United States Department of Agriculture

Food Assistance and Nutrition Research Report Number 14

April 2001

Electronic Report from the Economic Research Service

www.ers.usda.gov

Understanding the Food Stamp Benefit Formula

A Tool for Measuring the Component Effects

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Abstract

This report develops an accounting tool for measuring how the average benefit amount in the U.S. Food Stamp Program is affected by each major component of the rules that determine the benefit level. This tool is used to compare the benefits received by different subpopulations, distinguished by poverty level, demographic makeup, household size, and region of the country. This simple decomposition complements more complex tools, such as microsimulation methods, which help policy analysts understand and evaluate the effects of detailed Food Stamp Program regulations.

Keywords

Food Stamp Program, benefit formula, income, household size, poverty status, deductions

Acknowledgments

The author thanks Mark Nord, Steve Carlson, Craig Gundersen, and Bob Dalrymple, who commented on an earlier version of this report, and Lou King, for editorial assistance.

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Summary

This report develops an accounting tool for measuring how the average benefit amount in the U.S. Food Stamp Program is affected by each major component of the food stamp benefit formula. This formula is the set of rules that the Federal Government uses to determine the amount of program benefits available to each participating household, based on income and other characteristics. Using this formula, $16 billion in food stamp benefits were distributed in 1999, providing food assistance to more than 18 million low-income Americans.

The Federal Government chooses a benefit level such that benefits plus a proportion of cash resources suffice to purchase a certain bundle of foods, defined in the Government's Thrifty Food Plan. In general, each eligible household receives the maximum benefit based on its household size, minus 30 percent of net income. Net income equals the household's total cash income from earnings, welfare, and other sources, minus certain allowable deductions. If the allowable deductions exceed total cash income, net income is simply zero. There is also a minimum benefit of $10 for households with one or two members. The effects of the maximum benefit, the minimum benefit, cash income, and deductions interact in a complex way, so it is useful to have a tool for quantifying these effects.

Food Stamp Program Quality Control data from USDA's Food and Nutrition Service are used in this report to study the national food stamp population in 1998. Using these data, the average monthly food stamp benefit per person ($69.25) may be expressed as the sum of the average maximum benefit per person ($112.70) plus four main component effects, which may be positive or negative: an income effect (-$89.27), a deductions effect ($50.35), a maximum benefit effect ($-6.78), and a minimum benefit effect ($2.25).

Using this accounting tool, this report compares and analyzes the benefits received by food stamp participants with different poverty levels. Average per person benefits do not decrease as steeply with income as one might expect from a simple reading of the official benefit formula, which has a benefit reduction rate of 30 percent. Near-poor households, with cash income between 100 percent and 130 percent of the poverty guideline, receive more deductions than do very poor households, with cash income below 50 percent of the poverty guideline.

Likewise, near-poor households have their average benefits raised by $17 due to the minimum benefit rule, while very poor households receive no help from this rule. These effects partially offset the income effect, which produces lower benefits for near-poor households in comparison to very poor households.

The report makes similar comparisons for subpopulations distinguished by demographic makeup, household size, and region of the country. The simple decomposition developed here complements more complex tools, such as microsimulation methods, which help policy analysts understand and evaluate the effects of detailed Food Stamp Program regulations.

Understanding the Food Stamp Benefit Formula

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Introduction

The food stamp benefit formula is the set of rules that the Federal Government uses to determine the amount of program benefits available to each household participating in the Food Stamp Program (FSP), based on income and other characteristics. Choosing this formula is a major policy decision: $16 billion in food stamp benefits were distributed according to this formula in 1999, providing food assistance to more than 18 million low-income Americans (USDA, Food and Nutrition Service, 2000). The U.S. Congress signals the policy importance of the benefit formula by deciding every parameter itself, rather than delegating any aspect of the formula to the State and Federal agencies that administer the FSP.[1]

The benefit formula is complex in its details, but the main thrust is simple: the Federal Government chooses a benefit level such that benefits plus a proportion of cash resources suffice to purchase a certain bundle of foods, defined in the Government's Thrifty Food Plan (USDA, Center for Nutrition Policy and Promotion, 2000). In addition to food stamp benefits, the Government expects participant households to spend 30 percent of their "net" cash income on food, after making allowances for certain expenses (see USDA, Food and Nutrition Service, 2000 and the discussion below for further detail on the benefit regulations).

The complexity arises in translating this general principle into a concrete formula for implementation. The benefit formula is stated precisely in the next section, but some of the difficulties are mentioned here. There are maximum benefit levels for each household size, and minimum benefits for some household sizes. Benefits are based on cash income minus several types of deductions. The deductions include certain medical expenses, child support payments, child care expenses, shelter expenses, work expenses, and a standard deduction. The shelter deduction is based in part on the cash income remaining after the other deductions are taken, so the deductions must be computed in a particular order. These details of the benefit rules have complicated the analysis of food stamp policy by increasing the level of expertise required to understand precisely why different types of households get particular benefit amounts.

This report asks several questions about the benefit formula's main components:

• How much is the average benefit affected by the reduction that accompanies increased cash income?

• How much is the average benefit raised by each of the deductions permitted in calculating net cash income?

• To what extent is the average benefit limited by the maximum benefit amount?

• To what extent is the average benefit increased by the minimum benefit amount?

The report also examines how each component of the benefit formula affects food stamp units[2] with different characteristics along several dimensions:

[1]By contrast, the main Federal cash welfare program (Temporary Assistance for Needy Families) is structured as a block grant to the States, which are given much leeway in determining cash welfare policies.

[2]The food stamp unit is the official household definition for the Food Stamp Program. Technically, a food stamp unit is one or more individuals who live in a residential unit and purchase and prepare food together. This report uses food stamp unit and household synonymously.

Table 1—Monthly food stamp benefits for two-person households in the continental United States

Symbol	Component name	Deduction
		Percent
M	Maximum benefit	224.00
E1	Income effect	-157.12
E2	Deductions effect	86.80
E3	Maximum benefit effect	-9.86
E4	Minimum benefit effect	2.04
	Food stamp benefits	**145.87**

Note: Column entries are rounded to two significant digits after the decimal

Source: Author's calculations from 1998 Quality Control Data.

- Poverty status;
- Demographic composition;
- Household size;
- Region of residence.

To answer these research questions, the report develops a new tool for measuring each component of the benefit formula in the same metric—the effect in dollars on the mean food stamp benefit amount. For example, two-person food stamp units in the continental United States had a maximum benefit amount of $224 in 1998 (table 1). However, most of these food stamp units had some cash income, which usually reduced their benefit amount.

The extent of this reduction depended on the extent to which the units were eligible for deductions from gross income. In all, the mean food stamp benefit for two-person households ($145.87) is the sum of the maximum benefit amount plus four main effects (labeled E1 through E4 in table 1). These effects, which may be positive or negative, are defined formally and studied in the remainder of this report. This analysis shows at a glance how each effect contributes to the average benefit level.

This report summarizes complicated quantitative information about income, program rules, and benefit amounts in a consistent and intuitive format. However, this approach is limited for some purposes. For example, microsimulation methods are superior to this report's approach for the purpose of assessing policy-relevant counterfactual scenarios (see Jacobson et al., 2000).

Likewise, the annual Characteristics reports from the Food and Nutrition Service contain many useful tabulations of participant characteristics beyond the impact of the benefit formula (Castner and Rosso, 2000). The analytic tool presented here is most useful for transparently describing how much each feature of the benefit formula contributes to the average benefit amount and for comparing these contributions across different types of food stamp participants.

In the authorizing legislation for the Food Stamp Program, Congress instructed the Secretary of Agriculture:

> to develop and implement measures for evaluating, on an annual or more frequent basis, the effectiveness of the food stamp program in achieving its stated objectives, including, but not limited to,… the program's relative fairness to households of different income levels, different age composition, different size, and different regions of residence (Food Stamp Act of 1977, p. 1-89).

To assess the program's fairness requires, first, an understanding of how program regulations affect different types of households and, second, some criteria for determining what distribution of effects would be fair. This report compares food stamp participants along the same classifications mentioned by Congress: poverty status, demographic composition, household size, and region of residence. These comparisons do not on their own reflect a judgment about the fairness of the benefit formula.

This report first describes the food stamp benefit formula and explains how the benefit level may be decomposed into its respective parts. That description is followed by an empirical analysis, using Food Stamp Program Quality Control data for 1998. The final section discusses limitations and advantages of this approach.

Food Stamp Benefit Formula

Program Rules

To be eligible for food stamp benefits, a household must have few countable assets and low monthly cash income.[3] The asset limit is $2,000 for households that do not contain an elderly member and $3,000 for households that do. The gross income test, which applies only to households without an elderly or disabled member, requires that monthly cash income (including labor market earnings, all cash program benefits, and any other cash income) may not exceed 130 percent of the official poverty guideline. The net income test, for all households, requires that monthly cash income after certain deductions (described below) may not exceed 100 percent of the official poverty guideline (hereafter, all income and benefit variables are reported on a monthly basis, unless otherwise noted). Other eligibility restrictions apply to immigrants, students, strikers, and able-bodied adults without dependents (see Castner and Rosso, 2000, or USDA, Food and Nutrition Service, 2000, for more details).

Six types of deductions from gross cash income are used in computing monthly net income:

• D1—standard deduction ($134 per food stamp unit, in the contiguous United States in fiscal year 1998).

• D2—an earned income deduction (20 percent of the combined monthly labor market earnings of household members).

• D3—a dependent care deduction (certain expenses for care of children or other dependents while other household members work, seek employment, or go to school).

• D4—a medical deduction (nonreimbursed medical expenses for elderly or disabled members of the household, beyond the first $35 per month).

• D5—a child support payment deduction (legally obligated child support payments to somebody who is not a member of the household).

• D6—an excess shelter expense deduction (monthly shelter costs that exceed 50 percent of the monthly income remaining after all other deductions are subtracted from gross income). This deduction has a cap equal to $250 in 1998, which only applies to households without an elderly or disabled member. Because the excess shelter expense deduction depends on the income left after the preceding five deductions, it must be computed after the others.

Net income equals gross income minus deductions. Net income may not be reduced below zero, so in cases where the value of all deductions exceeds gross cash income, some potential deductions remain unused—they have no impact on the computation of net income.[4]

Net income plays a central role in determining the benefit amount. Any household with net income of zero receives the maximum benefit level, which is based on the Thrifty Food Plan and which varies according to household size. Households with positive net income receive the maximum benefit minus 30 percent of net income. For units with one or two members, a minimum benefit of $10 is provided.[5]

A Mathematical Statement of Program Rules

To state these rules mathematically for purposes of computing benefits correctly, it is most intuitive to begin by computing deductions and net income, and then to compute benefits. Let B be benefits; let M be the maximum benefit for a household with a certain number of members; let G be gross income; let D1-D6 be the six deductions defined above; let H (for housing) be the total shelter expenses; let H* be the cap on the shelter deduction; let N1 be an intermediate net income value based on all deductions except the shelter deduction;[6] and let N2 be the final net income.

First, intermediate net income is defined as gross income minus the first five deductions (unless this dif-

[3]Not all assets count toward the asset limit for food stamp eligibility. For example, a primary residence and some assets in the form of an automobile may be excluded for this purpose.

[4]For readers who are familiar with deductions mainly in an income tax context, it may be surprising that gross income minus deductions may ever be equal to or less than zero. Recall, however, that some deductions (such as the standard deduction) do not depend on a particular income source. Thus, any food stamp unit with gross income less than $134 will have net income equal to zero.

[5]For practical purposes, the minimum benefit would not be binding for larger households in any case. In our 1998 sample, just 0.14 percent of food stamp units with more than two members had benefits less than $10. In the empirical computations, we drop this very small group of observations.

[6]Because there is no cap on the shelter deduction for households with an elderly or disabled member, H* is set to equal H for these households. This is just a mathematical convenience, indicating that there is no cap limiting the deduction for these households.

ference yields a negative number, in which case intermediate net income is simply zero):

(1) N1 = Max [G - (D1 + D2 + D3 + D4 + D5) , 0].

Second, the shelter deduction equals any shelter expenses that exceed 50 percent of intermediate net income (H - 0.5 * N1). The minimum shelter deduction is zero, and the deduction is capped at H*:

(2) D6 = Min [H*, Max (H - 0.5 * N1, 0)].

Third, final net income equals gross income minus all six deductions (unless this difference yields a negative number, in which case net income is simply zero):

(3) N2 = Max [G - (D1 + D2 + D3 + D4 + D5 + D6), 0].

Fourth, food stamp benefits equal the maximum benefit minus 30 percent of net income (with a minimum benefit level of $10): [7]

(4) B = Max [M - 0.3 * N2 , 10].

A New Decomposition of Food Stamp Benefits

While the approach above is sensible for benefit computation, it is less useful for measuring and comparing the contribution of each component of the benefit formula toward the final benefit amount. For this purpose, it helps to restate the benefit amount as a simple sum of several component effects (table 2).

[7]Once again, to spare the reader some additional notation, we ignore the trivial number of units with more than two persons who receive less than $10.

Table 2—Components and subcomponents of total food stamp benefits

Symbol	Component name	Description (positive or negative sign)	Formula
M	Maximum benefit	Maximum food stamp benefit, depending on household size (+)	M
E1	Income effect	Effect of gross cash income on benefits, all else equal (-)	-0.3*G
E2	Deductions effect	Effect of deductions on benefits, all else equal (+)	0.3*D
E3	Maximum benefit effect	Effect of receiving the maximum benefit instead of M+E1+E2 (-)	0.3*Max[0,D-G]
E4	Minimum benefit effect	Effect of receiving the minimum benefit instead of M+E1+E2 (+)	Max[0,10-(M-0.3*N2)]
E2.1	Standard deduction effect	Effect of standard deduction on benefits, all else equal (+)	0.3*D1
E2.2	Earned income deduction effect	Effect of labor market income on benefits, all else equal (+)	0.3*D2
E2.3	Dependent care deduction effect	Effect of dependent care deduction on benefits, all else equal (+)	0.3*D3
E2.4	Medical deduction effect	Effect of medical deduction on benefits, all else equal (+)	0.3*D4
E2.5	Child support payment deduction effect	Effect of child support payments deduction, all else equal (+)	0.3*D5
E2.6	Shelter deduction effect	Effect of the shelter deduction on benefits, all else equal (+)	0.3*D6
E2.6.1	Raw shelter expense effect	Effect of gross shelter expenses on benefits, all else equal (+)	0.3*H
E2.6.2	Half-income rule effect	Effect of disqualifying half of intermediate net income (-)	-0.3*Min[0.5*N1,H]
E2.6.3	Shelter deduction cap effect	Effect of the rule that shelter deduction may not exceed $250 (-)	Min[0.3*H*-(E2.6.1+ E2.6.2),0]

Notes: M is the maximum benefit, G is gross cash income, D is total deductions, N1 is intermediate net income, N2 is final net income, D1 is the standard deduction, D2 is the earned income deduction, D3 is the dependent care deduction, D4 is the medical deduction, D5 is the child support payment deduction, D6 is the shelter deduction, H is gross shelter expenses, and H* is the cap on the shelter deduction. "All else equal" means holding constant all other components or subcomponents.

In overview, food stamp benefits may be expressed as the sum of the maximum benefit (M) plus four component effects—the income effect (E1), the deductions effect (E2), the maximum benefit effect (E3), and the minimum benefit effect (E4). These main effects are defined below and reported in the top third of table 2 and subsequent tables.

For some purposes, it is useful to analyze the deductions effect in greater detail. A further decomposition of the deductions effect is defined later in this report and detailed in the middle and bottom thirds of table 2 and subsequent tables. Readers who are interested only in the main component effects may focus on just the top third of each table of results.

The income effect (E1) is -0.3 (derived from the official benefit reduction rate of 30 percent) times gross income. If there were no deductions and no minimum benefit, food stamp benefits would simply equal the maximum benefit plus the income effect.

(5) $E1 = -0.3 * G.$

The deductions effect (E2) is 0.3 times total deductions. Except for unused deductions, as noted below, every dollar of deductions causes food stamp benefits to rise by 30 cents.

(6) $E2 = 0.3 * (D1 + D2 + D3 + D4 + D5 + D6).$

The maximum benefit effect (E3) is the effect of the fact that food stamp benefits may not exceed a maximum amount. If a household with sufficient deductions were permitted to have a net income value (N2) below zero—in essence, if it could use its unused deductions—then, according to equation (4), the household would have food stamp benefits that exceed the so-called maximum benefit (M).[8] The maximum benefit effect represents the consequences of being unable to have benefits greater than the maximum benefit. This effect is negative for those households whose potential deductions exceed their gross income, and is zero otherwise.

(7) $E3 = -0.3 * \text{Max} [0, (D1 + D2 + D3 + D4 + D5 + D6) - G].$

While the maximum benefit effect is a nonpositive number, this mathematical representation does not mean the effect should be interpreted as a penalty in a policy sense. Recall that the maximum benefit suffices to purchase the bundle of foods described in the Thrifty Food Plan. In this sense, the restriction that benefits may not exceed the maximum benefit is a purposeful policy choice, not a penalty on units with unused deductions.

Finally, the minimum benefit effect (E4) represents the effect of the minimum benefit rule on the benefit amount. This effect is positive for those one- and two-person units that would otherwise have received a benefit amount smaller than $10, and is zero for all others.

(8) $E4 = \text{Max} [0, 10 - (M - 0.3 * N2)].$

The benefit formula in equation (4) may be restated as a simple sum of the maximum benefit plus the four component effects.

(9) $B = M + E1 + E2 + E3 + E4.$

The proof is presented in Appendix A.

More Detail on the Deductions Effect

Deductions are a critical factor in determining the amount of benefits received. Total deductions (including unused deductions) are the simple sum of the six possible deductions, D1 through D6. Likewise, the deductions effect (E2), defined in equation (6) above, is the simple sum of six effects, E2.1 through E2.6, where each effect equals 0.3 times the corresponding deduction.

The excess shelter expense deduction (D6) is especially complex and important in terms of its effect on benefits. We decompose the shelter deduction effect into three subcomponent effects.

The raw shelter expense effect (E2.6.1) represents the impact that shelter expenses would have on benefits if all shelter expenses were deductible.[9]

(10) $E2.6.1 = 0.3 * H.$

The half-income rule effect (E2.6.2) represents the effect of the rule that only shelter expenses above 50 percent of intermediate net income count towards the shelter deduction. If intermediate net income is suffi-

[8]For this reason, the maximum benefit effect might alternatively have been called the unused deductions effect.

[9]This is not a purely hypothetical case because 11 percent of households have zero intermediate net income (N1), so for them, all shelter expenses are deductible (up to the cap).

ciently high, then this effect completely offsets the raw shelter expense effect.

(11) E2.6.2 = -0.3 * Min [0.5 * N1 , H].

Finally, the shelter deduction cap effect (E2.6.3) reflects the impact on food stamp benefits of the cap to the shelter deduction. This effect is negative for households that would otherwise be eligible for a deduction that exceeds the cap, and is zero otherwise.

(12) E2.6.3 = Min [0.3 * H* - (E2.6.1 + E2.6.2), 0].

The shelter deduction effect (E2.6) is the simple sum of these three subcomponent effects:

(13) E2.6 = 0.3 * D6 = E2.6.1 + E2.6.2 + E2.6.3.

The proof is presented in Appendix A.

Empirical Analysis

This section employs the tool from the previous section to measure the various components of the food stamp benefit formula using 1998 data from USDA's Food and Nutrition Service (FNS). The study analyzes the mean monthly food stamp benefit for all participants and for specific subpopulations defined by poverty status, demographic composition, household size, and region of residence.

In contrast with table 1, which reported mean food stamp benefits for two-person food stamp units, the subsequent analysis reports all monthly income and benefit variables on a per person basis. The report takes this approach because food stamp units of different sizes have very different income and benefit levels.

The alternative approach of reporting results on a per household basis makes it more difficult to distinguish the effect of household size from the effects of other variables. For the reader who would like to reconstruct the corresponding results on a per household basis, each table below reports the appropriate mean unit size variable that is needed for this calculation.

Data

Food Stamp Program Quality Control (FSPQC) data are generated from monthly quality control reviews of FSP cases. State agencies conduct these reviews to assess the accuracy of eligibility determinations and benefit calculations. Following a specified protocol, the State agencies send data files from these reviews to FNS. A contractor for FNS edits and compiles these files to produce nationally representative Quality Control (QC) data. In recent years, FNS has made these microdata available to the public on the agency's Web site.

These QC data "… are ideal for tabulations of the characteristics of food stamp units and for simulating the impact of various reforms to the FSP on current FSP units" (Brinkley, 1999). They contain detailed information about food stamp unit composition, income from various sources, each type of deduction, and food stamp benefit amounts. The 1998 QC data used in this report contain 47,145 food stamp unit observations, which may be used with sampling weights to represent approximately 8.2 million food stamp units nationally.

Full Sample

The mean monthly per person food stamp benefit in 1998 in our sample was $69.25. The first column of table 3 reports the decomposition of this mean benefit for the full sample, using the analytic tool described in the preceding section. In this subsection, we discuss each element of the decomposition in turn:

• First, the mean per person maximum benefit (M) was $112.70. This value is a weighted average of the per capita maximum benefit for each family size, where the weights are the proportion of the population with that family size.

• Next, the mean per person gross cash income was $297.57. If every dollar of income counted against food stamp benefits, this income would have reduced per capita benefits by $89.27 (using the 30 percent benefit reduction rate), so the income effect (E1) equaled -$89.27.

• However, not all income counted against benefits. On average, participant households were entitled to deductions from gross income totaling $167.83 per person. The deductions effect (E2) equaled 0.3 times this sum, or $50.35.

• Some food stamp units with sufficiently low income are entitled to more deductions than the total value of their cash income. In this case, some of their deductions are essentially unused, because net income is constrained to be greater than or equal to zero. This restriction also means that food stamp benefits may not ever exceed the maximum benefit for a particular family size. The impact of this limitation on benefits is called the maximum benefit effect (E3). In 1998, the mean per person value of E3 equaled -$6.78.

• Finally, one- and two-person food stamp units that would otherwise have received very low benefit amounts benefited from the rule setting the minimum benefit level at $10 per food stamp unit. The mean per person value of this minimum benefit effect (E4) was $2.25.

Note that the mean per person food stamp benefit of $69.25 equaled the sum of the mean maximum benefit plus these four main effects.

This decomposition shows how the deductions effects are central to determining the food stamp benefit level. About 56 percent of all income was eligible for one deduction or another ($50.35/$89.27). In the absence

Table 3—Composition of mean per capita benefits, by gross income category of food stamp unit

Symbol	Component name	Full sample	"Very poor" below 50% of poverty	"Poor" 50-100% of poverty	"Near poor" above 100% of poverty
			Dollars		
M	Maximum benefit	112.70	111.01	113.89	112.70
E1	Income effect	-89.27	-31.65	-115.45	-168.70
E2	Deductions effect	50.35	37.71	56.52	65.48
E3	Maximum benefit effect	-6.78	-15.80	-1.47	-0.92
E4	Minimum benefit effect	2.25	0.00	1.21	16.56
	Total food stamp benefits	**69.25**	**101.28**	**54.68**	**25.11**
E2.1	Standard deduction effect	24.21	21.44	26.21	24.03
E2.2	Earned income deduction effect	3.77	0.86	4.17	12.77
E2.3	Dependent care deduction effect	0.60	0.16	0.61	2.17
E2.4	Medical deduction effect	1.17	0.03	1.12	5.81
E2.5	Child support payment deduction effect	0.09	0.02	0.11	0.26
E2.6	Shelter deduction effect	20.51	15.21	24.29	20.44
	Total deductions effect (E2)	**50.35**	**37.71**	**56.52**	**65.48**
E2.6.1	Raw shelter expense effect	50.65	26.88	63.43	72.75
E2.6.2	Half-income rule effect	-26.85	-7.18	-36.37	-50.80
E2.6.3	Shelter deduction cap effect	-3.29	-4.50	-2.77	-1.50
	Shelter deduction effect (E2.6)	**20.51**	**15.21**	**24.29**	**20.44**
	Mean food stamp unit size	2.42	2.69	2.24	2.36
				Percent	
	Proportion of all food stamp units	100.0	37.4	52.8	9.8

Note: Column entries are rounded to two significant digits after the decimal.
Source: Author's calculations from 1998 Quality Control data.

of deductions, the mean food stamp benefit would have been reduced by over half.[10] The standard deduction effect (E2.1) and the shelter deduction effect (E2.6) are by far the largest, accounting for 89 percent of the total deductions effect.

The earned income deduction effect (E2.2)—the third largest—had a mean per person value of only $3.77 for the full sample. The final two deductions effects, the child support deduction effect (E2.3) and medical deduction effect (E2.4), do not have a large impact on mean food stamp benefits, but they may be important to those food stamp units that receive them. For example, only 4 percent of food stamp units receive any medical deduction effect (E2.4), but for those who receive this deduction the mean effect is $28.56 (not shown in table 3).

The further decomposition of the shelter deduction effect (E2.6) is similar to the main decomposition of food stamp benefits. The mean per person value of eligible shelter expenses in the 1998 QC data was $168.83 per month, leading to a raw shelter expense effect (E2.6.1) of $50.65.

However, not all shelter expenses are counted in the shelter deduction. Only shelter expenses over 50 percent of intermediate net income count toward the shelter deduction. This half-income rule effect (E2.6.2) equaled -$26.85. Finally, the cap on the shelter deduction further reduced benefits by $3.29 per person on average.

Income Groups

It is well understood that food stamp benefits vary inversely with gross cash income because the benefit reduction rate of 0.3 is a central component of the benefit formula. It is less widely understood how other stipulations of the benefit formula have differential effects on participants with different income levels.

In table 3, we consider three categories of food stamp units, according to whether the unit has gross income below 50 percent of the poverty guideline (very poor),

[10]Calculating the mean benefit under the hypothetical case where no deductions are permitted is not quite as simple as subtracting the deductions effect (E2) from the mean benefit. Recall that some deductions are "unused," and therefore are counted under the maximum benefit effect (E3).

between 50 and 100 percent of the guideline (poor), or greater than 100 percent of the guideline (near-poor).

The income effect (E1) is naturally largest in absolute value for the near-poor food stamp units (-$168.70 for near-poor units in comparison to -$31.65 for very poor units). This income effect reflects the fact that near-poor units have 5.3 times the mean per person gross income of very poor units.

The total deductions effect (E2), by contrast, is smallest for the poorest households. The earned income deduction effect (E2.2), for example, is $12.77 for near-poor units, but less than a dollar for very poor units (which have the lowest labor market earnings). The shelter deduction effect is also smaller for very poor food stamp units than for other units. Very poor food stamp units have much lower shelter expenses—only 37 percent of the per person shelter expenses that near-poor units have.

With lower shelter expenses, the very poor units cannot claim as much benefit from the shelter deduction. The shelter deduction cap effect is also largest for the poorest units. These patterns are only partially offset by the half-income rule—the rule that only shelter expenses above half of intermediate net income count toward the shelter deduction. This rule affects units with more income to a greater extent than other units.

The very poor food stamp units not only have a lower total deduction effect (E2), but they have the most substantial maximum benefit effect (E3) (a negative effect). This effect is -$15.80 for the very poor units, but just -$0.92 for the near-poor units. A greater amount of the deductions that the very poor units would otherwise have been entitled to goes unused due to lower gross income levels. As a result, only the very poor units have a substantial maximum benefit effect (E3). Likewise, the minimum benefit effect provides no help in raising the mean per person benefit for very poor units, and it is just $1.21 for poor units. By contrast, the minimum benefit effect is $16.56 for near-poor units.

The net consequence of these effects is that the benefit formula provides higher mean food stamp benefits to the poorest food stamp units (due to E1), but not as much higher as one might expect. One might anticipate (from the benefit reduction rate of 30 percent) that food stamp benefits would fall 30 cents for every dollar of additional income, but in fact the gradient is not so steep. The deductions effect (E2), maximum benefit effect (E3), and minimum benefit effect (E4) each have the least positive value for the poorest food stamp units. As a consequence, food stamp benefits generally fall by less than 30 cents if income increases by $1.00.

Demographic Categories

Patterns of food stamp benefit receipt differ substantially by demographic category. For example, some stipulations of the benefit formula apply only to food stamp units that contain an elderly or disabled person. Food stamp units that contain a single female parent with children are most likely to participate in the cash welfare program Temporary Assistance for Needy Families (TANF), so they differ from other food stamp units on a variety of demographic and economic characteristics. Food stamp units without children, elderly, or disabled members face a combination of time limits and work requirements that may complicate their participation in the Food Stamp Program.

In this subsection, we compare the benefit decomposition for five major demographic categories: units that are composed entirely of elderly or disabled persons (28.5 percent of the full sample), units that contain an elderly or disabled person living with other persons (11.1 percent), units without an elderly or disabled person that contain a single female parent with children (31.7 percent of the full sample), other food stamp units with children (16.9 percent), and other food stamp units without children (11.9 percent). Fewer than 6 percent of food stamp units simultaneously contain an elderly or disabled person and a single female with children, so this division of the sample into non-overlapping demographic categories seemed superior to a yet more disaggregated classification.

The food stamp units composed entirely of elderly or disabled persons have more than twice as much gross cash income per person as units in the categories without an elderly or disabled person (table 4 shows that the income effect E1 is more than twice as large for the former group). For many elderly or disabled persons, the main source of cash income is Social Security or Supplemental Security Income (SS/SSI). Units with an elderly or disabled member are exempted from the gross income test, so in the presence of sufficient deductions they could in principle have comparatively high gross income and still be eligible to participate. For the first demographic category alone, the absolute value of the income effect (E1) is greater than the mean maximum benefit (M), so the receipt of

Table 4—Composition of mean per capita benefits, by demographic category of food stamp unit

Symbol	Component name	Full sample	Elderly or disabled persons only	Elderly or disabled and others	With single female parent and no elderly or disabled	Other units with children	Other units with no children
				Dollars			
M	Maximum benefit	112.70	121.60	105.82	107.08	106.06	122.13
E1	Income effect	-89.27	-158.61	-80.99	-58.16	-63.63	-50.39
E2	Deductions effect	50.35	79.10	28.99	32.89	35.50	68.90
E3	Maximum benefit effect	-6.78	-3.66	-1.43	-3.12	-5.07	-31.40
E4	Minimum benefit effect	2.25	6.97	0.42	0.23	0.17	1.01
	Total food stamp benefits	**69.25**	**45.40**	**52.80**	**78.92**	**73.03**	**110.25**
E2.1	Standard deduction effect	24.21	38.49	13.82	14.51	14.99	38.61
E2.2	Earned income deduction effect	3.77	0.45	1.54	5.61	7.40	3.75
E2.3	Dependent care deduction effect	0.60	0.19	0.29	1.34	0.50	0.02
E2.4	Medical deduction effect	1.17	3.90	0.52	0.00	0.00	0.00
E2.5	Child support payment deduction effect	0.09	0.09	0.07	0.05	0.16	0.12
E2.6	Shelter deduction effect	20.51	35.99	12.76	11.39	12.45	26.40
	Total deductions effect (E2)	**50.35**	**79.10**	**28.99**	**32.89**	**35.50**	**68.90**
E2.6.1	Raw shelter expense effect	50.65	87.57	39.38	30.71	35.35	47.60
E2.6.2	Half-income rule effect	-26.85	-51.58	-26.62	-15.52	-17.70	-11.09
E2.6.3	Shelter deduction cap effect	-3.29	N/A	N/A	-3.81	-5.21	-10.11
	Shelter deduction effect (E2.6)	**20.51**	**35.99**	**12.76**	**11.39**	**12.45**	**26.40**
	Mean food stamp unit size	2.42	1.09	3.39	3.12	3.63	1.11
				Percent			
	Proportion of all food stamp units	100.0	28.5	11.1	31.7	16.9	11.9

NA=Households with an elderly or disabled person do not face a cap on the shelter deduction.
Note: Column entries are rounded to two significant digits after the decimal.
Source: Author's calculations from 1998 Quality Control data.

positive amounts of food stamp benefits for this category may be attributed almost entirely to the deductions effect (E2).

The deductions effect is highest for units composed entirely of elderly or disabled members, for several reasons. First, the mean per person standard deduction effect (E2.1) is higher for this category and for other units with no children, simply because household size tends to be smaller for these categories (the effect of household size is discussed at length in the next subsection).

Also, units composed entirely of elderly or disabled members are the only ones with a medical deduction effect (E2.4) exceeding $1.00. Most importantly, units composed entirely of an elderly or disabled member have the highest shelter deduction effect (E2.6). They have the highest mean per person shelter expenses, leading to a higher raw shelter expense effect (E2.6.1). Also, they are specifically exempted from the shelter deduction cap, which would otherwise limit the shelter deduction for many of these units (E2.6.3). Because of lower labor force participation, units with an elderly or disabled member benefit less from the earned income deduction (E2.2), but this pattern only slightly offsets the higher deductions noted above. The mean per person total deductions effect (E2) is $79.10 for units composed entirely of elderly or disabled members, compared with $32.89 for the single female parent category and $35.50 for other food stamp units with children.

Food Stamp Unit Size

The decomposition of food stamp benefits works in distinct ways for food stamp units of different sizes (table 5). Here, for tractability, we compare and contrast food stamp units with one to five members (only 4 percent of all food stamp units have more than five members).

To some extent, differences among different sizes of food stamp units result from purposeful program design decisions. For example, the benefit formula adjusts the maximum benefit by household size, and the formula explicitly sets the standard deduction at a fixed value for the food stamp unit (not per person in the unit). In part, however, differences by household size may proxy for other demographic or economic variables. For example, 67 percent of one-person units are composed of an elderly or disabled person alone, and most of the remaining one-person units are in the category "other adults without children." Thus, phenomena that appear related to unit size could in part be due to the demographic characteristics addressed in the previous subsection. However, an analysis that cross-tabulates family size and other demographic characteristics simultaneously is beyond the scope of this report.

Mean per person gross income declines steeply with unit size. In this sense, larger food stamp units tend to be poorer than smaller food stamp units. One-person units have the largest income effect (in absolute value), at -$126.90. However, several of the other effects are larger for small food stamp units, with the net consequence that mean per person food stamp benefits remain quite nearly constant in the neighborhood of $70 for all food stamp units with one to four members (declining slightly for five-person units).

The mean per person maximum benefit (M) is higher for smaller units because the Thrifty Food Plan on which the maximum benefit is based explicitly allows for economies of scale in food purchase and preparation. The deductions effect (E2) is also highest for smaller units. For example, the mean per person standard deduction effect (E2.1) falls with unit size because the standard deduction ($134 per food stamp unit in 1998) is constant regardless of the number of members. Shelter costs exhibit strong economies of scale because common areas of a house or apartment may be shared among several unit members. Smaller food stamp units have a much higher per person raw shelter expense effect (E2.6.1). Even after the partially offsetting influence of the half-income rule effect (E2.6.2), the smaller units have a much larger overall

Table 5—Composition of mean per capita benefits, by food stamp unit size

Symbol	Component name	Full sample	Food stamp unit size 1	2	3	4	5
					Dollars		
M	Maximum benefit	112.70	122.69	112.43	107.50	102.48	97.70
E1	Income effect	-89.27	-126.90	-78.73	-62.94	-57.53	-55.33
E2	Deductions effect	50.35	79.53	43.47	31.61	24.59	20.20
E3	Maximum benefit effect	-6.78	-13.03	-4.92	-2.52	-1.60	-0.90
E4	Minimum benefit effect	2.25	5.27	1.03	0.00	0.00	0.00
	Total food stamp benefits	**69.25**	**67.57**	**73.29**	**73.64**	**67.94**	**61.68**
E2.1	Standard deduction effect	24.21	40.39	20.18	13.46	10.09	8.09
E2.2	Earned income deduction effect	3.77	1.54	4.48	5.54	5.54	5.67
E2.3	Dependent care deduction effect	0.60	0.17	0.87	1.09	0.86	0.55
E2.4	Medical deduction effect	1.17	2.54	0.77	0.11	0.02	0.02
E2.5	Child support payment deduction effect	0.09	0.08	0.09	0.12	0.08	0.10
E2.6	Shelter deduction effect	20.51	34.80	17.09	11.30	8.00	5.76
	Total deductions effect (E2)	**50.35**	**79.53**	**43.47**	**31.61**	**24.59**	**20.20**
E2.6.1	Raw shelter expense effect	50.65	77.78	43.46	33.27	27.06	23.79
E2.6.2	Half-income rule effect	-26.85	-39.33	-22.66	-18.27	-16.84	-16.20
E2.6.3	Shelter deduction cap effect	-3.29	-3.64	-3.71	-3.71	-2.22	-1.82
	Shelter deduction effect (E2.6)	**20.51**	**34.80**	**17.09**	**11.30**	**8.00**	**5.76**
	Mean food stamp unit size	2.42	1.00	2.00	3.00	4.00	5.00
					Percent		
	Proportion of all food stamp units	100.0	38.6	21.0	17.9	12.3	6.0

Note: Column entries are rounded to two significant digits after the decimal
Source: Author's calculations from 1998 Quality Control data.

shelter deduction effect (E2.6). In all, the mean per person total deductions effect (E2) is almost four times as large for one-person food stamp units as for five-person units. This effect almost entirely offsets the differences in the income effect by unit size, leading small food stamp units to receive almost the same mean food stamp benefit as four-person units despite the smaller units' much higher income per person.

Census Regions

The two components that most strongly affect differences in food stamp benefits across regions of the country are the income effect (E1) and the shelter deduction effect (E2.6). Food stamp participants in the Northeast have comparatively high per person gross income, leading to an income effect of -$102.96 (table 6). Income is lowest in the South and West, with a corresponding income effect in each region of approximately -$80 (table 6).

Partly offsetting the income effect, food stamp units in the Northeast have the highest shelter expenses and likewise the highest shelter deduction effect (E2.6). These shelter expenses reflect higher property values in much of the Northeast, and also higher utility costs. The mean per person raw shelter expense effect (E2.6.1) is $77.37 in the Northeast, in contrast with about $41 in the South and West.

This difference is only partly compensated by the higher half-income rule effect (E2.6.2) and shelter deduction cap effect (E2.6.3) in the Northeast. Overall, the shelter deduction effect raises mean per person food stamp benefits by $34.93 in the Northeast, and by approximately $16 in the South and West.

Table 6—Composition of mean per capita benefits, by census region

Symbol	Component name	Full sample	Census region 1 Northeast	2 Midwest	3 South	4 West
				Dollars		
M	Maximum benefit	112.70	113.50	112.84	111.67	113.75
E1	Income effect	-89.27	-102.96	-94.65	-84.01	-79.60
E2	Deductions effect	50.35	65.16	50.84	45.43	44.04
E3	Maximum benefit effect	-6.78	-7.45	-6.72	-6.58	-6.55
E4	Minimum benefit effect	2.25	3.34	3.16	1.38	1.88
	Total food stamp benefits	**69.25**	**71.59**	**65.46**	**67.90**	**73.53**
E2.1	Standard deduction effect	24.21	26.28	25.31	23.43	22.41
E2.2	Earned income deduction effect	3.77	2.61	3.79	4.21	4.11
E2.3	Dependent care deduction effect	0.60	0.59	0.42	0.74	0.51
E2.4	Medical deduction effect	1.17	0.63	2.04	1.36	0.42
E2.5	Child support payment deduction effect	0.09	0.12	0.09	0.09	0.06
E2.6	Shelter deduction effect	20.51	34.93	19.19	15.61	16.53
	Total deductions effect (E2)	**50.35**	**65.16**	**50.84**	**45.43**	**44.04**
E2.6.1	Raw shelter expense effect	50.65	77.37	49.91	41.55	41.48
E2.6.2	Half-income rule effect	-26.85	-33.92	-28.47	-24.32	-22.71
E2.6.3	Shelter deduction cap effect	-3.29	-8.52	-2.25	-1.61	-2.24
	Shelter deduction effect (E2.6)	**20.51**	**34.93**	**19.19**	**15.61**	**16.53**
	Mean food stamp unit size	2.42	2.21	2.32	2.48	2.64
				Percent		
	Proportion of all food stamp units	100.0	20.6	20.8	39.3	19.4

Note: Column entries are rounded to two significant digits after the decimal.
Source: Author's calculations from 1998 Quality Control data.

Discussion

While the FSP benefit formula is rather complex, the computations reported here are straightforward (the SAS software program used to make these calculations is provided in Appendix B). For research purposes beyond the goals of this report, more complex tools such as microsimulation analysis are more suitable (Jacobson et al., 2000).[11] For example, this report's tool is not consistently useful for understanding counter-factual scenarios, such as "How would benefits change if gross income rose by $20?" Similarly, the tool does not address changes to eligibility rules that influence participation—the focus here is on the distribution of benefits for a fixed sample of participants. In contrast, microsimulation analysis is specifically designed for counterfactual investigations, and it does seek to measure how policy changes affect both the participation decision and the benefit level for participants.

The main advantage of this report's analytic tool is that it summarizes in a simple and consistent format a variety of stipulations and regulations that are usually stated in a manner that makes comparison difficult. Microsimulation analysis requires estimation of a vector of behavioral parameters with one data source from one time period, and then simulation of policy changes in a second data source and time period under the assumption that the behavioral parameters remain constant.

Conclusions from such analysis depend on both the accuracy of the estimated parameters and the characteristics of the sample in a fashion that may be difficult for the casual reader to disentangle. The tool developed for this report permits a transparent comparison of the various components of the benefit formula for different types of household, and it is simpler than alternative approaches for this purpose.

The tool developed in this report quantifies the relative importance of the reduction in benefits due to cash income, the increase in benefits due to deductions, and the minimum and maximum benefit levels. First, the income effect (E1)—defined here as -0.3 times gross cash income—is very large in absolute value. For the full sample, the income effect equals -$89.27, compared to a mean per person maximum benefit of $112.70. Second, deductions go a long way toward offsetting the reduction in benefits that would result if all cash income counted against benefits. For the full sample, the deductions effect (E2) equals $50.35. Average benefits are less strongly affected by the maximum benefit effect (E3) of -$6.78 and the minimum benefit effect (E4) of $2.25, but these effects are not trivial. In this analysis, the actual mean per person food stamp benefit ($69.25) may be expressed as the maximum benefit plus the effects of E1 through E4.

The income effect (negative) and the deductions effect (positive) are both so large in absolute value that the balance between these effects is a major factor in determining the mean food stamp benefit for any population or subpopulation of participants. Differences in the income effect and deductions effect across subpopulations are typically a dominant source of differences in the actual benefit received, while differences across subpopulations in the maximum benefit are often less important. To understand the distribution of food stamp benefits across different types of households requires a comprehensible account of the whole array of positive and negative effects on the benefits that participants actually receive. This report takes a step toward providing such an account.

[11] Microsimulation analyses estimate how a particular program change would influence the participation decision and benefit amount for each household in a particular sample. Then, the analyses aggregate the individual level responses to report how the change would affect overall caseloads and average benefit levels.

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Appendix A: Proofs

First, we prove that the decomposition in equation (9) is equivalent to the more traditional statement of the benefit formula in equation (4). Define total deductions (including unused deductions) as:

(A1) $D = D1 + D2 + D3 + D4 + D5 + D6.$

Substitute equations (A1), (5), (6), and (7) into equation (9) to get:

(A2) $B = M - 0.3 * G + 0.3 * D - 0.3 \text{ Max } (0, D\text{-}G) + E4$

$= M - 0.3 [G - D + \text{Max } (0, D - G)] + E4$

$= M - 0.3 [\text{Max } (G - D, 0)] + E4.$

Use equations (3) and (8) with (A2) to get:

(A3) $B = M - 0.3 * N2 + \text{Max } [0, 10 - (M - 0.3 * N2)]$

$= \text{Max } [M - 0.3 * N2, 10].$

This equals the right-hand side of equation (4) to complete the first proof.

Second, we prove that the shelter expense effect in equation (13) is equivalent to 0.3 times the shelter deduction (D5) in equation (2). From equations (10), (11), (12), and (13), we have:

(A4) $E2.6 = E2.6.1 + E2.6.2 + E2.6.3$

$= E2.6.1 + E2.6.2 + \text{Min } [0.3 * H^* - (E2.6.1 + E2.6.2), 0]$

$= \text{Min } [0.3 * H^*, E2.6.1 + E2.6.2]$

$= \text{Min } [0.3 * H^*, 0.3 * H - 0.3 * \text{Min } (0.5 * N1, H)]$

$= \text{Min } [0.3 * H^*, -0.3 \text{ Min } (0.5 * N1 - H, 0)]$

$= 0.3 \text{ Min } [H^*, \text{Max } (H - 0.5 * N1, 0)].$

This completes the second proof.

Appendix B: SAS Software Program

```
***  DECTOOL.SAS
***  Produces tables used in Wilde, 2000.
***  "Understanding the Food Stamp Benefit Formula"
***  Input data: qcfy1998.sd2
***  Parke Wilde
***  9/1/2000;

***  Define names of input data sets ***;
libname out 'e:/temp/ces/';
libname in 'e:/data/qc/qc98/';

options linesize=100;

***  Create data file DECOMP ***;
data out.decomp;
  set in.qcfy1998
  ( keep = fsndis fsnelder fsnkid fsngmom fsusize fywgt
           fsgrinc fsnetinc fstotded fstotde2
           fscsexp fsstdded fsernded fsdepded fsmedded
           fssltded shelcap benmax fsben
           fsminben netscrn state fssltexp
           urbrur tpov region);

  *** SHELTER SUB-COMPONENT EFFECTS ***;
  neldis=fsndis+fsnelder;
  if neldis ge 1 then d_diseld=1;
    else d_diseld=0;
  if d_diseld=0 then hstar=shelcap;
    else hstar=fssltexp;
  n1 = max(fsgrinc-(fsstdded+fsernded+fscsexp+fsmedded+fsdepded),0);
  e261 = 0.3*fssltexp;                  ** gross shelter;
  e262 = -0.3*min(0.5*n1,fssltexp);     ** half-income rule;
  e263 = min((0.3*hstar)-(e261+e262),0); ** shelter cap effect;
  e26 = e261+e262+e263;                 ** shelter ded effect;

  *** DEDUCTIONS EFFECTS ***;
  sumded = fsstdded+fsernded+fscsexp+fsmedded+fsdepded+(e26/0.3);
  e21 = 0.3*fsstdded;                   ** standard;
  e22 = 0.3*fsernded;                   ** earned income;
  e23 = 0.3*fsdepded;                   ** dependent care;
  e24 = 0.3*fsmedded;                   ** medical;
  e25 = 0.3*fscsexp;                    ** child support;
  e2 = e21+e22+e23+e24+e25+e26;         ** deductions effect;

  *** MAIN COMPONENT EFFECTS ***;
  e1 = -0.3*fsgrinc;                    ** income effect;
  e3 = -0.3*max(0,(sumded-fsgrinc));    ** max effect;
  e4 = max(0,10-(benmax-0.3*fsnetinc));  ** min effect;

  *** ALTERNATIVE DEFINITIONS FOR DOUBLE-CHECKING ***;
  alte26 = 0.3*fssltded;                ** alt shelt ded effect;
  alte2 = 0.3*fstotded;                 ** alt deductions effect;
  sumfsben = benmax+e1+e2+e3+e4;        ** total fs ben;

  ** INCOME CATEGORY ***;
  If tpov le 50 then inccat='1.below 50% pov';
  else if 50 < tpov le 100 then inccat='2.50-100% pov';
  else if 100 < tpov then inccat='3.above 100% pov';

  *** DEMOGRAPHIC CATEGORY ***;
  if d_diseld=1 and neldis ge fsusize then demcat='1.all_dis/eld';
  else if d_diseld=1 then demcat='2.some_dis/eld';
  else if fsngmom=1 then demcat='3.sngmom';
  else if fsnkid>0 then demcat='4.other_kids';
  else demcat='5.other_nokids';
```

```
 *** DUMMY FOR RECEIPT OF MEDICAL ***;
 IF E24>0 then yesmed=1; else yesmed=0;

 *** Observations with benefits below 10 ***;
 if fsben < 10 then lowflag=1; else lowflag=0;
 if fsusize>2 then fsubig=1; else fsubig=0;

 *** PER/PERSON BASIS ***;
 * (put comments around this section for hh level analysis option) *;
 hh_max = benmax;
 hh_e1 = e1;
 hh_e2 = e2;
 hh_e3 = e3;
 hh_e4 = e4;
 hh_fsben = fsben;
 array effects benmax e1-e4 e21-e26 e261-e263 alte2 alte26 sumfsben fsben;
 do over effects;
   effects=effects/fsusize;
 end;

 *** Net income of zero ***;
 if n1 le 0 then netzero=1; else netzero=0;

 *** Missing shelter values ***;
 if (alte26 ne .) and (e261 ne .) and (alte2 ne .) and (e23 ne .);

 *** Non-continental US states and territories ***;
 if state=2 or state=15 or state=66 or state=72 or state=78 then outstate=1;
 else outstate=0;

 label
 e1 = '. income effect'
 e2 = '. deductions effect'
 e3 = '. max effect'
 e4 = '. min effect'
 e21 = '. standard deduction effect'
 e22 = '. earnings deduction effect'
 e23 = '. dependent care ded. effect'
 e24 = '. medical deduction effect'
 e25 = '. child support ded. effect'
 e26 = '. shelter deduction effect'
 e261 = '. gross shelter exp. effect'
 e262 = '. half-income rule effect'
 e263 = '. shelter cap effect'
 alte2 = 'DEDUCTION EFFECT (ALT.)'
 alte26 = 'SHELTER DEDUCTION EFFECT (ALT.)'
 sumfsben = 'COMPUTED FOOD STAMP BENEFITS (ALT.)'
 d_diseld = 'DISABLED/ELDERLY PRESENT';

 *** Missing values to aid in formatting output ***;
 array missing miss1-miss6;
 do over missing;  missing=.; end;

run;

*** COUNT UNITS WITH BENEFITS BELOW $10 ***;
proc freq;
  table lowflag*fsubig;
run;

*** REMOVE OBS THAT DON'T OBEY MINIMUM BENEFIT ***;
data out.decomp;
  set out.decomp;
  if lowflag=1 then delete;
run;

***  DESCRIPTIVE FREQUENCIES ***;
```

```
proc freq data=out.decomp;
  weight fywgt;
  table fsngmom*d_diseld;
  table fsusize*demcat;
  table inccat*demcat;
  table region*demcat;
  table yesmed*demcat;
  table netzero;
run;

***  PRODUCE TABLE 1 ***;
proc means n sumwgt mean std data=out.decomp;
  where fsusize=2 and outstate=0;
  weight fywgt;
  var hh_max hh_e1 hh_e2 hh_e3 hh_e4 hh_fsben;
run;

*** ANALYSIS BY INCOME CATEGORY ***;
proc sort data=out.decomp;
  by inccat;
run;
proc means n sumwgt mean std data=out.decomp;
  weight fywgt;
  var benmax e1 e2 e3 e4 miss1 miss2
      e21 e22 e23 e24 e25 e26 miss3 miss4
      e261 e262 e263 miss5 miss6
      fsusize d_diseld alte2 alte26 sumfsben fsben;
run;
proc means n sumwgt mean std data=out.decomp;
  by inccat;
  weight fywgt;
  var benmax e1 e2 e3 e4 miss1 miss2
      e21 e22 e23 e24 e25 e26 miss3 miss4
      e261 e262 e263 miss5 miss6
      fsusize d_diseld alte2 alte26 sumfsben fsben;
run;

*** ANALYSIS BY DEMOGRAPHIC CATEGORY ***;
proc sort data=out.decomp;
  by demcat;
run;
proc means n sumwgt mean std data=out.decomp;
  weight fywgt;
  var fsusize fsnkid fsnelder fsndis;
run;
proc means n sumwgt mean std data=out.decomp;
  weight fywgt;
  by demcat;
  var fsusize fsnkid fsnelder fsndis;
run;
proc means n sumwgt mean std data=out.decomp;
  by demcat;
  weight fywgt;
  var benmax e1 e2 e3 e4 miss1 miss2
      e21 e22 e23 e24 e25 e26 miss3 miss4
      e261 e262 e263 miss5 miss6
      fsusize d_diseld alte2 alte26 sumfsben fsben;
run;

*** ANALYSIS BY HOUSEHOLD SIZE ***;
proc sort data=out.decomp;
  by fsusize;
run;
proc means n sumwgt mean std data=out.decomp;
  where fsusize le 6;
  by fsusize;
  weight fywgt;
  var benmax e1 e2 e3 e4 miss1 miss2
```

```
      e21 e22 e23 e24 e25 e26 miss3 miss4
      e261 e262 e263 miss5 miss6
      fsusize d_diseld alte2 alte26 sumfsben fsben;
run;

*** ANALYSIS BY CENSUS REGION ***;
proc sort data=out.decomp;
  by region;
run;
proc means n sumwgt mean std data=out.decomp;
  by region;
  weight fywgt;
  var benmax e1 e2 e3 e4 miss1 miss2
      e21 e22 e23 e24 e25 e26 miss3 miss4
      e261 e262 e263 miss5 miss6
      fsusize d_diseld alte2 alte26 sumfsben fsben;
run;

*** ANALYSIS BY RECEIPT OF MEDICAL DEDUCTION ***;
proc sort data=out.decomp;
  by yesmed;
run;
proc means n sumwgt mean std data=out.decomp;
  by yesmed;
  weight fywgt;
  var benmax e1 e2 e3 e4 miss1 miss2
      e21 e22 e23 e24 e25 e26 miss3 miss4
      e261 e262 e263 miss5 miss6
      fsusize d_diseld alte2 alte26 sumfsben fsben;
run;
```