

**The Food Stamp Program in an Era of Welfare Reform:  
Electronic Benefits and Changing Sources of Cash Income\***

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## **I. Introduction**

Research in the 1990s has demonstrated several practical advantages to Electronic Benefit Transfer (EBT) technology, which uses plastic debit cards in place of traditional food stamp coupons and welfare checks. Thirty-one states and the District of Columbia now have statewide EBT systems for the Food Stamp Program. In the first evaluation of a statewide EBT program, in Maryland, this technology was favored by most program administrators and it was popular with most program participants, in part because it reduces the stigma of making purchases with food stamp benefits [Abt Associates 1994]. It was shown to reduce errors in benefit payment, and it holds promise for reducing other types of fraud and misuse of benefits. For the Food Stamp Program in particular, the new technology lowered operating costs below those required to print, distribute, and redeem traditional food stamp coupons.

Beyond these concrete benefits, EBT technology offers a unique window on the food spending patterns of low-income program participants. Other papers in this session focus on how this technology may be used in conjunction with scanner data on specific purchases and with geocoded data describing home and store locations. This paper focuses on linked EBT data and survey data.

A recent report from the National Research Council (NRC), entitled “Evaluating Food Assistance Programs in an Era of Welfare Reform,” advises research programs to exploit linked administrative and survey data: “National survey data and administrative data complement each other well, often providing the information that is lacking in the other” [National Research Council 1999]. This observation holds especially true for EBT data, which provide a level of detail about interesting household behavior beyond even that provided by program administrative records discussed by the NRC. This paper, exploratory in nature and limited to data from just the Maryland evaluation, investigates the distinct roles played by food stamp and cash resources in the household budget at different times of the month.

## **II. Food Stamps and Cash Income in the Household Budget**

The traditional static analysis of food stamps emphasizes the distinction between those households who spend some of their own cash income on groceries (“inframarginal” households) and those who rely on food stamps alone to meet their grocery bill (“extramarginal” households). In principle, inframarginal households should respond to marginal changes in their food stamp benefits in exactly the same manner that they respond to marginal changes in cash income. After all, even without breaking any rules or selling food stamps illegally, they can always reduce or increase their cash spending on food to compensate for any change in their food stamp benefits, thereby achieving the same bundle of purchases with food stamps that they would have chosen with unrestricted cash income.

While this framework is intuitive, and it is often accepted outright in the economic literature, it fails in its simplest form to perform well in the real world. Consider the following phenomena, which appear mysterious in the traditional framework:

- First, food stamp benefits have been found in both experimental and nonexperimental studies to have a distinctly greater effect on food spending, in comparison with cash income [Fraker]. In past research, most food stamp recipients have been observed to spend some of their own cash income on groceries, so in the traditional analysis they should spend food stamps and cash income identically.<sup>1</sup>
- Second, if most recipients spend some cash on food, the traditional analysis provides no motivation for them ever to traffic their benefits, exchanging them illegally for food. The discount that sellers suffer for exchanging their food stamps would seem to make trafficking irrational if the seller could achieve the same bundle of goods legally. Yet trafficking is often reported in the news, and a USDA report estimated the value of trafficked benefits at roughly four cents of every dollar of food stamps issued [Macaluso 1995].

Understanding when and where benefits are redeemed could help to address these paradoxes. Consider an illustrative example of a household whose behavior would seem inexplicable in the traditional framework but perfectly intelligible (if not prudent) once one pays attention to when and where food stamp benefits are redeemed. Early in the food stamp month, when food stamp benefits have just arrived and cash income is comparatively scarce, the household finds itself constrained by the rule that food stamp

benefits must be spent on food. The household makes a very large grocery shopping trip to a supermarket, but spends less on nonfood goods during this period than it would if all its resources were unrestricted. The household is tempted to exchange food stamp benefits illegally for cash in a small local grocery store that offers this service. Later in the same month, when food stamp benefits have been exhausted, the same household receives some cash income and spends it on groceries. Under this scenario, several phenomena would begin to make sense, including the distinct impact of food stamps on food spending and the temptation to traffic in food stamps, even for a household that sometimes spends cash on groceries.

### **III. Data and Methods**

The Maryland survey data provide information about household resources, characteristics, and even people's assessment of their food security status and their knowledge of food stamp trafficking. Meanwhile, the EBT data offer detailed information on the time of month and the type of store where transactions take place, including whether the stores are supermarkets or smaller stores. Our analysis of these data includes the following components. First, we divide the sample of food stamp recipients into six categories according to their main source of cash income, and we report the relative share of household resources in each category that come from food stamp benefits. Second, we report for each category the total spending on food at home (not in restaurants) and cash spending on food at home, and relate these food spending patterns back to the share of household resources from food stamp benefits. Third, we

explore more specifically the timing of food stamp transactions and the type of store used by each category at different times of month. Fourth, for those households that receive both food stamps and cash welfare benefits through their EBT card, we discuss the even more complete information that EBT provides on the use over time of nearly all resources available to such households. Finally, we consider, for each category, respondents' own assessment of their food security situation and their reported knowledge about food stamp trafficking.

EBT demonstration programs began in a Baltimore neighborhood in 1988, and the bulk of Maryland statewide implementation took place between January 1992 and April 1993. About half of EBT clients receive food stamp benefits only, and about half receive both food stamp benefits and some form of "cash" welfare or public assistance through their EBT cards. A small proportion receive cash benefits alone through their EBT card. The evaluation of the statewide program employed both survey data and electronic EBT transactions data [Abt Associates 1994]. A "pre-implementation" household survey was conducted from March to September 1992, drawing a random sample from the Maryland caseload, excluding two counties and one district in Baltimore where EBT was already implemented. One year later, a "post-implementation" household survey was conducted from June to September 1993. The electronic transactions data were drawn from the beginning of September 1993 through the first benefit disbursement in October 1993. Large transactions files are available for all EBT clients in that month, though for our

purposes, attention is restricted to a sub-sample that corresponds to respondents in the post-implementation survey.

The post-implementation survey contains a random sample of 1,054 responding food stamp households. The survey's response rate is 60 percent of eligible cases released. Of these, 1,034 have consistent responses that may be used to categorize them into five groups according to main source of cash income in the most recent calendar month. The number of these households that could be matched to the September 1993 transactions data is 902, because some households changed their program status between their interview date and September. Sample size may also be lower than 1,034 for some sensitive questions, such as those relating to food stamp trafficking. The survey used a self-weighting two-stage cluster sampling strategy. Analysis weights are not required in principle under the sampling design, but are provided in the public use data file to compensate for nonresponse. Because the nonresponse considerations differ for the various questions in the following analysis, we forego the nonresponse weights and instead report unweighted results along with the number of households responding for each result. Nonresponse is a concern, because the households that respond to survey questions, especially about sensitive issues such as trafficking, plausibly could be systematically different from a true random sample.

We classify cash income sources into four categories: labor market income (Earnings); Aid to Families with Dependent Children (AFDC); Social Security and Supplemental

Security Income (SS/SSI); and other forms of public assistance, child support, and miscellaneous income (Miscellaneous). Because administrative files are likely to be more reliable than self reports, AFDC and other public assistance values from the administrative files are used for households that appear in both the survey and matched transaction files.<sup>2</sup> Even for these households, however, survey responses for other income categories such as Earnings are retained as reported. Similarly, the administrative value for food stamp benefit amounts is used for households that appear in both the survey and matched transaction files, while the self-reported amount is used for households that appear in the survey only. Households are classified according to which of the four cash income types has the greatest amount, and they are classified into a fifth category (None) if neither the survey nor the matched transaction file reports any cash income. AFDC households are the largest proportion of the sample (46 percent), followed by SS/SSI (27 percent), Earnings (14 percent), Miscellaneous (9 percent), and None (4 percent).

The subsequent analysis centers on comparisons across these five categories. Statistical tests in the main tables of results employ f-statistics for continuous variables and chi-square statistics for categorical variables. The null hypothesis for these tests is that there is no difference across the five categories. Occasionally, the text also comments on pair-wise comparisons between two categories. For t-tests of pair-wise comparisons, conservative significance levels are chosen according to Tukey's method (implemented in PROC GLM in SAS), which avoids the proliferation of type I error in multiple tests.

## **IV. Results**

### *IV.1. Food Stamp and Cash Resources*

The amount of household income varies with the main source (Table 1). The Earnings and SS/SSI categories have relatively high mean cash income per adult male equivalent (AME),<sup>3</sup> although income is still low enough to qualify for food stamp benefits. The AFDC category has much lower mean cash income per AME. The None category by definition has no known cash income, although many of these households are likely to have some resources we do not know about. The Miscellaneous category includes diverse income sources, so generalizations about it are difficult, but this category could not be broken down into more homogenous sub-categories due to sample size constraints. Results for the Miscellaneous category are carried along merely for completeness.<sup>4</sup>

Mean amounts of food stamp benefits per AME are inversely associated with mean cash income. Food stamp eligibility and benefit levels depend on household income and asset levels. If a household is not ruled ineligible on the basis of assets, its food stamp benefit level depends on “net” income, after certain allowable deductions. If a household of a particular size has no positive net income, the food stamp benefit level is 103 percent of the “Thrifty Food Plan” for that household size (under regulations in place in 1993). For each dollar of positive net income, food stamp benefits are reduced by 30 cents. Thus, the categories with the lowest mean cash income – AFDC, Miscellaneous, and None -- have the highest mean food stamp benefit levels. For these three categories, food stamp

benefits constitute a high proportion of total household resources (40 percent, 39 percent and 100 percent, respectively). This pattern raises the possibility that households in these categories are more likely to be constrained and thus exhibit distinct food spending behavior. We pursue this possibility in the subsequent analysis.

One should note, however, that the distinct budget constraints discussed in this paper are not the only characteristics distinguishing the five categories. Table 1 (bottom) indicates that food stamp recipients in the AFDC, Miscellaneous, and None categories are also more likely to be urban and less likely to be White than recipients in the Earnings and SS/SSI categories. Households in the Earnings category are more likely to report full- or part-time employment than any other category, although a minority of households who reported earnings for the month did not report such employment. These other household characteristics could offer competing explanations for observed spending patterns, beyond the main focus of this paper. Multivariate analysis would offer a natural direction for future research with this type of data.

#### *IV.2. Spending on Food at Home, by Category*

Mean self-reported food spending, like the evidence on household resources, suggests a distinct pattern for households in the AFDC, Miscellaneous, and None categories (Table 2). For the AFDC and Miscellaneous categories, monthly at-home food spending per AME is significantly higher than corresponding food spending levels for Earnings and SS/SSI categories. Even households in the None category have higher self-reported

mean at-home food spending than households in the Earnings and SS/SSI categories, although these latter pair-wise comparisons are not statistically significant. The higher food spending levels for the AFDC, Miscellaneous, and None categories are consistent with their higher food stamp benefit levels.

If food stamp benefits are subtracted from self-reported monthly at-home food spending, the AFDC and None categories are found to have the lowest implied mean levels of cash spending on food (Table 2, middle two rows). If each household is identified as inframarginal or not, based on whether monthly food spending exceeds food stamp benefits or not, the same pattern surfaces. Households in the AFDC and None categories appear less likely to spend cash income on food, and they appear less likely to be inframarginal or unconstrained by the form of their benefits than households in the Earnings and SS/SSI categories.

It is interesting that the proportion of households that are classified as inframarginal is generally lower than has sometimes been found in previous research [Ohls et al; Levedahl 1995]. One possible explanation is that the introduction of EBT has changed the way households coordinate food stamp and cash resources in their budget: the original Maryland evaluation suggested that EBT technology may reduce the marginal propensity for households to spend cash income on food [Abt Associates 1994], which would be consistent with increased extramarginal behavior under EBT. Another possible

explanation is that food stamp benefit or spending amounts were misreported in previous studies, which used survey data only, causing more households to appear inframarginal.

The mean level of implied cash food spending for the AFDC category is not merely zero, as one might expect for extramarginal households, but actually negative. This result would be consistent with illegal resale of food stamps or store purchases of nonfood goods that are not authorized under the Food Stamp Program. Another plausible explanation is that many households underestimate their total monthly at-home food spending in response to a short battery of survey questions. In either case, the evidence suggests that households in the AFDC and None categories are not exhibiting inframarginal behavior in the sense of contributing substantial cash income resources to their food budget.

#### *IV.3. Timing and Location of Food Stamp Transactions, by Category*

EBT transactions data offer unique information about patterns in benefit redemption at different times of the month and in the type of store where transactions take place (Table 3). The greatest portion of food stamp benefits for all household types gets spent in supermarkets, but the AFDC, Miscellaneous, and None categories have about twice the value of food stamp benefit transactions in non-supermarkets as the Earnings and SS/SSI categories have. These simple transaction amounts in part reflect the higher monthly food stamp allotment for the AFDC, Miscellaneous, and None categories, but even as a

proportion of total food stamp benefits, households in these categories spend greater amounts in non-supermarkets.

The AFDC and None categories also spend their food stamp benefits more quickly (the Miscellaneous category differs in this regard). For the AFDC and None categories, over 50 percent of benefits are spent in the first three days after benefits are received. This pattern is all the more striking, because the results in Table 2 suggested that these same two categories have the lowest levels of cash spending on food, so the quickly-spent food stamp resources represent a large proportion of the food budget.

Furthermore, the patterns in timing and type of store for food stamp transactions interact. Households in the Earnings and SS/SSI categories spend particularly low proportions of their food stamp benefits in non-supermarkets early in the month. These households spend higher amounts in such stores in smaller purchases later in the month, as one might expect if the non-supermarkets are used mainly for convenience. By contrast, households in the AFDC, Miscellaneous, and None categories spend a higher proportion of their food stamp benefits in non-supermarkets early in the month.

There are many possible explanations for this spending pattern early in the food stamp month, but one possibility that may be explored on a speculative basis is that food stamp benefits are redeemed improperly during this period. Previous research on food stamp resale has been hampered by the difficulty of observing an illegal activity, but several

tentative suggestions from previous work are relevant here. First, the Maryland EBT evaluation suggested based on survey responses that EBT technology may reduce trafficking by “dealers” on the street, because benefits become less fungible and less easily traded from person to person [Abt Associates 1994]. However, food stamp trafficking with the participation of an authorized retailer is still feasible, albeit more at risk of investigation, because store owners may process EBT cards as if they were conducting food sales, giving clients cash or other goods instead of authorized food items. Second, an earlier study of food stamp trafficking by stores suggested that non-supermarkets are substantially more at risk of this activity than supermarkets [Macaluso 1995]. Third, the same study noted that trafficking behavior might make sense even for households that spend cash on food at some times of month, because they may have food stamps but no cash at other times of month. In light of these earlier suggestions, it is interesting that the AFDC, Miscellaneous, and None categories, which appear most likely to appear extramarginal on a monthly basis, also are more likely to redeem food stamp benefits in non-supermarkets early in the food stamp month.<sup>5</sup>

#### *IV.4. Households that Receive Food Stamp and Cash Welfare Benefits*

For the nearly 50 percent of households that are in the AFDC category, EBT transactions data provide insight into both food stamp and cash transactions. Cash benefit transactions may take place in food stores, although one cannot confirm that these amounts are spent on food. Cash benefit transactions may also take place at automatic-teller machines (ATMs).

The benefit distribution policy in Maryland in September 1993 was a bit peculiar: cash benefits were typically released on days 1-3 of the calendar month, and food stamp benefits were typically released on days 5-7 of the calendar month. Thus, if the “food stamp month” is measured as the number of days since food stamp benefits were received, joint AFDC/food stamp recipients typically received cash welfare benefits on day 27 of the food stamp month.

Figure 1 shows mean daily transaction amounts for food stamp transactions, cash benefit transactions in food stores, and cash benefit transactions at ATMs. The pattern is quite revealing. Food stamp benefits are spent rapidly in the first days of the food stamp month. Then, there follows a long period with few food stamp or cash transactions. Then, after day 27, cash benefits are withdrawn so quickly that only a small proportion of cash benefits remain on the EBT card by the start of the next food stamp month just a few days later. By far the largest part of cash EBT transactions in food stores takes place on day 27. One cannot be certain that most of these transactions in food stores are spent on food, but one may conjecture. By day 27, food stamp transactions have been low for three weeks straight, and earlier results show that these same households have few cash resources other than AFDC benefits to spend in the interim (see Table 1). One suspects that many of these households experience hardship during this period before day 27.

These patterns suggest that households in the AFDC category may be similar in some respects to the household illustrative example from this paper's introduction: they show symptoms of being constrained by their food stamp benefits early in the food stamp month, shortly after food stamp benefits arrive -- certainly, it seems unlikely that they spend any cash income on groceries during this period. But they appear likely to spend cash income on food later the same month. Looking at Figure 1, it would seem improbable that food stamp benefits (which arrive on day 1) are spent at the margin exactly the same as cash income (which arrives largely on day 27). Yet in the traditional framework, on the basis of monthly cash spending on food, many of these households would be classified as inframarginal.

#### *IV.5. Food Insecurity and Food Stamp Trafficking*

The results in Table 3 and Figure 1 about the timing and type of store for food stamp transactions raise dual concerns: that some households may sell food stamps illegally in the first days of the food stamp month, when they have largest stocks of food stamp benefits but may be short of cash; and that some households run short of food later in the month when their food stamp benefits are exhausted. Survey respondents were asked about both issues, although the responses are less conclusive than the patterns discussed previously (Table 4).

The household survey includes the USDA "food sufficiency" question that has appeared on a number of national surveys [Fraker]. This question asks respondents whether their

household's diet contained, in the last month: enough of the kinds of food desired; enough, but not the kinds of food desired; sometimes not enough to eat; or often not enough to eat. The responses do not follow the same pattern across categories that has appeared in most of the preceding results. The SS/SSI category, in spite of its comparatively high mean income levels, has the highest proportion of respondents who report sometimes or often not enough to eat (17.1 percent).<sup>6</sup> Responses for the Earnings, AFDC, and None categories are quite similar, in spite of the very different budget constraints for these categories. Likewise, SS/SSI recipients are more likely to report that they received food from a soup kitchen or food bank (9.8 percent), while the Earnings, AFDC, and None categories have lower frequencies of receiving such assistance.

With regard to food stamp trafficking, respondents were asked if they know of any stores where one could sell food stamp benefits for cash. Overall, 9 percent of respondents say they know of such stores, but differences across categories are not statistically significant. Furthermore, the nonresponse rates for questions about trafficking are higher than for other questions. Respondents were also asked how many of the three food stamp recipients they know best had sold food stamp benefits in the past year. Households in the SS/SSI category are most likely not to know the answer or not to respond.

Comparatively high proportions of households in the AFDC and None categories (23 and 20 percent respectively) offer a positive number of such recipients who sold food stamps. However, the proportion of households in the Earnings category who give this response (18 percent) is not appreciably lower.

## **V. Conclusions**

In summary, a consistent pattern may be traced from the household budget constraint right through to patterns in food stamp transactions over the course of the food stamp month. When Maryland food stamp households whose main source of cash income is AFDC or None are compared to households whose main source of cash income is Earnings or SS/SSI, the former group is distinctive for the following characteristics: lower mean cash income, higher mean food stamp benefits, higher self-reported monthly food spending, lower implied food spending out of cash income, lower frequency of appearing inframarginal, higher share of food stamp benefits spent in non-supermarkets, and higher share of food stamp benefits spent in the first three days of the food stamp month.

This pattern raises some considerations for the ongoing evaluation of recent welfare reforms. The reforms hope to increase the amount of total resources available to low-income households as they move out of the welfare system. The reforms also explicitly intend to change the composition of cash resources, in particular replacing cash welfare benefits with earnings. Though one cannot extrapolate with confidence from the Maryland data, the role of food stamps in the household budget appears in this study to depend greatly on the composition of cash resources. In particular, people who leave cash welfare and acquire a new source of labor market earnings might be expected to behave more like people in the Earnings category: quite unconstrained by the requirement

that they spend their relatively small allotments of food stamp benefits on food. By contrast, people who leave cash welfare and fail to acquire a new income source might be expected to behave more like the people in the None category: with a moderate food spending level but destitute of other goods.

Because these observations are necessarily tentative, continued access to linked EBT and survey data could provide a powerful tool for evaluating the food spending patterns of low-income households during the welfare reform period. As part of its effort to prevent food stamp trafficking, the Food and Nutrition Service already has developed and uses a protocol for the routine acquisition of EBT data from the states, but to our knowledge the only research use of this data has been John Kirlin's paper in this session. Confidentiality concerns require substantial consideration before such use can be made, but the Maryland experience suggests such concerns should not be insurmountable. Development of further linked EBT and survey data sources would appear to have a low cost relative to the value of the information attained. It would respond to the recommendations of the National Research Council and, we would anticipate, generate considerable interest in the research community as well.

## Endnotes

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<sup>1</sup> For example, in a large cashout experiment in San Diego, only five percent of coupon recipients would be classified as extramarginal, yet coupon recipients spent significantly more on food than comparable (randomly-assigned) cash benefit recipients (Ohls et al.). In other research, econometric methods were used to attempt to distinguish the underlying “unconstrained” marginal propensities to consume food out of food stamp benefits and cash income, respectively. Again, these “unconstrained” marginal effects differed for food stamps and cash (Senauer and Young).

<sup>2</sup> The administrative records for total monthly food stamp and AFDC benefits are included in the analysis file from Abt Associates, along with the records on actual EBT transactions.

<sup>3</sup> The Adult Male Equivalent (AME) scale assigns a weight to each person based on his or her age and sex, to account for the fact that some types of people have lower caloric needs than others. Each person’s weight reflects caloric needs as a proportion of the caloric needs of an adult male. The AME scale normally also accounts for pregnancy and lactating status, although the data source does not permit that adjustment here.

<sup>4</sup> Households in each category receive relatively small mean cash income amounts from sources other than the main source (see the off-diagonal elements in the top section of Table 1).

<sup>5</sup> Mark Nord has pointed out to us that this finding suggests a direction for future research. By comparing patterns in how cash and food stamp EBT benefits are spent, by time of month and type of store, one could shed light on whether these patterns are potentially symptomatic of trafficking behavior or more likely explained by some other advantage consumers in poor neighborhoods gain from shopping in non-supermarkets early in the month.

<sup>6</sup> The overall chi-square statistic for the USDA “food sufficiency” question is significant at the .05 level. We have not yet computed an appropriate significance level for pair-wise comparisons across categories, but it is likely that in pair-wise comparisons the responses for the Earnings, AFDC, and None categories are not significantly different.

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