Institute for Research on Poverty
Discussion Paper no 1215-00

Welfare Reform and Food Stamp Caseload Dynamics

James P. Ziliak
Department of Economics
University of Oregon
jziliak@oregon.uoregon.edu

Craig Gundersen
Economic Research Service
United States Department of Agriculture
cggunder@ers.usda.gov

David N. Figlio
Department of Economics
University of Florida
figliodn@dale.cba.ufl.edu

November 2000

The authors thank Evelyne Betts-Freeland at the U.S. Department of Agriculture for providing the food stamp caseload data, Gilbert Crouse at the U.S. Department of Health and Human Services for providing AFDC caseload data, and Vee Burke at the Congressional Research Service for providing data on 1998 state need standards. In addition we thank Robert Moffitt, Mark Nord, Marianne Page, Laura Tiehen, and seminar participants at the Economic Research Service and the Food and Nutrition Service for comments on earlier versions of this research. Ziliak and Figlio gratefully acknowledge financial support from the Economic Research Service. The views expressed herein do not necessarily reflect the views of either the Economic Research Service or the U.S. Department of Agriculture.

Abstract

We use state-level panel data for federal fiscal years 1980–1998 to estimate the impacts of welfare reform and the business cycle on food stamp caseloads. The model we employ is a dynamic function of past caseloads, economic factors, AFDC and Food Stamp Program policies, political factors, AFDC caseload levels, and unobserved fixed and trending heterogeneity. Our results suggest that the robust economy has substantially influenced the recent decline in food stamp caseloads, but that the estimated aggregate effect of welfare reform is modest—we attribute around 45 percent of 1994–1998 decline to the macroeconomy and about 5 percent to welfare reform. We do find substantial heterogeneity in the impact of AFDC waiver policies. States with JOBS sanctions policies but not family cap or earnings disregard waivers can expect a larger long-run decline in caseloads than those states with all three policies. In addition, we do find some evidence, albeit weaker, that states with waivers for unemployed able-bodied adults without dependents can expect higher caseload levels than states without the waivers and that the Electronic Benefits Transfer program is leading to food stamp caseload declines. An important finding of this study is that modeling food stamp caseload dynamics has implications for the estimated effects of policy changes and economic factors—when dynamic models are employed, we observe substantially reduced welfare-reform effects but significantly increased effects of the macroeconomy on food stamp caseloads. These results are robust to models that permit the simultaneous determination of AFDC and food stamp caseloads.

Welfare Reform and Food Stamp Caseload Dynamics

The number of food stamp recipients fell from a historic high of 27.5 million in 1994 to 17.4 million by the end of 1999. During this period of unprecedented decline, the cash welfare system was transformed first with state-level waivers from federal requirements on the Aid to Families with Dependent Children (AFDC) program, and then by passage of the Personal Responsibility and Work Opportunity Reconciliation Act of 1996 (PRWORA). The waivers, along with PRWORA, introduced new rules on cash-assistance recipients such as terminal time limits, work requirements, and personal responsibility measures, which also likely affected the food stamp caseload since almost all AFDC recipients receive food stamps.[1] PRWORA also had a direct administrative effect on the Food Stamp Program by ending the eligibility of some recipients, reducing average benefit levels, and requiring states to replace paper coupons with Electronic Benefits Transfer (EBT) cards by October 2002. Concurrent with these reforms is the longest post-World War II economic expansion, a boom that has resulted in the lowest unemployment rates in 30 years and the highest employment rates for single female-headed households to date. The concurrent nature of the robust economy and the major changes in welfare policy make it impossible to casually ascribe credit for the recent caseload changes to policies or economic growth, but both seem highly likely to have contributed to the recent caseload reductions. In this paper we propose a model of food stamp caseload dynamics that quantifies the relative impacts of welfare reform and the business cycle on food stamp caseloads.

Several recent papers have documented the relative contributions of the business cycle and welfare reform to AFDC caseload declines (Bartik and Eberts 1999; Blank 1997; Council of Economic Advisers [CEA] 1997, 1999; Figlio and Ziliak 1999; Moffitt 1999; Wallace and Blank 1999; Ziliak et al. 2000). Most of these papers focus on the pre-PRWORA period when the Department of Health and

[1]PRWORA also replaced the AFDC program with a new state block-grant program called Temporary Assistance for Needy Families (TANF). For convenience we will refer to the program as AFDC throughout the paper.

Human Services selectively granted states' requests for waivers from federal AFDC requirements. While as much as one-third of the 1993–1996 decline in AFDC caseloads has been attributed to welfare reform (CEA 1997), Figlio and Ziliak (1999) and Ziliak et al. (2000) argue that this estimated relationship is, in large measure, spurious for the pre-PRWORA era. They argue that once caseload and business cycle dynamics are contolled for, little of the early caseload decline can be pegged to welfare waivers. The CEA (1999) updated its earlier work to include the 1997 and 1998 federal fiscal years and, when compared to its earlier work, found an even stronger welfare-reform effect. Although one would expect a larger role played by welfare reform because many of the initiatives required time to implement, the CEA continued to model the caseload process as static, not dynamic, and thus overstated the role of welfare reform. Figlio and Ziliak (1999), for instance, update their dynamic model to look at the post-PRWORA period and continue to find only a modest role for welfare reform in the aggregate national caseload reduction (although they find that welfare reform mattered greatly in some states). Hence, though welfare reform has contributed to the recent AFDC caseload decline, the consensus from this literature, as summarized in the recent book edited by Danziger (1999), indicates that the robust economy played the dominant role.

Perhaps surprisingly, little research has been conducted on the impact of the macroeconomy and welfare reform on food stamp caseloads. Wallace and Blank (1999) are a recent exception in their use of both static annual and dynamic monthly food stamp caseload models based on state-level panel data for the 1980 to 1998 federal fiscal years. They found that food stamp caseloads were strongly countercyclical and that the reform of AFDC led to weak declines in total caseloads. Specifically, they attribute up to 44 percent of the food stamp caseload decline between 1994 and 1998 to economic conditions and about 6 percent of the decline to welfare reform.

We improve upon the previous research on food stamp caseloads along several dimensions. First, we follow other research in estimating the impact of AFDC policy changes on food stamp caseloads, but we also examine the direct impact of food stamp policies on food stamp caseloads such as the introduction of EBT, waivers from the work requirement for unemployed able-bodied adults without

dependents (ABAWDs), and administrative error rates. Second, we consider several methods of modeling the policy variables. Specifically, aside from specifying the AFDC policy reform as an aggregate "any waiver" variable, we also consider models in which this variable is allowed to have a nonlinear impact before and after passage of PRWORA, models in which the waivers are disaggregated into their component parts such as time limits and work requirements, and models in which we use the implementation dates of the waivers rather than approval dates. Third, we permit general macroeconomic factors in the dynamic caseload models that will capture national reforms such as the expansions in the Earned Income Tax Credit (EITC) in the mid-1990s. Finally, we directly explore the possibility of simultaneity between food stamp and AFDC caseloads with a structural econometric model. Our instrumental variables estimator identifies the model parameters by exploiting the fact that a state's need standard affects AFDC caseloads directly but only affects food stamp caseloads indirectly via its effect on AFDC.

Across all the models, we find that the effect of welfare reform on food stamp caseloads is very modest. We attribute at most 9 percent of the recent decline to welfare reform in our preferred dynamic models. In contrast, the macroeconomy has had a major impact on food stamp caseloads, accounting for about 45 percent of the 1994–1998 decline in the preferred dynamic models. We do find evidence of heterogeneity in the impact of AFDC waiver policies—states with JOBS sanctions policies but not family cap or earnings disregard waivers can expect a larger long-run decline in caseloads than those states with all three policies. When dynamic models are employed, we observe substantially reduced welfare-reform effects but significantly increased effects of the macroeconomy on food stamp caseloads.

DATA AND EMPIRICAL MODEL

The data we use for the analysis span all 50 states and the District of Columbia for federal fiscal years 1980–1998.[2] We obtained information on administrative food stamp caseloads, EBT measures, ABAWD waivers, and error rates from the U.S. Department of Agriculture; data on administrative AFDC caseloads from the U.S. Department of Health and Human Services (DHHS); data on AFDC policy reform measures from Crouse (1999); data on combined AFDC/food stamp benefits and state need standards for a three-person family from selected issues of the Committee on Ways and Means *Green Book*; data on business-cycle measures from the Bureau of Labor Statistics; data on state population from the U.S. Census Bureau; and data on state political conditions from the Americans for Democratic Action (ADA), the National Governors Association, and the *Congressional Quarterly Almanac*. Table A1 contains summary statistics for the key variables used in the analysis.

We present descriptive evidence on trends in total food stamp and AFDC caseloads (Figure 1), and average state unemployment rates and per capita employment growth rates (Figure 2). In each diagram we highlight with vertical lines the years in which major federal tax and/or transfer legislation was passed—the Economic Recovery Tax Act of 1981 (ERTA), which lowered marginal income tax rates but raised the AFDC benefit reduction rate; the Tax Reform Act of 1986 (TRA86), which lowered marginal income tax rates further, removed over 6 million Americans from the tax rolls and expanded the EITC; the Family Support Act of 1988 (FSA88), which expanded Medicaid coverage and required all states to offer the AFDC-Unemployed Parent (AFDC-UP) program to low-income, two-parent households; the Omnibus Budget Reconciliation Acts of 1990 (OBRA90) and 1993 (OBRA93), both of which, among other things, expanded the EITC; and PRWORA in 1996.

---

[2]Currently, the amount of food stamps a household receives is inversely related to its income. Before 1980, all households had to purchase a fixed amount of food stamps, with the price rising with income. While understanding the impact of this "purchase requirement" on food stamp caseloads is interesting, this major change in the structure of the Food Stamp Program makes it more appropriate to use the post-1980 period.

Figure 1 depicts the dramatic swings in food stamp and AFDC caseloads in the 1990s alluded to in the previous section. Interestingly, aggregate caseloads do not seem to be related in an obvious fashion to any one piece of federal legislation. It is clear that the upward trend in caseloads occurred after passage of FSA88, but the more pronounced increase occurred after OBRA90, which contained little in the way of legislation affecting low-income households except for the EITC expansion (which, if anything, should lower caseloads). Aggregate welfare caseloads began declining after mid-1994, about 2 years before passage of PRWORA. Although this was a period of aggressive AFDC waiver approvals, Figlio and Ziliak (1999) and Ziliak et al. (2000) attribute little of the AFDC caseload declines to the waivers. There does, however, appear to be an acceleration of caseload declines after passage of PRWORA, suggesting that our econometric model should permit estimated policy effects to diverge before and after PRWORA.

Figure 2 shows how average business cycle conditions evolved over the 1980s and 1990s. Notable in this figure is the substantial increase in average state unemployment rates in the early 1980s, followed by a long secular decline after 1983. Aggregate caseloads were stubbornly constant during this period of declining unemployment rates, possibly because per capita employment growth rates were constant after 1984. The 1990–1992 surge in average unemployment rates was coincident with the early 1990s caseload growth, but unemployment declined and employment growth increased prior to the mid-1990s caseload declines. This pattern suggests that a dynamic relationship may exist between the business cycle and welfare caseloads, and our empirical model should permit such dynamic responses.

Empirical Model

The figures presented in the previous section are informative in that they offer guidance for the structure of our empirical model. They are only suggestive, however, because they are either aggregated to the national level or averaged across states and thus ignore potential variation in caseloads across states. Based on the AFDC caseload research of Figlio and Ziliak (1999) and Ziliak et al. (2000), we specify a model of food stamp caseloads that is a dynamic function of past caseloads, current and lagged

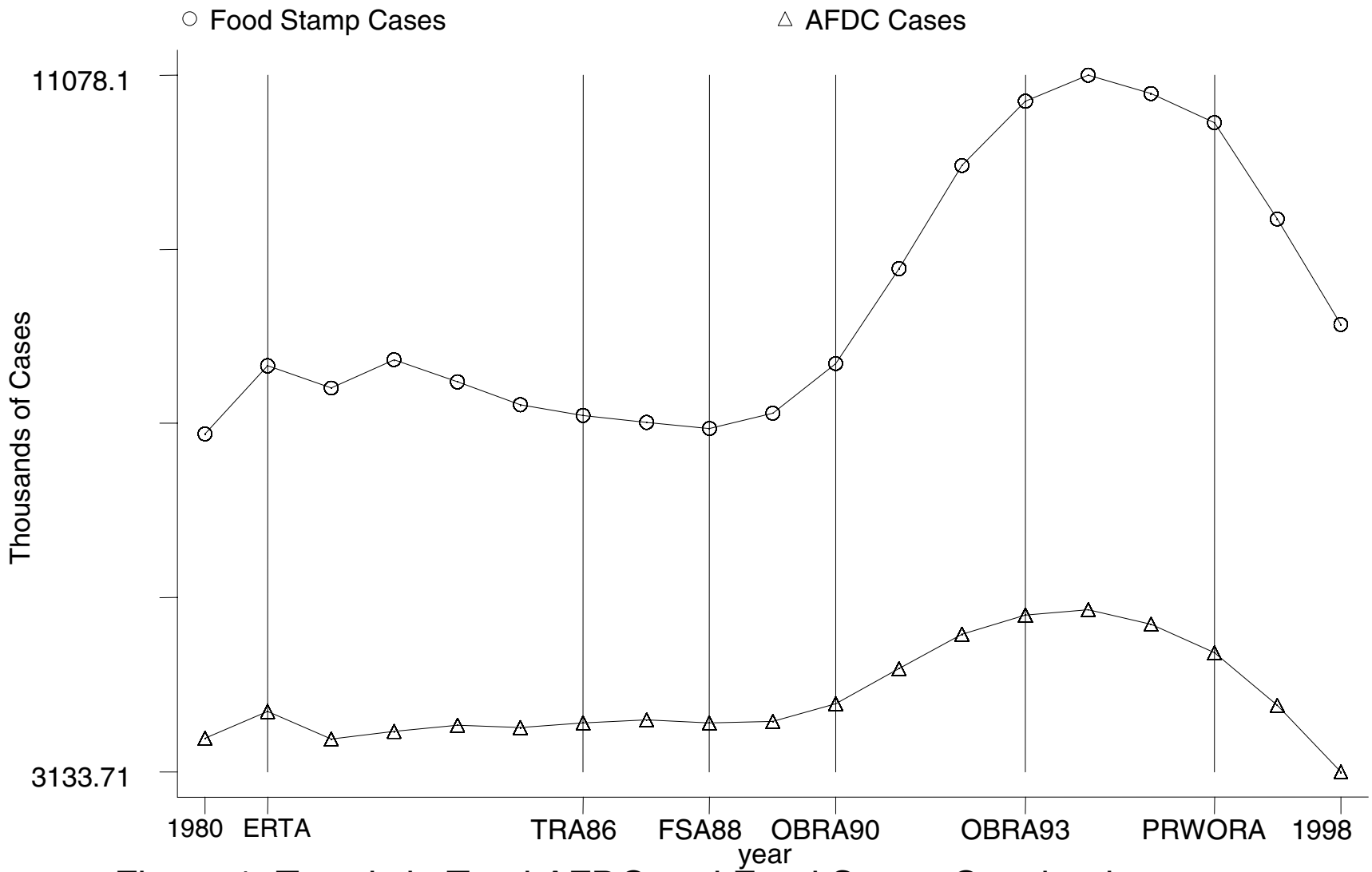

Figure 1: Trends in Total AFDC and Food Stamp Caseloads

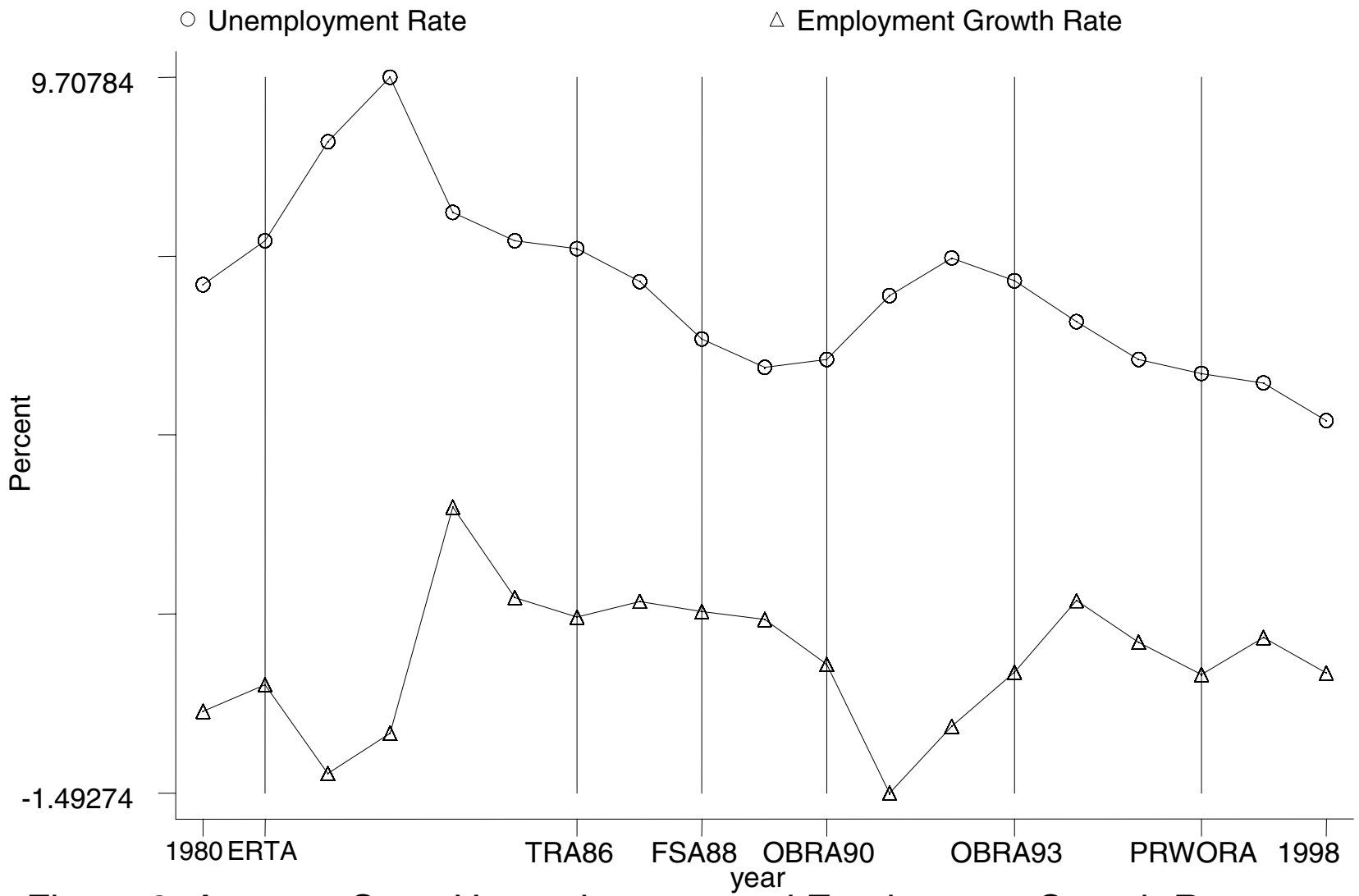

Figure 2: Average State Unemployment and Employment Growth Rates

business cycle conditions, welfare policies, political factors, and unobserved fixed and trending differences across states.

Specifically, our model for state i (i=1,...,51) in time period t (t=1,...,19) is

$$C_{it} = \mu + \sum_{s=1}^{S} \rho_s C_{it-s} + \sum_{j=0}^{J} \alpha_j U_{it-j} + \sum_{k=0}^{K} \iota_k E_{it-k} + \sum_{l=0}^{L} (\beta_l W_{it-l} + \theta_l B_{it-l} + \xi_l EBT_{it-l}$$

$$+ \eta_l ABAWD_{it-l} + \phi_l ER_{it-l}) + \sum_{m=0}^{M} \pi_m AFDC_{it-m} + \varphi P_{it} + \gamma_t + \delta_i + \lambda_i t + \varepsilon_{it}, \qquad (1)$$

where C_{it} is the natural log of per capita food stamp caseloads; U_{it} is the unemployment rate; E_{it} is the growth rate in employment per capita, defined as the annual difference in log per capita employment; W_{it} is either a scalar or vector of welfare reform indicators that equals the fraction of a year that a statewide AFDC waiver is in effect; B_{it} is the real maximum AFDC plus food stamp benefit for a family of three; EBT_{it} is an indicator that equals the fraction of a year that a state's recipients received benefits via the Electronic Benefits Transfer program; $ABAWD_{it}$ is the weighted percentage of a state's population waived from work requirements for unemployed able-bodied adults without dependents; ER_{it} is the error rate in the food stamp eligibility process; $AFDC_{it}$ is the natural log of per capita AFDC caseloads; P_{it} is a vector of variables reflecting the political climate of a state; γ_t is a vector of year effects; δ_i is a time-invariant, state-specific deviation from the overall constant μ; $\lambda_i t$ is a state-specific linear trend; and ε_{it} is a random error. The fixed effects capture unobserved permanent differences in food stamp caseloads across states, while the state-specific trends control for trending differences in states such as migration or fertility patterns, or general trends in a state's political climate that are imperfectly picked up by the political variables described above.[3,4]

Several of the variables used in the analysis warrant further description. Food stamp caseloads may sluggishly adjust to changing economic conditions. We capture these dynamics by permitting previous food stamp caseloads to have a direct impact on future caseloads, and by permitting current and lagged business cycle conditions to affect current caseloads. We expect lagged unemployment and employment growth to be important because, given the skill set of typical food stamp recipients, they are likely to be the last ones hired during an economic recovery and thus may not move instantaneously from welfare to work. Also, unemployed persons may become eligible for food stamps only with a lag during an economic downturn. For example, their initial asset levels may be too high and they only become eligible after drawing these down. Conversely, during economic expansions, newly employed persons may exit the program only when their food stamps must be renewed.

Recent research papers on AFDC caseloads typically define welfare reform as occurring on the date of waiver approval from DHHS, and often this variable is aggregated into a single category, which we label as "AFDC waiver." However, there is likely a lag between waiver approval and program implementation such that approval dates might capture other nonprogram effects occurring in states at the same time. Hence, in the specifications below we use both AFDC approval dates and reported implementation dates, and we also allow for lagged effects of the waivers. Because the AFDC welfare waivers are heterogeneous in scope, ranging from time-limiting benefits to sanctions for failing to comply with JOBS requirements to benefit caps on family size, we also explore the independent impact of these various waivers on food stamp caseloads. Moreover, as noted in Figure 1, it appears that caseload

---

[3]Always a concern when estimating dynamic panel data models is the correlation between the lagged dependent variable and the fixed effect, although the magnitude of this correlation, and hence the potential problem, diminishes as the time series becomes large (Nickell 1981). With 19 years of data, this correlation is likely to be small; however, in results not reported we instrumented the lagged dependent variable using lags of the economic, welfare, and political variables as instruments with very little change in the estimated coefficients.

[4]With passage of PRWORA, most noncitizen immigrants are no longer eligible for food stamps. This policy change affected the entire country and thus is likely captured in the year effects. To the extent that there are state differences in immigration patterns that are permanent or trending linearly, these differences are captured in the state fixed effects and trends. The latter seems plausible given that Wallace and Blank (1999) find no significant impact of the percentage of a state's population that are immigrants in static AFDC and food stamp caseload models after controlling for state fixed effects.

declines accelerated after passage of PRWORA, suggesting a nonlinear impact of the waivers before and after PRWORA. We accommodate this potential nonlinearity by introducing pre- and post-PRWORA "AFDC waiver" variables.[5]

Almost all AFDC recipients also get food stamps, and over half of food stamp recipients receive AFDC benefits. As a consequence, we incorporate the AFDC program into our food stamp model in two ways—directly by including the per capita AFDC caseload as a covariate, and indirectly by including the combined maximum AFDC/food stamp benefit for a three-person family. States did not have much authority over the design of their welfare programs until the 1990s, but they have had substantial voice with respect to the need standard and maximum benefits throughout the program history. The need standard is established by each state as the income level deemed necessary to meet basic consumption needs, and it is used to help determine who qualifies for AFDC because gross income cannot exceed 185 percent of need. However, the actual maximum benefit is typically tied to the state's payment standard, which is almost always below the need standard. Alternatively, the basic food stamp grant is fixed across the contiguous 48 states, with slight cost-of-living variation allowed for Alaska and Hawaii, but the food stamp benefit declines as the maximum AFDC benefit rises. In Figure 3 we depict trends in the combined maximum AFDC/food stamp benefit and in the state need standard for three-person families. While the food stamp benefit is tied to inflation, it is clear that states permitted the real value of their combined benefit package to decline throughout the period.

A potential problem with including per capita AFDC caseloads and the combined AFDC/food stamp benefits as control variables is that they may not be exogenous to food stamp caseloads. There is a close connection between the food stamp participation decision and the AFDC participation decision

---

[5]We follow the CEA (1997, 1999) and Figlio and Ziliak (1999) by defining the waivers as the fraction of the fiscal year a waiver is in place. In situations where a state did not receive a waiver, we use the TANF plan approval or implementation date. In the nonlinear models, the pre-PRWORA variable equals the fraction of the year a waiver is in place, while the post-PRWORA variable equals the fraction of the year the TANF plan is in place. Unfortunately, collinearity prevents us from allowing pre- and post-PRWORA effects for the disaggregated waiver models. See Crouse (1999) and Gallagher et al. (1998) for detailed descriptions of state waiver/TANF policies.

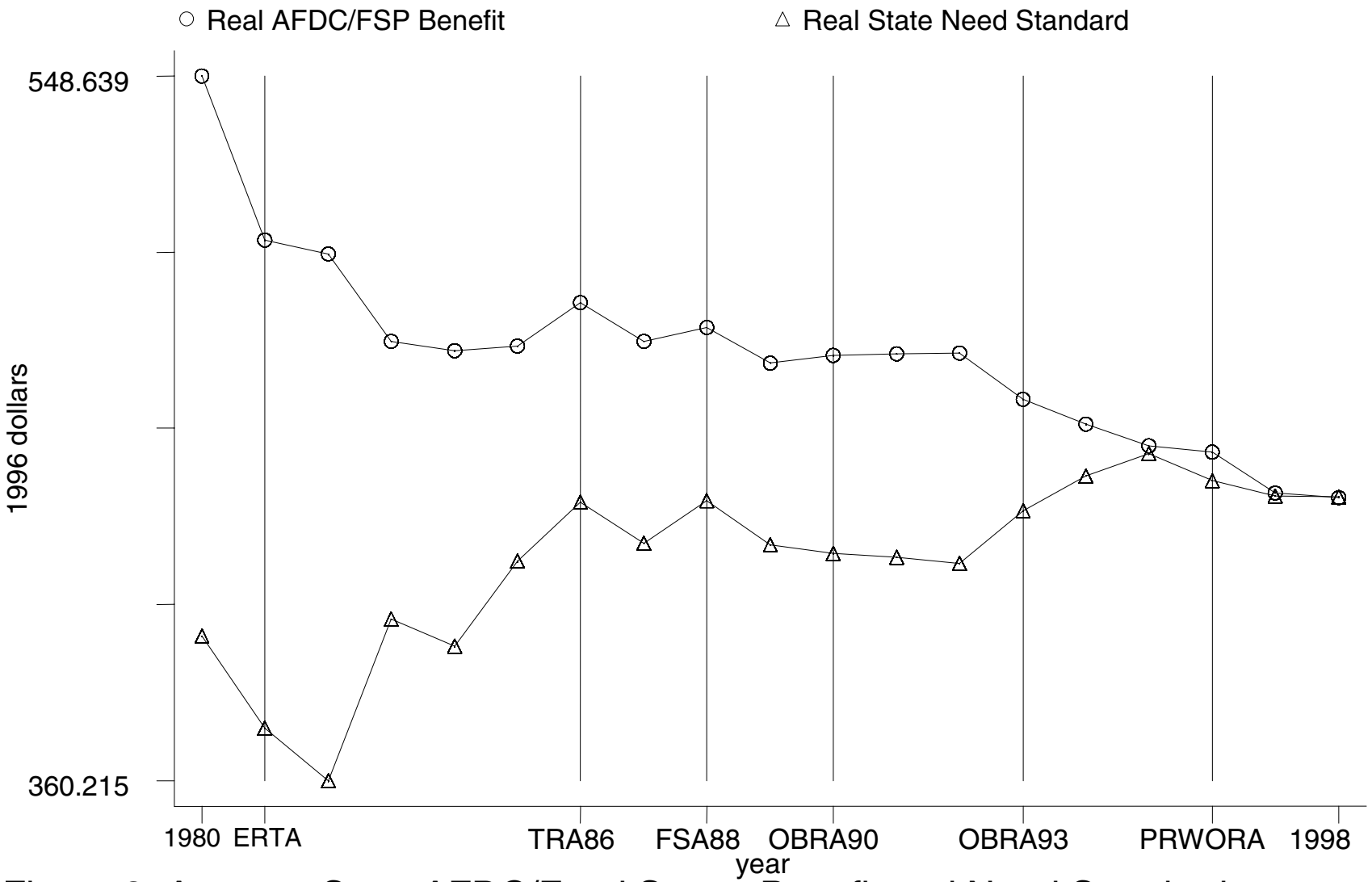

Figure 3: Average State AFDC/Food Stamp Benefit and Need Standard

(Fraker and Moffitt 1988). AFDC and now TANF recipients are categorically eligible for food stamps, and one applies for both programs in the same location. This makes entrance into the Food Stamp Program easier for AFDC recipients. Likewise, the AFDC/food stamp benefit level may not be exogenous insofar as states may set a lower benefit level in response to increased AFDC caseloads (Figlio, Kolpin, and Reid 1999). Figlio and Ziliak (1999) show that the estimated impacts of the macroeconomy and welfare reform on AFDC caseloads are not affected by the inclusion of the AFDC benefit; thus, endogeneity in terms of the combined AFDC/food stamp benefits in the present model of food stamp caseloads is even less likely to be problematic. However, we will investigate the possibility of endogeneity between the food stamp and AFDC caseload levels and will use the state need standard, which helps establish AFDC eligibility but not food stamp eligibility, as a key identifying instrument. This explicit difference in need standard causality makes this a particularly appealing choice for an instrumental variable.

The EBT program is a new method of dispensing and using food stamps. Instead of paper coupons, food stamp recipients use an EBT card similar to an ATM card. The program is targeted to be nationwide by 2002 but has been implemented on at least a pilot basis in selected states beginning in 1989. Currently, recipients in 37 states use an EBT card (21 states had statewide EBT programs in place by the end of the 1998 fiscal year). The goals of the EBT program include reducing the stigma associated with food stamp use in stores, preventing theft and loss of benefits, preventing misuse and illegal resale of benefits, and improving the distribution of benefits. Because EBT has some appealing features for program participants, it may tend to encourage participation. On the other hand, given the low rate of checking account holding among low-income households (Hurst, Luoh, and Stafford 1998), the ATM-type technology underlying the EBT may be a barrier to some households. Paralleling our AFDC waiver variables, we use both the USDA approval date for the statewide EBT and the date when EBT was implemented statewide (and permit lags of each).

Unemployed able-bodied adults without dependents (ABAWDs) are now ineligible for food stamps except for 3 months in any 36 month period. States can, however, receive an exemption from this

rule instituted by PRWORA. For any area with an unemployment rate over 10 percent and/or an insufficient number of jobs, a state can request that affected individuals not be subject to this rule. Our ABAWD variable is the percentage of the state that is waived from the ABAWD requirement weighted by the share of the waived part to total state population. States with a higher value for the ABAWD variable may have higher food stamp caseloads because of the increased number of eligible households. The existence of poor economic conditions is a necessary but not sufficient condition for ABAWD waivers because some eligible states may choose not to apply. As a consequence, estimated effects of ABAWD waivers may reflect both the policy treatment effects and the economic conditions that underlie the designation of ABAWD waiver areas. Hence, one should interpret the ABAWD policy effects with caution, as these two factors may be confounded.

The error rate is calculated as the percentage of total dollars that are incorrectly given to or taken from food stamp recipients. That is, it is the combination of the over-issuance of benefits, the issuance of benefits to ineligible households, and the under-issuance of benefits. The USDA did not include under-issuances in the official error rates until the mid-1980s, thus requiring us to calculate the under-issuances in the early 1980s to make a consistent series. Depending on the year, under-issuances are much less common—between 20 and 50 percent of the over-issuance rate. If a state, therefore, had to choose whether to cut back on under-issuances or over-issuances, the same percentage decline in the latter would lead to a sharper decline in the official error rate. In an effort to cut back on over-issuances, states have responded by increasing the frequency with which households have to recertify their eligibility status. This increase in application costs has been shown to produce a decrease in the probability of a household receiving food stamps (Gundersen and Andrews 2000), a decrease probably due to some households being ruled ineligible but also some eligible households deciding not to participate. Thus, we expect a direct relationship between error rates and caseloads.

The vector of political variables includes a dummy variable reflecting which party, if any, controls both chambers of the state legislature, a dummy variable for whether the governor is a Democrat, and an ADA index that measures the degree of political “liberalness” in a state’s U.S. Senate delegation.

It is hypothesized that eligible households may be more likely to receive food stamps in liberal states insofar as there may be less stigma attached to food stamp receipt. We have no a priori reason to believe that food stamp caseloads respond sluggishly to changes in a state's political conditions, so we do not permit lagged political factors in our econometric model.[6]

Finally, a word about the chosen lag structure is merited. The Schwarz criterion, which is a goodness-of-fit measure similar to the adjusted R^2 but which penalizes the loss of degrees of freedom more heavily, is used to determine optimal lag length for the nonwelfare policy variables. In the fully dynamic model, this translates into four lags each of food stamp caseloads, unemployment rates, and per capita employment growth rates.[7] We do, however, impose a common one-period lag within the welfare policy variables due to concerns of possible collinearity. For example, the ABAWD waiver did not exist before the 1997 federal fiscal year, so a two-period lag would render the variable equal to zero for all states.

RESULTS

In each of Tables 1 through 4 below, we report six specifications based on waiver approval or implementation dates for the basic "any waiver" model, the "any waiver" model with differential pre- and post-PRWORA effects, and the model with heterogeneous waiver variables. The results for the dynamic models are the implied long-run effects of a change in a given variable on food stamp caseloads. In Table 5, we report our specifications that incorporate AFDC caseloads, while Table 6 contains decompositions of the 1994–1998 decline in food stamp caseloads.

---

[6]This prior was borne out in preliminary work that permitted lagged political factors, which were jointly statistically indistinguishable from zero.

[7]While the degree of persistence implied by a structure with four lags of the dependent variable seems quite high, both Blanchard and Katz (1992) and Eberts and Stone (1991) find similar, or even more pronounced, lag structures in their state- and MSA-level analyses of employment, unemployment, and wages. The implication is that it takes about a decade for a shock to completely filter through the system.

Static Models

We begin by setting all coefficients on the lagged variables to zero, as well as the coefficient on contemporaneous per capita AFDC caseloads ($AFDC_{it}$). This yields a static model of food stamp caseloads with exogenous regressors, which is an interesting benchmark because of the emphasis on static models in several papers on AFDC caseloads (Blank 1997; CEA 1997, 1999). Following the AFDC caseload literature, we weight the regression models by state population such that weighted least squares yields consistent and efficient parameter estimates. The results are recorded in Table 1.

Across all six specifications in Table 1, the coefficient on the unemployment rate is highly statistically significant and reveals a strong countercyclical movement of food stamp caseloads. A 1 percentage point increase in the unemployment rate leads to about a 4 percent increase in food stamp caseloads. The coefficient on employment growth, however, suggests that food stamp caseloads are weakly procyclical; a 0.1 percentage point increase in growth of employment per capita leads to a 2.0 percent increase in food stamp caseloads. As seen below, this unexpected result, found also by Bartik and Eberts (1999) for AFDC caseloads, is due to the omission of caseload dynamics.

Welfare reform, as measured either by the aggregated "any waiver" or the pre- and post-PRWORA waiver, has no statistical influence on food stamp caseloads. While the post-PRWORA effect is quite sizable in specification 3—food stamp caseloads are 10.3 percent lower after PRWORA—this effect is not statistically significant at usual confidence levels. Moreover, the effect goes to zero with the use of implementation dates in specification 4. There exists, however, some evidence of statistically significant welfare reform effects with the disaggregated welfare waivers. Specifically, states with JOBS sanctions waivers experienced food stamp declines 8 percent larger than states without similar waivers, while states with family cap waivers had caseload increases of 11 percent larger than states without such waivers. That JOBS sanctions have a statistically significant negative influence on food stamp caseloads is quite interesting because when a family fails to comply with AFDC work requirements, only the AFDC benefit is subject to sanction except in some states where food stamp benefits are also subject to sanction.

TABLE 1
Static Estimates of the Impact of Welfare Reform and the Macroeconomy on Per Capita Food Stamp Program Caseloads

	(1)	(2)	(3)	(4)	(5)	(6)
Unemployment Rate	4.270	4.189	4.252	4.189	4.176	4.215
	(0.396)	(0.395)	(0.396)	(0.395)	(0.395)	(0.395)
Growth in Employment Per Capita	20.036	19.567	19.814	19.837	19.757	19.520
	(10.649)	(10.649)	(10.647)	(10.655)	(10.529)	(10.531)
AFDC Waiver	-2.690	-1.824				
	(1.920)	(1.926)				
Pre-PRWORA Waiver			-2.367	-2.322		
			(1.936)	(2.018)		
Post-PRWORA Waiver			-10.254	1.188		
			(6.344)	(4.052)		
Time Limit					-4.911	-0.632
					(3.510)	(3.221)
JOBS Exemptions					-1.667	-2.594
					(3.876)	(4.206)
JOBS Sanctions					-8.048	-5.800
					(4.077)	(4.158)
Earnings Disregards					2.496	0.789
					(2.376)	(2.665)
Family Cap					10.977	11.307
					(2.386)	(2.374)
Work Requirement					-1.442	-0.437
					(2.952)	(2.834)
EBT	-3.241	-5.480	-3.597	-5.782	-1.727	-3.208
	(2.106)	(2.828)	(2.124)	(2.849)	(2.179)	(2.859)
ABAWD Waiver	27.208	25.899	28.434	27.967	31.451	29.039
	(5.983)	(5.984)	(6.061)	(6.465)	(6.107)	(6.200)
Error Rate	29.876	29.688	29.539	29.683	30.386	29.970
	(7.492)	(7.490)	(7.494)	(7.492)	(7.431)	(7.432)
Log Max AFDC/ Food Stamp Benefit	-9.854	-9.581	-9.841	-9.861	-7.852	-7.897
	(5.854)	(5.854)	(5.852)	(5.865)	(5.803)	(5.810)
State House and Senate Democratic	-0.182	-0.453	-0.089	-0.429	0.194	-0.262
	(1.318)	(1.327)	(1.320)	(1.328)	(1.336)	(1.331)
State House and Senate Republican	-4.118	-4.494	-4.087	-4.657	-3.337	-3.439
	(1.620)	(1.629)	(1.619)	(1.641)	(1.615)	(1.663)
Governor Democratic	7.400	7.380	7.432	7.415	6.846	6.908
	(0.895)	(0.894)	(0.895)	(0.895)	(0.896)	(0.892)
Log ADA Score	-0.141	0.010	-0.230	0.042	-0.757	-0.364
	(1.150)	(1.139)	(1.152)	(1.140)	(1.153)	(1.133)

Notes: All coefficients are multiplied by 100. Standard errors are in parentheses. All regressions, based on data from fiscal years 1980–1998 for all 50 states and the District of Columbia, are weighted by state population and control for state-specific fixed effects and trends. Specifications 1, 3, and 5 are based on AFDC waiver and EBT program approval dates, while specifications 2, 4, and 6 are based on AFDC waiver and EBT program implementation dates.

This result suggests that sanctions are having a spillover effect from AFDC to food stamps, and may follow from the fact that one-stop benefit "shopping," i.e., the fact that AFDC and food stamp benefits can be obtained from the same welfare office, is causing sanctioned households to be diverted from food stamps as well. The positive family cap effect, on the other hand, suggests that since the AFDC benefit is capped for additional children in the 22 states that adopted caps, food stamps are becoming a relatively more attractive component of the safety net, and one that families are more likely to seek out.

Unlike the AFDC waivers, the estimated impact of the EBT is stronger when modeled by the implementation date, rather than by the approval date. This most likely occurs because the EBT technology has no signaling effect, but rather only influences caseloads after the technology is in place. Specifications 2 and 4 indicate that states implementing the EBT program experience about a 5.5 percent decline in per capita food stamp caseloads, suggesting that the stigma-reducing effect that should increase caseloads in the presence of the EBT is dominated by technological barriers. In contrast to EBT, a state with a full-state ABAWD waiver is estimated to experience nearly 30 percent higher caseloads than states without waivers. This estimated impact, however, is misleadingly large, since the average ABAWD waiver (conditional on having a waiver) covers just 17 percent of the state and the standard deviation is less than 19 percent of the state. However, the 5 percent estimated effect of a standard-deviation change in the proportion of the state covered by the ABAWD waiver is still substantial and suggests that either the very adverse economic conditions necessary to obtain a waiver, and/or the caseload-expanding nature of the waiver itself, contribute significantly to the food stamp caseload. The combined AFDC/food stamp benefits have an unexpected negative coefficient, but this effect is statistically indistinguishable from zero and is not robust to the introduction of dynamics. Finally, error rates are estimated to have a positive and statistically significant effect on caseloads. A 1 percentage point decrease in the error rate leads to a 30 percent decline in caseloads. As states move to reduce their error rates, they may expect a similar decline in their caseloads.

The political makeup of a state has a large estimated influence on food stamp caseloads in the static models. States where both legislative chambers are controlled by Republican have about 4 percent

lower caseloads than states where both legislative chambers are Democratic or where chamber control is split between the parties. Similarly, states with a Republican governor have about 7 percent lower caseloads than do states with Democratic governors. The estimated effects of a Democratic House and Senate and the measure of a state's political "liberalness," as measured by the voting records of the state's U.S. Senate delegation, are insignificant.

Dynamic Results

In Table 2 we relax the restriction of no dynamic effects by permitting a one-period lag of food stamp caseloads. As in the static models, the coefficient on the unemployment rate is highly statistically significant and positive. A 1 percentage point increase in the unemployment rate is estimated to lead to about a 12 percent long-run increase in the food stamp caseload.[8] The coefficient on employment growth now indicates the expected countercyclical relationship, but it is still insignificant.

The effects of the aggregated welfare reform variables and the pre- and post-PRWORA waivers are insignificant in these models, as they were in the static models. However, the sign on the "any waiver" variable is now positive rather than negative. The sign on the pre-PRWORA waiver variable is also positive, but the sign on the post-PRWORA waiver variable is negative. In the model with approval dates, the effect is again strong—food stamp caseloads are 20 percent lower in the long run after PRWORA—but the long-run effect is only 3.3 percent in the model with implementation dates. As opposed to the static models, the effects of JOBS sanctions and family cap are statistically insignificant when either approval or implementation dates are used. Unlike the case with static models, states with time limits have lower food stamp caseloads when approval dates are used. Insofar as time limits may make households less likely to use their limited eligibility period and households move off of food stamps and

---

[8]The long-run effect for any variable X_i is $LRE(X_i) = \frac{\sum_j \beta_{ij}}{1 - \frac{\sum_k \rho_k}{100}}$, where β_{ij} are the coefficient(s) associated with X_i and ρ_k are the coefficient(s) associated with the lagged dependent variable.

TABLE 2
AR(1) Estimates of the Impact of Welfare Reform and the Macroeconomy on Per Capita Food Stamp Program Caseloads

	(1)	(2)	(3)	(4)	(5)	(6)
Caseloads (t–1)	78.924	78.896	78.860	78.965	78.758	79.046
	(1.699)	(1.702)	(1.697)	(1.704)	(1.721)	(1.736)
Unemployment Rate	2.563	2.569	2.551	2.566	2.514	2.525
	(0.211)	(0.211)	(0.211)	(0.211)	(0.213)	(0.214)
Growth in Employment Per Capita	-8.068	-7.900	-8.342	-8.593	-8.777	-9.445
	(7.275)	(7.259)	(7.268)	(7.303)	(7.266)	(7.315)
AFDC Waiver	0.872	0.822				
	(0.958)	(0.961)				
Pre-PRWORA Waiver			1.095	1.126		
			(0.966)	(1.010)		
Post-PRWORA Waiver			-4.334	-0.688		
			(3.155)	(2.020)		
Time Limit					-3.260	-1.151
					(1.774)	(1.633)
JOBS Exemptions					0.934	-0.589
					(1.946)	(2.119)
JOBS Sanctions					-2.411	-1.156
					(2.052)	(2.098)
Earnings Disregards					2.254	2.346
					(1.201)	(1.358)
Family Cap					0.220	-0.165
					(1.233)	(1.233)
Work Requirement					0.056	-0.752
					(1.482)	(1.426)
EBT	-0.194	-0.186	-0.450	-0.036	-0.409	-0.007
	(1.057)	(1.430)	(1.066)	(1.440)	(1.102)	(1.460)
ABAWD Waiver	0.998	1.271	1.901	0.210	2.832	0.151
	(3.044)	(3.038)	(3.085)	(3.277)	(3.151)	(3.193)
Error Rate	8.865	8.820	8.682	8.813	9.165	9.099
	(3.784)	(3.784)	(3.781)	(3.784)	(3.793)	(3.801)
Log Max AFDC/ Food Stamp Benefit	1.818	1.080	1.851	1.946	2.016	2.021
	(2.990)	(2.992)	(2.986)	(2.997)	(2.989)	(3.002)
State House and Senate Democratic	1.215	1.183	1.282	1.180	1.467	1.338
	(0.674)	(0.678)	(0.674)	(0.679)	(0.691)	(0.690)
State House and Senate Republican	-1.451	-1.457	-1.377	-1.377	-1.166	-1.140
	(0.815)	(0.821)	(0.826)	(0.826)	(0.820)	(0.847)
Governor Democratic	1.717	1.721	1.751	1.706	1.807	1.761
	(0.482)	(0.482)	(0.482)	(0.482)	(0.484)	(0.484)
Log ADA Score	1.390	1.393	1.323	1.382	1.093	1.316
	(0.594)	(0.589)	(0.595)	(0.589)	(0.602)	(0.593)

Notes: All coefficients are multiplied by 100. Standard errors are in parentheses. Specifications 1, 3, and 5 are based on AFDC waiver and EBT program approval dates, while specifications 2, 4, and 6 are based on AFDC waiver and EBT program implementation dates. See notes to Table 1 for further details.

AFDC jointly, the negative effect of time limits is not surprising. In addition, regardless of whether approval or implementation dates are used, the earnings disregard is positive and significant. This is as expected since earnings disregards would tend to encourage continued AFDC recipiency and, possibly, encourage some households to enter the AFDC program. Differing from the situation with static models, the EBT and ABAWD variables are both insignificant. The combined AFDC/food stamp benefits variable is now of the expected sign (positive) but is still insignificant. The impact of error rates is even more pronounced in the dynamic model of Table 2—in the long run a 1 percentage point decrease is now estimated to lead to about a 42 percent decrease in caseloads.

The strong effect of the political variables is still present in the AR(1) models. States that are more liberal—as seen through the legislative control variables, the party of the governor, and the political "liberalness" of the state's Senate delegation—have statistically significantly higher caseloads than their more conservative neighbors.

In Table 3 we report the results from a more fully parameterized dynamic model based on the Schwarz criterion, but with the restrictions of no lagged welfare reform effects and no direct AFDC caseload effect. Because of the large number of estimated parameters, for ease of presentation we report the implied long-run effects of the variables along with the p-value from the null hypothesis that the long-run effect is zero. In the fully dynamic specifications, the estimated effect of unemployment is double the estimate implied by the static model in Table 1—a 1 percentage point increase in unemployment leads to about a 9 percent increase in food stamp caseloads. This result is similar across all six specifications, with only a slight decline when the disaggregated welfare reform variables are used (specifications 5 and 6). As opposed to the previous specifications, the growth in employment per capita is statistically significant and quite large—a 0.1 percentage point decrease in the growth of employment per capita, which is a 17 percent decrease when evaluated at the mean of 0.006, leads to about a 21.5 percent increase in specifications 1–4 and a 17 percent increase in specifications 5 and 6.

In spite of the introduction of more fully parameterized dynamic specifications, the effect of some of the disaggregated welfare reform variables remains strong. In the long run, states with JOBS sanctions

TABLE 3
Dynamic Model Estimates of the Impact of Welfare Reform and the Macroeconomy on Per Capita Food Stamp Program Caseloads: Implied Long-Run Effects

	(1)	(2)	(3)	(4)	(5)	(6)
Unemployment Rate	8.806	8.896	8.758	8.924	8.360	8.596
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Growth in Employment Per Capita	-216.723	-215.669	-218.861	-218.866	-168.970	-170.117
	[0.025]	[0.026]	[0.023]	[0.025]	[0.064]	[0.068]
AFDC Waiver	3.054	1.910				
	[0.192]	[0.416]				
Pre-PRWORA Waiver			3.352	2.533		
			[0.156]	[0.310]		
Post-PRWORA Waiver			-4.060	.903		
			[0.586]	[0.851]		
Time Limit					-4.823	-2.843
					[0.239]	[0.455]
JOBS Exemptions					0.897	-4.831
					[0.835]	[0.312]
JOBS Sanctions					-13.548	-8.843
					[0.004]	[0.065]
Earnings Disregards					8.620	10.514
					[0.002]	[0.001]
Family Cap					8.547	8.108
					[0.003]	[0.006]
Work Requirement					0.894	-1.407
					[0.789]	[0.665]
EBT	0.315	1.391	-0.052	1.661	0.555	3.808
	[0.902]	[0.696]	[0.983]	[0.645]	[0.825]	[0.279]
ABAWD Waiver	8.099	8.936	9.568	7.018	14.132	8.268
	[0.271]	[0.223]	[0.203]	[0.374]	[0.050]	[0.267]
Error Rate	1.494	1.303	1.485	1.397	2.609	2.77
	[0.872]	[0.889]	[0.873]	[0.888]	[0.769]	[0.785]
Log Max AFDC/ Food Stamp Benefit	38.159	36.209	38.598	38.226	48.753	50.810
	[0.132]	[0.151]	[0.128]	[0.135]	[0.045]	[0.041]
State House and Senate Democratic	0.685	0.540	0.772	0.527	1.726	1.426
	[0.716]	[0.775]	[0.682]	[0.782]	[0.351]	[0.446]
State House and Senate Republican	-7.603	-7.321	-7.505	-7.189	-6.108	-5.712
	[0.001]	[0.001]	[0.001]	[0.002]	[0.005]	[0.011]
Governor Democratic	3.481	3.547	3.550	3.535	3.445	3.474
	[0.013]	[0.012]	[0.012]	[0.012]	[0.010]	[0.010]
Log ADA Score	-.264	-0.262	-.346	-0.263	-1.357	-0.991
	[0.862]	[0.863]	[0.821]	[0.863]	[0.355]	[0.501]

Notes: P-values for the null hypothesis of no long-run effect are in brackets. Specifications 1, 3, and 5 are based on AFDC waiver and EBT program approval dates, while specifications 2, 4, and 6 are based on AFDC waiver and EBT program implementation dates. See notes to Table 1 for further details.

are estimated to have 8.8 percent lower food stamp caseloads than states without JOBS sanctions. (This is using implementation dates; the figure is 13.5 percent when using approval dates.) Controlling for other factors, states with family caps are estimated to have 8.5 percent higher food stamp caseloads in the long run (the figure is 8.1 percent with approval dates) and states with earnings disregard are estimated to have 10.5 percent higher food stamp caseloads in the long run (8.6 percent with approval dates). Specific welfare reform variables have an impact on food stamp caseloads, but the total effect of welfare reform is still insignificant, whether measured by the single waiver variable or broken down by pre- and post-PRWORA waivers. This may be because the effects of the disaggregated welfare reform variables are canceling each other out; JOBS sanctions tend to produce declines in food stamp caseloads while earnings disregards and family caps tend to produce increases. Thus, states with tough sanctions policies but without family caps or higher earnings disregards can expect larger caseload declines, all else equal. The EBT and error rates variables are insignificant in all six specifications. The ABAWD waiver variable is insignificant in all specifications except when measured by implementation date with disaggregated waiver variables. The AFDC/food stamp benefit level enters in the dynamic model much stronger in economic terms across all the specifications, with the effect weakly statistically significant in specifications 1–4 and strongly significant in specifications 5 and 6.

States with a Republican legislature and/or governor continue to have lower caseloads. If the Republicans control both chambers of the legislature, food stamp caseloads will be about 7 percent lower in the long run, and if the governor is a Republican, food stamp caseloads will be about 4 percent lower.

In Table 4 we expand on our dynamic model in Table 3 by permitting the welfare policy variables to have a contemporaneous and one-period lagged effect on log per capita food stamp caseloads. Most noticeable in Table 4 are the reduced impacts of per capita employment growth rates and several of the welfare policy variables. Specifically, the long-run effect of employment growth rates falls about 15 percent on average across the six specifications and loses some of its statistical significance. Likewise, JOBS sanctions and family caps fall in importance in Table 4, especially with the implementation dates in specification 6. Interestingly, however, the EBT becomes strongly negative in models using

TABLE 4
Dynamic Model Estimates of the Impact of Welfare Reform and the Macroeconomy on Per Capita Food Stamp Program Caseloads with One Lag of Welfare Reform Variables: Implied Long-Run Effects

	(1)	(2)	(3)	(4)	(5)	(6)
Unemployment Rate	8.940	8.849	8.872	8.903	8.425	8.492
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Growth in Employment Per Capita	-175.009	-197.903	-176.716	-192.510	-141.667	-155.779
	[0.074]	[0.036]	[0.070]	[0.043]	[0.120]	[0.092]
AFDC Waiver	2.807	3.697				
	[0.341]	[0.207]				
Pre-PRWORA Waiver			3.317	3.020		
			[0.261]	[0.324]		
Post-PRWORA Waiver			-19.767	8.616		
			[0.124]	[0.289]		
Time Limit					-10.731	-0.109
					[0.047]	[0.984]
JOBS Exemptions					4.598	-3.182
					[0.408]	[0.596]
JOBS Sanctions					-19.231	-5.394
					[0.001]	[0.365]
Earnings Disregards					10.349	9.294
					[0.004]	[0.027]
Family Cap					12.658	6.312
					[0.000]	[0.081]
Work Requirement					0.758	-5.239
					[0.874]	[0.242]
EBT	0.396	-13.202	-0.219	-13.535	3.155	-9.938
	[0.907]	[0.006]	[0.948]	[0.005]	[0.355]	[0.046]
ABAWD Waiver	-14.900	-12.749	-15.191	-6.958	3.378	-1.375
	[0.208]	[0.276]	[0.198]	[0.609]	[0.768]	[0.908]
Error Rate	-4.891	-7.263	-5.454	-6.875	3.277	-3.784
	[0.732]	[0.596]	[0.701]	[0.616]	[0.806]	[0.777]
Log Max AFDC/ Food Stamp Benefit	37.234	35.048	36.549	37.297	48.028	45.295
	[0.152]	[0.157]	[0.158]	[0.137]	[0.053]	[0.066]
State House and Senate Democratic	1.257	-0.657	1.573	-0.608	1.833	0.214
	[0.514]	[0.727]	[0.414]	[0.747]	[0.328]	[0.909]
State House and Senate Republican	-7.483	-7.115	-7.067	-7.525	-5.714	-5.673
	[0.001]	[0.001]	[0.002]	[0.001]	[0.009]	[0.013]
Governor Democratic	3.202	2.991	3.311	3.016	3.421	3.159
	[0.025]	[0.029]	[0.020]	[0.028]	[0.010]	[0.018]
Log ADA Score	-0.094	-0.017	-0.288	0.078	-1.372	-0.466
	[0.951]	[0.990]	[0.852]	[0.957]	[0.351]	[0.743]

Notes: P-values for the null hypothesis of no long-run effect are in brackets. All regressions, based on data from fiscal years 1980–1998 for all 50 states and the District of Columbia, are weighted by state population, and control for state-specific fixed effects and trends. Specifications 1, 3, and 5 are based on AFDC waiver and EBT program approval dates, while specifications 2, 4, and 6 are based on AFDC waiver and EBT program implementation dates.

implementation dates—the EBT leads to about a 10 percent decline in food stamp caseloads in the long run. Overall, though, inclusion of lags in welfare policies is pushing the data a bit too far, and thus the results in Table 3 are perhaps more credible.

Simultaneous Determination of Food Stamp and AFDC Caseloads

The models in Tables 1–4 can be viewed as reduced-form models in that they do not explicitly consider the possibility that food stamp caseloads may covary with AFDC caseloads. In Table 5 we relax this restriction by appending to specification 3 of Table 3 the log of per capita AFDC caseloads. As alluded to earlier, it is possible that food stamp and AFDC caseloads are jointly determined, which if true implies that weighted least squares estimates with AFDC caseloads are inconsistent. To address this possibility we employ an instrumental variables estimator to identify the model parameters. The identifying instrument is the log of the state need standard, which is used to determine AFDC eligibility but not food stamp eligibility. In addition, we include as overidentifying instruments the one-period lag of the need standard, as well as interactions of the need standard with the political variables. A potentially useful instrument is the one-period lag of AFDC caseloads, but this is only valid in a first difference panel data model and not in the levels model of equation 1 (Keane and Runkle 1992). Consequently, we present five specifications: weighted least squares in levels and first differences, weighted instrumental variables in levels and first differences using all instruments except the lagged AFDC caseloads, and weighted instrumental variables in first differences with the lagged AFDC caseloads as an instrument.[9]

It is apparent from Table 5, in which specifications 1 and 3 treat AFDC cases as exogenous and specifications 2, 4, and 5 treat AFDC cases as endogenous, that the potential simultaneity of AFDC and food stamp caseloads is of secondary importance when one is interested in estimating the effects of policies or the macroeconomy on food stamp caseloads. For instance, when estimating models in levels,

[9]The last two rows of Table 5 contain model specification tests for the instrumental variables estimator, a first-stage *F*-test of the correlation of the overidentifying instruments with the endogenous regressor, and the Sargan test of the validity of the overidentifying restrictions.

TABLE 5
Dynamic Least Squares and Instrumental Variables Estimates of the Impact of Welfare Reform and the Macroeconomy on Per Capita Food Stamp Caseloads: Implied Long-Run Effects

	Levels		First Differences		
	(1)	(2)	(3)	(4)	(5)
Unemployment Rate	6.704	7.560	5.446	4.617	5.230
	[0.000]	[0.056]	[0.000]	[0.004]	[0.000]
Growth in Employment Per Capita	-204.828	-187.368	-190.410	-170.472	-167.991
	[0.016]	[0.043]	[0.002]	[0.004]	[0.007]
Pre-PRWORA Waiver	4.292	4.425	1.423	1.557	1.520
	[0.042]	[0.067]	[0.240]	[0.183]	[0.215]
Post-PRWORA Waiver	1.715	-1.987	-1.538	-0.706	-1.108
	[0.797]	[0.882]	[0.577]	[0.825]	[0.733]
EBT	-0.091	-0.285	-2.572	-2.037	-2.163
	[0.968]	[0.917]	[0.069]	[0.156]	[0.145]
ABAWD Waiver	0.674	4.597	9.120	8.673	8.716
	[0.921]	[0.726]	[0.010]	[0.016]	[0.021]
Error Rate	1.799	-1.277	1.549	1.221	1.163
	[0.827]	[0.883]	[0.650]	[0.706]	[0.733]
Log Max AFDC/ Food Stamp Benefit	41.389	36.144	28.911	19.012	21.731
	[0.065]	[0.218]	[0.033]	[0.188]	[0.124]
State House and Senate Democratic	0.602	0.579	-0.719	-0.700	-0.766
	[0.718]	[0.762]	[0.361]	[0.359]	[0.333]
State House and Senate Republican	-5.682	-5.544	-0.503	-0.502	-0.593
	[0.005]	[0.157]	[0.637]	[0.627]	[0.580]
Governor Democratic	3.085	3.140	1.461	1.297	1.340
	[0.013]	[0.045]	[0.081]	[0.104]	[0.109]
Log ADA Score	-0.797	-0.404	-1.000	-0.879	-0.954
	[0.556]	[0.796]	[0.196]	[0.242]	[0.219]
Per Capita AFDC Caseloads	29.513	15.794	31.689	39.077	29.862
	[0.000]	[0.744]	[0.000]	[0.058]	[0.002]
First-Stage *F*-test on Overidentifying Instruments		2.280		5.060	29.360
		[0.045]		[0.000]	[0.000]
P-value on Wald Test of Validity of Overidentifying Restrictions		0.003		0.312	0.439

Notes: P-values for the null hypothesis of no long-run effect are in brackets. All regressions, based on data from fiscal years 1980–1998 for all 50 states and the District of Columbia, are weighted by state population, control for state-specific fixed effects and trends, and are based on AFDC waiver and EBT program approval dates. All regressions control for AFDC caseloads; in specifications 2 and 4 AFDC caseloads are instrumented by the AFDC need standard, the lagged AFDC standard, and the AFDC need standard interacted with the political party variables, while specification 5 adds one-period lagged AFDC caseloads to the instrument set.

the implied long-run effect of the unemployment rate is only 13 percent higher when treating AFDC caseloads as endogenous than when treating them as exogenous. In the differences specification, this difference is about 15 percent. Similarly small absolute differences between specifications (9 and 11 percent) are observed with regard to the estimated employment growth effects. When considering other variables, treatment of AFDC caseloads as endogenous occasionally leads to a reduction in magnitude or statistical significance of a treatment effect (e.g., with regard to EBT, in the difference specifications, or to AFDC/food stamp benefits in either levels or differences), but even in these cases the qualitative conclusions drawn from the results do not vary. Therefore, the treatment of AFDC caseloads as endogenous apparently does not affect the estimated effects of policy variables and the macroeconomy on food stamp caseloads in any substantive manner.

Caseload Decompositions

We now turn to an oft-asked question: How much of the post-1994 decline in food stamp caseloads is attributable to welfare reform and how much is attributable to the macroeconomy? To answer this question we focus on the models in Tables 1–3.

In the static models (Table 1), for any variable x_j, the proportion of caseload change from 1994 to 1998 that may be attributed to this variable in any state i is defined as:

$$EF(x_{ij})=\beta(x_{ij98}-x_{ij94})/(C_{i98}-C_{i94}),$$

where β is the parameter associated with x_j and C is the caseload. For the AR(1) models (Table 2) the proportion of caseload change from 1994 to 1998 that may be attributed to x_j is:

$$EF(x_{ij})=(\beta(x_{ij98}-x_{ij94})+ \beta\rho(x_{ij97}-x_{ij93})+ \rho^2\beta(x_{ij96}-x_{ij92})+\ldots+ \rho^{10}\beta(x_{ij85}-x_{ij81}))/(C_{i98}-C_{i94}),$$

where ρ is the parameter associated with lagged caseloads. For the models in Tables 3, the proportion of caseload change from 1994 to 1998 that may be attributed to x_j is:

$$EF(x_{ij})=(\beta(x_{ij98}-x_{ij94})+ \rho_1\beta(x_{ij97}-x_{ij93})+ \rho_2\beta(x_{ij96}-x_{ij92})+ \rho_3\beta(x_{ij95}-x_{ij91})+ \rho_4\beta(x_{ij94}-x_{ij90})+$$

$$\rho_1^2\beta(x_{ij96}-x_{ij92})+ \rho_2^2\beta(x_{ij95}-x_{ij91})+ \rho_3^2\beta(x_{ij94}-x_{ij90})+ \rho_4^2\beta(x_{ij93}-x_{ij89})+ \ldots$$

$$+ \rho_1^6\beta(x_{ij91}-x_{ij87})+ \rho_2^6\beta(x_{ij90}-x_{ij86})+ \rho_3^6\beta(x_{ij89}-x_{ij85})+ \rho_4^6\beta(x_{ij88}-x_{ij84}))/(C_{i98}-C_{i94}),$$

where ρ_1 is the parameter associated with the first lagged caseload, and so forth. For each equation, we then average over the states to arrive at the impact of the variable. Because more than one variable may be associated with "welfare reform" or "the macroeconomy," we then sum over the relevant variables to arrive at the percentage of the decline associated with welfare reform and the macroeconomy. In each of these models, the remaining decomposition can be ascribed to political variables, the other variables reflecting welfare policy, year fixed effects, and state time trends.[10]

The results from the decompositions are in Table 6. In the static models, the macroeconomy explains about 20 percent of the food stamp caseload decline. The effect of welfare reform varies widely, from a high of 28.2 percent in specification 3, to a low of –4.7 percent in specification 4.[11] In comparison to the static models, the AR(1) model predicts that the macroeconomic expansion explains more than twice as much of the decline, from 47.3 percent in specification 5 to 73.6 percent in specification 6. Except for specification 4, the effect of welfare reform is substantially less than in the static models, ranging from –2.7 percent to 9.8 percent. In the fully dynamic estimates from Table 3, the effect of the macroeconomy diminishes somewhat, with a range of 35.0 percent to 45.3 percent. The impact is still, however, substantially greater than the estimated effect of welfare reform, which ranges from –7.1 percent to 9.6 percent.

IV. CONCLUSION

This paper provides some of the first evidence of a relationship between welfare reform, the macroeconomy, and food stamp caseloads. Our results demonstrate that the macroeconomy has

---

[10]For all specifications in Tables 1 and 2, we sum over the effects of the unemployment rate and employment growth per capita variables to calculate the effect of the macroeconomy. Similarly, for all specifications in Tables 3, we sum over the effects of all the current and lagged unemployment rate and employment growth per capita variables. For specifications 1 and 2 in all tables, we use the "any waiver" variable to arrive at the effect of welfare reform; for specifications 3 and 4, we sum over the pre- and post- "any waiver" variables; and for specifications 5 and 6 we sum over the six disaggregated variables.

[11]In specifications 1–4 the effect of welfare reform is not statistically significant at usual confidence levels. Thus, the decomposition accorded to "welfare reform" must be treated with caution. In comparison, the macroeconomic variables, especially the unemployment rates, are strongly statistically significant.

TABLE 6
Decomposition of the Relative Impacts of the Macroeconomy and Welfare Reform on Food Stamp Caseloads: 1994 to 1998

Percent Attributable to:	(1)	(2)	(3)	(4)	(5)	(6)
	Static Estimates					
Macroeconomy	20.52	19.97	20.46	20.04	20.46	20.14
Welfare Reform	5.98	4.38	28.28	-4.71	22.80	8.19
	AR(1) Estimates					
Macroeconomy	53.72	50.74	49.29	67.73	47.28	73.62
Welfare Reform	-2.34	-2.90	9.97	-2.67	9.80	-3.08
	Dynamic Estimates without One Lag of Welfare Variables					
Macroeconomy	35.73	35.71	34.96	37.39	38.63	45.29
Welfare Reform	-7.17	-4.50	4.62	-0.41	9.58	5.28

Notes: All regressions, based on data from fiscal years 1980–1998 for all 50 states and the District of Columbia, are weighted by state population and control for state-specific fixed effects and trends. The coefficients used for the static estimates are in Table 1; for the AR(1) estimates, Table 2; and for the dynamic estimates without one lag of welfare variables, Table 3.

substantially influenced the recent decline in food stamp caseloads. In our preferred models, up to 45 percent of the decline in food stamp caseloads can be attributed to the macroeconomy. This substantial influence suggests that during the next recession, food stamp caseloads will likely increase again. More specifically, our results indicate that a 1 percent increase in the unemployment rate will lead to an 8 percent increase in food stamp caseloads.

In comparison to the effect of the macroeconomy, the estimated aggregate effect of welfare reform is modest and is not consistent across model specifications. Similar to Ziliak et al. (2000), we do find substantial heterogeneity in the impact of waiver and TANF policies—states with JOBS sanctions policies but not family cap or earnings disregard waivers can expect a larger long-run decline in caseloads than those states with all three policies. While the effects of foodstamp-specific policies such as the EBT, ABAWD waivers, and error rates are not consistent across specifications, a common finding is that states with ABAWD waivers can expect higher caseload levels than states without the waivers and that the EBT program is leading to food stamp caseload declines.

Our estimates also reveal that the specification of caseload and business cycle dynamics have important implications for the estimated effects of policy changes and economic factors—when dynamic models are employed, we observe substantially reduced welfare reform effects but significantly increased effects of the macroeconomy on food stamp caseloads. This pattern of results is robust not only to the lag structure of the dynamics but also to the simultaneous determination of AFDC caseload levels. Hence, in comparison to modeling food stamp caseload dynamics, modeling the simultaneity of food stamp and AFDC caseloads seems of lesser concern when estimating the effect of the business cycle and welfare reform on food stamp caseloads.

TABLE A1
Summary Statistics

Variable	Mean	Standard Deviation
Log Per Capita Food Stamp Caseloads	-3.476	0.373
Log Per Capita AFDC Caseloads	-4.327	0.411
Unemployment Rate	0.064	0.022
Per Capita Employment Growth Rate	0.006	0.022
Log Real AFDC/Food Stamp Benefit	6.139	0.214
Log Real Need Standard	5.977	0.352
Error Rate	0.099	0.041
AFDC Waiver	0.166	0.360
EBT	0.089	0.274
ABAWD	0.019	0.082
Time Limits	0.119	0.302
JOBS Exemptions	0.138	0.333
JOBS Sanctions	0.142	0.337
Earnings Disregards	0.136	0.332
Family Cap	0.071	0.250
Work Requirements	0.109	0.301
Both Houses Democratic	0.537	0.499
Both Houses Republican	0.247	0.431
Governor Democratic	0.548	0.498
Senate ADA Score	3.880	0.662

References

Bartik, T., and R. Eberts. 1999. "Examining the Effect of Industry Trends and Structure on Welfare Caseloads." In *Economic Conditions and Welfare Reform,* edited by S. Danziger. Kalamazoo, MI: Upjohn Institute. Pp. 119–158.

Blanchard, O., and L. Katz. 1992. "Regional Evolutions." *Brookings Papers on Economic Activity*. Part 1, pp. 1–75.

Blank, R. 1997. "What Causes Public Assistance Caseloads to Grow?" Joint Center for Poverty Research Working Paper #2.

Council of Economic Advisers (CEA). 1997. "Technical Report: Explaining the Decline in Welfare Receipt, 1993–1996." Washington, DC: Executive Office of the President of the United States.

Council of Economic Advisers (CEA). 1999. "Technical Report: The Effects of Welfare Policy and the Economic Expansion on Welfare Caseloads: An Update." Washington, DC: Executive Office of the President of the United States.

Crouse, G. 1999. "State Implementation of Major Changes to Welfare Policies, 1992–1998." Technical Document. On the Web at <http://aspe.hhs.gov/hsp/Waiver-Policies99/policy_CEA.htm>.

Danziger, Sheldon, ed. 1999. *Economic Conditions and Welfare Reform*. Kalamazoo, MI: Upjohn Institute.

Eberts, R., and J. Stone. 1991. *Wage and Employment Adjustment in Local Labor Markets*. Kalamazoo, MI: Upjohn Institute.

Figlio, D., V. Kolpin, and W. Reid. 1999. "Do States Play Welfare Games?" *Journal of Urban Economics* 46: 437–454.

Figlio, D., and J. Ziliak. 1999. "Welfare Reform, the Business Cycle, and the Decline in AFDC Caseloads." In *Economic Conditions and Welfare Reform*, edited by S. Danziger. Kalamazoo, MI: Upjohn Institute. Pp. 17–48.

Fraker, T., and R. Moffitt. 1988. "The Effect of Food Stamps on Labor Supply: A Bivariate Selection Model," *Journal of Public Economics* 35: 25–56.

Gallagher, L., M. Gallagher, K. Perese, S. Schreiber, and K. Watson. 1998. "One Year after Federal Welfare Reform: A Description of State Temporary Assistance for Needy Families (TANF) Decisions as of October 1997." Washington, DC: Urban Institute.

Gundersen, C., and M. Andrews. 2000. "Stigma, Transaction Costs, Employment Status, and the Food Stamp Participation Decision among Married Couples." Mimeo. U.S. Department of Agriculture, Economic Research Service.

Hurst, E., M. Luoh, and F. Stafford. 1998. "Wealth Dynamics of American Families, 1984–1994." *Brookings Papers on Economic Activity.* Part 1, pp. 267–329.

Keane, M., and D. Runkle. 1992. "On the Estimation of Panel-Data Models with Serial Correlation When Instruments Are Not Strictly Exogenous." *Journal of Business and Economic Statistics* 10: 1–9.

Moffitt, R. 1999. "The Effect of Pre-PRWORA Waivers on AFDC Caseloads and Female Earnings, Income, and Labor Force Behavior." In *Economic Conditions and Welfare Reform*, edited by S. Danziger. Kalamazoo, MI: Upjohn Institute. Pp. 91–118.

Nickell, S. 1981. "Biases in Dynamic Models with Fixed Effects." *Econometrica* 49: 1399–1416.

Wallace, G., and R. Blank. 1999. "What Goes Up Must Come Down? Explaining Recent Changes in Public Assistance Caseloads." In *Economic Conditions and Welfare Reform*, edited by S. Danziger. Kalamazoo, MI: Upjohn Institute. Pp. 48–89.

Ziliak, J., D. Figlio, E. Davis, and L. Connolly. 2000. "Accounting for the Decline in AFDC Caseloads: Welfare Reform or the Economy?" *Journal of Human Resources* 35: 570–586.