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Food Stamp Caseloads over the Business Cycle

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We use a dynamic model of food stamp caseloads with state-level panel data to estimate the impact of the business cycle on food stamp caseloads in the era of welfare reform. The macroeconomy has a substantial impact on food stamp caseloads: A one-percentage-point increase in the unemployment rate leads to a 2.3% increase after one year. In terms of welfare policy, a 10-percentage-point increase in the share of a state's population waived from rules limiting food stamp receipt among able-bodied adults without dependents (ABAWDs) results in a 0.5% increase in contemporaneous caseloads. States with waivers from the Aid to Families with Dependent Children (AFDC) program in the mid-1990s had caseloads about 1.9% higher than nonwaiver states. While changes in AFDC caseloads have historically resulted in coincident changes in food stamp caseloads, our results suggest that the link between AFDC caseload and food stamp caseload changes has dissipated substantially after welfare reform. The cyclical sensitivity of food stamp caseloads indicates the importance of food stamps in smoothing consumption during economic recessions.

1. Introduction

The onset of the current economic downturn following the longest expansion in U.S. history has renewed interest in the role of automatic stabilizers designed to insure households against negative cyclical income shocks. This system of income and consumption stabilizers includes, among others, the individual income tax and the panoply of social insurance programs, such as unemployment insurance and the Food Stamp Program. While the income tax and unemployment insurance have received recent attention (Gruber 1997; Auerbach and Feenberg 2000; Kniesner and Ziliak 2002a, b), little is known about the role of food stamps as an automatic stabilizer even though the program served over 27 million Americans at its peak in 1994. This gap in the literature is particularly acute in light of passage of the Personal Responsibility and Work Opportunity Reconciliation Act of 1996 (Welfare Reform Act), which introduced new rules on cash-assistance recipients and thus the nearly half of food stamp recipients who also receive cash welfare. Moreover, the 1996 welfare reform 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 Benefit Transfer cards. Importantly, the Welfare Reform Act also eliminated the

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entitlement status of the main cash-welfare program, Aid to Families with Dependent Children (AFDC), thus positioning food stamps as a more prominent countercyclical consumption stabilizer.

A first task in assessing the possible stabilization role of food stamps in the era of welfare reform is to identify the cyclical sensitivity of food stamp caseloads. If food stamp caseloads are acyclical, then we would expect no role for food stamps in smoothing consumption over the business cycle. If, however, food stamp caseloads are highly cyclical, then food stamps may function as an important antirecessionary tool. By the same token, the new welfare policies may independently affect food stamp caseload movements and interact with the business cycle, thereby altering the possible stabilization role of the program. In this paper, we specify a dynamic model of food stamp caseloads to estimate the responsiveness of the caseload to the business cycle, to welfare policies, and to interactions between the business cycle and welfare policies.

Unlike cash welfare, there has been scant research on the cyclicality of food stamp caseloads.[1] 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. With annual data, food stamp caseloads were strongly countercyclical, and reform of AFDC led to weak declines in total caseloads.[2] Specifically, they attribute up to 44% of the 1994 to 1998 food stamp caseload decline to economic conditions and about 6% of the decline to welfare reform. They reach broadly similar conclusions with monthly data. However, Wallace and Blank calculate that upward of 85% of the post-1996 decline in food stamp caseloads can be attributed to welfare reform if one is willing to ascribe all the unexplained residual to welfare reform, which as the authors note is undoubtedly an overestimate of welfare reform's effect on food stamp caseloads (p. 85). In their static models, Figlio, Gundersen, and Ziliak (2000) reached conclusions similar to Wallace and Blank's estimates with annual-level data. In their preferred dynamic models, they attribute about 35% of the 1994 to 1998 caseload decline to the macroeconomy and virtually nothing to welfare reform.

We improve on this previous research on food stamp caseloads along several dimensions. First, we not only follow other research in estimating the impact of AFDC policy changes on food stamp caseloads but also examine the impact of policies that are focused directly on food stamps. Specifically, we consider how food stamp caseloads respond to state decisions regarding the introduction of Electronic Benefit Transfer cards, waivers from the work requirement for unemployed able-bodied adults without dependents (ABAWDs), and administrative error rates. Additionally, we consider an alternative method of modeling welfare waiver variables because changes implemented after the Welfare Reform Act may be quite different in effect from those introduced beforehand. Instead of specifying the AFDC policy reform as an aggregate "any waiver" variable, we distinguish policies that were implemented before the Welfare Reform Act from those implemented after the act. Third, in contradistinction to previous work by Wallace and Blank (1999), our dynamic model directly admits aggregate macroeconomic conditions that more fully capture national reforms such as the expansions in the Earned Income Tax Credit in the mid-1990s. This is likely to be important, as Wallace and Blank (1999) report that the magnitude of the estimated impact of welfare reform on AFDC caseloads declines by about half with even rudimentary macroeconomic controls. Fourth,

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[1] The literature on cash welfare has focused primarily on identifying the relative contributions of the macroeconomy and welfare reform to the dramatic declines in AFDC caseloads in the 1990s. Examples of this research include Council of Economic Advisers (1997, 1999), Bartik and Eberts (1999), Figlio and Ziliak (1999), Moffitt (1999), Wallace and Blank (1999), Ziliak et al. (2000), and Blank (2001).

[2] While welfare reform did replace the AFDC program with a new program called Temporary Assistance for Needy Families (TANF), for convenience we will refer to the program as AFDC throughout the paper.

because most AFDC recipients receive food stamps and nearly half of food stamp recipients receive AFDC, we examine the links between food stamp and AFDC caseloads and for possible changes in these links after welfare reform. Finally, as states with robust economies may foster a more hospitable environment to implement welfare reform (e.g., transitions from welfare to work are more rapid), we test for interactions between welfare reform and macroeconomic performance.[3]

Using state-level panel data for federal fiscal years 1980 to 1999, our results demonstrate a strong countercyclical relationship between macroeconomic activity and food stamp caseloads. A one-percentage-point decrease in the unemployment rate leads to a 2.3% decrease in food stamp caseloads after one year and upward of an 8% decrease in the long run. These results suggest an important role to be played by the Food Stamp Program to counteract the impact of negative income shocks. We also find evidence, after the Welfare Reform Act, of a breakdown in the traditionally strong link between TANF and the Food Stamp Program.

2. Empirical Model

To gauge the potential countercyclical insurance role of food stamps, one could employ aggregate time-series data. However, time-series data mask important heterogeneity in caseload movements across states because of heterogeneity in state economic conditions and state variation in the types and timing of adoption of welfare policies. This masked heterogeneity in macroeconomic conditions is readily apparent in a comparison of Figure 1, which contains aggregate food stamp caseloads and unemployment rates, and Figure 2, which contains state-specific changes in caseloads between 1984 and 1989. In Figure 1, it is clear that aggregate unemployment fell substantially in the 1980s expansion but that food stamp caseloads declined only slightly. In Figure 2, however, we observe the reasons for this modest aggregate decline because while many states experienced caseload declines, others experienced caseload increases.

A likely source of the varied caseload experience is due to cross-state differences in business cycle conditions. For example, in the 1980s, while many states experienced robust growth (e.g., New England), other areas suffered recessions (e.g., the oil bust in Texas). Indeed, in Figure 3, across the two aggregate business cycles over the past 20 years, we see the substantial heterogeneity in state unemployment rates, ranging from a low of 3.7% in Nebraska to a high of 10.4% in West Virginia. For modeling purposes, then, one should admit this state heterogeneity to more accurately identify the cyclicality of food stamp caseloads.

More recently, movements in food stamp caseloads have likely been affected by the radical changes in the administration of welfare programs, changes that affected both cash assistance and in-kind programs. The momentum toward passage of the Welfare Reform Act began in the early 1990s when the U.S. Department of Health and Human Services (DHHS) selectively granted states' requests for waivers from federal AFDC requirements. These waivers included policies such as terminal time limits, work requirements, and personal responsibility measures. Thus, in addition to meeting the usual sequence of income and asset tests in order to qualify for program benefits, recipients in the 35 states with statewide waivers had to satisfy many new rules. Passage of the Welfare Reform Act codified these state-specific waivers into federal law.

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[3] Using a very different methodology and data, Hamermesh and Johannes (1985) examined the Food Stamp Program's important role as both a monetary and a fiscal stabilizer.

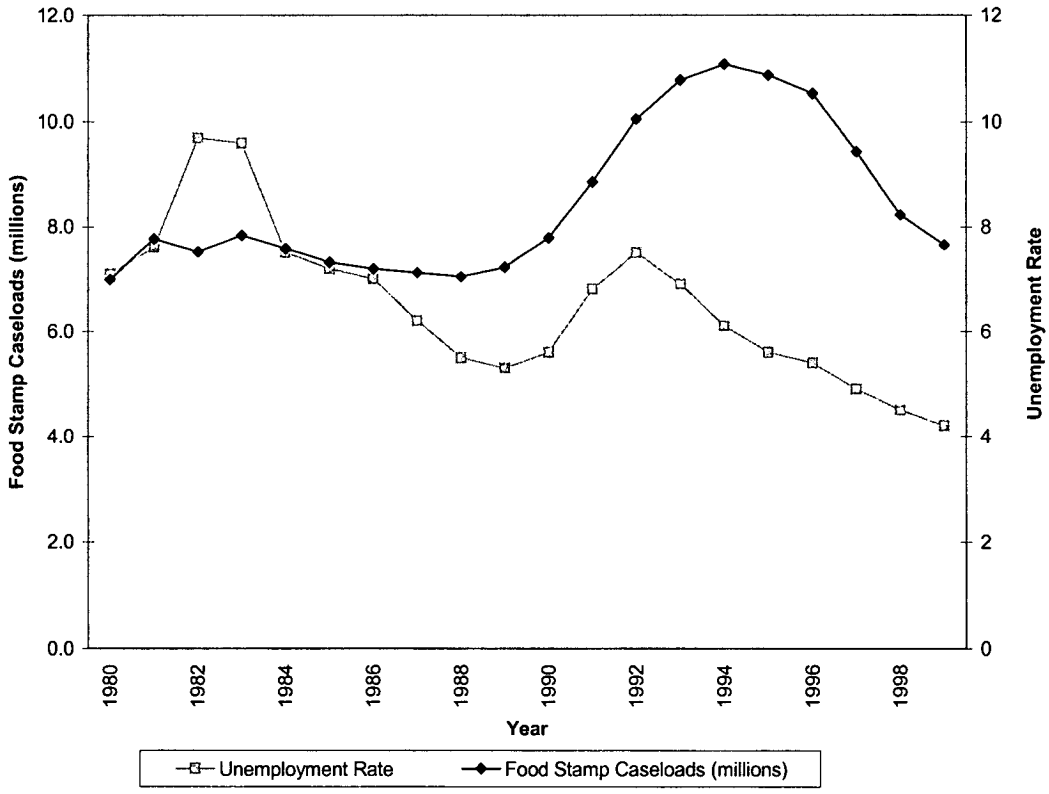

Figure 1. Changes in Aggregate Food Stamp Caseloads and Unemployment Rates

The benefits distributed by the Food Stamp Program are federally funded, and it is an entitlement program. States are, however, responsible for the administration of the Food Stamp Program. While many of the rules for food stamps are the same across all states (e.g., the benefit levels are established in the same manner), states still have substantial autonomy with the construction of the Food Stamp Program. There are three primary ways this autonomy has manifested itself in recent years. First, even though all states have the same benefit calculation formula, the ways and frequency with which this information is garnered can differ widely. For example, states can have shorter recertification periods if they believe this will allow them to more accurately calculate recipient benefit levels and eligibility status. Second, states had control over when they implemented the new Electronic Benefit Transfer card. This card is operationally similar to an ATM card and is replacing the previous method of dispensing food stamp benefits: paper coupons. The Electronic Benefit Transfer program is designed to reduce the stigma associated with food stamp use in stores, to prevent theft and loss of benefits, to impede misuse and illegal resale of benefits, and to improve the distribution of benefits. Third, the Welfare Reform Act introduced further opportunities for state autonomy. After 1996, most unemployed ABAWDs are now ineligible for food stamps except for three months in any 36-month time period. However, at state request, the U.S. Department of Agriculture may waive part or all of a state's ABAWD population from the rule provided that the waived area has an unemployment rate over 10% and/or an insufficient number of jobs. As with the business cycle, in order to identify the

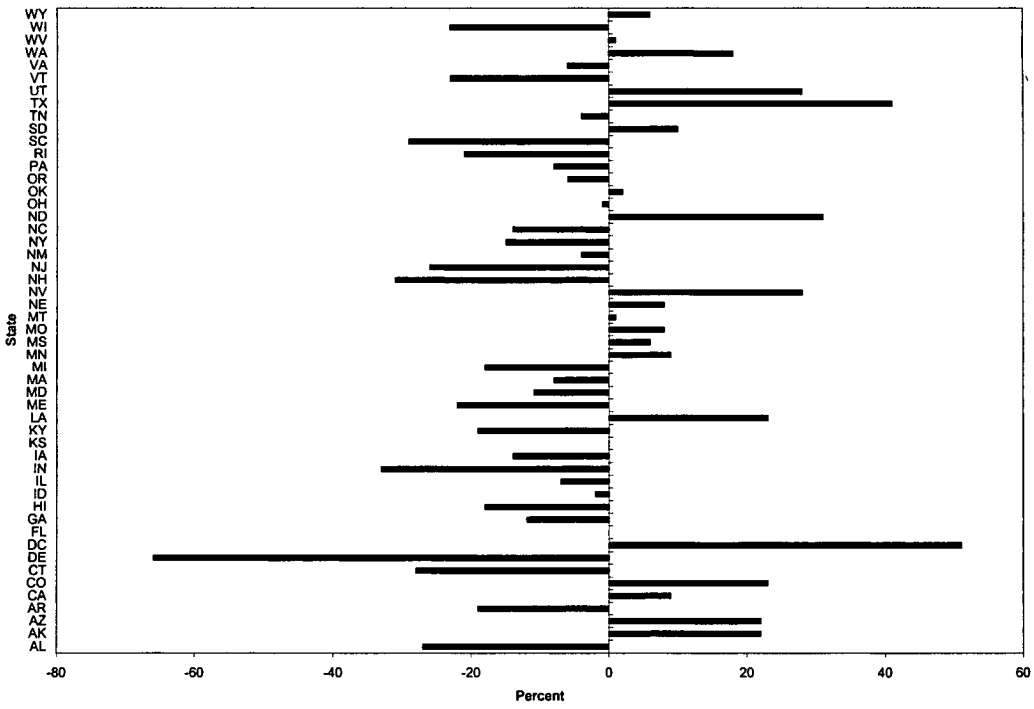

Figure 2. Percentage Change in Food Stamp Caseloads by State for 1984–1989.

impact of the state-specific food stamp policies on food stamp caseloads, it is necessary to abandon aggregate time-series data in favor of more disaggregated state-level data.[4]

To estimate the cyclicality of food stamp caseloads, we employ a model based on state-level panel data. Specifically, our model for state i in time period t is

$$C_{it} = \mu + \sum_{s=1}^{S} \rho_s C_{it-s} + \sum_{j=0}^{J} \alpha_j U_{it-j} + \sum_{k=0}^{K} l_k E_{it-k} + W_{it}\beta + Z_{it}\varphi + \gamma_t + \delta_i + \lambda_i t + \varepsilon_{it}, \qquad (1)$$

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 a vector of AFDC and food stamp welfare policies, Z_{it} is a vector of observed control variables that likely affect food stamp caseloads in a given state-year such as the political climate of a state and the log of AFDC caseloads per capita, 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 migratory or fertility patterns or general trends in a state's political climate (or, more accurately, its deviation from the national political trend) that are imperfectly picked up by the observed political variables. The year fixed effects control for aggregate macroeconomic performance and policy activity, such as changes in the Earned Income Tax Credit that affect all states identically in a given time period.

[4] Because benefits in the Food Stamp Program are federally funded, this may have an influence on how states behave in contradistinction to programs that are, at least in part, funded at the state level.

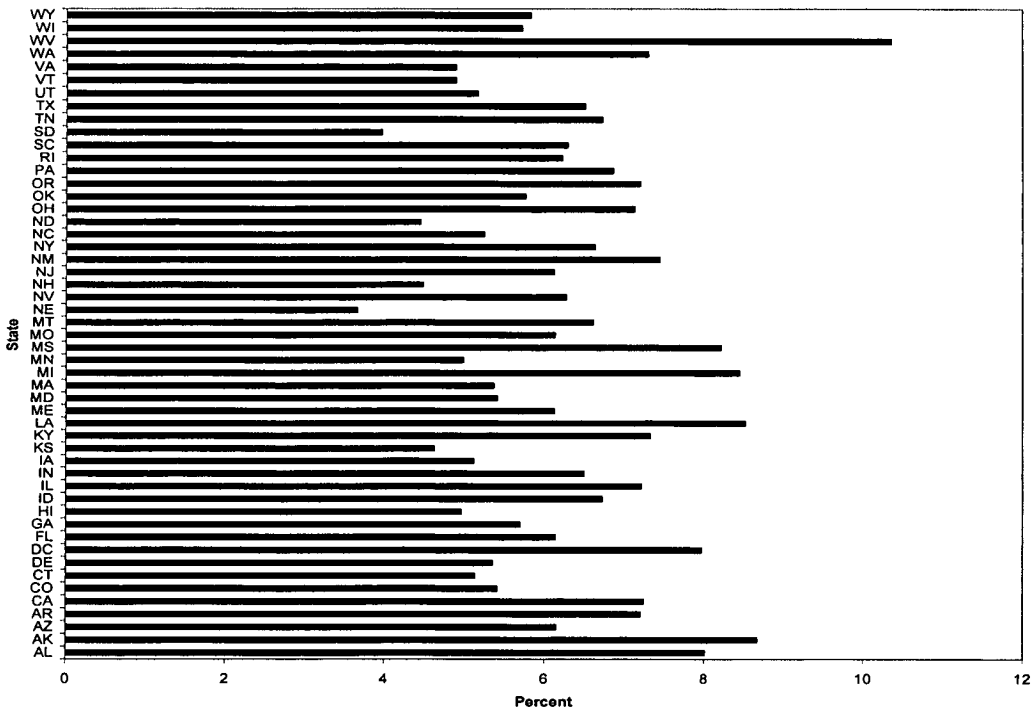

Figure 3. Average State Unemployment Rates, 1980–1999

We use the dynamic specification of Equation 1 for several reasons. First, it allows us to capture possible autocorrelation in the caseload process. If the error term is serially correlated, then this autocorrelation can be captured by the lagged dependent variables; and if it is correlated with the welfare reform variables, then it could be that the latter are just picking up the effects of lagged values of the caseload. Second, the dynamic models can capture the "regression to the mean" phenomenon; that is, if the caseload is transitorily high compared to "average," then the dynamic model permits us to isolate this impact. Third, the dynamic model is advantageous because it permits us to isolate contemporaneous from intermediate from long-run impacts of the macroeconomy and welfare reform on food stamp caseloads depending on whether we consider dynamic feedback through the caseloads.[5,6]

[5] In order to choose the optimal number of lags, we used the Schwarz criterion. This goodness-of-fit measure is similar to the adjusted R^2, but it penalizes the loss of degrees of freedom more heavily. By this criterion, there are four lags each of food stamp caseloads, unemployment rates, and per capita employment growth rates. While the degree of persistence implied by a structure with four lags of the dependent variable may seem quite high, both Eberts and Stone (1991) and Blanchard and Katz (1992) find similar or even more pronounced lag structures in their state- and MSA-level analyses of employment, unemployment, and wages.

[6] In our models, we use annual rather than monthly data. While monthly data have their advantages, we use annual data for several reasons. First, many of our policy variables, including the error rate variable, are available only at an annual level of aggregation. As a consequence, we would have to remove many of our variables if we were to use monthly data. Second, monthly variables are often measured with more error than annual data. While this is not so much a problem with administrative caseload data and waivers, it is with state-specific unemployment and employment growth rates. Third, to the extent to which households make decisions to be on or off food stamps slowly over time, annual data are more likely to pick up these longer-run patterns.

Finally, because food stamp caseloads may sluggishly adjust to changing economic conditions, we expect lagged unemployment and employment growth to be important. This expectation arises because of the skill set of typical food stamp recipients insofar as they are likely to be the last ones hired during an economic recovery and thus may not move instantaneously from welfare to work. Unemployed persons may become eligible for food stamps only with a lag during an economic downturn, perhaps, for example, because of excessive initial asset levels that must be drawn down prior to eligibility. Conversely, during economic expansions, newly employed persons may exit the program only when their food stamps must be renewed. To further address this sluggishness of the macroeconomic factors on food stamp caseloads, we also control for changes in income inequality as defined as the ratio of median earnings to the 10th percentile.

Among the welfare policies contained in the vector W_{it}, we consider those affecting AFDC and food stamp rules. The latter includes proxies for the Electronic Benefit Transfer program, ABAWD waivers, and administrative error rates. Because the general mix of state-level AFDC policies tended to vary between the pre– and post–Welfare Reform Act periods, we allow differential pre– and post–Welfare Reform Act "AFDC waivers" to possibly affect food stamp caseloads. In these models, the pre–Welfare Reform Act AFDC waiver is turned off when the post–Welfare Reform Act AFDC waiver is turned on. As done in Council of Economic Advisers (1997, 1999) and Figlio and Ziliak (1999), we define the pre–welfare reform variable as the fraction of the year a waiver is in place and the post–welfare reform variable as the fraction of the year the TANF plan is in place. The dates of implementation and the types of waivers requested have been well documented by the Department of Health and Human Services in consultation with state officials (Gallagher et al. 1998; Crouse 1999).

The Electronic Benefit Transfer program is a new method of dispensing and using food stamps. The program began in some states in 1989, and by the end of the 1999 fiscal year, 35 states had statewide Electronic Benefit Transfer programs in place. Because the Electronic Benefit Transfer program has some appealing features for participants, it may tend to encourage participation. On the other hand, given the low use of checking accounts by low-income households (Hurst, Luoh, and Stafford 1998), the Electronic Benefit Transfer card's ATM-type technology may be a barrier to some households. Paralleling our AFDC waiver variables, we use the date when the Electronic Benefit Transfer program was implemented statewide.

In the aftermath of the Welfare Reform Act, there has been a marked decline in the number of ABAWDs receiving food stamps. From August 1996 to September 1997, there was a drop of one-third in the number of unemployed ABAWDs receiving food stamps, with the sharpest decline in January and March, when the time limits first became binding for many recipients (Genser 2000). However, the effect of this policy has likely been mitigated because, as noted previously, states can receive an exemption from this rule. Our ABAWD variable is thus constructed as the fraction of the ABAWD population subject to work requirements/time limits. Specifically, we first ascertain the percentage of the state's population that is waived from the ABAWD requirement and then multiply this by the portion of the year the waiver is in effect. We then subtract this value from 1 in 1997 through 1999 and from 1/12 in 1996. (States could have the waiver for only one month in 1996.) For all states the value is set to 0 in 1995 and earlier. Thus, states with a full statewide waiver are treated the same before and after the implementation of the ABAWD restrictions. States with a lower value for the

ABAWD variable (i.e., with more of the state covered by the waiver) may have higher food stamp caseloads because of the increased number of eligible households.[7]

In determining eligibility for program benefits, administrative errors in determining status frequently arise. As a consequence, the U.S. Department of Agriculture annually constructs a so-called error rate for each state in order to monitor the delivery of benefits. Specifically, the error rate is calculated as the percentage of total dollars incorrectly given to or taken from food stamp recipients. That is, it is the combination of the overissuance of benefits, the issuance of benefits to ineligible households, and the underissuance of benefits. In an effort to cut back on overissuances (the more common type of error), states have responded by increasing the frequency with which a household has to recertify their eligibility status. This increase may lead to a fall in caseloads. Consistent with our conjecture, four of the 10 states increasing the use of three-month certification periods had the largest declines in food stamp participation among working families from 1994 to 1998 (Rosenbaum 2000).

To complete our model specification, we wish to control for several additional factors in Z_{it} that may determine movements in food stamp caseloads. For example, a substantial proportion of food stamp recipients also receive AFDC. In 1995, 50.4% of food stamp recipients lived in households receiving AFDC (Smolkin and Howard 1997, table A-1). This did not change much after welfare reform—in 1997, 46.1% of recipients lived in households receiving TANF (Cody and Castner 1999, table A-1). Because of the large number of food stamp recipients who also receive AFDC and the close connection between the food stamp participation decision and the AFDC participation decision (Fraker and Moffitt 1988), we incorporate the AFDC program into our food stamp model in two ways. We incorporate it directly by including the log of per capita AFDC caseloads as a covariate and indirectly by including the combined maximum AFDC/Food Stamp benefit for a three-person family. While states did not have much authority over the design of their welfare programs until the 1990s, they have had substantial voice with respect to maximum benefits throughout the program history.

Finally, we hypothesize that eligible households may be more likely to receive food stamps in politically liberal states insofar as less stigma may be attached to food stamp receipt. To control for this possibility (and also for the unobserved generosity or stinginess associated with a state's political climate), we include a vector of political variables, such as 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 index constructed by the Americans for Democratic Action that measures the degree of political "liberalness" in a state's U.S. Senate delegation. For the latter measure, we use the mean of each state's senators' score.

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[7] The Welfare Reform Act also restricted the eligibility of noncitizen immigrants. While there is a great deal of variation across states in terms of the percentage of population that are immigrants, there is little variation over time that is needed for this paper's econometric models. As a consequence, we are not able to control for the restrictions on the immigrants' eligibility. We should note, however, that the real decline in food stamp caseloads is probably substantially less than portrayed with national administrative data because numerous states worked to offset this restriction by providing state-funded food stamps to at least a subset of immigrants. In 1998, 12 states, representing the vast majority of the nation's immigrant population, had such programs, including California, Texas, New York, Florida, and Illinois (General Accounting Office 1998). Moreover, many immigrants would have left the Food Stamp Program even in the absence of welfare reform. The effects of these restrictions are likely portrayed in the year fixed effects, and insofar as there are state differences in immigration patterns that are permanent or trending linearly, these differences are also portrayed in the state fixed effects and trends. The latter seems plausible given Wallace and Blank's (1999) finding that once they control for state fixed effects, there is no significant impact of the percentage of a state's population that are immigrants on AFDC and food stamp caseloads.

Data

For our analysis, we use data from all 50 states and the District of Columbia for federal fiscal years 1980 to 1999.[8] We obtained information on administrative food stamp caseloads, Electronic Benefit Transfer measures, ABAWD waivers, and error rates from the U.S. Department of Agriculture; data on administrative AFDC caseloads from the 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; data on state inequality from the Current Population Survey; and data on state political conditions from the Americans for Democratic Action, the National Governors Association, and the Congressional Quarterly Almanacs. Appendix A contains summary statistics for the key variables used in the analysis.

3. Results

We estimate the model in Equation 1 with and without controls for AFDC caseloads. When the latter is omitted, the macroeconomic, political, and welfare reform variables reflect the total impact (direct and indirect via AFDC) on food stamp caseloads, while in models with AFDC, the covariates reflect the direct impact alone.[9] In the tables, we suppress the coefficients on the year effects, the state fixed effects, and the state trends.

Short-Run Effects

The short-run estimates in Table 1 indicate that a one-percentage-point increase in the unemployment rate generates a 1.3% increase in contemporaneous food stamp caseloads. Unlike unemployment, there is no short-run impact of employment growth on food stamp caseloads. Likewise, the only welfare policies with a short run influence on caseload movements are pre–Welfare Reform Act waivers and ABAWD waivers. The instantaneous impact of pre–Welfare Reform Act waivers is to increase food stamp caseloads by at least 1.6%. As noted in Ziliak et al. (2000), many pre–Welfare Reform Act waivers are associated with declines in AFDC caseloads. One may then conclude that, at least before the 1996 Welfare Reform Act, states with waivers may have made a concerted effort to ensure that when food stamp eligible recipients left AFDC, they stayed on the

[8] Currently, the amount of food stamps a household receives is inversely related to their 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.

[9] One may conjecture that food stamps and AFDC caseloads might be endogenously determined. So we conducted a Hausman test on this issue. In order to broaden the list of potential instruments to include lagged levels of AFDC caseloads, which are powerful predictors of current AFDC caseloads, we estimated the models in first differences. First differences are required because lagged values of potentially endogenous regressors such as AFDC are valid instruments only in first-difference models and not the standard fixed effect model in Equation 1 (Keane and Runkle 1992). Thus, the instruments for AFDC caseloads included the state-specific real need standard and lagged AFDC caseloads. Even though the instruments were of high quality (first-stage F-test = 29), the estimated AFDC coefficient from instrumental variable (IV) was little changed from the ordinary least squares estimate, and so the Hausman test failed to reject the null that AFDC is exogenous. This is perhaps not surprising because AFDC recipients are categorically eligible for food stamps but not vice versa. Thus, the model with AFDC caseloads is more akin to a recursive model in the simultaneous equations literature where AFDC explains food stamps but food stamps do not directly explain AFDC.

Table 1. Estimates of the Impact of Welfare Reform and the Macroeconomy on per Capita Food Stamp Program Caseloads

	1	2
Caseloads ($t - 1$)	114.599	109.134
	(3.934)	(3.997)
Caseloads ($t - 2$)	−37.619	−35.724
	(5.520)	(5.426)
Caseloads ($t - 3$)	−0.444	−0.165
	(4.591)	(4.504)
Caseloads ($t - 4$)	−6.342	−5.765
	(3.003)	(2.948)
Unemployment rate (t)	1.323	1.314
	(0.322)	(0.316)
Unemployment rate ($t - 1$)	0.177	0.050
	(0.376)	(0.370)
Unemployment rate ($t - 2$)	0.457	0.369
	(0.355)	(0.349)
Unemployment rate ($t - 3$)	−0.535	−0.565
	(0.338)	(0.332)
Unemployment rate ($t - 4$)	1.005	0.808
	(0.267)	(0.265)
Growth in employment per capita (t)	1.142	−1.091
	(10.630)	(10.435)
Growth in employment per capita ($t - 1$)	−14.139	−19.086
	(11.737)	(11.551)
Growth in employment per capita ($t - 2$)	11.084	9.125
	(12.507)	(12.274)
Growth in employment per capita ($t - 3$)	−30.667	−32.733
	(7.696)	(7.560)
Growth in employment per capita ($t - 4$)	−3.312	−4.770
	(5.326)	(5.231)
Pre–Welfare Reform Act waiver	1.611	2.204
	(0.773)	(0.766)
Post–Welfare Reform Act waiver	1.269	1.587
	(1.535)	(1.507)
Electronic Benefit Transfer program	0.537	0.640
	(0.975)	(0.957)
ABAWD waiver	−5.331	−3.663
	(2.239)	(2.219)
Error rate	0.000	0.001
	(0.031)	(0.031)
Log max AFDC/food stamp benefit	−0.599	−2.505
	(2.681)	(2.654)
State House and Senate Democratic	0.193	0.042
	(0.624)	(0.613)
State House and Senate Republican	−2.276	−1.921
	(0.745)	(0.734)
Governor Democratic	0.571	0.387
	(0.452)	(0.444)
Log Americans for Democratic Action score	0.377	0.227
	(0.475)	(0.467)

Table 1. Continued

	1	2
Ratio of 50th to 10th income percentile	0.418	0.515
	(0.605)	(0.594)
AFDC caseloads		8.843
		(1.687)

All coefficients are multiplied by 100. Standard errors are in parentheses. All regressions, based on data from fiscal years 1980–1999 for all 50 states and the District of Columbia, are weighted by state-population and control for state-specific fixed effects and trends, year fixed effects, and political factors.

Food Stamp Program. With each 10-percentage-point increase in the fraction of a state's ABAWD population waived from the ABAWD rule, short-run caseload movements are upward of 0.5% higher. As discussed earlier, the existence of poor economic conditions is a necessary but not sufficient condition for ABAWD waivers because eligible states need not apply. As a consequence, estimated effects of ABAWD waivers may reflect both the policy treatment effects and the substate 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. As hypothesized, there is also a strong relationship between AFDC and food stamp caseloads—a 10% short-run increase in per capita AFDC caseloads leads to about a 9% increase in food stamp caseloads.

Intermediate and Long-Run Impacts

The coefficients on the lagged dependent variables in Table 1 demonstrate the high degree of persistence in food stamp caseloads. This suggests that the assumption of no dynamic feedback in the previous paragraph will understate the longer-term impact of macroeconomic activity and welfare policies on food stamp caseloads. To aid in interpretation, we report the long-run effects of changes in the variables in Table 2. In addition, because recent recessions tend to last one to three years, we also report the effects of one-percentage-point changes in the unemployment rate for one, two, and three years. When relevant, the results in Table 2 combine the effects of the current and lagged variables.

In the long run, a one-percentage-point increase in the unemployment rate leads to an 8.2% increase in food stamp caseloads when we do not control for AFDC caseloads and a 6.1% increase when we condition on AFDC. (In the results in column 2, the effect of variables on AFDC caseloads is not incorporated into our estimates of the effect of variables on food stamp caseloads, so the estimates of the effects of these variables are understated.) Using the results from column 1 and incorporating dynamic feedback through caseloads, a one-percentage-point increase leads to about a 2.4% increase in food stamp caseloads after one year, a 3.7% increase after two years, and a 4.0% increase after three years. The typical postwar recession in the United States entails a two- to four-percentage-point increase in the unemployment rate and lasts between one and two years. Thus, we would expect food stamp caseloads to rise between 5% and 15%, depending of the length and depth of the recession.

Some of the food stamp policy variables have a sizable and statistically significant impact on food stamp caseloads in the long run, notably, the ABAWD waiver variable. Given the small number of unemployed ABAWDs among the eligible food stamp population, this result further leads us to believe this variable is also portraying these states' negative economic conditions and perhaps the greater generosity toward poor households in states with ABAWD waivers. Evidence for this conjecture is found in a model of AFDC caseloads that includes the ABAWD waiver as a covariate

Table 2. Estimates of the Impact of Welfare Reform and the Macroeconomy on per Capita Food Stamp Program Caseloads: Intermediate and Long-Run Effects

	1	2
Unemployment rate	8.144	6.075
	[0.000]	[0.000]
Growth in employment per capita	−120.204	−149.311
	[0.227]	[0.098]
Pre–Welfare Reform Act waiver	5.403	6.777
	[0.041]	[0.005]
Post–Welfare Reform Act waiver	4.256	4.881
	[0.407]	[0.291]
Electronic Benefit Transfer program	1.800	1.969
	[0.583]	[0.504]
ABAWD waiver	−17.885	−11.265
	[0.016]	[0.097]
Error rate	0.001	0.001
	[0.990]	[0.985]
Log max AFDC/food stamp benefit	−2.007	−7.702
	[0.823]	[0.342]
State House and Senate Democratic	0.645	0.129
	[0.758]	[0.945]
State House and Senate Republican	−7.637	−5.905
	[0.002]	[0.009]
Governor Democratic	1.916	1.189
	[0.201]	[0.381]
Log Americans for Democratic Action score	1.265	0.698
	[0.429]	[0.629]
Ratio of 50th to 10th income percentile	1.402	1.584
	[0.490]	[0.386]
AFDC caseloads		27.192
		[0.000]
Change in per capita caseloads due to a one-percentage-point change in unemployment after		
One year	2.428	2.250
Two years	3.661	3.251
Three years	3.992	3.362

All coefficients are multiplied by 100. *p*-values for the null hypothesis of no long-run effects are in brackets. All regressions, based on data from fiscal years 1980–1999 for all 50 states and the District of Columbia, are weighted by state population and control for state-specific fixed effects and trends and year fixed effects.

(not tabulated). Because ABAWDs are not eligible for AFDC, these waivers should have no direct effect on AFDC caseloads. The coefficient on this variable is −1.964 with a standard error of 1.243. While this is significant only at the 15% confidence level, it is evidence of the ABAWD waiver's having an influence beyond its direct effect.

Aside from the confounding influence of local economic conditions on the identification of the ABAWD effect, another potential concern is with regard to the fact the post-welfare reform programs and ABAWD waivers were coming on line in many states at the same time and thus generating possible collinearity. However, the collinearity problems in this case are likely minimal. First, there was no necessity for the implementation of state TANF policies and states' decisions regarding the

application for waivers from the ABAWD requirements to occur at the same time. States could have gotten waivers from the ABAWD requirements before the post-Welfare Reform Act waivers were implemented and vice versa. There is also substantial heterogeneity both within and across states in the amount of time changes to the state welfare systems and ABAWD waivers were operational. We also ran models without the ABAWD variable, and the results reported are unchanged. This suggests to us that the concern about multicollinearity between the two variables is not borne out in the data.

In both models, states with waivers from AFDC rules before the Welfare Reform Act had higher food stamp caseloads than states without waivers. In the long run, these states would have caseloads 5.4% higher (in the model without AFDC caseloads) and 6.8% higher (in the model with AFDC caseloads). Interestingly, neither the Electronic Benefit Transfer program nor the maximum AFDC/food stamp benefit has an impact of food stamp caseloads—the former implies that the technology associated with the Electronic Benefit Transfer card is not drawing new families onto the rolls at a faster rate than they might be detracted, while the latter is perhaps not surprising given that the combined benefit fell in real terms nearly monotonically throughout the period. Finally, except when the Republican Party controls both a state's legislature and senate, the political variables have no effect on food stamp caseloads.

With some exceptions (e.g., Ziliak et al. 2000), research on AFDC caseloads have used static rather than dynamic models. For the sake of comparison, in Appendix B we present static food stamp caseload regression models akin to those in Table 1. In other words, we set the lagged caseloads equal to zero ($\rho_1 = \rho_2 = \rho_3 = \rho_4 = 0$) and the lagged unemployment and employment growth rates to zero ($\alpha_1 = \alpha_2 = \alpha_3 = \alpha_4 = 0$ and $l_1 = l_2 = l_3 = l_4 = 0$). While signs and magnitudes of many of the coefficients are similar in the dynamic and static results, there are some unexpected results. In particular, employment growth per capita has a large and statistically significant positive sign, and the combined maximum AFDC and food stamp benefit level has a large and statistically significant negative sign. These surprising results, which are not present in the dynamic models, suggest an omitted variable bias problem in the static models.

Interactions between Welfare Reform and the Macroeconomy

The assumption implicit in the analysis thus far is that welfare reform, economic activity, and changes in AFDC caseloads have independent effects on food stamp caseloads but no interactive effects. We now turn to four models with interactive effects. First, we consider the possibility that states with relatively more robust economies were able to foster the implementation of welfare reform more effectively than states with weaker economies. Second, we analyze whether states with waivers from federal AFDC rules were better poised to implement the full provisions of the Welfare Reform Act in comparison to states without waivers. Third, we consider the possible breakdown of the relationship between AFDC and food stamp caseloads after 1996. Finally, we consider a more complete specification incorporating all these interactions and record the results in Table 3.

For sake of comparison, in column 1 of Table 3, we reproduce the results from column 2 of Table 1. In this and all further specifications, we include AFDC caseloads. For all the interaction terms involving a continuous variable (i.e., the unemployment rate and/or AFDC caseloads) and an indicator variable, we demean the continuous variables prior to interacting. This implies that the average impact of the indicator variables (i.e., pre– and post–Welfare Reform Act waivers) is obtained from the coefficients on the noninteracted waiver variables. In column 2, we record the estimates from interacting contemporaneous unemployment with the pre– and post–Welfare Reform Act waivers. In

Table 3. Estimates of the Impact of Welfare Reform and the Macroeconomy on per Capita Food Stamp Program Caseloads: Various Models

	1	2	3	4	5
Unemployment rate (t)	1.314	1.273	1.315	1.255	1.176
	(0.316)	(0.320)	(0.317)	(0.305)	(0.312)
Unemployment rate ($t - 1$)	0.050	−0.007	0.050	−0.079	−0.084
	(0.370)	(0.367)	(0.370)	(0.357)	(0.357)
Unemployment rate ($t - 2$)	0.369	0.397	0.369	0.293	0.325
	(0.349)	(0.346)	(0.349)	(0.337)	(0.337)
Unemployment rate ($t - 3$)	−0.565	−0.607	−0.564	−0.569	−0.583
	(0.332)	(0.329)	(0.332)	(0.320)	(0.320)
Unemployment rate ($t - 4$)	0.808	0.821	0.806	0.493	0.494
	(0.265)	(0.262)	(0.267)	(0.260)	(0.261)
Pre–Welfare Reform	2.204	2.645	2.201	2.922	3.682
Act waiver	(0.766)	(0.782)	(0.770)	(0.861)	(0.955)
Post–Welfare Reform	1.587	−1.346	1.583	1.521	0.683
Act waiver	(1.507)	(1.716)	(1.511)	(1.547)	(1.730)
AFDC caseloads	8.843	9.752	8.847	20.963	21.221
	(1.687)	(1.694)	(1.691)	(2.419)	(2.463)
Unemployment rate		0.573			0.752
(t) * pre–Welfare Reform		(0.432)			(0.470)
Act waiver					
Unemployment rate (t) *		−1.518			−0.348
post–Welfare Reform Act		(0.586)			(0.599)
waiver					
Presence of pre–Welfare			1.399		
Reform Act waiver * post–			(28.183)		
Welfare Reform Act waiver					
AFDC caseloads * pre–				−2.549	−6.453
Welfare Reform Act waiver				(4.125)	(4.640)
AFDC caseloads * post–				−17.640	−17.441
Welfare Reform Act waiver				(2.667)	(2.791)

All coefficients are multiplied by 100. Standard errors are in parentheses. All regressions, based on data from fiscal years 1980–1999 for all 50 states and the District of Columbia, are weighted by state population and control for state-specific fixed effects and trends, year fixed effects, political factors, and the variables in Appendix A.

the pre–Welfare Reform Act era, states with waivers saw no larger fall in caseloads than states without waivers. After the implementation of welfare reform, however, a decrease in the unemployment rate actually led to instantaneous increases in food stamp caseloads. The likely explanation is that states with higher unemployment rates were more sluggish in their economic recovery during the 1990s, and thus caseload declines took a longer period to take hold in these states. Finally, the conjecture that waiver states were better able to implement the Welfare Reform Act and thus experienced more rapid caseload declines is not supported by the data insofar as there are no statistically significant differences between states with waivers and states without waivers (column 3 of Table 3).

In column 4, we interact AFDC caseloads with pre– and post–Welfare Reform Act policy variables. The inclusion of this interaction more than doubles the primary effect of AFDC caseloads on food stamp caseloads (from 0.09 to 0.21), but it has little impact on the coefficients of the remaining variables. In the pre–Welfare reform era, states with waivers saw no larger impact of AFDC caseloads than states without waivers. In other words, the expected close connection between food stamp and AFDC caseloads is observed in all states regardless of the presence of

welfare waivers. This close connection appears to have ended after welfare reform, when states with early implementation of TANF rules saw substantially less declines in food stamp caseloads for a given decline in AFDC caseloads than states implementing TANF later. This breakdown of the relationship between AFDC/TANF and food stamp caseloads is also observed when the post–Welfare Reform Act waiver variable is replaced with either a post-1996 indicator variable or a full interaction between AFDC caseloads with year dummies (not tabulated). It is beyond the scope of the current project to fully investigate the source of this change, but key candidates include the fact that AFDC lost its entitlement status after welfare reform and the possibility that AFDC recipients confronted with a booming economy and time-limited TANF benefits dropped off of TANF but not the food stamp rolls, which are not time limited. Finally, in column 5, we include the unemployment interactions along with the interactions in column 4. In the presence of the AFDC caseload interactions, the interaction between the unemployment rate and the post–Welfare Reform Act variables becomes insignificant, while the positive retention effect of pre–Welfare Reform Act waivers increases slightly.

4. Conclusion

After years of caseload declines, policymakers have begun discussing the reasons for the recent rise of welfare caseloads. This paper provides an explanation for why this caseload increase is occurring. Our results demonstrate the macroeconomy's substantial impact on food stamp caseloads both before and after the implementation of welfare reform. The substantial influence of the macroeconomy and the dynamic nature of the ways in which macroeconomic features affect the food stamp caseload suggest that a recession may trigger sizable increases in food stamp caseloads—upward of at least a 15% increase after two years. More broadly, our results demonstrate the continuing importance of food stamps as an automatic stabilizer for low-income families, even in the era of welfare reform. The results also suggest that state budget forecasts predicting permanent sharp reductions in food stamp caseloads may end up dramatically understating necessary food stamp expenditures in the future.

But much has changed in the policy landscape since the last recession. Our results indicate that several of the policies implemented during the 1990s to reform the Food Stamp Program have influenced the recent changes in the food stamp caseload. For instance, while our finding that states' waivers from the ABAWD work requirement led to substantial changes in the food stamp caseload may be due to unmeasured substate variation in macroeconomic attributes, it is also likely that this policy change had effects on the food stamp caseload independent of the contribution of local economic factors. Future research should examine how much of this effect is due to the waivers themselves and how much reflects the negative economic conditions at a more local level. While such research would have import for the Food Stamp Program, it would also help inform other policy questions examining how, in a post-welfare reform era of block grants, funding should be increased in response to negative economic conditions at a local level. Another change worth exploring further is the possible breakdown of the traditionally close relationship between AFDC and food stamps after welfare reform. Our result, which is robust to alternative specifications, has implications for policymakers who have traditionally looked to changes in AFDC caseloads as a prime mover for food stamp caseloads. After welfare reform, policymakers may wish to consider how food stamps and TANF move independent of one another and the attendant implications of such independence for both programs.

Appendix A
Summary Statistics

Variable	Mean	Standard Deviation
Log of food stamp caseloads per capita	−3.433	0.318
Unemployment rate	6.504	2.045
Growth in employment per capita	0.005	0.031
Pre–Welfare Reform Act waiver	0.084	0.260
Post–Welfare Reform Act waiver	0.139	0.337
Electronic Benefit Transfer program	0.054	0.220
ABAWD waiver	0.125	0.300
Log max AFDC/food stamp benefit	6.130	0.209
Error rate	10.603	4.545
Ratio of 50th to 10th income percentile	3.331	0.396
Log of AFDC/TANF caseloads per capita	−4.225	0.401
State House and Senate Democratic	0.529	0.499
State House and Senate Republican	0.250	0.433
Governor Democratic	0.538	0.498
Log Americans for Democratic Action score	3.873	0.675

Appendix B
Static Estimates of the Impact of Welfare Reform and the Macroeconomy on per Capita Food Stamp Program Caseloads

	1	2
Unemployment rate	3.656	2.896
	(0.447)	(0.382)
Growth in employment per capita	88.120	47.593
	(20.240)	(17.386)
Pre–Welfare Reform Act waiver	−0.608	2.545
	(1.653)	(1.418)
Post–Welfare Reform Act waiver	−0.351	2.049
	(3.293)	(2.803)
Electronic Benefit Transfer program	−3.275	−0.610
	(2.073)	(1.770)
ABAWD waiver	−23.332	−9.675
	(4.757)	(4.131)
Log max AFDC/food stamp benefit	−10.679	−16.432
	(5.727)	(4.882)
Error rate	0.277	0.199
	(0.066)	(0.056)
Ratio of 50th to 10th income percentile	3.401	2.657
	(1.290)	(1.098)
AFDC caseloads		42.879
		(2.638)

All coefficients are multiplied by 100. Standard errors are in parentheses. All regressions, based on data from fiscal years 1980–1999 for all 50 states and the District of Columbia, are weighted by state population and control for state-specific fixed effects and trends and year fixed effects.

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