earnings if working 30 hours a week at state minimum wage (2009$, caseload-weighted mean)	$816	$866	$912
C. Economy				
Unemployment rate	Moving average of previous 12 months' unemployment rate	6.1%	4.0%	9.3%

Note: Years refer to the federal fiscal year. Variants of vehicle policies, expanded categorical eligibility, simplified reporting, and sanctions are constructed to be mutually exclusive. The Appendix further describes sources and coding. All appendices are available at the end of this article as it appears in JPAM online. See the complete article at wileyonlinelibrary.com.

*Although not narrowly welfare policies, state minimum wages are policies; we include them in this category here and in the regression tables for compactness of display.

In Equation (1), the g (for "group") subscript indexes the four caseload components (WE, NC, SS, and AO), emphasizing that our core models stratify totally by caseload component. The s subscript indexes states, and the t subscript indexes time measured in months. Per capita participation is defined as the ratio of participants, M, in group g to the total population, N (no g subscript). Since the dependent variables are the natural log of SNAP recipients per capita, the parameter estimates can be interpreted as percentage changes in the SNAP caseload (or segment of the caseload) caused by a forcing variable—a SNAP policy, a welfare policy, or the economy.

On the right-hand side of Equation (1), X represents the K forcing variables (e.g., SNAP policies, welfare policies, and the economy). The β's are the corresponding K regression coefficients for each subcaseload. The model also includes a vector of 51 state dummies μ (for the 50 states, plus the District of Columbia), dummies for federal fiscal year and month of the year $f[t, \theta]$, a set of state-specific linear time trends γ, and the residual ε.[19]

Given the difference-in-differences assumption—that is, that conditional on fixed effects and state-specific time trends, changes in policies within a state over time are uncorrelated with the regression error term—the resulting estimates have a causal interpretation (Meyer, 1995). We note that our difference-in-differences approach implies that we cannot estimate the impact of national policies such as benefit changes.

When specifying the economy, the previous literature has sometimes included lagged values of the economy, and those lagged values often substantially increase the estimated total effect of the economy (Council of Economic Advisors, 1999; Figlio, Gundersen, & Ziliak, 2000; Klerman & Haider, 2004; Kornfeld, 2002; Ziliak, Gundersen, & Figlio, 2003).[20] In connection with the SNAP caseload in particular, see Schoeni (2001), who argues that the conventional parameterization using only contemporaneous economic variables likely underestimates the true impact of the economy.

We follow this earlier literature and include lagged values of the economic variables. Because caseloads have changed rapidly over a substantial part of the past several decades, and because eligibility is calculated monthly, we measure caseloads at monthly intervals. However, to retain parsimony in these monthly models, our specification uses a 12-month moving average of the state-level unemployment rate. We include the current and five annual lags of this moving average.[21]

We include state-specific linear time trends in the models, noting that there is some controversy in the literature about their inclusion. Wallace and Blank (1999) have argued that the time series are too short to estimate such linear time trends, so that including them soaks up true policy effects. Because we have more than a decade of additional post-implementation data in the time series for many of the key policies we consider, these concerns are likely to be less salient.[22]

[19] We also include three proxies for the demographic composition of the population (percent under age 5, percent age 5 to 15, and percent 65 and older) and dummy variables indicating the months for which we interpolated caseload components because there were no sampled cases in a month and state. The parameter estimates on the latter are small and insignificant for the welfare and no cash subcaseloads, but significant in the case of the SSI subcaseload. Our sensitivity analyses explore the consequences for our policy estimates of dropping observations for which there are no sampled cases.

[20] Another approach in the literature includes lagged dependent variables to capture the correlation of current with earlier caseloads (Figlio, Gundersen, & Ziliak, 2000). However, lagged dependent variables induce inconsistency in models with fixed effects and autocorrelated errors and they have several other disadvantages (Greene, 2002; Nickell, 1981). Danielson and Klerman (2008) provides a fuller discussion.

[21] We choose the lag length using incremental F-tests, adding lags until the test of the longest lag is not significant at the conventional level. Our sensitivity analyses consider the implications of including only the current unemployment rate to capture the state of the economy. We also consider how the estimates change if we estimate the models on average annual caseloads in place of monthly caseloads.

[22] In fact, across models we tend to estimate fewer significant SNAP and welfare policy effects if we exclude these trends. See Appendix Table B.3. All appendices are available at the end of this article as it appears in JPAM online. See the complete article at wileyonlinelibrary.com.

We estimate our preferred models using weighted least squares. The weights are the estimated population in each state and month.[23] Estimation proceeds in Stata using the *suest* routine, allowing us to treat the four caseloads as a system and to perform appropriate tests of cross-equation restrictions. (Since the covariates are identical across equations, there is no gain in precision from estimation as a system.) Our standard errors are clustered on state (Bertrand, Duflo, & Mullianathan, 2004) and are robust to heteroscedasticity.

RESULTS

Table 2 presents results for our main specification. We begin by considering the effects of policies and the economy on the overall caseload measured with monthly administrative caseload reports filed by every state.[24] We then turn to our core estimates for the disaggregated caseloads—measured using states' monthly quality control samples—for additional insight into factors driving the changing composition of the overall caseload.

Looking at Panel A, SNAP policies, we find that the caseload as a whole (column 1) responded to selected asset and reporting policy changes.[25] We note that the insignificant SNAP policy estimates in column 1 are not only statistically insignificantly different from zero; they are almost always also substantively small (less than 1 percent).

Specifically, the total caseload grew by an estimated 6.3 percent in the wake of broadly expanding categorical eligibility, but not after expanding categorical eligibility more narrowly or excluding vehicles from the asset test. The total caseload also grew as states lengthened certification periods over the 2000s, but not when they adopted simplified reporting. Scaling the estimate of the effect of short certification periods (0.32) by the 2000 to 2009 change in the fraction of the caseload subject to such periods (0.18, from Table 1), the estimate implies that the caseload grew by 5.8 percent ($= 0.32 \times 0.18$) as a result of the lengthening of certification intervals over the 2000s.

The previous literature has also generally found a negative effect of short certification periods, but more mixed evidence of an effect of simplified reporting (Hanratty, 2006; Kabbani & Wilde, 2003; Ratcliffe, McKernan, & Finegold, 2008).[26] The two types of reporting policies are negatively correlated, although the cross-sectional correlation between broad implementation of simplified reporting and short certification periods at the end of our data (in September 2009) is still fairly modest, at -0.40. Dropping simplified reporting completely from the model does not alter the estimate of the impact of short certification periods (-0.32). If we instead drop the measure of short certification periods, we continue to obtain insignificant estimates of simplified and expanded simplified reporting (latter two

[23] The optimal weighting scheme if the model were exactly correct and the only lack of fit was due to sampling variability would be to weight by sample size (Greene, 2002). We present sample size-weighted estimates in Appendix Table B.1. All appendices are available at the end of this article as it appears in JPAM online. See the complete article at wileyonlinelibrary.com.

[24] Estimates shown in the first column of Appendix Table B.5 use total monthly SNAP caseloads computed from the QC files instead of the caseload counts given in the FNS-388 administrative reports. The estimates in the first columns of Table 2 and Table B.5 are, unsurprisingly, quite similar. The weights provided with the QC files are derived using information provided in the FNS-388 reports; thus, the similarity is largely mechanical. All appendices are available at the end of this article as it appears in JPAM online. See the complete article at wileyonlinelibrary.com.

[25] We define the two variants of expanded categorical eligibility, of vehicle policies, and of simplified reporting policies to be mutually exclusive. That is, a state could have one or the other, but not both. States that used expansions of categorical eligibility to exclude vehicles are categorized as having expanded categorical eligibility, not having loosened vehicle asset rules.

[26] We continue to estimate a negative effect of short recertification periods if we estimate the model on data from 1990 to 2000, a time period closer to that used in the previous literature (see Appendix Table B.2). We cannot estimate the effects of simplified reporting using only this shorter time series because those policies were only put in place over the 2000s.

models not shown). Below, we also discuss a specification that interacts short certifications and simplified reporting. This allows us to assess whether or not the effects of the two types of reductions in paperwork burden are simply additive.

Turning to the subcaseloads (columns 2 to 5), we find substantial evidence that the effects of SNAP policies have been concentrated in the non-welfare subcaseloads. Table 2 indicates that the WE subcaseload responded only to the switch from paper food stamps to EBT electronic cards, rising 10 percent, and was insensitive to the easing of asset rules and reporting requirements. At the same time, EBT, vehicle exclusions, expansions of categorical eligibility, and lengthening certification periods

Table 2. Parameter estimates, main model.

	(1)	(2)	(3)	(4)	(5)
Caseload:	Total (FNS-388)	NC	WE	SS	AO
A. SNAP policies					
Fraction of SNAP issuance made via EBT	0.025 (0.016)	0.13* (0.051)	0.10* (0.044)	0.018 (0.046)	0.058* (0.027)
Departure from USDA vehicle asset rules: Some vehicles excluded	0.0042 (0.020)	0.099 (0.056)	−0.14 (0.074)	−0.10 (0.091)	−0.0067 (0.025)
Departure from USDA vehicle asset rules: All vehicles excluded	0.0087 (0.021)	0.12* (0.052)	−0.063 (0.061)	−0.053 (0.053)	−0.0072 (0.022)
Participation-based expanded categorical eligibility	0.0099 (0.021)	0.084* (0.039)	−0.041 (0.080)	0.067 (0.070)	0.011 (0.026)
Information-based expanded categorical eligibility	0.063** (0.020)	0.049 (0.036)	−0.031 (0.054)	0.15* (0.071)	0.069** (0.022)
Simplified reporting	0.035 (0.023)	0.021 (0.032)	0.027 (0.052)	0.0048 (0.051)	0.021 (0.023)
Expanded simplified reporting	0.0012 (0.021)	−0.044 (0.051)	0.0028 (0.052)	−0.15 (0.079)	−0.048 (0.025)
Percent with recertification intervals of 3 months or less	−0.32** (0.055)	−0.19** (0.053)	−0.15 (0.097)	0.090* (0.042)	−0.37** (0.088)
B. Welfare policies					
TANF program in place	−0.017 (0.023)	0.056 (0.063)	−0.042 (0.052)	0.11 (0.15)	−0.068** (0.024)
Diversion program	−0.026 (0.021)	0.069 (0.047)	−0.11 (0.062)	0.096 (0.052)	0.00061 (0.024)
Sanctions: Eventual grant elimination	−0.0053 (0.019)	0.032 (0.052)	−0.14* (0.060)	0.14** (0.056)	0.024 (0.035)
Sanctions: Immediate elimination	−0.014 (0.033)	0.095 (0.071)	−0.33** (0.078)	0.28** (0.057)	0.085 (0.060)
Time limit in place	−0.048 (0.027)	−0.071 (0.074)	−0.051 (0.032)	0.0052 (0.14)	−0.025 (0.027)
Earnings at which grant for family of 3 is $0	−0.0025 (0.0023)	−0.010 (0.0072)	0.013 (0.0092)	−0.0071 (0.0086)	−0.0086* (0.0034)
Maximum cash grant, family of 3	−0.027 (0.018)	−0.033 (0.041)	−0.030 (0.041)	0.042 (0.047)	−0.020 (0.025)
State-level minimum wage	−0.0026 (0.0058)	0.0061 (0.017)	−0.027 (0.021)	−0.11** (0.033)	−0.024* (0.010)

(*Continued*)

Table 2. (*Continued*)

Caseload:	(1) Total (FNS-388)	(2) NC	(3) WE	(4) SS	(5) AO
C. Economy					
Unemployment rate (current)	0.044**	0.036*	0.039**	−0.0095	0.046**
	(0.0049)	(0.014)	(0.013)	(0.025)	(0.0066)
Unemployment rate (12-month lag)	0.015**	0.027*	0.0028	0.032	0.0075
	(0.0044)	(0.012)	(0.021)	(0.023)	(0.0070)
Unemployment rate (24-month lag)	0.021**	−0.014	0.017	−0.052	0.021*
	(0.0048)	(0.022)	(0.014)	(0.039)	(0.0085)
Unemployment rate (36-month lag)	0.011**	−0.014	0.035*	0.026	−0.0062
	(0.0033)	(0.010)	(0.014)	(0.043)	(0.0099)
Unemployment rate (48-month lag)	0.0052	0.015	−0.0052	−0.060	0.014
	(0.0036)	(0.015)	(0.012)	(0.032)	(0.0072)
Unemployment rate (60-month lag)	0.020**	0.0049	0.033*	−0.0024	0.012
	(0.0057)	(0.013)	(0.016)	(0.024)	(0.0085)
Observations	12,852	12,852	12,852	12,852	12,852
R-squared	0.960	0.852	0.844	0.569	0.916

Notes: Dependent variables are log recipients divided by total population. NC, WE, SS, and AO subcaseloads are defined in the text. Caseloads are interpolated for months in which no cases in the relevant caseload were sampled. Weighted least squares estimated with population weights. Minimum wages, earnings, and benefits are in hundreds of 2009 dollars. All models include three proxies for the demographic composition of the population (percent under age 5, percent age 5 to 15, and percent 65 and older), dummy variables for state, fiscal year, and calendar month, and state-specific linear trends. Models also include dummy variables indicating state–year–month cells in which no cases in the relevant caseload were sampled. Complete results available from the authors upon request.

Total observations reflect 252 months of observations on 51 states.

Standard errors in parentheses; computed clustering on state.

* Significantly different from zero at the 5 percent level; ** significantly different from zero at the 1 percent level.

all raised the NC caseload. Our estimates imply that the AO subcaseload also responded positively to the introduction of EBT, expanded categorical eligibility, and lengthening certification periods. We discuss the relatively unexpected estimates for the SS subcaseload as follows.[27]

In the case of asset policies, excluding all vehicles raised the NC caseload by an estimated 12 percent. Broadening the scope of categorically eligible applicants to those participating in noncash assistance programs such as child care or transportation subsidies increased this subcaseload by an estimated 8.4 percent. Our estimates imply that the AO and SS subcaseloads responded to even broader expansions of categorical eligibility, rising by 6.9 percent and 15 percent in the wake of the broadening.

Generally speaking, we would expect no direct effect on welfare and SSI households of widening the group of applicants categorically eligible for SNAP. We, however, expect a negative indirect effect because welfare and SSI participation are now

[27] In Appendix Table B.4, we reestimate the models dropping months in which no cases were sampled. This sensitivity analysis potentially affects the SS subcaseload the most substantially because 26 percent of state–month observations are missing. While doing so raises concerns about selecting on observables, we obtain essentially similar estimates.

relatively less attractive. Any such direct and indirect effects are diluted by the fact that households with some welfare or SSI income do not always meet the traditional definition of categorically eligible, which is only applied if all household members have income from welfare or SSI. Our estimates imply no effect of categorical eligibility expansions on the WE subcaseload, and an unexpected, positive effect on the SS subcaseload.

Looking across the models in Table 2, we reject the hypothesis that the vehicle policy coefficients are equal across the four subcaseloads ($p = 0.038$ for some vehicles excluded; $p = 0.0042$ for all vehicles excluded). We also reject homogeneity of the estimates for the other main effort to loosen asset requirements, expansions of categorical eligibility, in its broader form ($p = 0.023$).

For short recertification periods, we find a negative effect on the NC and AO subcaseloads and a positive—although when scaled, small—effect on the SS subcaseload.[28] We reject the hypothesis of equal impacts across the caseloads ($p = 0.0000$). Short certification periods appear to depress participation in SNAP overall, but the effect is concentrated in the portions of the caseload we would expect to be more sensitive to paperwork burden. Controlling for the prevalence of short recertification intervals, we find no effect of the other main effort to reduce the reporting burden—simplified reporting—on any of the subcaseloads.[29]

Table 3 presents the results of a sensitivity analysis with respect to the specification of SNAP policy variables. States made two distinct types of changes in their reporting policies (length of certification periods and simplifying interim reporting) and in their asset policies (excluding some or all vehicles and waiving the asset test altogether). These changes may be duplicative, implying that their effects are less than the sum of the two separate changes. When we investigate this possibility by interacting asset policies (vehicle exclusions and broad categorical eligibility expansions) and reporting policies (simplified reporting and short certification periods), the resulting estimates do suggest that the percentage change in the caseload from adopting two similar policies is smaller than the sum of adopting each policy separately (calculated from Table 2).

The picture is perhaps sharpest for asset policies and the NC subcaseload. The estimates in Table 3 imply that the NC subcaseload increased in response to both vehicle exclusions and categorical eligibility expansions in isolation, but that there is a negative interaction between the two types of asset policies, such that the combined effect of having both types of policies is no larger than having either policy in isolation. In particular, the caseload rises by 17 percent after all vehicles are excluded and by 12 percent when either form of expanded categorical eligibility is implemented. However, the two interactions between these policies are negative and close to the same size as the main estimates. The implication is that the impact of implementing both is about the same as implementing each alone. Overall, the estimates of these interactive effects are only imprecisely estimated. This is not surprising given that we have less than a decade of post-implementation data with which to estimate these interactions.

Panel B of Table 2 considers welfare and minimum wage policies. For these policies, we have more years of post-implementation evidence: Welfare policy changes began in the mid-1990s, and sometimes earlier. In column 1, we find no effect of the introduction of specific TANF-era policies—diversion, sanctions, time limits, and

[28] The use of short certification periods dropped from 11.7 percent to 1.6 percent of the SS subcaseload between 2000 and 2009. The parameter estimate implies that the SS subcaseload increased by 0.9 percent ($= 10.1 \times 0.09$) in response.

[29] Models that exclude simplified reporting alter estimates of short certification periods vary little, and the pattern of significance in these models is unchanged. Excluding certification periods from models that include simplified reporting imply that the SSI subcaseload dropped 16 percent in response to the introduction of expanded simplified reporting, but do not result in significance across the other subcaseloads. (Estimates available from the authors upon request.)

Table 3. Parameter estimates, model including SNAP policy interactions.

	(1)	(2)	(3)	(4)	(5)
Caseload:	Total (FNS-388)	NC	WE	SS	AO
A. SNAP policies					
Fraction of SNAP issuance made via EBT	0.028 (0.016)	0.14* (0.053)	0.069 (0.047)	0.014 (0.050)	0.060* (0.025)
Departure from USDA vehicle asset rules: Some vehicles excluded	0.034 (0.019)	0.17** (0.060)	−0.13 (0.088)	−0.18 (0.13)	0.041 (0.026)
Departure from USDA vehicle asset rules: All vehicles excluded	−0.014 (0.029)	0.096 (0.051)	0.080 (0.060)	−0.0028 (0.063)	−0.025 (0.030)
Participation-based expanded categorical eligibility	0.019 (0.018)	0.12** (0.044)	0.073 (0.11)	−0.023 (0.074)	0.060** (0.021)
Information-based expanded categorical eligibility	0.068** (0.023)	0.12* (0.059)	−0.12 (0.12)	0.16* (0.062)	0.083* (0.036)
Interaction between expanded categorical eligibility (participation-based) and vehicles (some excluded)	−0.079** (0.027)	−0.16* (0.064)	−0.18 (0.14)	0.25 (0.14)	−0.14** (0.031)
Interaction between expanded categorical eligibility (participation-based) and vehicles (all excluded)	0.034 (0.037)	0.050 (0.076)	−0.37** (0.13)	−0.0082 (0.071)	−0.013 (0.049)
Interaction between expanded categorical eligibility (information-based) and vehicles (some excluded)	0.019 (0.032)	−0.11 (0.072)	0.095 (0.13)	0.094 (0.15)	−0.079 (0.050)
Interaction between expanded cat. eligibility (info.-based) and vehicles (all excluded)	0.014 (0.044)	−0.037 (0.089)	0.042 (0.16)	−0.20 (0.12)	0.061 (0.057)
Simplified reporting	0.011 (0.029)	0.0014 (0.038)	0.029 (0.052)	0.033 (0.056)	−0.021 (0.027)
Expanded simplified reporting	−0.012 (0.024)	−0.044 (0.060)	0.0071 (0.047)	−0.14 (0.073)	−0.088** (0.029)
Percent with recertification intervals of 3 months or less	−0.33** (0.056)	−0.18** (0.054)	−0.23* (0.099)	0.095* (0.046)	−0.42** (0.087)
Interaction between short certification and simplified reporting	0.21 (0.13)	0.075 (0.087)	0.066 (0.18)	−0.19 (0.25)	0.37 (0.21)
Interaction between short certification and expanded simplified reporting	0.13 (0.13)	−0.30 (0.25)	0.68** (0.24)	0.23 (0.26)	0.56** (0.18)
B. Welfare policies					
TANF program in place	−0.016 (0.022)	0.057 (0.062)	−0.045 (0.054)	0.11 (0.15)	−0.066** (0.024)
Diversion program	−0.028 (0.020)	0.066 (0.045)	−0.099 (0.060)	0.099 (0.052)	0.000025 (0.024)
Sanctions: Eventual grant elimination	−0.0079 (0.019)	0.023 (0.052)	−0.14* (0.062)	0.15** (0.055)	0.019 (0.033)
Sanctions: Immediate elimination	−0.019 (0.033)	0.081 (0.070)	−0.32** (0.080)	0.28** (0.057)	0.077 (0.058)
Time limit in place	−0.048 (0.026)	−0.071 (0.072)	−0.042 (0.031)	0.0035 (0.14)	−0.025 (0.026)
Earnings at which grant for family of 3 is $0	−0.0027 (0.0022)	−0.010 (0.0077)	0.011 (0.0079)	−0.0056 (0.0084)	−0.0087** (0.0033)

(*Continued*)

Table 3. (*Continued*)

	(1)	(2)	(3)	(4)	(5)
Caseload:	Total (FNS-388)	NC	WE	SS	AO
Maximum cash grant, family of 3	−0.025	−0.032	−0.042	0.039	−0.022
	(0.018)	(0.041)	(0.036)	(0.046)	(0.023)
State-level minimum wage	−0.0010	0.010	−0.030	−0.11**	−0.023*
	(0.0057)	(0.017)	(0.021)	(0.033)	(0.0099)
C. Economy					
Unemployment rate (current)	0.042**	0.029*	0.048**	−0.00100	0.044**
	(0.0046)	(0.015)	(0.015)	(0.026)	(0.0066)
Unemployment rate (12-month lag)	0.015**	0.031*	−0.00088	0.029	0.0067
	(0.0046)	(0.012)	(0.021)	(0.022)	(0.0072)
Unemployment rate (24-month lag)	0.021**	−0.014	0.018	−0.053	0.022*
	(0.0050)	(0.022)	(0.012)	(0.039)	(0.0087)
Unemployment rate (36-month lag)	0.012**	−0.014	0.035*	0.026	−0.0051
	(0.0032)	(0.010)	(0.014)	(0.044)	(0.010)
Unemployment rate (48-month lag)	0.0041	0.014	−0.0086	−0.057	0.011
	(0.0037)	(0.015)	(0.011)	(0.033)	(0.0069)
Unemployment rate (60-month lag)	0.020**	0.0045	0.035*	−0.0016	0.012
	(0.0057)	(0.013)	(0.014)	(0.024)	(0.0085)
Observations	12,852	12,852	12,852	12,852	12,852
R-squared	0.960	0.852	0.846	0.569	0.916

Notes: Dependent variables are log recipients divided by total population. NC, WE, SS, and AO subcaseloads are defined in the text. Caseloads are interpolated for months in which no cases in the relevant caseload were sampled. Weighted least squares estimated with population weights. Minimum wages, earnings, and benefits are in hundreds of 2009 dollars. All models include three proxies for the demographic composition of the population (percent under age 5, percent age 5 to 15, and percent 65 and older), dummy variables for state, fiscal year, and calendar month, and state-specific linear trends. Models also include dummy variables indicating state-year-month cells in which no cases in the relevant caseload were sampled. Complete results available from the authors upon request.

Total observations reflect 252 months of observations on 51 states.

Standard errors in parentheses; computed clustering on state.

* Significantly different from zero at the 5 percent level; ** significantly different from zero at the 1 percent level.

benefits—or of the minimum wage on the entire SNAP caseload. However, we do find offsetting effects of sanction policies across two of the subcaseloads, and they are large: Implementing gradual and immediate sanctions lowers the WE subcaseload by 14 and 33 percent, respectively, but increases the SS subcaseload by 14 and 28 percent. We decisively reject equality of both sets of parameter estimates across models ($p = 0.0014$ and $p = 0.0000$, respectively). These estimates are broadly consistent with the previous literature examining cross-program effects of welfare policy changes (Nadel, Wamhoff, & Wiseman, 2003/2004; Schmidt & Sevak, 2004; Wallace & Blank, 1999; Wamhoff & Wiseman, 2005/2006).

The earlier welfare literature ascribed large impacts to the replacement of AFDC with TANF, but did not estimate separate impacts of individual components of the change. In contrast, we find no significant effect of the dummy variable for the replacement of AFDC with TANF over and above the effects of specific welfare reform policies across the three caseloads of households containing children. We view this positively: With additional years of post-reform data, we can attribute the TANF changes to specific policies.

The exception is the AO caseload. This caseload is sensitive to the dummy variable for the general program change, dropping by 6.8 percent in the wake of a state's shift from AFDC to TANF. The federal legislation that mandated the implementation of TANF bundled a number of changes together, including restrictions on SNAP receipt among able-bodied adults without dependents (ABAWDs). Although we do not pinpoint the source of this effect, it is not surprising that, for this subcaseload, we estimate an effect of these other changes in the general indicator for TANF implementation.

Finally, we find evidence that increasing the state-specific minimum wage reduces the SS and AO subcaseloads, but not the WE and NC caseloads—and we reject the hypothesis that the effect of the minimum wage is identical across subcaseloads ($p = 0.0001$).

Overall, Table 2 shows that estimating separate impacts for each of the subcaseloads enables us to identify differential responses to policies across mutually exclusive subcaseloads. This is the case even though our reliance on sample data to construct these subcaseloads necessarily reduces the precision of the estimated effects.[30]

We turn next to the unemployment rate estimates in Panel C. For the caseload as a whole (column 1 of Table 2), we find a significant and large estimate for the current unemployment rate (4.5 percent); four of the five lags are also significant, lying between 1.1 and 2.1 percent. The positive signs on the coefficients indicate that the caseload increases when the unemployment rate increases. The significance of the estimates of lagged unemployment rates implies that this response takes several years to be fully reflected in the SNAP caseload.

The columns for the subcaseloads show fewer statistically significant parameters, due in part to the reduced precision of the estimates. Nevertheless, we find that the WE, the NC, and the AO subcaseloads all show evidence of a countercyclical response to the economy. The SS subcaseload alone shows no evidence of being sensitive to the state of the macroeconomy. We decisively reject the hypothesis that the effect of the unemployment rate is identical across the four subcaseloads ($p = 0.0003$).

The estimates from Table 2 imply that a sustained 1 percentage point increase in the unemployment rate leads to about a 5 percent increase after one year in the WE, AO, and NC subcaseloads. Three years after the change, this impact grows to between 6.8 and 9.3 percent in the WE and AO subcaseloads and grows further to between 9.4 and 12.1 percent at five years out. The estimated impact of the economy on the NC subcaseload does not grow with time, remaining at about 5 percent.

Figure 3 summarizes these long-run changes and compares them with the most parsimonious specification that includes only the most current 12-month moving average of the unemployment rate. Consistent with Schoeni (2001), this comparison shows that the richer specification of the macroeconomy (contemporaneous plus five annual lags) results in estimated effects for the AO and WE subcaseloads that are approximately two times larger than the most parsimonious specification.

We considered whether the overall SNAP caseload or its component subcaseloads are differentially sensitive to the state of the economy in the 2000s as compared to the 1990s by interacting an indicator for the 2000s with the simpler specification of the macroeconomy. The estimates (not shown) provide no evidence of increased sensitivity in the more recent decade.

[30] Under the fairly strong assumption that sampling variability is solely responsible for heteroscedasticity in the models, sample sizes are the optimal weights. We present these estimates in Appendix Table B.1. They give a similar picture overall, although we find sharper evidence of offsetting SNAP and welfare policy impacts in this latter set of estimates.

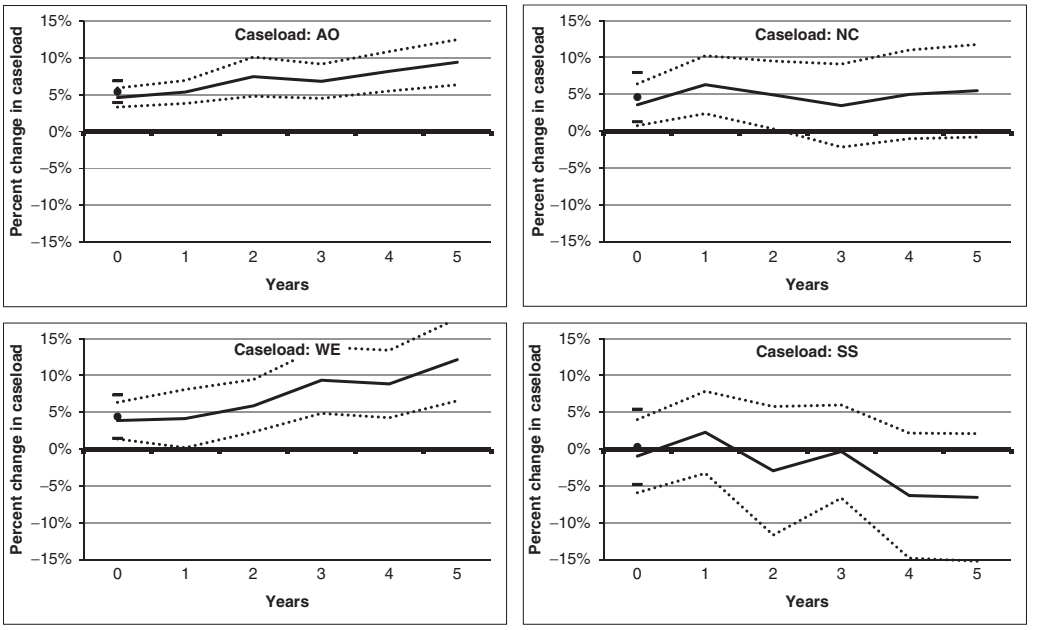


Figure 3. Implied impulse response functions: Percent change in number of recipients in the wake of a one-unit increase in the unemployment rate. Figures indicate estimated impacts on each subcaseload in the *N*th year after a 1 percentage point deterioration in the unemployment rate. Solid lines show estimates computed from Table 2 and dotted lines designate 95 percent confidence bounds. Points plotted for the 0th year show estimates from an alternate specification that includes only the current unemployment rate. All functions are, by assumption, constant beyond the plotted final year.

The estimates from our preferred models lead us to conclude that both SNAP and welfare policy changes had differential effects on distinct components of the SNAP caseload and the economy has a sizable effect on all but the SS subcaseload.[31]

SIMULATION RESULTS

The previous section presented parameter estimates for a set of models estimated separately by SNAP caseload component. While these parameter estimates are interesting, they are not directly informative about the forces behind the changing composition of the caseload and the substantial caseload increase over the 2000s.

[31] We conduct two further sensitivity analyses: (1) In Appendix Table B.5, we assess the robustness of the estimates to using mean caseloads by fiscal year rather than monthly caseloads. Because caseloads change each month—and sometimes rapidly—doing so introduces measurement error into our outcome variables. The estimates in Table B.5 are generally similar in magnitude to those in Table 2, but are, as expected, less precisely estimated. (2) In Table B.6, we consider whether policy changes that may have deterred immigrants from participating in cash and food assistance programs drive the estimates of welfare policy effects. Since a large share of U.S. immigrants is Hispanic, we reestimate the main model using caseloads of non-Hispanics for the outcome variables. While the reductions in the size of the samples used to estimate the caseloads results in somewhat larger standard errors, we continue to find a similar pattern of negative impacts in the WE subcaseload and some evidence of offsetting positive impacts in the SS subcaseload. If immigrant response were driving the estimates, we would expect fewer negative estimates across subcaseloads. We infer that the results are not merely due to the immigrant provisions of PRWORA or immigrant reactions to them, although previous research has found some evidence of such effects (Haider et al., 2004).

In this section, we conduct simulations to draw out the implications of our parameter estimates for understanding caseload changes over time. Each simulation represents a counterfactual. Specifically, we compare the predicted path of the caseload given the observed path of the covariates to the predicted path of the caseload given some alternative, counterfactual path of the covariates.

We include both statistically significant and insignificant estimates in these simulations for two reasons. First, in the case of the current and lagged unemployment rate, individual parameter estimates are difficult to interpret because they are strongly correlated. Second, in the case of both the policy and economy estimates, our purpose in simulating is to illustrate the ability of our models to account for the observed changes across states over the time period. In other words, it is a descriptive rather than a causal exercise.[32]

We consider four scenarios:

1. SNAP, welfare, and minimum wage policies fixed at their October 1994 (pre-welfare reform) values.
2. The unemployment rate fixed at its value in February 1992 (the highest value during a period defined by five years previous to the caseload maximum in 1994).[33]
3. SNAP, welfare, and minimum wage policies fixed at their October 2000 values, just as state-level SNAP policy changes were beginning to be implemented.
4. The unemployment rate fixed at its value in October 2000 (its lowest value prior to the caseload minimum in 2000).

Figure 4 summarizes the implications of the first set of policy simulations and the first unemployment rate simulation for the composition of the caseload. The figure shows actual caseloads in 1994—when the caseload was at its first maximum and political momentum was building to replace AFDC with TANF—and 2009, followed by simulated caseloads in 2009 for each of the simulations.[34]

To interpret the figure, it is important to understand exactly what we have done. For each simulation, we hold the specified group of variables fixed at their values at the start of the simulation period and allow all other variables to vary as they did over the simulation period. These other variables include the year fixed effects. Thus for each of the simulations, the closer the simulated composition of the caseload is to its 1994 actual composition, the larger the amount of change accounted for by that group of variables. Conversely, the closer the simulated composition is to its 2009 actual composition, the smaller the amount of change accounted for by that group of variables.

Collectively, these simulations imply that, in the absence of policy changes, the composition of the SNAP caseload would have been markedly different in 2009. Looking at the percent of the caseload made up of NC recipients and of WE recipients depicted in the first two bars of Figure 4, we see again the sharp increase in the share of NC recipients and the equally marked decline in the share of WE recipients between 1994 and 2009. The SNAP and welfare policy simulations illustrated in the next two bars indicate that about half of the increase since 1994 in the NC

[32] We simulate using model estimates from Table 3. The opposite-signed interactions imply that the simulations will tend to account for a smaller share of caseload changes if we use these estimates rather than the estimates from Table 2.

[33] We prefer to simulate the economy from the turning point of the unemployment rate rather than the turning point of the caseload because our interest is in summarizing the influence of the former on the latter, and our estimates imply that the economy affects the caseload with long lags. However, Table 5 also presents simulations that hold unemployment rates fixed from the 1994 caseload height.

[34] Some welfare and food assistance policy changes were put in place before 1994, but the majority occurred later. Table 1 shows the percentage of the national SNAP caseload living in states with key welfare and food assistance policy changes in place as of 1994.

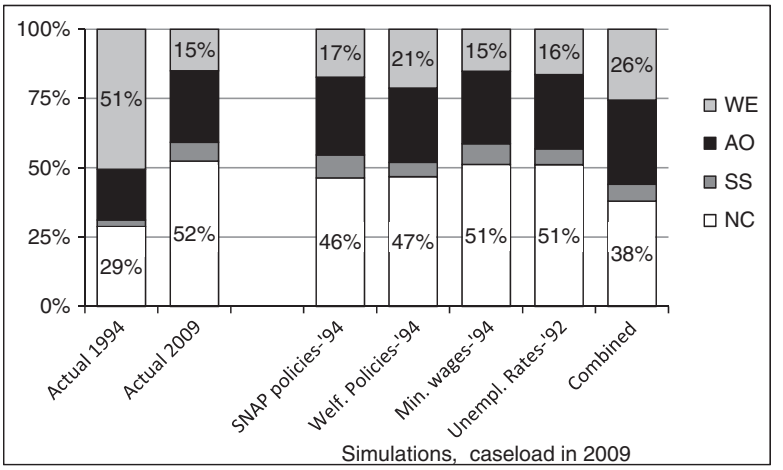


Figure 4. Simulated and actual caseload composition. Simulations use parameter estimates shown in Table 3. Caseloads are fiscal year means. Because the simulations hold the specified set of determinants fixed at 1990s levels, the closer a simulated caseload share is to its 1994 actual share, the more important is the set of variables. In the simulations, the year fixed effects evolve and capture any otherwise unexplained aggregate changes over time. For example, in the final "Combined" simulation, the increase of the NC subcaseload from 29 percent to 38 percent of the total caseload is unexplained by the included policies.

share of the caseload can be attributed to policies, while close to a third of the reduction in the WE share can be attributed to these factors. The minimum wage and unemployment rate simulations contribute essentially nothing to the combined simulation, depicted in the final bar.

The combined simulation indicates that the NC share of the SNAP caseload would have been 38 percent, not 52 percent, in 2009 if TANF and SNAP policy changes had not occurred. This is more than halfway to this subcaseload's share in 1994 (29 percent). Similarly, the simulation results imply that the WE subcaseload would have made up about 26 percent of the entire caseload in 2009 had policy changes not occurred. This is nearly a third of the way between the actual share in 2009 (15 percent) as compared to 1994 (51 percent).

Tables 4 and 5 summarize the implications of the simulations for the path of the SNAP caseload. Table 4 reports the implications of our models for the role of welfare, SNAP, and minimum wage policies for the 39 percent decline in the overall caseload between 1994 and 2000, and the 93 percent increase between 2000 and 2009. Table 5 does the same for the unemployment rate simulations. When the total caseload was decreasing during the 1990s, three of the four subcaseloads dropped (the SS subcaseload increased). During the 2000s, all but the welfare subcaseload increased.

Focusing on the columns labeled "percent explained" and looking across the two time periods, Table 4 shows that our models attribute none of the 1994 to 2000 decline to SNAP policies. In other words, caseload reductions resulting from the increase in use of short certification periods between 1994 and 2000, shown in Table 1, was more than offset by the adoption of EBT. Welfare policy changes account for 13 percent of the 1994 to 2000 overall caseload decline, but their role varies widely across subcaseloads. The included welfare policies account for three-quarters of the SS subcaseload increase over the period, about a fifth of the WE and AO subcaseload drops, and none of the NC subcaseload decline.

Table 4. Policy simulations.

	Actual Change	Simulated Change	Percent Explained by Simulation	Simulated Change	Percent Explained by Simulation	Simulated Change	Percent Explained by Simulation
				FY 1994 to 2000			
		SNAP Policies Fixed at 10/1994		Welfare Policies Fixed at 10/1994		Minimum Wages Fixed at 10/1994	
No cash	−0.23	−0.27	—	−0.27	—	−0.23	—
Welfare	−0.57	−0.58	—	−0.44	21%	−0.56	1%
SSI	0.39	0.35	10%	0.10	75%	0.48	—
Adult only	−0.26	−0.28	—	−0.21	19%	−0.25	4%
All recipients	−0.39	−0.41	—	−0.34	13%	−0.38	2%
				FY 2000 to 2009			
		SNAP Policies Fixed at 10/2000		Welfare Policies Fixed at 10/2000		Minimum Wages Fixed at 10/2000	
No cash	1.78	1.30	27%	1.62	9%	1.77	1%
Welfare	−0.20	−0.15	22%	−0.14	30%	−0.18	7%
SSI	1.42	1.68	—	1.34	6%	1.57	—
Adult only	1.24	1.20	3%	1.15	7%	1.27	—
All recipients	0.93	0.77	16%	0.87	6%	0.94	—

Note: Simulations use parameter estimates from Table 3, Panels A and B.

Table 5. Unemployment rate simulations.

	Actual Change	Simulated Change	Percent Explained by Simulation	Simulated Change	Percent Explained by Simulation	Actual Change	Simulated Change	Percent Explained by Simulation
	Caseload Change, FY 1994 to 2000					Caseload Change, FY 2000 to 2009		
		Unemployment Rates Fixed at 2/1992		Unemployment Rrates Fixed at 3/1994			Unemployment Rates Fixed at 10/2000	
No cash	−0.23	−0.11	52%	−0.12	46%	1.78	1.44	19%
Welfare	−0.57	−0.45	21%	−0.46	18%	−0.20	−0.35	—
SSI	0.39	0.27	30%	0.28	28%	1.42	1.64	—
Adult only	−0.26	−0.08	68%	−0.10	61%	1.24	0.87	30%
All recipients	−0.39	−0.27	31%	−0.28	28%	0.93	0.68	27%

Note: Simulations use unemployment rate parameter estimates from Table 3, Panel C.

SNAP policy changes play a larger role in accounting for the 2000 to 2009 caseload increase, and welfare policies play a smaller role. Overall, SNAP policies enable us to account for 16 percent of the caseload increase, and welfare policies add 6 percent.

Turning to Table 5, the economy accounts for 31 percent of the 1994 to 2000 caseload decline and 27 percent of the 2000 to 2009 caseload increase. If instead of simulating from the 1992 turning point of the economy we simulate from the 1994 turning point of the caseload, the share of the 1990s decline accounted for by the economy drops several percentage points, from 31 to 28 percent. Both are in line with those found in the previous literature that range from 19 percent to 35 percent (Figlio, Gundersen, & Ziliak, 2000; Kabbani & Wilde, 2003; Kornfeld, 2002).

Across the subcaseloads, our ability to account for the changes differs widely. The economy explains between approximately half and two-thirds of the 1990s decrease in the NC and AO subcaseloads, respectively. We are least able to account for SS subcaseload changes—adults receiving SSI have not typically been expected to work, and parents caring for SSI-eligible children are less likely to be members of the labor force. Despite the WE subcaseload's responsiveness to the economy, as evidenced by the parameter estimates, we are also relatively unable to account for its time path with the economy. This subcaseload dropped much more than can be explained by the strong economy of the mid- and late-1990s and dropped further in the 2000s, despite variable economy. Both of these periods of decline were due in part to state TANF policies that pushed this subcaseload down.

Across the policy and economy simulations, the total amount of the 1990s decline accounted for by states' improving economies and 1990s policy changes is 44 percent. In the 2000s, the caseload increase was much sharper. The combination of the variable economy and further policy changes accounts for 51 percent of the 2000 to 2009 caseload increase.

CONCLUSION

SNAP has assumed a new prominence in the U.S. social safety net. Largely an adjunct to means-tested cash assistance programs in the 1990s, SNAP is now the most common source of government-provided income support to needy families. Our analysis sets SNAP squarely within larger policy changes that have focused the U.S. social safety net increasingly on work.

We have used a difference-in-differences identification strategy and monthly SNAP QC data for the period 1989 to 2009 to estimate effects of SNAP policies, welfare policies, and the economy on both the total SNAP caseload and four mutually exclusive and exhaustive subcaseloads. The models yield rich and plausible estimates of these variables: SNAP and welfare policies had sharply different effects on subcaseloads defined by the presence or absence of cash-based income support in the household.

Welfare policy changes occurred first. Combined with an improving economy, they pushed the welfare subcaseload down sharply. Among welfare policies, our models attribute the most substantial decline to the adoption of strict sanction policies, and, with the exception of AO recipients, we find no effect of the implementation of TANF above and beyond the impacts of specific policies. Given the substantial amount of post-implementation data now available, future analyses that consider the effects of the 1990s welfare reforms should include specific welfare policies rather than a dummy variable capturing the implementation of TANF.

SNAP policy changes occurred later. Here again, our models identify the effect of specific policy changes and suggest that the effects of these policies are concentrated in the NC and AO caseloads. Using simulation, we conclude that SNAP and welfare policy changes were responsible for about half of the large shift toward relying on the food-based safety net alone, and close to a third of the shift away from combining welfare and food assistance.

Our analysis also confirms the strong impact of the economy on the SNAP caseload. Simple inspection of the time series might suggest that the connection between the economy and the SNAP caseload weakened over the early and mid-2000s. Our multivariate analysis suggests a different interpretation: The economy affects SNAP caseloads with long lags—pushing the caseload up through the mid-2000s—and substantial SNAP policy changes reinforced these impacts. Furthermore, the estimated lag patterns on the economy imply that the SNAP caseload is likely to continue increasing at a rapid pace for several years past the end of our data (2009). The full impact of any decrease in response to an improving economy (as measured by the unemployment rate) will also occur with long lags.

An important question remains open in this line of research: Our models leave at least half of the recent changes in level and composition of the SNAP caseload unexplained. More research is needed to better understand what else drove the changes. A promising approach is further geographic disaggregation of caseloads and caseload determinants—primarily the economy—that vary substantially within states. Local area estimates would reduce the measurement error inherent in more aggregated models and would allow the inclusion of more flexible state-by-year fixed effects (vs. separate state and year fixed effects). Such an approach has the potential to substantially improve our estimates of the impact of the economy on the caseload.

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APPENDIX A

Details of Data File Construction

This appendix provides additional detail on data file construction. We begin with the QC data, then describe SNAP and TANF policies and finally discuss the proxies for the economy.

QC DATA

Our analysis file begins with the files distributed by Mathematica Policy Research. For FFY 1996 through FFY 2009, the files are on the Mathematica Web site (http://hostm142.mathematica-mpr.com/fns/). For earlier years, Mathematica provided files directly to the project team. Leftin et al. (2010) provide documentation for the 2009 data file. Other reports in this series provide documentation for the data files for earlier years.

We use the weights provided in these files to construct counts of recipients by state and month for each of the four subcaseloads that we define. Mathematica weights the QC files for fiscal years 2003 and later to the administrative FNS-388 person, case, and issuance totals by state and month. Earlier years are weighted to FNS-388 case totals only (with a known, small bias toward overestimating persons). For all years, the weights are constructed after subtracting any recipients of disaster assistance who are included in the FNS-388 reports.

We compared total caseloads obtained from the QC files with FNS-388 totals. Not surprisingly, the QC and FNS-388 totals coincide closely. The mean difference in the two definitions of the caseload nationally is 1 percent across fiscal years 1989 to 2009, and is never larger than 3 percent. We would not expect them to exactly coincide because the administrative totals include families receiving disaster assistance benefits as well as some who were in fact ineligible for a benefit.

In constructing caseloads from the QC files, we consider only the 50 states and the District of Columbia. We thus drop Guam, Puerto Rico, and the U.S. Virgin Islands. We also exclude individuals in sampled households determined during the course of the quality control review to be ineligible for SNAP, or eligible for a zero benefit. We do so because from FY 2003 forward the files distributed by Mathematica exclude such households.

Apparently no reviews were conducted in the District of Columbia in March, July, August, and September of 1995; for Louisiana in June through December of 2005; and for Mississippi in June through September of 2005 (Hurricane Katrina). In addition, in some states and months, there simply were no reviewed cases in one or more of our four caseload components (Table A1). Our analysis file fills in the missing information by linear interpolation from adjacent months in which reviews were conducted.

Partially in response to PRWORA's caseload reduction credit, in the late 1990s and early 2000s, many states moved some (and in a few cases most) of their welfare

Table A1. Incidence of zero sampled QC cases across the analysis subcaseloads.

Caseload	Number of State–Months with Sampled Cases	Percent of All Possible Observations (FY 1989 to 2009)
NC	12,831	99.8
WE	12,783	99.5
SS	9,479	73.8
AO	12,837	99.9

recipients from federal funding to Separate State Programs (SSPs). The fraction of cases in SSPs varied widely across states, but the numbers were large. Failure to adjust for this movement substantially overestimates the TANF caseload decline (Danielson & Klerman, 2008). Until the Deficit Reduction Act of 2005, cases in SSPs were not subject to federal work participation requirements, allowing states to avoid penalties in their TANF programs. However, it is not clear that SSP payments are recorded in the QC data's TANF income field. Thus, using that field alone could result in a substantial understatement of the welfare caseload. In order to capture such payments, we include three additional forms of government-funded cash assistance beyond AFDC/TANF in the definition of welfare payments. In doing so, we err on the side of overcounting welfare recipients.

Our definition of income from welfare includes AFDC or TANF payments (depending on the time period), diversion payments, General Assistance payments, and other government assistance. We expanded the definition of welfare to include these three latter forms of assistance in order to account for the possibility that some states that established a partially or wholly state-funded cash assistance program after 1996 did not count income from such programs in the AFDC/TANF category. In the QC files, the difference between including only AFDC/TANF payments and all four types of payments averages 11 percent across the period 1989 to 1994, 9 percent between 1995 and 2000, but 18 percent from 2001 to 2009. Consistent with this result, Danielson and Klerman (2008) report that 34 states set up state cash assistance programs parallel to their TANF programs between 2000 and 2005.

In Table B.6 we exclude Hispanics from the caseload counts. We use the variable identifying household members' race and ethnicity in the QC data to identify Hispanic recipients.

SNAP POLICIES

Electronic Benefits Transfer

PRWORA required that all states implement EBT by October 1, 2002. FNS reports the timing of statewide implementation of EBT programs at http://www.fns.usda.gov/SNAP/ebt/ebt_status_report.htm. We thank Katie Fitzpatrick at the Economic Research Service, U.S. Department of Agriculture, for providing us a data set of state-level, monthly statistics for a fraction of total SNAP issuance made via EBT. Statewide implementation of EBT occurred between April 1993 and June 2004.

Certification Periods

Once a household is deemed eligible for food stamps, it is certified for a period of months, the length of the certification period depending on characteristics of the household and state policy. Once that period ends, the household must be recertified (i.e., current income and family structure must be documented to prove continued eligibility for food stamps). We compute the fraction of cases with certification periods of three months or less directly from the QC data set. This is the approach taken in Kabbani and Wilde (2003). We compute these fractions separately for each subcaseload in each state and month and linearly interpolate for months in which no cases were sampled for a subcaseload.

Simplified Reporting

Even between certifications, the household is required to report changes in circumstances that may affect eligibility or benefit level. States may choose to require households to report changes within ten days of occurrence ("incident reporting") or at specified intervals ("periodic reporting"). The latter reduces the burden on

households with frequent changes in income. The simplified system further reduces the burden of periodic reporting by requiring households to report changes that happen during a certification period only when their income rises above 130 percent of the federal poverty line. Initially, states could choose to apply simplified reporting to households with earned income only. Subsequent legislation allowed them to expand the set of households included in simplified reporting.

We obtained information about states' adoption of simplified reporting from a report series published by the USDA's Food and Nutrition Service between 2002 and 2009 (e.g., Food and Nutrition Service, 2009). We supplemented this information by consulting with experts at the USDA's Food and Nutrition Service and Economic Research Service, and by contacting all state program administrators via phone and email between November 2009 and August 2010. Danielson et al. (2011) provides a fuller description of the data collection effort.

We construct a variable indicating whether simplified reporting is in place for households with earned income and a variable indicating whether any expansion is in place. The two variables are constructed to be mutually exclusive.

Expanded Categorical Eligibility

Households in which every member of the SNAP unit is receiving cash assistance (AFDC/TANF, SSI, or GA) are categorically eligible—that is, they do not need to meet the asset tests or net income test in order to be determined eligible for SNAP benefits. States expanded the definition of households that are categorically eligible in a number of ways, and we count any such expansion as an implementation of expanded categorical eligibility (ECE). We classify these expansions into two types: program-based ("narrow") and information-based ("broad"). Program-based ECE requires a household (although not necessarily every member of a household) to receive a noncash benefit of some type—for instance, a child care subsidy or employment retention services. Information-based ECE requires only that a household receive information—for instance, a family planning services brochure—that is at least partly funded out of a state's cash assistance budget. The two variables are constructed to be mutually exclusive.

We obtained information about states' implementation of such programs using the same process of consulting published sources, contacting experts at USDA, and contacting state program administrators as described above for simplified reporting. Danielson et al. (2011) provides a fuller description of the data collection effort.

Vehicle Asset Rules

We coded whether a state excluded some or all vehicles from the asset test. The two variables are constructed to be mutually exclusive. The comparison policy is applying the federal standard exemption of the first $4,650 of a vehicle's value, or applying a higher exemption amount (but not excluding the value of one or more vehicles completely). Again, our sources of information were published sources, USDA experts, and state program administrators. Danielson et al. (2011) provides a fuller description of the data collection effort.

CASH ASSISTANCE POLICIES

We include one high-level welfare reform variable that captures the date of implementation of states' TANF programs. We draw the dates of implementation from Crouse (1999); this is also the coding used in Council of Economic Advisors (1999). We also include specific welfare policies that past analysis of the AFDC/TANF caseload has shown to affect that caseload (Danielson & Klerman, 2008). We obtained policy details and dates of implementation from Crouse (1999) and from the Urban

Institute's Welfare Rules Database, available at http://anfdata.urban.org/wrd/WRDWelcome.cfm.

Work-Related Sanctions

We include a variable coding whether the state eliminates a family's grant immediately if an adult is out of compliance with work-related program requirements, and another variable coding whether the state gradually eliminates the family's grant in the case of noncompliance. The two variables are constructed to be mutually exclusive. The excluded category is grant reduction in the case of noncompliance.

Welfare Time Limits

We include a variable coding whether the state has a welfare time limit in place. We do not distinguish between grant elimination and grant reduction time limits.

Maximum Welfare Benefit

We include a variable measuring the real value of the maximum monthly benefit for a family of three. We use the CPI-U to deflate the nominal dollar amounts.

Financial Incentives to Combine Work and Welfare

We include the real monthly amount of earnings at which a family's welfare grant drops to zero in a state and year. We use the CPI-U to deflate the nominal dollar amounts.

Diversion

We include a variable capturing whether a state has a diversion program in place. Diversion programs are intended to assist families experiencing temporary emergencies by giving them a lump sum payment in lieu of a monthly welfare check. While the details of the programs vary, the amount of the diversion payment is typically a multiple (usually two to four times) the monthly welfare payment that a family would otherwise receive.

Minimum Wage

We are grateful to William Wascher for sharing a data set of historical, state-level minimum wages (used in Neumark & Wascher, 2007). We updated this file using information provided on the U.S. Department of Labor's Web site. If a state's minimum wage is recorded as being below the federal minimum wage, we code the federal minimum wage for that state–year. We deflate these dollar amounts using the CPI-U. The analysis variable transforms this state-level minimum wage into monthly earnings, assuming 4.33 weeks in a month and 30 hours of work each week.

ECONOMY

Unemployment Rate

We include monthly, state-level, not seasonally adjusted unemployment rates (multiplied by 100) from the Bureau of Labor Statistics's Local Area Unemployment Statistics series, computing a 12-month moving average of the monthly statistics.

APPENDIX B

Additional Model Results

Table B1. Reestimate main model using cases sampled as weights.

	(1)	(2)	(3)	(4)
Caseload:	NC	WE	SS	AO
A. SNAP policies				
Fraction of SNAP issuance made via EBT	0.068 (0.035)	0.098** (0.037)	0.040 (0.050)	0.033 (0.027)
Departure from USDA vehicle asset rules: Some vehicles excluded	0.10** (0.040)	−0.11 (0.063)	−0.040 (0.059)	0.0018 (0.023)
Departure from USDA vehicle asset rules: All vehicles excluded	0.11* (0.046)	−0.12* (0.053)	−0.053 (0.045)	−0.022 (0.024)
Participation-based expanded categorical eligibility	0.072* (0.035)	−0.017 (0.076)	0.077 (0.060)	0.0027 (0.020)
Information-based expanded categorical eligibility	0.089* (0.038)	−0.043 (0.059)	0.12* (0.055)	0.079** (0.027)
Simplified reporting	0.033 (0.032)	−0.00079 (0.038)	0.059 (0.040)	0.022 (0.022)
Expanded simplified reporting	0.034 (0.034)	0.0021 (0.044)	−0.058 (0.056)	−0.0086 (0.025)
Percent with recertification intervals of 3 months or less	−0.18** (0.040)	−0.097 (0.093)	0.065 (0.041)	−0.32** (0.099)
B. Welfare policies				
TANF program in place	0.013 (0.063)	−0.081 (0.043)	0.023 (0.091)	−0.059* (0.025)
Diversion	0.14** (0.043)	−0.15** (0.055)	0.16** (0.051)	0.016 (0.025)
Sanctions: Eventual grant elimination	0.015 (0.044)	−0.14** (0.044)	0.12* (0.058)	−0.0099 (0.027)
Sanctions: Immediate elimination	0.026 (0.060)	−0.29** (0.068)	0.21** (0.067)	0.000040 (0.041)
Welfare time limit in place	−0.059 (0.072)	−0.022 (0.032)	−0.084 (0.089)	−0.036 (0.026)
Earnings at $0 benefit, family of 3	−0.0095 (0.0063)	0.016* (0.0071)	−0.015* (0.0066)	−0.0068* (0.0028)
Maximum cash grant, family of 3	−0.018 (0.040)	−0.017 (0.032)	0.0014 (0.047)	−0.013 (0.020)
State-level minimum wage	0.028 (0.019)	−0.036* (0.017)	−0.045 (0.026)	−0.015 (0.0093)
C. Economy				
Unemployment rate (current)	0.037** (0.013)	0.042** (0.010)	−0.018 (0.020)	0.046** (0.0071)
Unemployment rate (12-month lag)	0.018 (0.011)	0.0074 (0.013)	0.0024 (0.025)	2.5e-06 (0.0085)
Unemployment rate (24-month lag)	0.0054 (0.0097)	0.0085 (0.0099)	0.0063 (0.027)	0.022* (0.0087)

(*Continued*)

Table B1. (*Continued*)

	(1)	(2)	(3)	(4)
Caseload:	NC	WE	SS	AO
Unemployment rate (36-month lag)	0.0031	0.017	0.014	0.0050
	(0.012)	(0.013)	(0.027)	(0.0076)
Unemployment rate (48-month lag)	0.0027	0.0079	−0.046	0.0081
	(0.012)	(0.013)	(0.027)	(0.0075)
Unemployment rate (60-month lag)	0.017	0.012	−0.0019	0.011
	(0.0090)	(0.013)	(0.022)	(0.0078)
Observations	12,852	12,852	12,852	12,852
R-squared	0.846	0.841	0.614	0.888

Notes: Dependent variables are log recipients divided by total population. Caseloads are interpolated for months in which no cases in the relevant caseload were sampled. Weighted least squares estimated, where the weight is the total SNAP cases sampled in a state–month–year cell. Minimum wages, earnings and benefits are in hundreds of 2009 dollars. All models include three proxies for the demographic composition of the population (percent under age 5, percent age 5 to 15, and percent 65 and older), and dummy variables for state, fiscal year, and calendar month, and state-specific linear trends. Complete results available from the authors upon request.

Standard errors in parentheses; computed clustering on state.

* Significantly different from zero at the 5 percent level; ** significantly different from zero at the 1 percent level.

Table B2. Reestimate main model using shorter time period: Calendar years 1990 to 2000.

	(1)	(2)	(3)	(4)	(5)
Caseload:	Total (FNS 388)	NC	WE	SS	AO
A. SNAP policies					
Fraction of SNAP issuance made via EBT	0.061**	0.078	0.034	0.048	0.075**
	(0.016)	(0.040)	(0.036)	(0.072)	(0.022)
Departure from USDA vehicle asset rules: Some vehicles excluded	−0.034	0.098	−0.63**	0.88**	0.052
	(0.024)	(0.068)	(0.051)	(0.074)	(0.050)
Participation-based expanded categorical eligibility	0.021	0.13*	−0.012	−0.015	−0.023
	(0.025)	(0.055)	(0.046)	(0.090)	(0.027)
Information-based expanded categorical eligibility	0.0060	−0.0052	0.065	−0.25	−0.0037
	(0.033)	(0.074)	(0.092)	(0.13)	(0.036)
Short certification periods	−0.25**	−0.089	−0.14	0.11*	−0.16**
	(0.043)	(0.064)	(0.077)	(0.049)	(0.044)
B. Welfare policies					
TANF program in place	−0.020	−0.0024	−0.016	−0.0055	−0.060*
	(0.014)	(0.045)	(0.035)	(0.11)	(0.026)
Diversion	−0.028	0.072	−0.13**	−0.019	−0.0018
	(0.018)	(0.065)	(0.046)	(0.067)	(0.027)
Sanctions: Eventual grant elimination	−0.0042	−0.071	−0.030	0.028	0.022
	(0.016)	(0.044)	(0.041)	(0.067)	(0.026)

(*Continued*)

Table B2. (*Continued*)

	(1)	(2)	(3)	(4)	(5)
Caseload:	Total (FNS 388)	NC	WE	SS	AO
Sanctions: Immediate elimination	−0.0067	−0.054	−0.100	0.26*	0.027
	(0.030)	(0.058)	(0.058)	(0.10)	(0.037)
Welfare time limit in place	−0.030*	0.0096	−0.026	0.14	−0.036
	(0.015)	(0.044)	(0.029)	(0.085)	(0.023)
Maximum cash grant, family of 3	0.0067	−0.0016	−0.0038	0.0098	−0.0060
	(0.013)	(0.0082)	(0.0045)	(0.0070)	(0.0036)
Earnings at $0 benefit, family of 3	−0.0026	−0.10	−0.026	0.045	−0.037**
	(0.0015)	(0.064)	(0.021)	(0.060)	(0.013)
State-level minimum wage	−0.024**	0.025	−0.052**	−0.19**	−0.038**
	(0.0048)	(0.024)	(0.011)	(0.070)	(0.0091)
C. Economy					
Unemployment rate (current)	0.041**	0.081*	0.036	0.029	0.018
	(0.0083)	(0.038)	(0.020)	(0.071)	(0.017)
Unemployment rate (12-month lag)	0.010	0.025	0.019	0.024	−0.00034
	(0.0067)	(0.021)	(0.014)	(0.034)	(0.014)
Unemployment rate (24-month lag)	0.015**	0.023	−0.015	−0.041	0.024
	(0.0049)	(0.019)	(0.011)	(0.042)	(0.015)
Unemployment rate (36-month lag)	−0.0021	−0.017	0.017	−0.029	−0.025
	(0.0054)	(0.020)	(0.013)	(0.043)	(0.013)
Unemployment rate (48-month lag)	0.00039	0.016	−0.015	−0.060	−0.0095
	(0.0049)	(0.018)	(0.013)	(0.048)	(0.0088)
Unemployment rate (60-month lag)	0.023**	0.041	0.013	0.019	0.021
	(0.0077)	(0.022)	(0.017)	(0.024)	(0.015)
Observations	6,732	6,732	6,732	6,732	6,732
R-squared	0.978	0.810	0.878	0.506	0.900

Notes: Dependent variables are log recipients divided by total population. Caseloads are interpolated for months in which no cases in the relevant caseload were sampled. Weighted least squares estimated, where the weight is the estimated total population in a state–month–year cell. Minimum wages, earnings, and benefits are in hundreds of 2009 dollars. All models include three proxies for the demographic composition of the population (percent under age 5, percent age 5 to 15, and percent 65 and older), and dummy variables for state, fiscal year, and calendar month, and state-specific linear trends. Models also include dummy variables indicating state–year–month observations in which no cases in the relevant caseload were sampled. Some SNAP policy variables could not be estimated because they were implemented exclusively in the 2000s. Complete results available from the authors upon request.

Standard errors in parentheses; computed clustering on state.

* Significantly different from zero at the 5 percent level; ** significantly different from zero at the 1 percent level.

Table B3. Reestimate the main model excluding state-specific trends.

	(1)	(2)	(3)	(4)
Caseload:	NC	WE	SS	AO
A. SNAP policies				
Fraction of SNAP issuance made via EBT	0.17	0.13*	−0.0048	0.087
	(0.095)	(0.053)	(0.049)	(0.052)
Departure from USDA vehicle asset rules: Some vehicles excluded	0.15	−0.085	−0.043	0.053
	(0.078)	(0.086)	(0.085)	(0.041)
Departure from USDA vehicle asset rules: All vehicles excluded	0.097	0.0091	0.057	0.0050
	(0.054)	(0.072)	(0.071)	(0.039)
Participation-based expanded categorical eligibility	0.042	−0.16*	0.021	0.016
	(0.058)	(0.077)	(0.070)	(0.028)
Information-based expanded categorical eligibility	0.16**	−0.13	0.14	0.092**
	(0.054)	(0.083)	(0.072)	(0.034)
Simplified reporting	0.21**	0.035	−0.041	0.039
	(0.047)	(0.096)	(0.071)	(0.030)
Expanded simplified reporting	0.046	0.027	−0.24*	0.040
	(0.050)	(0.089)	(0.095)	(0.037)
Short certification periods	−0.16**	−0.090	0.094	−0.50**
	(0.060)	(0.10)	(0.051)	(0.11)
B. Welfare policies				
TANF program in place	0.11	−0.0029	0.11	−0.058
	(0.11)	(0.061)	(0.18)	(0.030)
Diversion	−0.011	−0.22**	0.10	−0.020
	(0.058)	(0.071)	(0.055)	(0.041)
Sanctions: Eventual grant elimination	0.15	−0.23**	0.15*	0.066
	(0.085)	(0.057)	(0.076)	(0.051)
Sanctions: Immediate elimination	0.047	−0.31**	0.098	0.049
	(0.088)	(0.073)	(0.074)	(0.057)
Welfare time limit in place	−0.17	−0.045	−0.0091	−0.073
	(0.14)	(0.046)	(0.15)	(0.041)
Earnings at $0 benefit, family of 3	0.0063	0.0058	0.0060	0.0014
	(0.0074)	(0.010)	(0.010)	(0.0046)
Maximum cash grant, family of 3	−0.068	−0.072	0.030	−0.063*
	(0.050)	(0.048)	(0.045)	(0.026)
State-level minimum wage	0.034	−0.0019	−0.055	0.012
	(0.022)	(0.029)	(0.035)	(0.016)
C. Economy				
Unemployment rate (current)	0.057**	0.032	0.0100	0.057**
	(0.017)	(0.020)	(0.033)	(0.0090)
Unemployment rate (12-month lag)	0.043**	−0.0090	0.042*	0.0043
	(0.011)	(0.021)	(0.021)	(0.0079)
Unemployment rate (24-month lag)	0.0083	0.018	−0.047	0.035**
	(0.020)	(0.011)	(0.040)	(0.0070)
Unemployment rate (36-month lag)	−0.012	0.024	0.031	−0.0040
	(0.014)	(0.015)	(0.041)	(0.0088)
Unemployment rate (48-month lag)	0.017	−0.0049	−0.051	0.013
	(0.014)	(0.013)	(0.031)	(0.0080)

(*Continued*)

Table B3. (*Continued*)

	(1)	(2)	(3)	(4)
Caseload:	NC	WE	SS	AO
Unemployment rate (60-month lag)	−0.028	0.025	−0.024	−0.0018
	(0.016)	(0.015)	(0.019)	(0.0089)
Observations	12,852	12,852	12,852	12,852
R-squared	0.816	0.802	0.545	0.897

Notes: Dependent variables are log recipients divided by total population. Caseloads are interpolated for months in which no cases in the relevant caseload were sampled. Weighted least squares estimated, where the weight is the estimated total population in a state–month–year cell. Minimum wages, earnings, and benefits are in hundreds of 2009 dollars. All models include three proxies for the demographic composition of the population (percent under age 5, percent age 5 to 15, and percent 65 and older), and dummy variables for state, fiscal year, and calendar month. Models also include dummy variables indicating state–year–month observations in which no cases in the relevant caseload were sampled. Some SNAP policy variables could not be estimated in the models presented in Table B.2 because they were implemented exclusively in the 2000s. Complete results available from the authors upon request.

Standard errors in parentheses; computed clustering on state.

* Significantly different from zero at the 5 percent level; ** significantly different from zero at the 1 percent level.

Table B4. Reestimate main model dropping months with no sampled cases.

	(1)	(2)	(3)	(4)
Caseload:	NC	WE	SS	AO
A. SNAP policies				
Fraction of SNAP issuance made via EBT	0.13*	0.10*	0.016	0.058*
	(0.051)	(0.045)	(0.047)	(0.027)
Departure from USDA vehicle asset rules: Some vehicles excluded	0.099	−0.14	−0.030	−0.0066
	(0.056)	(0.075)	(0.064)	(0.025)
Departure from USDA vehicle asset rules: All vehicles excluded	0.12*	−0.065	−0.048	−0.0073
	(0.052)	(0.061)	(0.041)	(0.022)
Participation-based expanded categorical eligibility	0.083*	−0.041	0.10	0.011
	(0.039)	(0.081)	(0.063)	(0.026)
Information-based expanded categorical eligibility	0.049	−0.031	0.17*	0.069**
	(0.036)	(0.054)	(0.068)	(0.022)
Simplified reporting	0.021	0.027	0.012	0.020
	(0.032)	(0.052)	(0.047)	(0.023)
Expanded simplified reporting	−0.044	0.0015	−0.086	−0.049
	(0.051)	(0.053)	(0.067)	(0.025)
Short certification periods	−0.19**	−0.15	0.11*	−0.37**
	(0.053)	(0.098)	(0.047)	(0.088)

(*Continued*)

Table B4. (*Continued*)

	(1)	(2)	(3)	(4)
Caseload:	NC	WE	SS	AO
B. Welfare policies				
TANF program in place	0.056	−0.041	−0.092	−0.068**
	(0.063)	(0.053)	(0.080)	(0.024)
Diversion	0.070	−0.11	0.057	0.00065
	(0.047)	(0.063)	(0.049)	(0.024)
Sanctions: Eventual grant elimination	0.032	−0.14*	0.15**	0.024
	(0.052)	(0.060)	(0.057)	(0.035)
Sanctions: Immediate elimination	0.095	−0.33**	0.26**	0.085
	(0.071)	(0.078)	(0.057)	(0.060)
Welfare time limit in place	−0.071	−0.051	−0.055	−0.025
	(0.074)	(0.032)	(0.11)	(0.027)
Earnings at $0 benefit, family of 3	−0.010	0.012	−0.014	−0.0086*
	(0.0072)	(0.0090)	(0.0070)	(0.0034)
Maximum cash grant, family of 3	−0.033	−0.032	−0.021	−0.020
	(0.041)	(0.041)	(0.082)	(0.025)
State-level minimum wage	0.0061	−0.027	−0.077*	−0.024*
	(0.017)	(0.021)	(0.031)	(0.010)
C. Economy				
Unemployment rate (current)	0.036*	0.038**	−0.024	0.046**
	(0.015)	(0.013)	(0.017)	(0.0066)
Unemployment rate (12-month lag)	0.027*	0.0029	0.052*	0.0076
	(0.012)	(0.022)	(0.021)	(0.0070)
Unemployment rate (24-month lag)	−0.014	0.018	−0.013	0.021*
	(0.022)	(0.014)	(0.032)	(0.0085)
Unemployment rate (36-month lag)	−0.014	0.034*	0.0088	−0.0064
	(0.010)	(0.014)	(0.028)	(0.0099)
Unemployment rate (48-month lag)	0.015	−0.0054	−0.029	0.014
	(0.015)	(0.012)	(0.024)	(0.0072)
Unemployment rate (60-month lag)	0.0049	0.034*	−0.021	0.012
	(0.013)	(0.015)	(0.022)	(0.0085)
Observations	12,831	12,783	9,479	12,837
R-squared	0.851	0.843	0.521	0.916

Notes: Dependent variables are log recipients divided by total population. Caseloads are interpolated for months in which no cases in the relevant caseload were sampled. Weighted least squares estimated, where the weight is the estimated total population in a state–month–year cell. Minimum wages, earnings, and benefits are in hundreds of 2009 dollars. All models include three proxies for the demographic composition of the population (percent under age 5, percent age 5 to 15, and percent 65 and older), and dummy variables for state, fiscal year, and calendar month, and state-specific linear trends. Complete results available from the authors upon request.

Standard errors in parentheses; computed clustering on state.

* Significantly different from zero at the 5 percent level; ** significantly different from zero at the 1 percent level.

Table B5. Reestimate main model using total caseloads computed from sample data and subcaseloads at annual intervals.

	(1)	(2)	(3)	(4)	(5)
Caseload:	Total (QC)	NC	WE	SS	AO
A. SNAP policies					
Fraction of SNAP issuance made via EBT	0.031 (0.017)	0.12* (0.046)	0.12* (0.047)	−0.0045 (0.056)	0.064* (0.028)
Departure from USDA vehicle asset rules: Some vehicles excluded	0.00020 (0.020)	0.12 (0.079)	−0.21* (0.089)	−0.10 (0.088)	−0.0067 (0.033)
Departure from USDA vehicle asset rules: All vehicles excluded	0.016 (0.023)	0.10 (0.072)	−0.094 (0.064)	−0.045 (0.077)	−0.010 (0.029)
Participation-based expanded categorical eligibility	0.0066 (0.023)	0.093 (0.048)	−0.070 (0.077)	0.055 (0.069)	0.015 (0.031)
Information-based expanded categorical eligibility	0.070** (0.021)	0.075 (0.044)	−0.044 (0.059)	0.16 (0.086)	0.076* (0.032)
Simplified reporting	0.045* (0.022)	0.0071 (0.050)	0.040 (0.067)	0.011 (0.050)	0.023 (0.032)
Expanded simplified reporting	0.0014 (0.021)	−0.083 (0.074)	0.0093 (0.069)	−0.23* (0.095)	−0.092* (0.035)
Percent with recertification intervals of 3 months or less	−0.28** (0.056)	−0.26** (0.074)	−0.26 (0.15)	−0.20 (0.13)	−0.64** (0.16)
B. Welfare policies					
TANF program in place	−0.0032 (0.026)	0.094 (0.081)	−0.038 (0.088)	0.20 (0.26)	−0.064 (0.045)
Diversion program	−0.031 (0.020)	0.081 (0.054)	−0.11 (0.070)	0.11 (0.058)	0.0072 (0.029)
Sanctions: Eventual grant elimination	−0.010 (0.019)	0.026 (0.062)	−0.14* (0.066)	0.17* (0.067)	0.021 (0.039)
Sanctions: Immediate elimination	−0.028 (0.032)	0.094 (0.084)	−0.33** (0.081)	0.32** (0.062)	0.081 (0.065)
Time limit in place	−0.056 (0.029)	−0.10 (0.087)	−0.066 (0.046)	0.013 (0.19)	−0.033 (0.040)
Earnings at which grant for family of 3 is $0	−0.0035 (0.0025)	−0.011 (0.0081)	0.015 (0.010)	−0.0028 (0.0090)	−0.0073 (0.0044)
Maximum cash grant, family of 3	−0.036 (0.019)	−0.033 (0.052)	−0.016 (0.046)	0.041 (0.054)	−0.024 (0.031)
State-level minimum wage	−0.0046 (0.0065)	0.0051 (0.022)	−0.041 (0.030)	−0.11** (0.040)	−0.031 (0.015)
C. Economy					
Unemployment rate (current)	0.041** (0.0055)	0.038 (0.023)	0.028 (0.014)	−0.013 (0.030)	0.020* (0.0089)
Unemployment rate (12-month lag)	0.022** (0.0052)	0.034* (0.015)	0.0074 (0.017)	0.049 (0.050)	0.034** (0.011)
Unemployment rate (24-month lag)	0.013** (0.0047)	−0.030 (0.035)	0.0069 (0.017)	−0.044 (0.047)	0.0059 (0.0099)
Unemployment rate (36-month lag)	0.011** (0.0040)	0.014 (0.018)	0.048* (0.020)	0.012 (0.033)	0.0088 (0.0096)
Unemployment rate (48-month lag)	0.0080 (0.0045)	−0.013 (0.012)	−0.00037 (0.016)	−0.065* (0.029)	−0.0015 (0.010)

(*Continued*)

Table B5. (*Continued*)

	(1)	(2)	(3)	(4)	(5)
Caseload:	Total (QC)	NC	WE	SS	AO
Unemployment rate (60-month lag)	0.020**	0.020	0.033	−0.016	0.023
	(0.0061)	(0.012)	(0.020)	(0.025)	(0.014)
Observations	12,852	1,071	1,071	1,071	1,071
R-squared	0.937	0.959	0.956	0.899	0.977

Notes: Dependent variables are log recipients divided by total population. Caseloads are interpolated for fiscal years in which no cases in the relevant caseload were sampled. Weighted least squares estimated, where the weight is the estimated total population in a state–year cell. Minimum wages, earnings, and benefits are in hundreds of 2009 dollars. All models include three proxies for the demographic composition of the population (percent under age 5, percent age 5 to 15, and percent 65 and older), and dummy variables for state, fiscal year, and state-specific linear trends. Models also include dummy variables indicating state–year observations in which no cases in the relevant caseload were sampled. Complete results available from the authors upon request.

Standard errors in parentheses; computed clustering on state.

* Significantly different from zero at the 5 percent level; ** significantly different from zero at the 1 percent level.

Table B6. Reestimate main model, regressing on non-Hispanic caseloads.

	(1)	(2)	(3)	(4)
Caseload:	NC	WE	SS	AO
A. SNAP policies				
Fraction of SNAP issuance made via EBT	0.12	0.051	0.17	0.020
	(0.065)	(0.050)	(0.13)	(0.024)
Departure from USDA vehicle asset rules: Some vehicles excluded	0.072	−0.16*	0.17*	−0.022
	(0.065)	(0.077)	(0.082)	(0.036)
Departure from USDA vehicle asset rules: All vehicles excluded	0.11*	−0.071	0.084	−0.017
	(0.053)	(0.060)	(0.061)	(0.023)
Participation-based expanded categorical eligibility	0.11**	−0.015	0.16	0.025
	(0.038)	(0.078)	(0.094)	(0.024)
Information-based expanded categorical eligibility	0.051	−0.025	0.15*	0.052
	(0.041)	(0.055)	(0.074)	(0.040)
Simplified reporting	0.025	0.039	0.11	0.053*
	(0.043)	(0.052)	(0.062)	(0.026)
Expanded simplified reporting	−0.046	0.0072	−0.16*	−0.028
	(0.071)	(0.053)	(0.076)	(0.023)
Short certification periods	−0.21**	−0.15	0.19**	−0.43**
	(0.054)	(0.094)	(0.052)	(0.075)

(*Continued*)

Table B6. (*Continued*)

	(1)	(2)	(3)	(4)
Caseload:	NC	WE	SS	AO
B. Welfare policies				
TANF program in place	0.073	−0.026	−0.061	−0.056
	(0.081)	(0.050)	(0.093)	(0.031)
Diversion	0.023	−0.15*	−0.16	−0.042
	(0.055)	(0.061)	(0.11)	(0.033)
Sanctions: eventual grant elimination	0.064	−0.11*	0.094	0.039
	(0.063)	(0.058)	(0.094)	(0.048)
Sanctions: immediate elimination	0.12	−0.31**	0.35**	0.076
	(0.089)	(0.060)	(0.094)	(0.085)
Welfare time limit in place	−0.13	−0.049	−0.25*	−0.010
	(0.085)	(0.034)	(0.12)	(0.025)
Earnings at $0 benefit, family of 3	−0.012	0.012	−0.0065	−0.0084*
	(0.0075)	(0.0088)	(0.0083)	(0.0038)
Maximum cash grant, family of 3	−0.034	−0.038	−0.37**	−0.032
	(0.044)	(0.039)	(0.13)	(0.030)
State-level minimum wage	0.0028	−0.032	−0.13**	−0.014
	(0.020)	(0.022)	(0.028)	(0.0099)
C. Economy				
Unemployment rate (current)	0.034*	0.061**	0.036	0.047**
	(0.016)	(0.017)	(0.035)	(0.012)
Unemployment rate (12-month lag)	0.029	−0.012	−0.020	0.0072
	(0.016)	(0.024)	(0.052)	(0.011)
Unemployment rate (24-month lag)	−0.0059	0.013	0.021	0.019
	(0.023)	(0.015)	(0.039)	(0.014)
Unemployment rate (36-month lag)	−0.0093	0.033*	0.035	−0.010
	(0.015)	(0.015)	(0.030)	(0.014)
Unemployment rate (48-month lag)	0.020	0.0049	−0.020	0.013*
	(0.014)	(0.013)	(0.030)	(0.0060)
Unemployment rate (60-month lag)	−0.00061	0.023	−0.017	0.0070
	(0.012)	(0.015)	(0.022)	(0.0086)
Observations	12,852	12,852	12,852	12,852
R-squared	0.832	0.810	0.823	0.884

Notes: Dependent variables are log recipients divided by total population. Caseloads are interpolated for months in which no cases in the relevant caseload were sampled. Weighted least squares estimated, where the weight is the estimated total population in a state–month–year cell. Minimum wages, earnings, and benefits are in hundreds of 2009 dollars. All models include three proxies for the demographic composition of the population (percent under age 5, percent age 5 to 15, and percent 65 and older), and dummy variables for state, fiscal year, and calendar month, and state-specific linear trends. Models also include dummy variables indicating state–year–month observations in which no cases in the relevant caseload were sampled. Complete results available from the authors upon request.

Standard errors in parentheses; computed clustering on state.

* Significantly different from zero at the 5 percent level; ** significantly different from zero at the 1 percent level.