Contract No.: FNS-03-030-TNN / 43-3198-3-3724
MPR Reference No.: 6044-512

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Empirical Bayes Shrinkage Estimates of State Food Stamp Program Participation Rates in 2004-2006 for All Eligible People and the Working Poor

Final Report

February 2009

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EXECUTIVE SUMMARY

The Supplemental Nutrition Assistance Program (SNAP)—formerly the Food Stamp Program (FSP)—is a central component of American policy to alleviate hunger and poverty. The program's main purpose is "to permit low-income households to obtain a more nutritious diet . . . by increasing their purchasing power" (Food and Nutrition Act of 2008). SNAP is the largest of the domestic food and nutrition assistance programs administered by the U.S. Department of Agriculture's Food and Nutrition Service. During fiscal year 2008, the program served 28 million people in an average month at a total annual cost of over $34 billion in benefits. The average monthly program benefit was about $212 per household.

This report presents estimates that, for each state, measure the need for the FSP and the program's effectiveness in each of the three years from 2004 to 2006. The estimated numbers of people eligible for the FSP measure the need for the program. The estimated FSP participation rates measure, state by state, the program's performance in reaching its target population. In addition to the participation rates that pertain to all eligible people, we derived estimates of participation rates for the "working poor," that is, people who were eligible for the FSP and lived in households in which someone earned income from a job.

The estimates for all eligible people and for the working poor were derived jointly using empirical Bayes shrinkage estimation methods and data from the Current Population Survey, the decennial census, and administrative records. The shrinkage estimator that was used averaged sample estimates of participation rates in each state with predictions from a regression model. The predictions were based on observed indicators of socioeconomic conditions in the states, such as the percentage of the total state population receiving FSP benefits. The shrinkage estimates derived are substantially more precise than direct sample estimates from the Current Population Survey or the Survey of Income and Program Participation, the best sources of current data on household incomes used to model program eligibility. Shrinkage estimators improve precision by "borrowing strength," that is, by using data for multiple years from all the states to derive each state's estimates for a given year and by using not only sample survey data but also census and administrative data. This report describes our shrinkage estimator in detail.

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I. INTRODUCTION

This report presents estimates of the Food Stamp Program (FSP) participation rate and the number of people eligible for the FSP in each state for the years 2004 to 2006.[1] It also presents estimates of the participation rates for the working poor and the numbers of eligible working poor, where we define as "working poor" any person who was eligible for the FSP and lived in a household in which a member earned income from a job. These estimates were derived using "shrinkage" estimation methods. This introductory chapter overviews the advantages and some previous applications of shrinkage estimation. Chapter II describes how we derived shrinkage estimates, and Chapter III presents our state estimates for all eligible people and for the working poor. Technical details and additional information about our estimation methods are provided in Appendix A.

The principal challenge in deriving state estimates like those presented in this report is that the leading national surveys collecting current income data for families and used for estimating program eligibility—the Current Population Survey (CPS) and the Survey of Income and Program Participation (SIPP)—have small samples for most states. Thus, "direct" estimates—estimates based on data from one source for the state and time period in question—from these surveys are imprecise. For example, to calculate a direct estimate of North Dakota's 2006 FSP participation rate, we use just 2006 data on households in the CPS from North Dakota. Because of the potential errors introduced by the CPS surveying only a small number of families in North Dakota rather than all families in the state, though, we can be confident—by a commonly used standard—only that North Dakota's FSP participation rate in 2006 was between about 47 and 64

[1] The estimates presented here are also reported and compared with one another in Cunnyngham, Castner, and Schirm (2008).

percent. This range is wide (but typical), reflecting our substantial uncertainty about what North Dakota's participation rate actually was.

To improve precision, statisticians have developed "indirect" estimators. These estimators "borrow strength" by using data from other states, time periods, or data sources. The assumption underlying indirect estimation is that what happened in other states in 2006 or what happened in North Dakota (and other states) in other years is relevant to estimating what happened in North Dakota in 2006. Using indirect estimation, the Census Bureau has improved the precision of state poverty rates derived from the CPS by calculating two- and three-year averages (DeNavas-Walt et al. 2006).

A generally superior indirect estimator is the "shrinkage" estimator. A shrinkage estimator averages estimates obtained from different methods. For example, Fay and Herriott (1979) developed a shrinkage estimator that combined direct sample and regression estimates of per capita income for small places (population less than 1,000). Their estimates were used to allocate funds under the General Revenue Sharing Program. Shrinkage estimators have also been used to develop state estimates of income-eligible infants and children for allocating funds under the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) (Schirm 2000). To borrow strength across both space (states) and time, the current WIC eligibles estimator uses several years of CPS data and combines direct sample estimates with predictions from a regression model. The predictions of WIC eligibles are based on, for example, state poverty rates for children according to tax return data and per capita family income according to Census 2000. States with similar socioeconomic conditions, as reflected in these poverty rate and income statistics, are observed (and predicted) to have similar proportions of infants and children eligible for WIC. The shrinkage estimator uses data for all the states (with data for prior years and data from other sources) to estimate a regression model and formulate a prediction for North

Dakota. Then, the shrinkage estimator optimally averages the direct sample and regression estimates for North Dakota to obtain a shrinkage estimate. This contrasts with the direct estimator that ignores systematic patterns across states, using, for example, only North Dakota's data to derive an estimate for North Dakota, even though conditions may be similar in South Dakota or Idaho. In another application of shrinkage methods, shrinkage estimates of poor school-aged children by state and county were used in allocating Title I compensatory education funds for disadvantaged youth (National Research Council 2000).

In these and other applications of shrinkage estimation, the gain in precision from borrowing strength via a shrinkage estimator can be substantial. For example, the confidence intervals for the shrinkage estimates of WIC eligibles in 1992 were, on average, 61 percent narrower than the corresponding confidence intervals for the direct estimates (Schirm 1995). To obtain that same gain in precision with a direct estimator would require—according to rough calculations—more than a six-fold increase in sample size. Therefore, we use an indirect estimator and borrow strength to derive state estimates of FSP participation rates and counts of all eligible people and the eligible working poor (while recognizing that the gain in precision might not be as large as for the 1992 WIC estimates).

The shrinkage estimator we used combined direct sample and regression estimates and borrowed strength across states, over time, and between groups (all eligible people and the working poor). Like the estimators used in the other applications described in this chapter, our estimator also borrowed strength by using data from outside the main sample survey (the CPS), specifically, data from administrative records systems and the decennial census. In all, our estimator used one year of census data, three years of CPS data, and three years of FSP administrative data, population estimates, and tax return data for all states to obtain estimates for each state in each year (2004 to 2006) for all eligible people and for the working poor.

The shrinkage estimates derived for any one application are not guaranteed to be more accurate than estimates obtained using some other method. They have good statistical properties in general, however, and we have found for our specific application that as in previous applications, shrinkage estimation can greatly improve precision. Additional support for shrinkage estimators is provided by the findings from simulation studies. For example, in a comprehensive evaluation of the relative accuracy of alternative estimators of state poverty rates, Schirm (1994) found that shrinkage estimates are substantially more accurate than direct estimates or indirect estimates obtained from other methods that have been widely used.

II. A STEP-BY-STEP GUIDE TO DERIVING STATE ESTIMATES

This chapter describes our procedure for estimating state FSP participation rates for all eligible people and the working poor and the numbers of people eligible for FSP benefits for 2004 to 2006. This procedure, summarized by the flow chart in Figure II.1, has the following four steps:

1. From CPS data and FSP administrative data, derive direct sample estimates of state FSP participation rates for each of the three years 2004 to 2006.
2. Using a regression model, predict state FSP participation rates based on administrative and decennial census data.
3. Using "shrinkage" methods, average the direct sample estimates and regression predictions to obtain preliminary shrinkage estimates of state FSP participation rates.
4. Adjust the preliminary shrinkage estimates to obtain final shrinkage estimates of state FSP participation rates.

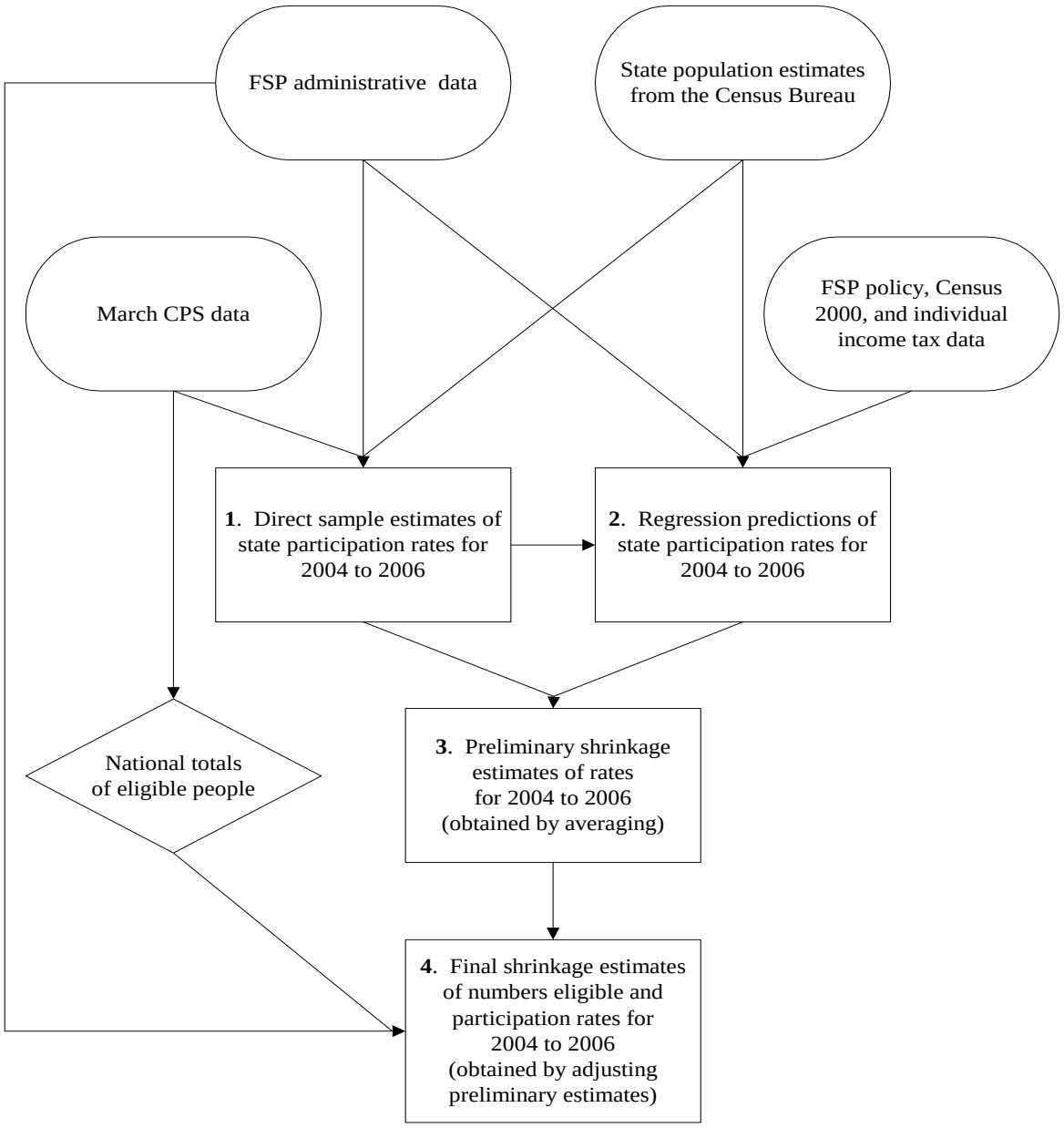
Each step is described in the remainder of this chapter. Additional technical details are provided in Appendix A.

1. From CPS data and FSP administrative data, derive direct sample estimates of state FSP participation rates for each of the three years 2004 to 2006

A FSP participation rate is obtained by dividing an estimate of the number of people participating in the FSP by an estimate of the number of people eligible for the FSP, with the resulting ratio expressed as a percentage. We used FSP administrative data to estimate numbers of participants in an average month in the fiscal year and we used CPS data to estimate numbers of eligibles. Because the CPS collects family income data for the prior calendar year, we obtained estimates of eligibles in 2006, for example, from the March 2007 CPS. To derive a participation rate for the working poor, we divided the number of working poor participants by the number of working poor people who were eligible.

FIGURE II.1

THE ESTIMATION PROCEDURE



As noted in Chapter I, direct sample estimates of participation rates are relatively imprecise. The standard errors for the estimates, reported in Appendix A along with the estimated rates, tend to be large, so our uncertainty about states' true rates is great. For example, according to commonly used statistical standards, we can be confident only that North Dakota's participation rate for all eligible people in 2006 was between 47 percent and 64 percent. This range is so wide and our uncertainty so great because the CPS sample for North Dakota is small. This lack of data, that is, the small number of sample observations that pertain directly to the target geographic area and time period— North Dakota and 2006 in our example—is the fundamental problem of "small area estimation."

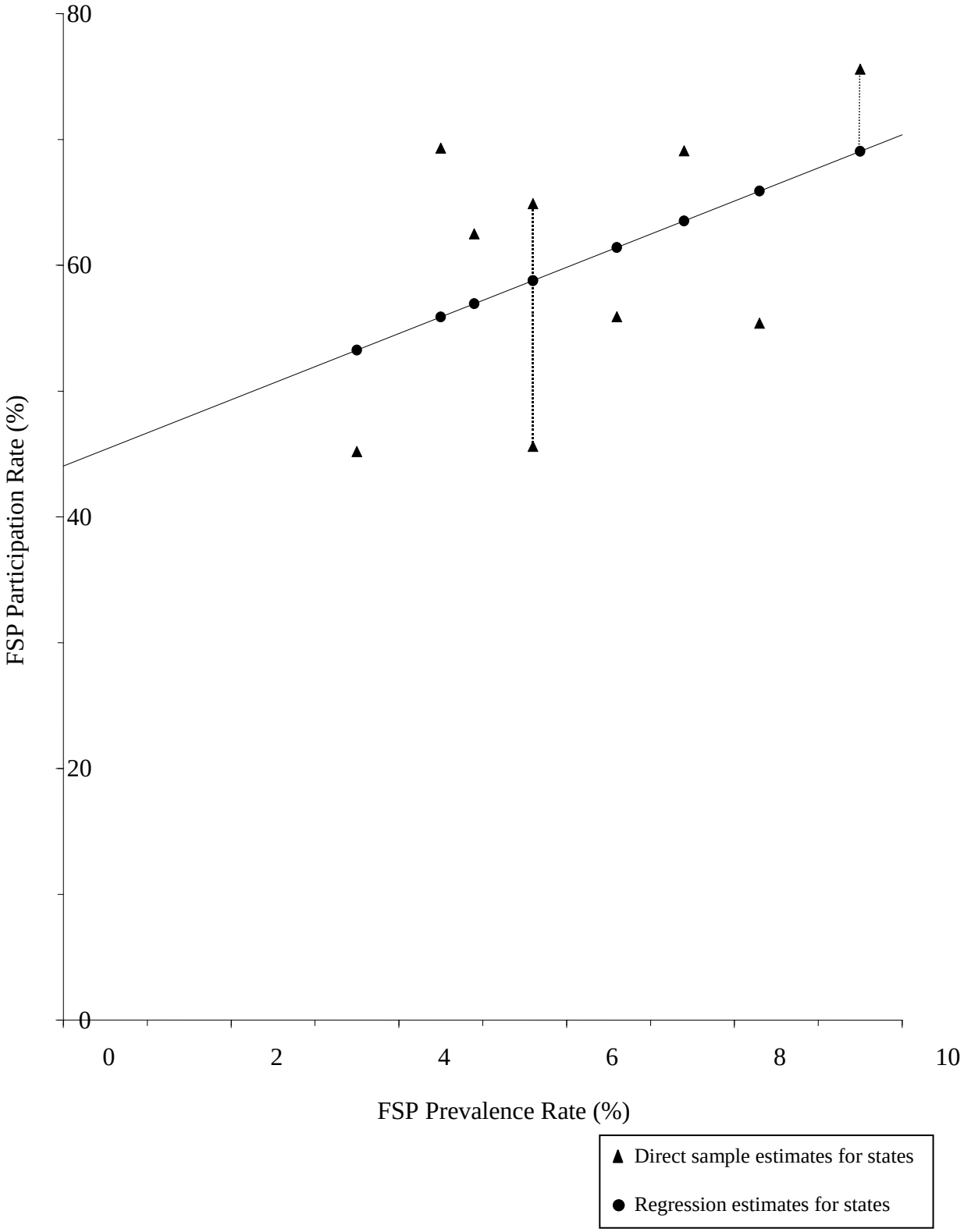
2. Using a regression model, predict state FSP participation rates based on administrative and decennial census data

The main limitation of the sample estimates derived in the previous step is imprecision. Regression can reduce that imprecision. Regression estimates are predictions based on nonsample or highly precise sample data, such as census and administrative records data. The latter include records from government tax and transfer programs.

Figure II.2 illustrates how the regression estimator works. The simple example in the figure has only nine states and data for just one year on one predictor—the FSP "prevalence" rate—that will be used to predict each state's FSP participation rate for eligible people. The FSP prevalence rate is measured by the percentage of all people (eligible and ineligible combined) who received FSP benefits, in contrast to the FSP participation rate, which is measured by the percentage of eligible people who received FSP benefits. The triangles in the figure correspond to direct sample estimates; a triangle shows the prevalence rate in a state (read off the horizontal axis) and the sample estimate of the participation rate in that state (read off the vertical axis). Not surprisingly, the graph suggests that prevalence and participation rates are systematically

FIGURE II.2

AN ILLUSTRATIVE REGRESSION ESTIMATOR



associated. States with higher percentages of all people participating in the program tend to have higher percentages of eligible people participating, although the relationship is far from perfect. To measure this relationship between prevalence and participation rates and derive predictions, we can use a technique called "least squares regression" to draw a line through the triangles (that is, we "regress" the sample estimates on the predictor). Regression estimates of participation rates are points on that line, the circles in Figure II.2. The predicted participation rate for a particular state is obtained by moving up or down from the state's direct sample estimate (the triangle) to the regression line (where there is a circle) and reading the value off the vertical axis. For example, the regression estimator predicts a participation rate of just under 60 percent for both states with prevalence rates of about 5.5 percent. In contrast, for the state with about 9.5 percent of people receiving FSP benefits, the predicted participation rate is nearly 70 percent.

To derive the regression estimates for 2004 to 2006 and for all eligible people and the working poor, we included all of the states, not just nine as in our illustrative example, and we used seven predictors, not just one. Adding six predictors improves our predictions. The seven predictors used measure:

- The percentage of the population receiving FSP benefits, that is, the FSP prevalence rate
- The percentage of households with no children in 1999 according to Census 2000
- The median household income in 1999 according to Census 2000
- The median family income in 1999 according to Census 2000
- The percentage of families at or below the federal poverty level in 1999 according to Census 2000
- The nonelderly nonfiler rate—the percentage of nonelderly individuals who were not claimed on tax returns—according to individual income tax data
- An indicator that the state extended categorical eligibility to most low income households in the prior year

The first and sixth predictors are obtained from administrative data and population estimates and the second through fifth predictors are from the decennial census. The last predictor is based on information provided by the U.S Department of Agriculture's Food and Nutrition Service. These seven predictors were selected as the best from a longer list described in Appendix A, which provides complete definitions and sources for the predictors. Appendix A also presents the regression estimates and their standard errors. The standard errors tend to be fairly equal across the states and much smaller than the largest standard errors for direct sample estimates, reflecting substantial gains in precision from regression for the states with the most error-prone direct sample estimates.

Comparing how the direct sample and regression estimators use data reveals how the regression estimator "borrows strength" to improve precision. When we derived direct sample estimates in Step 1, we used only one year's CPS sample data from North Dakota to estimate North Dakota's participation rate in that year, even though North Dakota, like nearly all states, has a small CPS sample. Deriving regression estimates in this step, we estimated a regression line from sample, administrative, and census data for multiple years and all the states and used the estimated line (with administrative and census data for North Dakota) to predict North Dakota's participation rate in a given year. In other words, the regression estimator not only uses the sample estimates from every state for multiple years to develop a regression estimate for a single state in a single year but also incorporates data from outside the sample, namely, data in administrative records systems and the census. To improve precision even further, the estimator borrows strength across groups—all eligible people and the working poor—by deriving estimates for the groups jointly.

The regression estimator improves precision by using more data. It uses that additional data to identify states with direct sample estimates that seem too high or too low because of sampling

error, that is, error from drawing a sample—a subset of the population—that has a higher or lower participation rate than the entire state population has. For example, suppose a state has a low FSP prevalence rate and values for other predictors that are consistent with a low FSP participation rate. Then, our regression estimator would predict a low participation rate for that state, implying that a direct sample estimate showing a high rate is too high. The regression estimate will be lower than the direct sample estimate for such a state. On the other hand, if the sample data for a state show a much lower participation rate than expected in light of the FSP prevalence rate and the other predictors, the regression estimate for that state will be higher than the sample estimate.

3. Using "shrinkage" methods, average the direct sample estimates and regression predictions to obtain preliminary shrinkage estimates of state FSP participation rates

As noted before, the limitation of the direct sample estimator is imprecision. The limitation of the regression estimator is called "bias." Some states really have higher or lower participation rates than we expect (and predict with the regression estimator) based on the FSP prevalence rate and other predictors used. Such errors in regression estimates reflect bias.

These limitations arise for the following reasons. The direct sample estimator uses relatively little information. It uses only the typically small number of sample observations for one state and one year to obtain an estimate for that state and year. It does not use sample data for other states or other years or data from other sources, such as administrative records or the census. Although the regression estimator borrows strength, using data from all the states and multiple years as well as administrative and census data, it makes no further use of the sample data after estimating the regression line. It treats the entire difference between the sample and regression estimates as sampling error, that is, error in the direct sample estimate. No allowance is made for prediction error, that is, error in the regression estimate. Although not all, if any, true state

participation rates lie on the regression line, the assumption underlying the regression estimator is that they do.

Using all of the information at hand, a shrinkage estimator addresses the limitations of the direct sample and regression estimators by combining the sample and regression estimates, striking a compromise. As illustrated in Figure II.3, a shrinkage estimator takes a weighted average of the sample and regression estimates, weighting them according to their relative accuracy. We calculated weights using the empirical Bayes methods described in Appendix A. Generally, the more precise the direct sample estimate for a state, the closer the shrinkage estimate will be to it. The larger samples drawn in large states support more precise direct sample estimates, so shrinkage estimates tend to be closer to the direct sample estimates for large states. Given the precision of the direct sample estimate for a state, the weight given to the regression estimate depends on how well the regression line "fits." If we find good predictors reflecting why some states have higher participation rates than other states, we say that the regression line "fits well." The shrinkage estimate will be closer to the regression estimate and farther from the direct sample estimate when the regression line fits well than when the line fits poorly. Striking a compromise between the direct sample and regression estimators, the shrinkage estimator strikes a compromise between imprecision and bias. The direct sample and regression estimates are optimally weighted to improve accuracy by minimizing a measure of error that reflects both imprecision and bias. By accepting a little bias, the shrinkage estimator may be substantially more precise than the direct sample estimator. By sacrificing a little precision, the shrinkage estimator may be substantially less biased than the regression estimator. The shrinkage estimator optimizes the tradeoff between imprecision and bias.

FIGURE II.3

SHRINKAGE ESTIMATION

Poor predictions or state with relatively large sample ⇒ more weight on direct sample estimate:

Good predictions or state with relatively small sample ⇒ more weight on regression estimate:

In the next step of our estimation procedure, we make some fairly small adjustments to the shrinkage estimates that we derive in this step. Thus, we call the estimates from this step "preliminary" and the estimates from the next step "final."

4. Adjust the preliminary shrinkage estimates to obtain final shrinkage estimates of state FSP participation rates

We adjusted the preliminary shrinkage estimates of participation rates so that the eligibles counts implied by the rates sum to the national eligibles count estimated directly from the CPS. This adjustment was carried out separately for each year and for the two groups of eligible people (all eligible people and the working poor). The following description of the adjustment will focus on the 2006 estimates for all eligible people. In Appendix A, we describe the results of

the adjustment for other years and for the working poor and discuss our adjustment method in more detail.

To implement the adjustment, we calculated preliminary estimates of eligibles counts from the preliminary estimates of participation rates derived in Step 3 and the administrative estimates of the numbers of FSP participants obtained in Step 1. The state eligibles counts summed to 38,020,579 for 2006, while the national total for 2006 estimated directly from the CPS was 37,417,632. To obtain estimated eligibles counts for states that sum (aside from rounding error) to the direct estimate of the national total, we multiplied each of the preliminary eligibles counts by 37,417,632 ÷ 38,020,579 (≈ 0.9841). Such benchmarking of estimates for smaller areas to a relatively precise estimated total for a larger area is common practice.

Applying this adjustment, we obtained our final shrinkage estimates of the numbers of people eligible for the FSP. From those estimates and our administrative estimates of the numbers of FSP participants, we derived final shrinkage estimates of participation rates. Our final shrinkage estimates are presented in the next chapter.

III. STATE ESTIMATES OF FOOD STAMP PROGRAM PARTICIPATION RATES AND NUMBERS OF ELIGIBLE PEOPLE FOR 2004 TO 2006 FOR ALL ELIGIBLE PEOPLE AND THE WORKING POOR

Tables III.1 and III.2 present our final shrinkage estimates of FSP participation rates in each state for 2004 to 2006 for all eligible people and for the working poor, respectively. For those same years, Tables III.3 and III.4 display our final shrinkage estimates of the number of people eligible for the FSP and the number of eligible working poor in each state.

These shrinkage estimates are relatively precise; they have much smaller standard errors and narrower confidence intervals than the CPS direct sample estimates. Tables III.5 to III.10 display approximate 90-percent confidence intervals showing the uncertainty remaining after using shrinkage estimation. One interpretation of such an interval is that there is a 90-percent chance that the true value—that is, the true participation rate or the true number of eligible people—falls within the estimated bounds. For example, while our best estimate is that North Dakota's participation rate for all eligible people was 57 percent in 2006 (see Table III.1), the true rate may have been higher or lower. However, according to Table III.7, the chances are 90 in 100 that the true rate was between 51 and 63 percent, an interval that is 69 percent as wide as the interval (47 to 64 percent, as cited in Chapter I) around the direct sample estimate. A narrower interval means that we are less uncertain about the true value. According to our calculations, a shrinkage confidence interval for a participation rate is, on average, only about 60 percent as wide as the corresponding sample confidence interval. Thus, shrinkage substantially improves precision and reduces our uncertainty.

Despite the impressive gains in precision, however, substantial uncertainty about the true participation rates for some states remains even after the application of shrinkage methods. Nevertheless, as discussed in Cunnyngham, Castner, and Schirm (2008), the shrinkage estimates

are sufficiently precise to show, for example, whether a state's FSP participation rate was probably near the top, near the bottom, or in the middle of the distribution of rates in a given year. That is enough information for many important purposes, such as guiding an initiative to improve program performance.

TABLE III.1

FINAL SHRINKAGE ESTIMATES OF FOOD STAMP PROGRAM PARTICIPATION RATES,
ALL ELIGIBLE PEOPLE
(Percent)

	2004	2005	2006
Alabama	60	66	66
Alaska	60	67	63
Arizona	62	62	61
Arkansas	71	77	77
California	48	49	50
Colorado	52	53	54
Connecticut	59	65	65
Delaware	62	65	73
District of Columbia	77	73	86
Florida	57	59	62
Georgia	66	70	68
Hawaii	73	72	72
Idaho	58	59	57
Illinois	69	76	79
Indiana	67	72	74
Iowa	59	66	71
Kansas	54	59	59
Kentucky	72	77	78
Louisiana	74	80	75
Maine	81	86	96
Maryland	52	54	60
Massachusetts	48	52	61
Michigan	65	72	80
Minnesota	63	67	69
Mississippi	59	61	63
Missouri	86	95	98
Montana	58	61	62
Nebraska	62	66	67
Nevada	53	51	54
New Hampshire	61	64	68
New Jersey	55	59	60
New Mexico	65	69	71
New York	55	60	63
North Carolina	60	63	67
North Dakota	51	53	57
Ohio	62	67	70
Oklahoma	67	70	69
Oregon	79	80	85
Pennsylvania	65	71	75
Rhode Island	53	56	55
South Carolina	67	70	74
South Dakota	53	56	58
Tennessee	85	91	91
Texas	56	59	63
Utah	58	61	56
Vermont	70	75	80
Virginia	63	66	69
Washington	67	68	75
West Virginia	76	78	83
Wisconsin	55	59	67
Wyoming	51	52	53
United States	61	65	67

TABLE III.2

FINAL SHRINKAGE ESTIMATES OF FOOD STAMP PROGRAM PARTICIPATION RATES, WORKING POOR
(Percent)

	2004	2005	2006
Alabama	54	63	58
Alaska	57	67	62
Arizona	49	49	50
Arkansas	61	72	68
California	34	35	36
Colorado	42	36	40
Connecticut	48	45	45
Delaware	57	59	65
District of Columbia	34	34	43
Florida	42	46	50
Georgia	58	62	59
Hawaii	60	65	62
Idaho	50	53	52
Illinois	59	65	66
Indiana	65	72	72
Iowa	52	58	65
Kansas	47	50	51
Kentucky	65	75	71
Louisiana	71	81	70
Maine	77	87	93
Maryland	44	40	45
Massachusetts	39	34	42
Michigan	66	72	78
Minnesota	45	45	49
Mississippi	50	58	55
Missouri	78	90	92
Montana	51	56	56
Nebraska	51	54	55
Nevada	37	37	43
New Hampshire	53	55	59
New Jersey	48	45	45
New Mexico	61	73	69
New York	43	46	48
North Carolina	51	56	58
North Dakota	51	51	54
Ohio	59	63	64
Oklahoma	60	66	62
Oregon	68	70	74
Pennsylvania	59	65	68
Rhode Island	40	37	36
South Carolina	63	68	67
South Dakota	52	56	56
Tennessee	74	85	81
Texas	49	57	56
Utah	48	54	49
Vermont	62	68	73
Virginia	53	55	58
Washington	55	59	65
West Virginia	70	80	79
Wisconsin	51	54	61
Wyoming	53	54	53
United States	52	56	57

TABLE III.3

FINAL SHRINKAGE ESTIMATES OF NUMBERS OF PEOPLE ELIGIBLE FOR THE FOOD STAMP PROGRAM, ALL ELIGIBLE PEOPLE
(Thousands)

	2004	2005	2006
Alabama	810	787	809
Alaska	82	80	87
Arizona	829	859	852
Arkansas	480	477	481
California	3,838	4,018	3,931
Colorado	457	450	451
Connecticut	325	306	312
Delaware	83	86	82
District of Columbia	112	118	99
Florida	2,056	2,110	1,911
Georgia	1,264	1,278	1,337
Hawaii	133	127	121
Idaho	152	154	156
Illinois	1,514	1,499	1,519
Indiana	763	745	763
Iowa	296	304	309
Kansas	305	295	302
Kentucky	746	732	733
Louisiana	934	886	835
Maine	163	166	156
Maryland	501	508	483
Massachusetts	679	670	678
Michigan	1,375	1,328	1,292
Minnesota	374	370	371
Mississippi	627	621	639
Missouri	783	788	797
Montana	130	130	125
Nebraska	179	176	177
Nevada	222	235	213
New Hampshire	77	79	81
New Jersey	670	650	662
New Mexico	339	340	335
New York	2,865	2,852	2,778
North Carolina	1,234	1,236	1,257
North Dakota	77	76	70
Ohio	1,500	1,460	1,476
Oklahoma	599	581	610
Oregon	482	491	456
Pennsylvania	1,459	1,433	1,421
Rhode Island	138	132	130
South Carolina	728	729	708
South Dakota	99	98	100
Tennessee	927	913	921
Texas	3,896	3,932	3,837
Utah	211	211	230
Vermont	59	57	56
Virginia	758	722	712
Washington	649	743	702
West Virginia	327	327	311
Wisconsin	562	535	499
Wyoming	49	48	45
United States	37,921	37,951	37,418

TABLE III.4

FINAL SHRINKAGE ESTIMATES OF NUMBERS OF PEOPLE ELIGIBLE FOR THE FOOD STAMP PROGRAM, WORKING POOR
(Thousands)

	2004	2005	2006
Alabama	371	331	346
Alaska	43	38	40
Arizona	447	456	521
Arkansas	221	220	235
California	2,108	2,087	2,171
Colorado	254	233	220
Connecticut	104	127	129
Delaware	40	40	41
District of Columbia	30	38	30
Florida	1,007	997	878
Georgia	582	621	704
Hawaii	69	57	58
Idaho	91	85	88
Illinois	677	674	697
Indiana	329	333	336
Iowa	143	151	159
Kansas	141	137	164
Kentucky	296	266	299
Louisiana	453	392	383
Maine	59	59	61
Maryland	181	209	223
Massachusetts	212	237	218
Michigan	586	591	570
Minnesota	175	191	168
Mississippi	294	285	299
Missouri	351	410	464
Montana	65	64	64
Nebraska	91	77	94
Nevada	110	104	109
New Hampshire	29	32	33
New Jersey	236	258	300
New Mexico	174	163	176
New York	1,052	1,116	1,267
North Carolina	547	534	551
North Dakota	37	36	33
Ohio	647	641	645
Oklahoma	298	276	293
Oregon	249	224	202
Pennsylvania	584	579	573
Rhode Island	46	56	39
South Carolina	330	304	326
South Dakota	48	44	52
Tennessee	432	337	376
Texas	2,116	2,101	2,096
Utah	122	122	126
Vermont	23	23	22
Virginia	363	311	324
Washington	281	318	314
West Virginia	124	116	122
Wisconsin	284	243	245
Wyoming	26	25	22
United States	17,582	17,370	17,907

TABLE III.5

APPROXIMATE 90-PERCENT CONFIDENCE INTERVALS FOR FINAL SHRINKAGE ESTIMATES FOR 2004, ALL ELIGIBLE PEOPLE

	Participation Rate (Percent)		Number of Eligible People (Thousands)	
	Lower Bound	Upper Bound	Lower Bound	Upper Bound
Alabama	56	64	758	862
Alaska	56	64	76	87
Arizona	57	68	754	905
Arkansas	67	75	452	508
California	46	50	3,649	4,026
Colorado	48	57	422	492
Connecticut	53	65	291	359
Delaware	57	67	77	90
District of Columbia	71	84	102	121
Florida	54	60	1,950	2,162
Georgia	62	71	1,175	1,353
Hawaii	67	79	122	144
Idaho	53	63	139	165
Illinois	65	73	1,434	1,595
Indiana	62	72	705	820
Iowa	55	63	274	318
Kansas	49	59	279	331
Kentucky	67	76	700	791
Louisiana	68	79	867	1,001
Maine	76	86	153	174
Maryland	48	57	458	544
Massachusetts	44	52	628	730
Michigan	62	68	1,308	1,443
Minnesota	58	68	344	405
Mississippi	56	63	592	663
Missouri	81	90	743	823
Montana	54	62	121	138
Nebraska	57	66	167	192
Nevada	48	58	202	243
New Hampshire	55	67	70	84
New Jersey	49	60	601	740
New Mexico	61	68	319	359
New York	52	58	2,706	3,024
North Carolina	57	64	1,154	1,313
North Dakota	46	57	68	85
Ohio	58	65	1,406	1,594
Oklahoma	62	71	559	640
Oregon	73	84	449	516
Pennsylvania	61	69	1,364	1,553
Rhode Island	49	58	127	150
South Carolina	63	71	688	768
South Dakota	49	56	92	106
Tennessee	79	91	864	991
Texas	53	59	3,686	4,107
Utah	54	62	197	225
Vermont	65	76	55	64
Virginia	58	67	705	812
Washington	62	72	604	695
West Virginia	72	80	309	346
Wisconsin	52	59	528	596
Wyoming	46	56	44	54
United States	60	62	37,311	38,530

TABLE III.6

APPROXIMATE 90-PERCENT CONFIDENCE INTERVALS FOR FINAL SHRINKAGE ESTIMATES FOR 2005, ALL ELIGIBLE PEOPLE

	Participation Rate (Percent)		Number of Eligible People (Thousands)	
	Lower Bound	Upper Bound	Lower Bound	Upper Bound
Alabama	63	70	741	833
Alaska	62	73	74	87
Arizona	57	67	794	924
Arkansas	72	82	448	507
California	46	51	3,831	4,205
Colorado	49	58	414	486
Connecticut	59	70	278	334
Delaware	60	70	79	93
District of Columbia	67	79	108	127
Florida	55	63	1,974	2,246
Georgia	66	74	1,200	1,356
Hawaii	66	79	116	138
Idaho	54	64	141	167
Illinois	72	80	1,415	1,583
Indiana	68	77	696	794
Iowa	62	70	286	322
Kansas	54	63	273	317
Kentucky	72	81	688	775
Louisiana	74	86	822	951
Maine	80	92	155	178
Maryland	49	59	463	553
Massachusetts	48	56	615	726
Michigan	69	76	1,260	1,395
Minnesota	61	72	338	402
Mississippi	56	66	574	669
Missouri	89	100	741	834
Montana	56	65	120	140
Nebraska	62	70	164	188
Nevada	46	56	214	257
New Hampshire	58	69	72	86
New Jersey	55	64	599	700
New Mexico	65	74	320	361
New York	58	63	2,727	2,977
North Carolina	59	67	1,159	1,314
North Dakota	48	58	68	83
Ohio	64	70	1,395	1,525
Oklahoma	65	74	545	618
Oregon	74	85	457	526
Pennsylvania	67	75	1,347	1,519
Rhode Island	52	60	122	141
South Carolina	66	74	685	773
South Dakota	52	61	90	105
Tennessee	85	96	856	970
Texas	55	62	3,691	4,173
Utah	56	67	192	230
Vermont	69	80	52	61
Virginia	61	70	676	768
Washington	62	73	685	802
West Virginia	73	83	307	348
Wisconsin	55	63	499	572
Wyoming	47	58	43	53
United States	64	66	37,340	38,561

TABLE III.7

APPROXIMATE 90-PERCENT CONFIDENCE INTERVALS FOR FINAL SHRINKAGE ESTIMATES FOR 2006, ALL ELIGIBLE PEOPLE

	Participation Rate (Percent)		Number of Eligible People (Thousands)	
	Lower Bound	Upper Bound	Lower Bound	Upper Bound
Alabama	62	70	758	860
Alaska	58	68	80	93
Arizona	56	66	782	921
Arkansas	72	81	454	508
California	48	52	3,788	4,074
Colorado	50	59	416	487
Connecticut	59	72	282	342
Delaware	68	78	76	87
District of Columbia	79	94	91	108
Florida	58	66	1,799	2,023
Georgia	64	72	1,264	1,411
Hawaii	66	78	111	131
Idaho	52	62	143	170
Illinois	75	83	1,435	1,603
Indiana	68	79	709	816
Iowa	67	76	289	329
Kansas	54	63	279	326
Kentucky	74	83	692	773
Louisiana	69	80	772	897
Maine	90	100	146	165
Maryland	54	65	442	524
Massachusetts	57	65	632	724
Michigan	76	83	1,235	1,349
Minnesota	63	74	342	401
Mississippi	59	68	593	684
Missouri	93	100	754	840
Montana	58	67	116	134
Nebraska	62	71	165	188
Nevada	49	60	193	234
New Hampshire	63	74	74	87
New Jersey	55	65	604	719
New Mexico	67	75	317	354
New York	60	66	2,643	2,913
North Carolina	63	71	1,181	1,333
North Dakota	51	63	63	77
Ohio	66	73	1,394	1,559
Oklahoma	66	73	580	640
Oregon	79	91	425	486
Pennsylvania	71	79	1,347	1,495
Rhode Island	51	59	120	140
South Carolina	69	78	664	753
South Dakota	53	62	92	108
Tennessee	86	97	868	973
Texas	60	67	3,617	4,057
Utah	51	61	210	251
Vermont	75	85	53	60
Virginia	65	73	666	757
Washington	69	80	651	752
West Virginia	78	87	294	327
Wisconsin	62	71	464	534
Wyoming	47	58	41	50
United States	66	69	36,844	37,992

TABLE III.8

APPROXIMATE 90-PERCENT CONFIDENCE INTERVALS FOR FINAL SHRINKAGE ESTIMATES FOR 2004, WORKING POOR

	Participation Rate (Percent)		Number of Eligible People (Thousands)	
	Lower Bound	Upper Bound	Lower Bound	Upper Bound
Alabama	48	60	330	413
Alaska	50	63	38	48
Arizona	41	57	372	522
Arkansas	54	67	198	245
California	31	37	1,914	2,302
Colorado	36	47	222	286
Connecticut	42	55	90	119
Delaware	48	65	34	46
District of Columbia	25	43	23	38
Florida	38	47	902	1,112
Georgia	50	65	507	658
Hawaii	52	68	60	78
Idaho	43	56	80	103
Illinois	54	65	614	740
Indiana	58	72	293	364
Iowa	47	58	128	158
Kansas	42	53	124	158
Kentucky	59	71	269	323
Louisiana	63	80	399	508
Maine	68	85	52	65
Maryland	38	50	156	207
Massachusetts	32	45	178	247
Michigan	60	72	529	643
Minnesota	39	52	150	200
Mississippi	46	55	266	322
Missouri	71	85	320	381
Montana	45	57	58	72
Nebraska	46	57	82	100
Nevada	31	43	93	128
New Hampshire	45	62	24	33
New Jersey	41	56	200	272
New Mexico	54	68	155	193
New York	38	48	926	1,178
North Carolina	45	57	484	609
North Dakota	44	59	32	43
Ohio	53	64	589	706
Oklahoma	53	67	264	333
Oregon	59	77	217	282
Pennsylvania	53	65	524	644
Rhode Island	34	46	39	53
South Carolina	56	70	295	366
South Dakota	45	59	41	54
Tennessee	65	83	380	484
Texas	44	54	1,912	2,319
Utah	42	54	107	136
Vermont	54	70	20	26
Virginia	46	59	320	406
Washington	48	62	247	316
West Virginia	62	79	110	139
Wisconsin	46	55	260	309
Wyoming	45	60	22	30
United States	51	54	17,067	18,097

TABLE III.9

APPROXIMATE 90-PERCENT CONFIDENCE INTERVALS FOR FINAL SHRINKAGE ESTIMATES FOR 2005, WORKING POOR

	Participation Rate (Percent)		Number of Eligible People (Thousands)	
	Lower Bound	Upper Bound	Lower Bound	Upper Bound
Alabama	56	69	296	366
Alaska	59	75	33	42
Arizona	42	55	396	516
Arkansas	65	79	199	242
California	30	39	1,839	2,336
Colorado	31	41	202	264
Connecticut	37	53	104	150
Delaware	50	69	34	46
District of Columbia	23	46	25	50
Florida	40	52	864	1,130
Georgia	55	69	549	694
Hawaii	56	73	50	65
Idaho	47	59	75	94
Illinois	58	72	602	745
Indiana	64	79	298	369
Iowa	52	64	136	166
Kansas	44	56	120	153
Kentucky	68	81	243	289
Louisiana	72	91	347	437
Maine	77	96	52	65
Maryland	34	47	175	242
Massachusetts	27	42	188	286
Michigan	64	80	526	657
Minnesota	38	52	161	221
Mississippi	50	66	244	326
Missouri	82	99	370	450
Montana	49	63	56	71
Nebraska	48	60	69	86
Nevada	30	43	86	123
New Hampshire	46	63	27	37
New Jersey	38	53	214	302
New Mexico	66	81	146	179
New York	41	52	978	1,254
North Carolina	50	63	474	593
North Dakota	44	59	31	42
Ohio	57	69	582	699
Oklahoma	59	72	248	304
Oregon	61	79	196	253
Pennsylvania	58	72	518	641
Rhode Island	29	44	45	67
South Carolina	61	75	272	337
South Dakota	49	63	39	50
Tennessee	76	93	302	371
Texas	51	63	1,873	2,330
Utah	46	61	105	139
Vermont	60	77	21	26
Virginia	48	62	272	350
Washington	51	67	274	362
West Virginia	71	89	103	130
Wisconsin	47	60	215	271
Wyoming	46	63	21	28
United States	54	58	16,747	17,992

TABLE III.10

APPROXIMATE 90-PERCENT CONFIDENCE INTERVALS FOR FINAL SHRINKAGE ESTIMATES FOR 2006, WORKING POOR

	Participation Rate (Percent)		Number of Eligible People (Thousands)	
	Lower Bound	Upper Bound	Lower Bound	Upper Bound
Alabama	51	64	306	385
Alaska	55	70	35	45
Arizona	43	58	440	602
Arkansas	62	74	215	256
California	32	40	1,924	2,419
Colorado	34	46	188	252
Connecticut	36	54	104	154
Delaware	56	75	35	47
District of Columbia	32	54	22	37
Florida	44	56	773	982
Georgia	52	65	624	785
Hawaii	55	70	51	65
Idaho	45	59	76	99
Illinois	60	73	631	763
Indiana	64	79	302	371
Iowa	59	71	143	174
Kansas	45	57	144	184
Kentucky	65	78	272	326
Louisiana	60	79	330	436
Maine	84	100	55	67
Maryland	38	53	186	261
Massachusetts	35	49	182	254
Michigan	70	86	512	628
Minnesota	43	55	146	190
Mississippi	48	62	260	339
Missouri	83	100	420	509
Montana	49	64	55	72
Nebraska	48	61	83	105
Nevada	36	50	92	126
New Hampshire	51	68	28	38
New Jersey	38	53	252	348
New Mexico	61	76	157	196
New York	42	53	1,117	1,417
North Carolina	52	64	494	607
North Dakota	45	63	28	39
Ohio	58	70	585	705
Oklahoma	56	68	264	321
Oregon	65	83	177	227
Pennsylvania	61	74	519	627
Rhode Island	29	42	32	46
South Carolina	60	75	290	361
South Dakota	49	64	45	59
Tennessee	74	88	343	409
Texas	50	62	1,878	2,314
Utah	43	56	109	143
Vermont	65	82	20	25
Virginia	52	65	288	360
Washington	57	72	276	352
West Virginia	71	87	110	135
Wisconsin	54	68	217	274
Wyoming	45	61	19	25
United States	55	59	17,309	18,505

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APPENDIX A

THE ESTIMATION PROCEDURE: ADDITIONAL TECHNICAL DETAILS

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This appendix provides additional information and technical details about our four-step procedure to estimate state Food Stamp Program (FSP) participation rates for all eligible people and the working poor. Each step is discussed in turn.

1. From CPS data and FSP administrative data, derive direct sample estimates of state FSP participation rates for each of the three years 2004 to 2006

Tables A.1 and A.2 display direct sample estimates of participation rates for all eligible people and for the working poor, respectively. Tables A.3 and A.4 present standard errors for the direct sample estimates. The method for obtaining the standard errors is described later.

We derived direct sample estimates of participation rates for all eligible people for a given year according to:

$$(1) \quad Y_{1,i} = 100 \frac{P_i(\varepsilon_{1,i}/100)}{(E_{1,i}/100)T_i},$$

where $Y_{1,i}$ is the estimated participation rate for all eligible people for state i; P_i is the number of people participating in the FSP in the year in question according to FSP Statistical Summary of Operations ("Program Operations") data; $\varepsilon_{1,i}$ is the "correctly-eligible" rate, that is the percentage of participating people who are correctly receiving benefits according to FSP Quality Control (FSPQC) data, calculated as 100 minus the payment error rate; $E_{1,i}$ is the number of people who are eligible for the FSP according to the CPS, expressed as a percentage of the CPS population; and T_i is the resident population according to decennial census and administrative records (mainly vital statistics) data.[1,2,3,4]

[1] P_i is adjusted to exclude from our estimate of participants those people who received FSP benefits only because of a natural disaster, are not otherwise eligible, and, thus, are not included in our estimate of eligibles. The adjustment allows us to measure a state's participation rate under "normal" circumstances. Because P_i is obtained from FSP Program Operations data, which include the full population of FSP cases, it is not subject to sampling error. Participant figures, including counts of participants eligible only through disaster assistance, were provided by the Food and Nutrition Service (FNS).

Similarly, we derived sample estimates of participation rates for the working poor for a given year according to:

$$(2) \quad Y_{2,i} = 100 \frac{P_i(\varepsilon_{2,i}/100)}{(E_{2,i}/100)T_i},$$

where $Y_{2,i}$ is the estimated participation rate for the working poor for state i; $\varepsilon_{2,i}$ is the percentage of participating people who are working poor and correctly receiving FSP benefits according to FSPQC data;[5] $E_{2,i}$ is the number of people who are working poor and eligible for the FSP according to the CPS, expressed as a percentage of the CPS population; and P_i and T_i are as defined above.

As noted, we estimated eligibility percentages rather than eligibility counts from the CPS. Estimated percentages are more precise than estimated counts because the sampling errors in the numerators and denominators of percentages tend to be positively correlated and, therefore, partially "cancel out."

Table A.5 presents estimates of the number of people participating in the FSP, and Table A.6 presents the population totals. Table A.7 presents the percentages of participating people who are correctly receiving FSP benefits, and Table A.8 presents the percentages of participating

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(continued)

[2] We adjusted for payment errors in order to exclude from our estimates of participants those people who were ineligible for the FSP and, thus, are not included in our estimates of eligibles.

[3] We obtained estimates for 2004 to 2006 from the March CPS samples for 2005 to 2007, for which the survey instruments collected family income data for the prior calendar years, that is, 2004 to 2006.

[4] In broad terms, the population estimates derived by the Census Bureau in its Population Estimates Program are obtained by subtracting from census counts people "exiting" the population (due to death or net out-migration) and adding people "entering" the population (due to birth or net in-migration). The estimates for all three years were released in May 2008 at http://www.census.gov/popest/datasets.html. The population estimates pertain to July 1 of each year.

[5] We use the same payment error adjustment methodology for eligible working poor participants as for all eligible participants.

people who are correctly receiving FSP benefits and are working poor. Tables A.9 and A.10 display direct sample estimates of FSP eligibility percentages for all eligible people and for the working poor, respectively.

We define as "working poor" any person who is eligible for the FSP and lives in a household in which a member earns money from a job. Working poor who are participating in the FSP are identified slightly differently in the FSPQC data than in the CPS. In the FSQPC data, they are identified not just by their earnings but also by other indicators of earnings that suggest a household was very likely to have a member who worked. Specifically, a household is identified as working poor if the household had earnings according to the edited FSPQC datafile, or if prior to the editing process, multiple earnings indicators suggest that a member of the household was working (Figure A.1).[6] In Table A.11 we show the percentage of participating households that are correctly eligible and working poor based on the indicators that suggest a member was working. The first column shows the percentage of participants in households identified as working poor based on the edited FSPQC datafile. The second column shows the additional percentage that were counted as working poor based on other household information.

We derived FSP eligibility estimates for states by applying FSP rules to CPS households. However, some key information needed to determine whether a household is eligible for the FSP is not collected in the CPS. For example, there are no data on asset balances or expenses deductible from gross income. Also, it is not possible to ascertain directly which members of a dwelling unit purchase and prepare food together or which members may be ineligible for the FSP under provisions of the Personal Responsibility and Work Opportunity Reconciliation Act of 1996 (P.L. 104-193) and subsequent legislation pertaining to noncitizens and nondisabled

[6] Wolkwitz and Ewell (2008) describe the procedure for editing the FSPQC data to ensure consistency between a household's income and FSP benefit.

childless adults ages 18 to 50. Yet another limitation is that only annual, rather than monthly, income amounts are recorded.

FIGURE A.1

ALGORITHM TO IDENTIFY WORKING POOR HOUSEHOLDS

A household is identified as working poor if it meets one of the following criteria:

1. Earnings in the edited FSPQC data
2. Multiple indicators of earnings in the unedited FSPQC data
    a. At least one person with recorded earned income AND
        i. A recorded earned income deduction or at least one person with a recorded workforce participation variable indicating he or she is employed

        OR

        ii. Recorded earned and unearned income that sum to the recorded total income, or recorded earned income with the earned income deduction already subtracted and unearned income that sum to the recorded total income (some states subtract the earned income deduction from income deemed by an ineligible member before recording it on the file)

    b. A recorded earned income deduction AND
        i. At least one person with a recorded workforce participation variable indicating that he or she is employed

        OR

        ii. Earnings implied by the recorded earned income deduction and recorded unearned income that sum to the recorded total income

        OR

        iii. Recorded gross income that is more than the earned income implied by the earned income deduction and both unearned and earned income equal zero (to account for household records that have no recorded individual income amounts but do have what appear to be consistent household-level indicators)

Methods have been developed to address these data limitations. These methods—including procedures for identifying the members of the FSP household within the (potentially) larger CPS household, taking account of the restrictions on participation by noncitizens and nonelderly nondisabled childless adults, distributing annual amounts across months, and imputing net income—are described in Wolkwitz (2008) and earlier reports in that series.[7,8]

In addition to our point estimates of participation rates, we need estimates of their sampling variability. We can estimate the variances of $Y_{1,i}$ and $Y_{2,i}$ as follows:[9]

$$\text{(3)} \quad \begin{aligned} \text{var}(Y_{1,i}) &= \text{variance due to } E_{1,i} \text{ when } \varepsilon_{1,i} \text{ is fixed} + \text{variance due to } \varepsilon_{1,i} \text{ when } E_{1,i} \text{ is fixed} \\ &= \text{var}_{E_1|\varepsilon_1}(Y_{1,i}) + \text{var}_{\varepsilon_1|E_1}(Y_{1,i}) \end{aligned}$$

and

$$\text{(4)} \quad \begin{aligned} \text{var}(Y_{2,i}) &= \text{variance due to } E_{2,i} \text{ when } \varepsilon_{2,i} \text{ is fixed} + \text{variance due to } \varepsilon_{2,i} \text{ when } E_{2,i} \text{ is fixed} \\ &= \text{var}_{E_2|\varepsilon_2}(Y_{2,i}) + \text{var}_{\varepsilon_2|E_2}(Y_{2,i}). \end{aligned}$$

When a variable is held fixed, we fix it at its point estimate. Note that we do not include covariance terms in these expressions because the estimates of $E_{1,i}$ and $\varepsilon_{1,i}$—like the estimates of $E_{2,i}$ and $\varepsilon_{2,i}$—are based on independent samples.

[7] These reports also describe how we applied the FSP gross and net income tests and calculated the benefits for which an eligible household would qualify.

[8] Because our focus in this document is on participation among people who are eligible for the FSP, these estimates of FSP eligibility counts and participation rates do not include people who are not legally entitled to receive FSP benefits, such as Supplemental Security Income (SSI) recipients in California who receive cash in lieu of FSP benefits. We excluded these SSI recipients when identifying the members of FSP households. It might be useful in other contexts, however, to consider participation rates among those eligible for the FSP or a cash substitute.

[9] Correctly-eligible rates are estimated from FSPQC sample data and are subject to sampling error, although it is small relative to other sources of error in the estimated participation rates. In taking into account this sampling error when deriving the estimates presented here, we take into account its correlation with the sampling error associated with the identification of the working poor participants, also estimated using the FSPQC data. That is, we take into account the correlation between $\varepsilon_{1,i}$, the correctly eligible rate, and $\varepsilon_{2,i}$, the correctly eligible working poor rate.

For a given year, we estimated $\text{var}_{E_1|\varepsilon_1}(Y_{1,i})$ and $\text{var}_{E_2|\varepsilon_2}(Y_{2,i})$ using the jackknife estimator proposed by Rao, Wu, and Yue (1992), treating CPS rotation groups as clusters. To obtain the first of these variances, for example, we let $Z_{1,i}$ equal the CPS sample estimate of the number of eligible people in state *i* (*i* = 1, 2, ..., 51) and $Z_{1,i,r}$ equal the contribution of rotation group *r* (*r* = 1, 2, ..., 8) to that estimate. In other words:

$$(5) \quad Z_{1,i} = \sum_{r=1}^{8} Z_{1,i,r} .$$

We also let N_i equal the CPS sample estimate of the population in state *i* and $N_{i,r}$ equal the contribution of rotation group *r* to that estimate. That is:

$$(6) \quad N_i = \sum_{r=1}^{8} N_{i,r} .$$

If, as described before, $E_{1,i}$ equals the CPS sample estimate of the percentage eligible in state *i*:

$$(7) \quad E_{1,i} = 100 \frac{Z_{1,i}}{N_i} .$$

If we were to exclude the observations in rotation group *r*, we could estimate the percentage eligible in state *i* and the participation rate for state *i* by:

$$(8) \quad E_{1,i(r)} = 100 \frac{Z_{1,i} - Z_{1,i,r}}{N_i - N_{i,r}}$$

and

$$(9) \quad Y_{1,i(r)} = 100 \frac{P_i(\varepsilon_{1,i}/100)}{(E_{1,i(r)}/100)T_i} .$$

The "(*r*)" subscript indicates that rotation group *r* has been excluded. By excluding each of the eight rotation groups in turn, we obtain eight alternative estimates for the participation rate in state *i*. Then, we can assess the degree of sampling variability (estimate the variance of $Y_{1,i}$) by measuring the variability among the eight estimates according to:

(10) $$\text{var}_{E_1|\varepsilon_1}(Y_{1,i}) = \frac{7}{8}\sum_{r=1}^{8}(Y_{1,i(r)} - Y_{1,i})^2.$$

The factor 7/8 enters this expression because the $Y_{1,i(r)}$ are obtained from samples that are only 7/8 the size of the full CPS sample for state *i* and, hence, are expected to be more variable than $Y_{1,i}$ (by a factor of 8/7). We obtain jackknife estimates of sampling error variances pertaining to the participation rates for the working poor in the same manner, substituting $Z_{2,i}$, the CPS sample estimate of the number of eligible working poor in state *i*, for $Z_{1,i}$; $Z_{2,i,r}$, the contribution of rotation group *r* to $Z_{2,i}$, for $Z_{1,i,r}$; $E_{2,i}$ for $E_{1,i}$; $E_{2,i(r)}$ for $E_{1,i(r)}$; $\varepsilon_{2,i}$ for $\varepsilon_{1,i}$; and $Y_{2,i(r)}$ for $Y_{1,i(r)}$, in Equations (5) to (9). This results in:

(11) $$\text{var}_{E_2|\varepsilon_2}(Y_{2,i}) = \frac{7}{8}\sum_{r=1}^{8}(Y_{2,i(r)} - Y_{2,i})^2.$$

Then, based on Equation (1) we can estimate $\text{var}_{\varepsilon_1|E_1}(Y_{1,i})$ according to:

(12) $$\text{var}_{\varepsilon_1|E_1}(Y_{1,i}) = \left(100\frac{P_i}{T_i E_{1,i}}\right)^2 \text{var}(\varepsilon_{1,i}),$$

since P_i and T_i are constants (or, at least, subject to negligible sampling variability) and $E_{1,i}$ is held fixed at its point estimate. Also note that we estimated $\varepsilon_{1,i}$ (the correctly-eligible rate) and $\varepsilon_{2,i}$ (the percentage of participants who are working poor and correctly eligible) from the FSPQC sample data as follows:

(13) $$\varepsilon_{1,i} = 100\frac{\sum_h m_{i,h}\varepsilon_{1,i,h}}{\sum_h m_{i,h}},$$

and

$$(14) \quad \varepsilon_{2,i} = 100 \frac{\sum_h m_{i,h} \varepsilon_{2,i,h}}{\sum_h m_{i,h}},$$

where h indexes households in a state's FSPQC sample; $m_{i,h}$ equals the number of people in household h times the weight for household h; $\varepsilon_{1,i,h}$ is an indicator that household h is eligible to receive FSP benefits; and $\varepsilon_{2,i,h}$ is an indicator that household h is working poor and eligible to receive FSP benefits. Then:

$$(15) \quad \text{var}_{\varepsilon_1|E_1}(Y_{1,i}) = \left(100 \frac{P_i}{T_i E_{1,i}}\right)^2 \frac{1}{(\sum_h m_{i,h})^2} \left(\frac{n_i}{n_i - 1}\right) \sum_h m_{i,h}{}^2 \left(\varepsilon_{1,i,h} - \varepsilon_{1,i}\right)^2,$$

where n_i is the total number of households from state i in the FSPQC sample. Similarly, we estimate $\text{var}_{\varepsilon_2|E_2}(Y_{2,i})$ according to:

$$(16) \quad \text{var}_{\varepsilon_2|E_2}(Y_{2,i}) = \left(100 \frac{P_i}{T_i E_{2,i}}\right)^2 \frac{1}{(\sum_h m_{i,h})^2} \left(\frac{n_i}{n_i - 1}\right) \sum_h m_{i,h}{}^2 \left(\varepsilon_{2,i,h} - \varepsilon_{2,i}\right)^2.$$

Summing the estimates from Equations (10) and (15)—as indicated by Equation (3)—and taking the square root of the sum provides an estimated standard error of the participation rate for all eligible people. Similarly, summing the estimates from Equations (11) and (16)—as indicated by Equation (4)—and taking the square root of the sum provides an estimated standard error of the participation rate for the working poor. Estimated standard errors for the direct estimates of participation rates for all eligible people and for the working poor are presented in Tables A.3 and A.4, respectively.

We estimated the covariance between the estimates of participation rates for all eligible people and the working poor, for a given year, according to:[10]

[10] We do not need to include additional terms because the CPS and FSPQC samples are independent.

(17) $\text{cov}(Y_{1,i}, Y_{2,i}) =$ covariance due to $E_{1,i}$ and $E_{2,i}$ when $\varepsilon_{1,i}$ and $\varepsilon_{2,i}$ are fixed
+ covariance due to $\varepsilon_{1,i}$ and $\varepsilon_{2,i}$ when $E_{1,i}$ and $E_{2,i}$ are fixed
$= \text{cov}_{E_1E_2|\varepsilon_1\varepsilon_2}(Y_{1,i}, Y_{2,i}) + \text{cov}_{\varepsilon_1\varepsilon_2|E_1E_2}(Y_{1,i}, Y_{2,i}).$

To derive an estimate of the first term in this expression, we obtained a jackknife estimate of the covariance due to $E_{1,i}$ and $E_{2,i}$ according to:

$$(18) \quad \text{cov}_{E_1E_2|\varepsilon_1\varepsilon_2}(Y_{1,i}, Y_{2,i}) = \frac{7}{8}\sum_{r=1}^{8}(Y_{1,i(r)} - Y_{1,i})(Y_{2,i(r)} - Y_{2,i}).$$

For the second term, we estimated the covariance due to $\varepsilon_{1,i}$ and $\varepsilon_{2,i}$ according to:

$$(19) \quad \text{cov}_{\varepsilon_1\varepsilon_2|E_1E_2}(Y_{1,i}, Y_{2,i}) = \left(100\frac{P_i}{T_iE_{1,i}}\right)\left(100\frac{P_i}{T_iE_{2,i}}\right)\text{cov}(\varepsilon_{1,i}, \varepsilon_{2,i})$$

where:

$$(20) \quad \text{cov}(\varepsilon_{1,i}, \varepsilon_{2,i}) = \frac{1}{(\sum_h m_{i,h})^2}\left(\frac{n_i}{n_i - 1}\right)\sum_h {m_{i,h}}^2\left(\varepsilon_{1,i,h} - \varepsilon_{1,i}\right)\left(\varepsilon_{2,i,h} - \varepsilon_{2,i}\right).$$

Because CPS samples from different years are not independent, participation rates for different years are correlated.[11] We derived a preliminary jackknife estimate of the correlation between $Y_{1,i,t}$ and $Y_{2,i,t-g}$, the sample estimate for all eligibles for one year and the sample estimate for the working poor for g years earlier, according to either:

$$(21) \quad \text{cov}(Y_{1,i,t}, Y_{2,i,t-g}) = \frac{7}{8}\left[\sum_{r=1}^{4}(Y_{1,i(r),t} - Y_{1,i,t})(Y_{2,i(r+4),t-g} - Y_{2,i,t-g}) + \sum_{r=5}^{8}(Y_{1,i(r),t} - Y_{1,i,t})(Y_{2,i(r-4),t-g} - Y_{2,i,t-g})\right],$$

if g is odd, or:

$$(22) \quad \text{cov}(Y_{1,i,t}, Y_{2,i,t-g}) = \frac{7}{8}\left[\sum_{r=1}^{8}(Y_{1,i(r),t} - Y_{1,i,t})(Y_{2,i(r),t-g} - Y_{2,i,t-g})\right],$$

[11] In contrast, FSPQC samples from different years are independent. Hence, sampling variability in estimates from the CPS is the only source of intertemporal covariation between participation rates.

if g is even.

The correlation between $Y_{1,i,t}$ and $Y_{2,i,t-g}$ is:

$$(23) \quad \text{corr}(Y_{1,i,t}, Y_{2,i,t-g}) = \frac{\text{cov}(Y_{1,i,t}, Y_{2,i,t-g})}{\sqrt{\text{var}(Y_{1,i,t})\,\text{var}(Y_{2,i,t-g})}}.$$

To improve the precision of estimated correlations (and covariances), we used a simple smoothing technique in which we "replaced" the state-specific correlation from Equation (23) by the average correlation between $Y_{1,i,t}$ and $Y_{2,i,t-g}$ across states:

$$(24) \quad \overline{\text{corr}}(Y_{1,t}, Y_{2,t-g}) = \frac{\sum_{i=1}^{51}(n_{i,t} + n_{i,t-g})\,\text{corr}(Y_{1,i,t}, Y_{2,i,t-g})}{\sum_{i=1}^{51}(n_{i,t} + n_{i,t-g})},$$

where $n_{i,t}$ and $n_{i,t-g}$ are the (unweighted) number of households in the March CPS samples for one year and g years earlier, respectively. Using this average correlation, we obtained as our final estimate of the covariance between $Y_{1,i,t}$ and $Y_{2,i,t-g}$:

$$(25) \quad \text{cov}(Y_{1,i,t}, Y_{2,i,t-g}) = \overline{\text{corr}}(Y_{1,t}, Y_{2,t-g})\sqrt{\text{var}(Y_{1,i,t})\,\text{var}(Y_{2,i,t-g})}.$$

Other intertemporal covariances—such as the covariance between the participation rates for the working poor in two different years—are similarly estimated. As described under Step 3, the variances and covariances obtained in this step are the elements of a variance-covariance matrix used in deriving shrinkage estimates of participation rates.[12]

[12] All interstate covariances equal zero because state samples are independent in both the CPS and the FSPQC.

2. Using a regression model, predict state FSP participation rates based on administrative and decennial Census data

Our regression model consisted of six equations, with three predicting FSP participation rates for all eligible people in 2004, 2005, and 2006, and three predicting FSP participation rates for the working poor in 2004, 2005, and 2006. The six equations were estimated jointly, and the values of the regression coefficients could vary from equation to equation. The predictors used were (in addition to an intercept):

- The percentage of the population receiving FSP benefits, that is, the FSP prevalence rate
- The percentage of households with no children in 1999 according to Census 2000
- The median household income in 1999 according to Census 2000
- The median family income in 1999 according to Census 2000
- The percentage of families at or below the federal poverty level in 1999 according to Census 2000
- The nonelderly nonfiler rate—the percentage of nonelderly individuals who were not claimed on tax returns—according to individual income tax data
- An indicator that the state extended categorical eligibility to most low income households in the prior year

The values for the second through fifth predictors are the same in each of the six equations of our regression model. For the first predictor and the last two predictors, we used 2004 values in both equations for predicting 2004 participation rates, 2005 values in both equations for predicting 2005 rates, and 2006 values in both equations for predicting 2006 rates. Because prediction errors were allowed to be correlated and intergroup and intertemporal correlations among direct sample estimates were taken into account as specified in the next step, the shrinkage estimates for a group (all eligible people or the working poor) in any one year were determined by the predictions and sample estimates for all three years and both groups.

In addition to the predictors that we selected for our "best" model, we considered many other potential predictors measuring, for example, the elderly poverty rates, the unemployment insurance rate, and the prevalence of a bachelor's degree or higher among adults age 25 or older. All of the predictors considered had three characteristics: (1) they are face valid, that is, it is plausible that they are good indicators of differences among states in FSP participation rates; (2) they could be defined and measured uniformly across states; and (3) they could be obtained from nonsample or highly precise sample data—such as census or administrative records data—and, thus, measured with little or no sampling error.

As shown in the next step, where we describe the regression estimation procedure in more detail, we do not have to calculate regression estimates as a separate step, although we do have to select a best regression model before we can calculate shrinkage estimates. We selected our best model on the basis of its strong relative performance in predicting participation rates, judging performance by examining functions of the regression residuals, such as mean squared error.[13] In addition to assessing the predictive fit of alternative specifications, we checked for potential biases as part of our extensive model evaluation. To check for biases, we looked for a persistent tendency to under- or overpredict the number of eligibles for certain types of states categorized by, for example, population size, region, and percentage of the population that is black or Hispanic. We found no strong evidence of correctable bias.

Definitions and data sources for the predictors in our best regression model are given in Table A.12. The values for the second through fifth predictors listed above are displayed in Table A.13. Values for the other predictors, which vary by year, are presented in Tables A.14 to A.16. Regression estimates of participation rates for all eligible people are in Table A.17, and

[13] The regression equations do not express causal relationships. Rather, they imply only statistical associations. For this reason, predictors are often called "symptomatic indicators." They are symptomatic of differences among states in conditions associated with having higher or lower participation rates.

regression estimates of rates for the working poor are in Table A.18. The standard errors for the regression estimates for all eligible people and for the working poor are in Tables A.19 and A.20, respectively.

3. Using shrinkage methods, average the direct sample estimates and regression predictions to obtain preliminary shrinkage estimates of state FSP participation rates

To average the direct sample estimates and the regression predictions, we used an empirical Bayes shrinkage estimator.[14] The estimator does not have a closed-form expression from which we can calculate shrinkage estimates. Instead, we must numerically integrate over six scalar parameters—σ_1, σ_2, ρ, η_1, η_2, and η_{12}—that measure the lack of fit of the regression model and the correlations among regression prediction errors. To perform the numerical integration, we specified a grid of 7,987,980 equally-spaced points, starting with σ_1 = 0.001, σ_2 = 0.001, ρ = -0.999, η_1 = 0.000, η_2 = 0.000, and η_{12} = -0.999 and incrementing σ_1, σ_2, ρ, η_1, η_2, and η_{12} by 0.500, 0.800, 0.333, 0.300, 0.500, and 0.111, respectively, up to σ_1 = 5.001, σ_2 = 7.201, ρ = 0.999, η_1 = 7.500, η_2 = 10.000, and η_{12} = 0.999. For combination k of σ_1, σ_2, ρ, η_1, η_2, and η_{12} (k = 1, 2, ..., 7987980), we calculated a vector of shrinkage estimates:

$$(26) \quad \theta_k = (\Sigma_k^{-1} + V^{-1})^{-1}(\Sigma_k^{-1} X\hat{B}_k + V^{-1}Y),$$

a variance-covariance matrix:

$$(27) \quad U_k = (\Sigma_k^{-1} + V^{-1})^{-1} + (\Sigma_k^{-1} + V^{-1})^{-1}\Sigma_k^{-1} X(X'(\Sigma_k + V)^{-1}X)^{-1} X'\Sigma_k^{-1}(\Sigma_k^{-1} + V^{-1})^{-1},$$

and a probability:

[14] Although our shrinkage estimator averages direct sample and regression estimates, a state's shrinkage estimate for either all eligible people or the working poor in a given year does not have to be between the direct sample and regression estimates for the group and year in question. It may be above both of those estimates if, for example, they seem too low based on data from other years. In most cases, the shrinkage estimates presented in this report are between the direct sample and regression estimates. In the remaining cases, the shrinkage estimate is usually close to either the sample or regression estimate, and it is often close to both because the sample and regression estimates are close to each other.

$$(28)\quad p_k^* = |\Sigma_k + V|^{-1/2} |X'(\Sigma_k + V)^{-1} X|^{-1/2} \exp\left(-\frac{1}{2}(Y - X\hat{B}_k)'(\Sigma_k + V)^{-1}(Y - X\hat{B}_k)\right).$$

In these expressions, *Y* is a column vector of direct sample estimates (from Step 1) with 306 elements, six sample estimates for each of the 51 states. The first six elements of *Y* pertain to the first state, the next six to the second state, and so forth. For a given state, the first two elements are the 2004 sample estimates for all eligible people and the working poor, respectively; the second two elements are the 2005 estimates; and the final two elements are the 2006 estimates. The vector of shrinkage estimates, θ_k, has the same structure as the vector of sample estimates, *Y*. *V* is the (306 × 306) variance-covariance matrix for the sample estimates. Because state samples are independent in the CPS, *V* is block-diagonal with 51 (6 × 6) blocks. We described under Step 1 how we derived estimates for the elements of *V*. *X* is a (306 × 48) matrix containing values for each of the seven predictors (plus an intercept) for every state, every year (2004, 2005 and 2006), and both groups (all eligible people and the working poor). The first six rows of *X* pertain to the first state, the next six rows pertain to the second state, and so forth. The six rows for state *i* are given by:

$$(29)\quad X_i = \begin{pmatrix} x'_{i11} & \underline{0} & \underline{0} & \underline{0} & \underline{0} & \underline{0} \\ \underline{0} & x'_{i12} & \underline{0} & \underline{0} & \underline{0} & \underline{0} \\ \underline{0} & \underline{0} & x'_{i21} & \underline{0} & \underline{0} & \underline{0} \\ \underline{0} & \underline{0} & \underline{0} & x'_{i22} & \underline{0} & \underline{0} \\ \underline{0} & \underline{0} & \underline{0} & \underline{0} & x'_{i31} & \underline{0} \\ \underline{0} & \underline{0} & \underline{0} & \underline{0} & \underline{0} & x'_{i32} \end{pmatrix},$$

where x'_{it1} is a row vector for year *t* (*t* = 1 for 2004, *t* = 2 for 2005, and *t* = 3 for 2006) with eight elements (an intercept plus the seven predictors listed under Step 2) to predict participation rates for all eligible people. x'_{it2} is a row vector for year *t* with eight elements to predict participation rates for the working poor. $\underline{0}$ is a row vector with eight zeros. In a given year, the values of the

predictors are the same for the equations for all eligible people and for the working poor. Thus, $x'_{it1} = x'_{it2}$. $\hat{B}_k$ is a (48 × 1) vector of regression coefficients, and is given by:

$$(30) \quad \hat{B}_k = (X'(\Sigma_k + V)^{-1} X)^{-1} X'(\Sigma_k + V)^{-1} Y .$$

Finally, Σ_k is a block-diagonal matrix with 51 (6 × 6) blocks, and every block equals:

$$(31) \quad \Sigma_k^* = \begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix} \otimes \begin{pmatrix} \sigma_{1,k}^2 & \sigma_{1,k}\sigma_{2,k}\rho_k \\ \sigma_{1,k}\sigma_{2,k}\rho_k & \sigma_{2,k}^2 \end{pmatrix} + \begin{pmatrix} 1 & 1 & 1 \\ 1 & 1 & 1 \\ 1 & 1 & 1 \end{pmatrix} \otimes \begin{pmatrix} \eta_{1,k}^2 & \eta_{1,k}\eta_{2,k}\eta_{12,k} \\ \eta_{1,k}\eta_{2,k}\eta_{12,k} & \eta_{2,k}^2 \end{pmatrix}.$$

After calculating θ_k , U_k , and p_k^* 7,987,980 times (once for each combination of σ_1, σ_2, ρ, η_1, η_2, and η_{12}), we calculated the probability of ($\sigma_{1,k}$, $\sigma_{2,k}$, ρ_k, $\eta_{1,k}$, $\eta_{2,k}$, $\eta_{12,k}$):

$$(32) \quad p_k = \frac{p_k^*}{\sum_{k=1}^{7,987,980} p_k^*} ,$$

which is also an estimate of the probability that the shrinkage estimates θ_k are the true values. As Equation (32) suggests, the p_k are obtained by normalizing the p_k^* to sum to one.

To complete the numerical integration over σ_1, σ_2, ρ, η_1, η_2, and η_{12} and obtain a single set of shrinkage estimates, we calculated a weighted sum of the 7,987,980 sets of shrinkage estimates, weighting each set θ_k by its associated probability p_k. Thus, our shrinkage estimates are:

$$(33) \quad \theta = \sum_{k=1}^{7,987,980} p_k \theta_k .$$

We call these estimates "preliminary" because we make some fairly small adjustments to them in the next step to derive our "final" estimates. The variance-covariance matrix for our preliminary shrinkage estimates is:

$$(34) \quad U = \sum_{k=1}^{7,987,980} p_k U_k + \sum_{k=1}^{7,987,980} p_k (\theta_k - \theta)(\theta_k - \theta)' .$$

The first term on the right side of this expression reflects the error from sampling variability and the lack of fit of the regression model. The second term captures how the shrinkage estimates vary as σ_1, σ_2, ρ, η_1, η_2, and η_{12} vary. Thus, the second term accounts for the variability from not knowing and, thus, having to estimate σ_1, σ_2, ρ, η_1, η_2, and η_{12}. As described later, standard errors of the final shrinkage estimates for states are calculated as functions of the square roots of the diagonal elements of *U*.

Regression estimates can be similarly obtained. They are:

$$(35) \quad R = \sum_{k=1}^{7,987,980} p_k R_k \ ,$$

where $R_k = X\hat{B}_k$ is the vector of regression estimates obtained when $\sigma_1=\sigma_{1,k}$; $\sigma_2=\sigma_{2,k}$; $\rho = \rho_k$; $\eta_1=\eta_{1,k}$; $\eta_2=\eta_{2,k}$; and $\eta_{12}=\eta_{12,k}$. The variance-covariance matrix is:

$$(36) \quad G = \sum_{k=1}^{7,987,980} p_k G_k + \sum_{k=1}^{7,987,980} p_k (R_k - R)(R_k - R)' \ ,$$

where $G_k = X(X'(\Sigma_k + V)^{-1}X)^{-1}X' + \Sigma_k$. We can estimate the regression coefficient vector by:

$$(37) \quad \hat{B} = \sum_{k=1}^{7,987,980} p_k \hat{B}_k \ .$$

Regression estimates of participation rates for all eligible people and for the working poor were presented before in Tables A.17 and A.18, respectively. Preliminary shrinkage estimates of FSP participation rates are displayed in Tables A.21 and A.22.

4. Adjust the preliminary shrinkage estimates to obtain final shrinkage estimates of state FSP participation rates

We adjusted the preliminary shrinkage estimates of FSP participation rates so that the eligibles counts implied by the rates sum to the national eligibles counts estimated directly from the CPS. This adjustment was carried out for each year and each group separately. The following description of the adjustment will focus on the 2006 estimates for all eligible people.

To implement the adjustment, we calculated preliminary estimates of counts for all eligible people according to:

$$(38) \quad \psi_{1,i} = \frac{P_i(\varepsilon_{1,i}/100)}{(\theta_{1,i}/100)},$$

where $\psi_{1,i}$ is the preliminary count of all eligible people for state *i*, P_i and $\varepsilon_{1,i}$ are the participant count and correctly-eligible rate (100 minus the payment error rate) figures used in Equation (1), and $\theta_{1,i}$ is the preliminary participation rate derived in Equation (33). The state eligibles counts from Equation (38) summed to 38,020,579 for 2006, while the national total for 2006 estimated directly from the CPS was 37,417,632. To obtain estimated eligibles counts for states that sum (aside from rounding error) to the direct estimate of the national total, we multiplied each of the eligibles counts from Equation (38) by 37,417,632 ÷ 38,020,579 (≈0.9841).[15]

Our final shrinkage estimates of the numbers of people eligible for the FSP were shown earlier in Table III.3 of Chapter III. From those final shrinkage estimates of the numbers of eligible people, we calculated final shrinkage estimates of participation rates according to:

$$(39) \quad \theta_{F,1,i} = 100\,\frac{P_i(\varepsilon_{1,i}/100)}{\psi_{F,1,i}},$$

where $\theta_{F,1,i}$ is the final shrinkage estimate of the participation rate for all eligible people in state *i*, and $\psi_{F,1,i}$ is the final shrinkage estimate of the number of all eligible people. P_i and $\varepsilon_{1,i}$ are the participant count and correctly-eligible rate figures used in Equations (1) and (38). Participation rates for all states and all eligible people were shown in Chapter III, Table III.1. We derived final participation rates for the working poor in the same way. Our final estimates of the number of

[15] The adjustment factors for 2004 and 2005 for all eligible people were, respectively, 0.9898, and 0.9797. The direct estimates of the national totals for all eligibles for those years were 37,920,574 and 37,950,525. The adjustment factors for 2004, 2005, and 2006 for working poor eligibles were, respectively, 0.9729, 0.9675 and 0.9638. The direct estimates of the national totals for working poor eligibles for those years were 17,581,994, 17,369,632, and 17,907,063.

eligible working poor people were shown in Chapter III, Table III.4, and the final participation rates were shown in Chapter III, Table III.2.

In Tables III.5 to III.7 of Chapter III, we reported approximate 90-percent confidence intervals for our final shrinkage estimates for all eligible people. In Tables III.8 to III.10 we reported the confidence intervals for the final shrinkage estimates for the working poor. The upper and lower bounds of the confidence intervals were calculated according to:

(40) $\mathit{Upper\ Bound}_i = F_i + 1.645\, e_i$

and:

(41) $\mathit{Lower\ Bound}_i = F_i - 1.645\, e_i$,

where F_i is the final shrinkage estimate for state i and e_i is the standard error of that estimate. For participation rates and eligibles counts, the standard errors are, respectively:

(42) $e_i = \frac{1}{r}\sqrt{U(6i-1,6i-1)}$

and

(43) $e_i = \frac{\psi_{F,1,i}}{\theta_{F,1,i}}\ \frac{1}{r}\sqrt{U(6i-1,6i-1)}$,

where r is the ratio used to adjust preliminary estimates of state eligibles counts to the direct estimate of the national total (≈ 0.9841 for all eligible people for 2006), and U(6i-1,6i-1) is the (6i-1,6i-1) diagonal element of U, which was derived according to Equation (34).[16] Our estimate of e_i does not take account of the correlation between r and our preliminary shrinkage estimates for states, which were summed to obtain the denominator of r. Instead, r is treated as a constant.

[16] The square root of U(6i-1,6i-1) is the standard error of the preliminary shrinkage estimate of the 2006 participation rate for all eligible people for state i. When deriving estimates for 2004 and 2005, we would use the (6i-5,6i-5) and (6i-3,6i-3) diagonal elements of U, respectively. When deriving estimates for the working poor for 2004, 2005, and 2006, we would use the (6i-4,6i-4), (6i-2,6i-2), and (6i,6i) diagonal elements of U, respectively.

Tables A.23 and A.24 present final shrinkage estimates of participation rates for all eligible people (values of $\theta_{F,1,i}$) and for the working poor (values of $\theta_{F,2,i}$), respectively. Tables A.25 and A.26 present standard errors for the rates. Tables A.27 and A.28 display final shrinkage estimates of the numbers of all eligible people (values of $\psi_{F,1,i}$) and eligible working poor (values of $\psi_{F,2,i}$), respectively, and Tables A.29 and A.30 present the standard errors for those estimated counts.[17] Finally, Tables A.31 and A.32 show payment-error-adjusted numbers of all people receiving FSP benefits (values of $P_i(\varepsilon_{1,i}/100)$) and the working poor receiving FSP benefits (values of $P_i(\varepsilon_{2,i}/100)$).

[17] The rates and counts for all eligible people in Tables A.23 and A.27 are the same as the rates and counts in Tables III.1 and III.3 of Chapter III, except for the number of digits displayed. Likewise, the rates and counts for the working poor in Tables A.24 and A.28 are the same as the rates and counts in Tables III.2 and III.4 of Chapter III, except for the number of digits displayed.

TABLE A.1

DIRECT SAMPLE ESTIMATES OF FSP PARTICIPATION RATES,
ALL ELIGIBLE PEOPLE

	2004	2005	2006
Alabama	54.834	65.195	70.510
Alaska	56.233	59.796	62.371
Arizona	67.664	64.041	61.496
Arkansas	69.138	84.547	71.382
California	47.453	48.153	49.483
Colorado	52.999	47.515	55.278
Connecticut	49.630	59.922	74.864
Delaware	62.072	64.525	76.696
District of Columbia	79.478	69.536	89.528
Florida	55.112	60.938	59.275
Georgia	69.365	74.730	69.158
Hawaii	92.681	81.857	74.193
Idaho	60.776	60.524	60.285
Illinois	67.486	79.336	82.567
Indiana	62.756	65.338	75.742
Iowa	59.157	64.125	71.134
Kansas	52.434	57.384	53.322
Kentucky	67.333	72.360	77.020
Louisiana	77.282	82.070	79.452
Maine	84.714	85.566	103.772
Maryland	49.658	49.167	60.338
Massachusetts	49.437	51.978	54.608
Michigan	65.019	72.438	77.329
Minnesota	71.337	72.909	66.388
Mississippi	59.890	56.040	59.007
Missouri	88.039	103.685	106.976
Montana	58.514	61.399	62.965
Nebraska	59.207	65.873	70.704
Nevada	51.015	46.963	51.686
New Hampshire	59.531	56.233	61.728
New Jersey	57.913	60.034	53.047
New Mexico	64.192	66.999	72.790
New York	53.042	59.958	63.347
North Carolina	59.333	56.261	63.402
North Dakota	59.579	54.709	55.671
Ohio	61.779	63.604	67.631
Oklahoma	88.180	70.728	65.640
Oregon	78.382	85.336	88.893
Pennsylvania	62.375	73.454	75.461
Rhode Island	52.378	55.662	56.661
South Carolina	66.002	65.953	82.521
South Dakota	50.579	60.472	65.113
Tennessee	84.997	88.917	87.378
Texas	54.329	55.948	61.733
Utah	58.920	66.831	50.845
Vermont	72.164	80.508	80.751
Virginia	62.813	65.417	68.754
Washington	62.707	79.494	87.494
West Virginia	79.565	78.430	75.742
Wisconsin	53.406	55.687	61.474
Wyoming	53.818	51.680	56.063

TABLE A.2

DIRECT SAMPLE ESTIMATES OF FSP PARTICIPATION RATES,
WORKING POOR

	2004	2005	2006
Alabama	49.396	60.846	58.383
Alaska	52.120	56.441	59.200
Arizona	59.507	49.264	61.524
Arkansas	58.676	77.695	59.975
California	34.600	32.068	35.206
Colorado	46.268	29.009	40.052
Connecticut	40.291	40.205	59.813
Delaware	68.790	71.397	79.752
District of Columbia	28.562	35.258	36.944
Florida	39.930	48.921	47.242
Georgia	66.953	73.205	59.938
Hawaii	75.785	74.529	52.649
Idaho	49.203	52.276	55.195
Illinois	55.722	72.347	71.008
Indiana	57.698	72.172	83.372
Iowa	54.209	53.640	63.431
Kansas	42.405	48.373	47.804
Kentucky	62.381	67.853	66.458
Louisiana	83.228	82.849	75.277
Maine	75.811	82.745	115.389
Maryland	40.616	34.168	46.919
Massachusetts	41.079	36.301	29.702
Michigan	69.503	75.690	77.181
Minnesota	42.154	52.522	43.611
Mississippi	46.502	60.114	54.312
Missouri	77.574	105.168	121.836
Montana	49.964	51.353	69.009
Nebraska	47.865	49.204	56.257
Nevada	33.050	37.545	41.197
New Hampshire	45.244	50.913	50.492
New Jersey	56.507	43.570	39.439
New Mexico	62.778	69.017	73.258
New York	40.780	45.468	52.860
North Carolina	47.213	54.173	50.806
North Dakota	56.692	48.967	55.391
Ohio	57.691	58.023	63.163
Oklahoma	89.413	67.074	54.173
Oregon	72.896	70.535	76.057
Pennsylvania	56.925	70.917	68.843
Rhode Island	38.525	37.438	30.487
South Carolina	66.639	58.742	69.172
South Dakota	54.421	59.361	63.867
Tennessee	88.522	67.304	68.813
Texas	44.623	54.093	53.013
Utah	45.371	58.378	42.212
Vermont	62.771	67.426	71.229
Virginia	53.236	59.411	56.330
Washington	51.036	82.193	69.284
West Virginia	83.849	73.340	74.565
Wisconsin	46.313	53.794	58.611
Wyoming	66.137	68.317	51.593

TABLE A.3

STANDARD ERRORS OF DIRECT SAMPLE ESTIMATES OF PARTICIPATION RATES, ALL ELIGIBLE PEOPLE

	2004	2005	2006
Alabama	3.829	3.696	4.801
Alaska	2.889	5.784	4.449
Arizona	7.596	3.770	4.580
Arkansas	4.492	6.658	4.872
California	1.563	1.469	1.148
Colorado	3.666	4.234	3.995
Connecticut	7.914	6.323	8.476
Delaware	6.589	8.641	5.395
District of Columbia	4.929	3.775	5.645
Florida	2.108	3.308	2.955
Georgia	7.400	4.025	2.752
Hawaii	10.619	13.731	6.615
Idaho	6.655	5.809	5.807
Illinois	2.934	4.664	4.922
Indiana	6.767	5.279	8.791
Iowa	5.721	3.141	6.775
Kansas	5.887	4.273	5.780
Kentucky	4.628	5.269	4.452
Louisiana	5.634	6.929	6.274
Maine	4.632	6.621	6.357
Maryland	4.275	4.841	6.995
Massachusetts	2.705	3.758	3.274
Michigan	2.462	3.226	2.844
Minnesota	4.883	8.900	6.338
Mississippi	2.332	4.642	4.563
Missouri	3.488	7.191	5.991
Montana	3.091	6.678	7.348
Nebraska	5.044	4.550	4.122
Nevada	6.028	4.109	9.533
New Hampshire	6.320	5.583	7.164
New Jersey	6.840	3.684	4.734
New Mexico	3.316	3.635	3.348
New York	2.546	1.951	2.636
North Carolina	3.702	4.018	4.143
North Dakota	5.944	4.505	5.059
Ohio	4.305	2.178	4.774
Oklahoma	8.062	6.540	2.541
Oregon	6.066	6.622	8.497
Pennsylvania	5.379	5.358	3.433
Rhode Island	4.492	3.141	3.188
South Carolina	3.087	4.249	5.559
South Dakota	3.159	4.997	6.170
Tennessee	8.688	6.383	5.246
Texas	2.171	2.723	2.723
Utah	2.753	6.024	4.781
Vermont	6.134	10.737	5.506
Virginia	5.549	4.302	5.650
Washington	5.283	7.351	8.729
West Virginia	4.050	6.044	3.957
Wisconsin	2.445	3.645	6.745
Wyoming	7.167	6.506	5.418

TABLE A.4

STANDARD ERRORS OF DIRECT SAMPLE ESTIMATES OF PARTICIPATION RATES, WORKING POOR

	2004	2005	2006
Alabama	6.156	8.352	7.650
Alaska	5.270	8.591	7.296
Arizona	9.983	4.738	7.680
Arkansas	8.801	9.918	5.116
California	2.014	2.729	2.800
Colorado	4.552	3.720	5.233
Connecticut	5.784	8.549	11.537
Delaware	13.775	18.555	20.146
District of Columbia	5.871	8.332	8.043
Florida	3.203	5.897	5.235
Georgia	10.523	8.262	5.206
Hawaii	12.974	16.701	8.203
Idaho	8.017	5.431	8.310
Illinois	4.740	10.169	6.049
Indiana	9.092	12.220	10.412
Iowa	5.472	5.384	8.409
Kansas	5.804	5.976	7.387
Kentucky	5.394	7.042	7.836
Louisiana	10.531	9.773	13.487
Maine	8.663	9.738	11.336
Maryland	5.660	5.865	11.256
Massachusetts	5.235	6.381	5.617
Michigan	5.077	10.482	8.336
Minnesota	6.928	9.782	5.703
Mississippi	3.234	10.290	6.967
Missouri	5.508	12.165	15.984
Montana	4.800	7.852	15.593
Nebraska	4.679	5.899	7.975
Nevada	5.680	6.587	8.471
New Hampshire	9.835	8.389	12.488
New Jersey	7.663	6.964	6.092
New Mexico	6.032	7.262	7.783
New York	4.381	6.152	5.553
North Carolina	5.966	8.361	5.930
North Dakota	6.965	6.245	8.914
Ohio	4.909	6.276	7.541
Oklahoma	14.445	8.657	5.082
Oregon	12.079	9.853	13.431
Pennsylvania	6.690	10.882	6.703
Rhode Island	5.345	6.425	5.378
South Carolina	6.631	8.197	8.596
South Dakota	7.422	7.630	10.976
Tennessee	13.156	10.124	5.813
Texas	3.367	4.856	4.230
Utah	4.422	6.853	5.224
Vermont	9.732	15.669	12.167
Virginia	6.884	11.252	7.207
Washington	8.249	16.098	9.167
West Virginia	12.260	13.946	8.630
Wisconsin	3.020	6.039	9.248
Wyoming	9.601	12.532	7.125

TABLE A.5

NUMBER OF PEOPLE RECEIVING FSP BENEFITS, MONTHLY AVERAGE

	2004	2005	2006
Alabama	497,591	533,881	538,680
Alaska	49,323	55,567	57,153
Arizona	529,559	550,291	540,782
Arkansas	346,441	372,517	380,120
California	1,855,898	1,990,919	1,999,656
Colorado	241,780	245,926	251,385
Connecticut	195,980	204,146	210,288
Delaware	55,642	61,586	65,698
District of Columbia	88,655	88,799	89,168
Florida	1,202,227	1,283,661	1,232,949
Georgia	867,148	917,940	936,342
Hawaii	98,589	93,548	87,942
Idaho	91,395	93,441	91,106
Illinois	1,069,596	1,158,271	1,225,093
Indiana	526,324	555,875	574,696
Iowa	179,179	206,696	225,717
Kansas	169,528	177,782	183,071
Kentucky	544,744	570,277	589,102
Louisiana	705,700	736,743	673,550
Maine	141,929	152,910	160,294
Maryland	273,872	288,943	305,395
Massachusetts	334,939	368,122	431,518
Michigan	943,713	1,047,594	1,133,793
Minnesota	247,465	259,937	263,986
Mississippi	376,864	387,814	407,482
Missouri	699,616	766,425	796,350
Montana	77,478	80,870	81,567
Nebraska	113,900	117,415	119,683
Nevada	120,275	121,707	117,920
New Hampshire	48,449	52,310	56,338
New Jersey	368,695	392,416	405,667
New Mexico	222,716	240,637	244,672
New York	1,598,143	1,754,861	1,785,914
North Carolina	747,301	799,747	854,407
North Dakota	41,421	42,204	42,576
Ohio	945,435	1,007,172	1,063,920
Oklahoma	411,840	424,402	435,519
Oregon	419,736	429,358	434,239
Pennsylvania	960,941	1,042,809	1,092,298
Rhode Island	77,528	76,085	73,195
South Carolina	497,218	521,125	534,294
South Dakota	53,459	56,095	58,466
Tennessee	806,490	848,739	863,745
Texas	2,258,951	2,418,865	2,575,076
Utah	123,411	133,263	131,753
Vermont	42,862	45,218	47,202
Virginia	485,877	488,481	506,656
Washington	453,497	508,472	535,768
West Virginia	255,936	262,442	267,630
Wisconsin	324,047	345,748	367,918
Wyoming	25,649	25,482	24,236

TABLE A.6

POPULATION ON JULY 1

	2004	2005	2006
Alabama	4,508,540	4,539,611	4,590,240
Alaska	661,661	669,411	677,450
Arizona	5,744,367	5,952,083	6,165,689
Arkansas	2,742,898	2,772,152	2,809,111
California	35,721,991	35,990,312	36,249,872
Colorado	4,609,264	4,673,724	4,766,248
Connecticut	3,481,890	3,486,490	3,495,753
Delaware	827,671	840,558	852,747
District of Columbia	579,621	582,049	585,459
Florida	17,342,623	17,736,027	18,057,508
Georgia	8,921,371	9,107,719	9,342,080
Hawaii	1,254,172	1,267,581	1,278,635
Idaho	1,391,751	1,425,894	1,463,878
Illinois	12,680,053	12,719,550	12,777,042
Indiana	6,218,863	6,257,121	6,302,646
Iowa	2,946,009	2,955,587	2,972,566
Kansas	2,730,828	2,741,665	2,755,817
Kentucky	4,139,859	4,171,016	4,204,444
louisiana	4,487,966	4,495,670	4,243,288
Maine	1,308,892	1,312,222	1,314,910
Maryland	5,537,662	5,573,163	5,602,017
Massachusetts	6,433,676	6,429,137	6,434,389
Michigan	10,102,720	10,107,940	10,102,322
Minnesota	5,085,626	5,113,824	5,154,586
Mississippi	2,886,860	2,900,456	2,899,112
Missouri	5,744,753	5,787,885	5,837,639
Montana	926,721	935,784	946,795
Nebraska	1,743,954	1,754,042	1,763,765
Nevada	2,329,960	2,408,948	2,492,427
New Hampshire	1,294,285	1,303,112	1,311,821
New Jersey	8,641,235	8,657,445	8,666,075
New Mexico	1,892,182	1,916,331	1,942,302
New York	19,258,479	19,262,545	19,281,988
North Carolina	8,538,378	8,679,089	8,869,442
North Dakota	636,814	635,938	637,460
Ohio	11,452,808	11,459,776	11,463,513
Oklahoma	3,516,552	3,535,926	3,577,536
Oregon	3,583,027	3,629,959	3,691,084
Pennsylvania	12,348,618	12,367,276	12,402,817
Rhode Island	1,072,859	1,066,721	1,061,641
South Carolina	4,201,437	4,254,989	4,330,108
South Dakota	774,129	780,046	788,467
Tennessee	5,912,063	5,989,309	6,074,913
Texas	22,454,811	22,843,999	23,407,629
Utah	2,430,841	2,505,013	2,579,535
Vermont	618,794	619,736	620,778
Virginia	7,464,033	7,557,588	7,640,249
Washington	6,189,869	6,270,838	6,374,910
West Virginia	1,804,618	1,805,626	1,808,699
Wisconsin	5,510,199	5,540,473	5,572,660
Wyoming	503,258	506,541	512,757

TABLE A.7

PERCENTAGES OF PARTICIPANTS WHO ARE CORRECTLY ELIGIBLE

	2004	2005	2006
Alabama	97.424	97.877	98.723
Alaska	98.873	97.414	95.761
Arizona	97.759	96.574	96.105
Arkansas	98.153	98.534	97.185
California	98.981	98.355	98.880
Colorado	99.218	97.850	97.523
Connecticut	97.954	96.750	96.860
Delaware	92.793	91.008	90.461
District of Columbia	97.569	96.845	95.745
Florida	97.349	96.539	95.972
Georgia	96.820	97.740	97.214
Hawaii	98.177	98.017	99.081
Idaho	96.676	97.050	97.775
Illinois	97.662	98.545	97.815
Indiana	96.573	96.956	97.610
Iowa	97.634	97.186	97.267
Kansas	97.251	97.547	96.843
Kentucky	97.972	98.391	97.615
Louisiana	97.451	96.013	92.785
Maine	93.390	93.770	93.212
Maryland	95.298	94.796	94.134
Massachusetts	97.173	94.564	95.619
Michigan	94.794	91.476	91.026
Minnesota	95.263	85.079	96.639
Mississippi	98.847	97.752	99.241
Missouri	96.083	97.524	98.392
Montana	97.515	97.640	95.649
Nebraska	97.434	98.771	98.351
Nevada	97.196	98.476	98.530
New Hampshire	96.947	96.588	97.795
New Jersey	99.247	98.276	97.864
New Mexico	98.319	98.238	97.365
New York	98.242	98.096	98.138
North Carolina	99.756	97.989	98.547
North Dakota	95.362	95.009	93.996
Ohio	97.776	97.048	96.583
Oklahoma	97.234	95.498	96.818
Oregon	90.375	91.316	88.980
Pennsylvania	98.446	97.759	97.912
Rhode Island	94.771	96.846	97.995
South Carolina	98.285	97.664	97.508
South Dakota	97.259	98.235	98.962
Tennessee	97.387	97.395	97.375
Texas	96.686	95.435	94.078
Utah	99.099	97.347	97.685
Vermont	97.754	93.535	94.964
Virginia	97.680	97.011	97.033
Washington	95.835	98.861	97.984
West Virginia	96.921	97.723	95.921
Wisconsin	95.845	90.941	90.207
Wyoming	97.899	98.777	98.281

TABLE A.8

PERCENTAGES OF PARTICIPANTS WHO ARE CORRECTLY ELIGIBLE AND WORKING POOR

	2004	2005	2006
Alabama	39.981	38.824	37.019
Alaska	49.404	45.325	43.808
Arizona	41.202	40.385	48.534
Arkansas	38.902	42.554	42.230
California	38.960	36.284	39.238
Colorado	43.723	34.065	34.886
Connecticut	25.763	27.850	27.622
Delaware	40.674	38.774	41.148
District of Columbia	11.684	14.599	14.331
Florida	35.534	35.926	35.833
Georgia	38.657	41.866	44.032
Hawaii	42.169	39.496	41.130
Idaho	49.713	48.454	50.241
Illinois	37.640	37.714	37.673
Indiana	40.870	43.008	42.050
Iowa	41.873	42.247	45.652
Kansas	39.523	38.209	45.537
Kentucky	35.489	34.908	36.195
Louisiana	45.869	43.331	39.542
Maine	31.671	33.275	35.382
Maryland	29.015	29.156	33.170
Massachusetts	24.556	22.196	21.294
Michigan	41.042	40.547	39.075
Minnesota	32.062	27.492	31.201
Mississippi	39.273	42.644	40.446
Missouri	39.066	48.407	53.578
Montana	42.706	43.961	43.912
Nebraska	41.092	35.635	43.078
Nevada	33.965	31.457	39.533
New Hampshire	31.570	33.547	34.624
New Jersey	30.977	29.741	33.456
New Mexico	47.629	49.576	49.606
New York	28.340	29.546	33.895
North Carolina	37.167	37.643	37.414
North Dakota	45.820	44.138	42.578
Ohio	40.177	40.087	38.663
Oklahoma	43.235	42.605	41.719
Oregon	40.242	36.537	34.400
Pennsylvania	35.969	35.938	35.583
Rhode Island	23.804	26.979	18.815
South Carolina	41.832	39.713	41.047
South Dakota	46.464	44.228	49.835
Tennessee	39.714	33.550	35.195
Texas	46.051	49.359	45.457
Utah	47.124	49.096	46.909
Vermont	33.494	35.375	34.698
Virginia	39.255	35.122	37.350
Washington	34.029	37.019	37.864
West Virginia	34.161	35.442	36.056
Wisconsin	44.503	37.662	40.712
Wyoming	54.100	52.298	48.039

TABLE A.9

DIRECT SAMPLE ESTIMATES OF PERCENTAGES OF PEOPLE ELIGIBLE FOR THE FSP, ALL ELIGIBLE PEOPLE

	2004	2005	2006
Alabama	19.609	17.656	16.431
Alaska	13.107	13.523	12.953
Arizona	13.319	13.942	13.707
Arkansas	17.931	15.661	18.423
California	10.837	11.299	11.023
Colorado	9.820	10.836	9.305
Connecticut	11.109	9.454	7.783
Delaware	10.050	10.334	9.087
District of Columbia	18.777	21.248	16.288
Florida	12.245	11.466	11.055
Georgia	13.567	13.182	14.089
Hawaii	8.327	8.837	9.185
Idaho	10.446	10.508	10.094
Illinois	12.207	11.311	11.359
Indiana	13.024	13.183	11.751
Iowa	10.038	10.599	10.383
Kansas	11.514	11.023	12.065
Kentucky	19.146	18.591	17.758
Louisiana	19.828	19.172	18.537
Maine	11.954	12.770	10.950
Maryland	9.491	9.996	8.505
Massachusetts	10.233	10.417	11.743
Michigan	13.619	13.088	13.211
Minnesota	6.498	6.625	7.455
Mississippi	21.546	23.323	23.639
Missouri	13.291	12.455	12.547
Montana	13.933	13.743	13.087
Nebraska	10.748	10.037	9.439
Nevada	9.835	10.594	9.019
New Hampshire	6.096	6.895	6.804
New Jersey	7.312	7.420	8.636
New Mexico	18.028	18.412	16.850
New York	15.370	14.905	14.349
North Carolina	14.715	16.049	14.973
North Dakota	10.411	11.525	11.277
Ohio	13.065	13.410	13.254
Oklahoma	12.914	16.206	17.956
Oregon	13.507	12.657	11.776
Pennsylvania	12.282	11.222	11.427
Rhode Island	13.075	12.410	11.924
South Carolina	17.623	18.136	14.580
South Dakota	13.279	11.682	11.270
Tennessee	15.630	15.522	15.845
Texas	17.903	18.062	16.765
Utah	8.539	7.749	9.813
Vermont	9.383	8.477	8.942
Virginia	10.123	9.585	9.359
Washington	11.197	10.084	9.412
West Virginia	17.276	18.110	18.739
Wisconsin	10.554	10.191	9.688
Wyoming	9.271	9.615	8.286

TABLE A.10

DIRECT SAMPLE ESTIMATES OF PERCENTAGES OF PEOPLE ELIGIBLE FOR THE FSP, WORKING POOR

	2004	2005	2006
Alabama	8.933	7.504	7.441
Alaska	7.066	6.666	6.243
Arizona	6.383	7.579	6.919
Arkansas	8.374	7.360	9.528
California	5.850	6.259	6.148
Colorado	4.957	6.179	4.594
Connecticut	3.599	4.056	2.778
Delaware	3.975	3.979	3.975
District of Columbia	6.257	6.317	5.908
Florida	6.169	5.315	5.179
Georgia	5.612	5.764	7.363
Hawaii	4.374	3.911	5.373
Idaho	6.635	6.074	5.665
Illinois	5.698	4.747	5.087
Indiana	5.995	5.294	4.599
Iowa	4.698	5.508	5.465
Kansas	5.786	5.122	6.328
Kentucky	7.486	7.034	7.631
Louisiana	8.666	8.571	8.338
Maine	4.530	4.686	3.738
Maryland	3.533	4.424	3.854
Massachusetts	3.112	3.501	4.808
Michigan	5.516	5.552	5.682
Minnesota	3.701	3.206	3.664
Mississippi	11.025	9.485	10.467
Missouri	6.133	6.095	5.999
Montana	7.146	7.398	5.482
Nebraska	5.607	4.848	5.196
Nevada	5.305	4.233	4.54
New Hampshire	2.612	2.645	2.945
New Jersey	2.339	3.094	3.971
New Mexico	8.930	9.020	8.53
New York	5.767	5.920	5.939
North Carolina	6.890	6.403	7.094
North Dakota	5.257	5.982	5.134
Ohio	5.749	6.072	5.681
Oklahoma	5.663	7.624	9.375
Oregon	6.467	6.127	5.321
Pennsylvania	4.917	4.273	4.552
Rhode Island	4.465	5.140	4.255
South Carolina	7.429	8.280	7.322
South Dakota	5.896	5.358	5.786
Tennessee	6.120	7.064	7.272
Texas	10.382	9.662	9.433
Utah	5.273	4.474	5.676
Vermont	3.696	3.828	3.704
Virginia	4.800	3.821	4.397
Washington	4.885	3.652	4.593
West Virginia	5.778	7.024	7.155
Wisconsin	5.651	4.369	4.586
Wyoming	4.169	3.851	4.401

TABLE A.11

PERCENTAGE OF FSP PARTICIPANTS WITH EARNERS IN THE HOUSEHOLD, BY INDICATORS OF EARNINGS, 2006

	Earned Income in Household	No Earned Income But Identified Based on Other Household Information	Total
Alabama	37.5	0.0	37.5
Alaska	45.9	0.0	45.9
Arizona	50.5	0.0	50.5
Arkansas	43.0	0.4	43.4
California	39.1	0.6	39.7
Colorado	35.8	0.0	35.8
Connecticut	28.5	0.1	28.6
Delaware	48.6	0.2	48.8
District of Columbia	14.7	0.3	15.0
Florida	37.3	0.0	37.3
Georgia	45.3	0.0	45.3
Hawaii	41.3	0.3	41.6
Idaho	51.4	0.0	51.4
Illinois	38.5	0.0	38.5
Indiana	43.0	0.1	43.1
Iowa	46.9	0.0	46.9
Kansas	47.1	0.0	47.1
Kentucky	37.2	0.0	37.2
Louisiana	42.6	0.0	42.6
Maine	40.2	0.0	40.2
Maryland	37.1	0.3	37.4
Massachusetts	24.5	0.0	24.5
Michigan	45.5	0.0	45.5
Minnesota	32.7	0.1	32.8
Mississippi	40.6	0.2	40.8
Missouri	54.7	0.0	54.7
Montana	45.9	0.0	45.9
Nebraska	43.9	0.0	43.9
Nevada	40.1	0.0	40.1
New Hampshire	35.0	0.4	35.4
New Jersey	34.2	0.0	34.2
New Mexico	50.7	0.2	50.9
New York	34.6	0.0	34.6
North Carolina	38.0	0.1	38.1
North Dakota	47.9	0.0	47.9
Ohio	40.0	0.0	40.0
Oklahoma	43.1	0.0	43.1
Oregon	43.6	0.0	43.6
Pennsylvania	36.3	0.1	36.3
Rhode Island	19.1	0.1	19.2
South Carolina	41.9	0.2	42.0
South Dakota	50.5	0.0	50.5
Tennessee	36.1	0.0	36.1
Texas	49.7	0.1	49.8
Utah	48.7	0.0	48.7
Vermont	38.5	0.0	38.5
Virginia	38.5	0.0	38.6
Washington	38.8	0.0	38.8
West Virginia	37.5	0.1	37.6
Wisconsin	48.3	0.4	48.7
Wyoming	48.5	0.4	48.9

TABLE A.12

DEFINITIONS AND DATA SOURCES FOR PREDICTORS

Predictor[a]	Definition	Principal Data Source[b]
FSP prevalence rate	$100 \times \frac{\text{Number of people receiving FSP benefits}}{\text{Resident population}}$	Counts of people receiving FSP benefits are from FSP Program Operations data and were provided by the Food and Nutrition Service. For more information, see the first footnote of Appendix A.
Childless household rate	$100 \times \frac{\text{Total households - households with children}}{\text{Total households}}$	The data for constructing these predictors were obtained from the Census 2000 Demographic Profiles released between May 7, 2002 and June 4, 2002 at http://www2.census.gov/census_2000/datasets/100_and_sample_profile and from U.S. DHHS.
Median household income	$\frac{\text{Median household income}}{\text{DHHS poverty guidelines}}$	
Median family income	$\frac{\text{Median family income}}{\text{DHHS poverty guidelines}}$	
Family poverty rate	$100 \times \frac{\text{Number of families below the poverty level}}{\text{Total number of families}}$	
Nonelderly tax nonfiler rate	$100 - \left(100 \times \frac{\text{Number of exemptions on tax returns for people under age 65}}{\text{Resident population of people under age 65}} \right)$	All data for this predictor were obtained from the U.S. Census Bureau.
Categorical eligibility policy indicator	1, if the state extended categorical eligibility to most low income households in the prior year 0, if state did not extend categorical eligibility to most low income households in the prior year	The data for constructing this predictor were collected from various sources, including the Food and Nutrition Service, state websites, and the Center for Budget and Policy Priorities (http://www.cbpp.org).

[a]Values for the first two predictors and the last predictor vary across the year-specific equations of our regression model, while values for the third through sixth predictors do not vary.

[b]For estimates of the resident population in a given year, we used the July 1 population estimates released on May 1, 2008 by the Census Bureau for that year. The population estimates are available at http://www.census.gov/popest/datasets.html.

TABLE A.13

VALUES FOR TEMPORALLY CONSTANT PREDICTORS

	Family Poverty Rate	Median Household Income	Median Family Income	Childless Household Rate
Alabama	12.518	4.191	5.114	63.913
Alaska	6.686	5.058	5.791	57.072
Arizona	9.897	4.979	5.736	64.555
Arkansas	12.020	3.951	4.747	64.387
California	10.594	5.831	6.510	60.272
Colorado	6.190	5.795	6.861	64.698
Connecticut	5.643	6.622	8.044	65.321
Delaware	6.466	5.817	6.784	64.573
District of Columbia	16.699	4.927	5.682	75.442
Florida	9.040	4.766	5.602	68.656
Georgia	9.883	5.210	6.050	60.946
Hawaii	7.647	5.314	6.076	62.055
Idaho	8.326	4.613	5.339	61.254
Illinois	7.817	5.720	6.820	63.764
Indiana	6.691	5.103	6.171	64.267
Iowa	6.024	4.846	5.894	66.722
Kansas	6.692	4.988	6.093	64.459
Kentucky	12.655	4.134	5.026	64.532
Louisiana	15.771	3.998	4.883	60.791
Maine	7.771	4.572	5.547	67.641
Maryland	6.081	6.491	7.597	62.691
Massachusetts	6.653	6.200	7.571	67.059
Michigan	7.424	5.484	6.563	64.406
Minnesota	5.082	5.784	6.983	65.250
Mississippi	15.958	3.847	4.593	60.380
Missouri	8.565	4.657	5.653	65.256
Montana	10.474	4.055	4.971	66.668
Nebraska	6.713	4.819	5.897	65.478
Nevada	7.538	5.473	6.243	64.748
New Hampshire	4.284	6.073	7.069	64.524
New Jersey	6.253	6.771	8.026	63.365
New Mexico	14.540	4.191	4.840	61.402
New York	11.468	5.328	6.346	65.048
North Carolina	9.038	4.811	5.689	64.730
North Dakota	8.319	4.248	5.360	67.344
Ohio	7.815	5.028	6.143	65.495
Oklahoma	11.184	4.101	4.998	64.294
Oregon	7.914	5.023	5.977	66.577
Pennsylvania	7.759	4.924	6.039	67.359
Rhode Island	8.853	5.168	6.480	67.093
South Carolina	10.744	4.553	5.430	63.480
South Dakota	9.297	4.332	5.308	65.210
Tennessee	10.318	4.464	5.343	64.807
Texas	11.975	4.902	5.631	59.050
Utah	6.479	5.614	6.264	54.211
Vermont	6.255	5.016	5.970	66.379
Virginia	6.983	5.731	6.651	64.110
Washington	7.332	5.620	6.600	64.819
West Virginia	13.888	3.646	4.479	68.240
Wisconsin	5.605	5.376	6.496	66.113
Wyoming	8.049	4.652	5.609	65.011

TABLE A.14

2004 VALUES FOR TEMPORALLY VARIABLE PREDICTORS

	FSP Prevalence Rate	Nonelderly Tax Nonfiler Rate	Expanded Categorical Eligibility in Previous Year
Alabama	11.037	14.617	0
Alaska	7.454	11.695	0
Arizona	9.219	19.500	0
Arkansas	12.631	15.273	0
California	5.195	15.970	0
Colorado	5.245	13.472	0
Connecticut	5.629	9.613	0
Delaware	6.723	11.436	1
District of Columbia	14.848	27.480	0
Florida	6.876	13.329	0
Georgia	9.720	17.024	0
Hawaii	7.861	10.694	0
Idaho	6.567	11.365	0
Illinois	8.435	12.178	0
Indiana	8.463	9.860	0
Iowa	6.082	9.771	0
Kansas	6.208	10.519	0
Kentucky	13.159	14.182	0
Louisiana	15.724	17.121	0
Maine	10.843	9.373	1
Maryland	4.946	11.210	1
Massachusetts	5.206	11.742	1
Michigan	9.341	12.751	1
Minnesota	4.866	9.016	0
Mississippi	13.055	17.498	0
Missouri	12.178	12.118	0
Montana	8.360	10.752	0
Nebraska	6.531	8.586	0
Nevada	5.162	14.614	0
New Hampshire	3.743	6.209	0
New Jersey	4.267	9.226	0
New Mexico	11.770	14.519	0
New York	8.298	15.863	0
North Carolina	8.752	13.747	0
North Dakota	6.504	7.713	1
Ohio	8.255	10.015	0
Oklahoma	11.711	14.656	0
Oregon	11.715	15.413	1
Pennsylvania	7.782	9.405	0
Rhode Island	7.226	12.988	0
South Carolina	11.835	14.973	1
South Dakota	6.906	9.341	0
Tennessee	13.641	12.688	0
Texas	10.060	14.874	1
Utah	5.077	11.523	0
Vermont	6.927	7.680	0
Virginia	6.069	11.022	0
Washington	7.326	11.894	0
West Virginia	14.182	13.999	0
Wisconsin	5.881	8.321	1
Wyoming	5.097	7.280	0

TABLE A.15

2005 VALUES FOR TEMPORALLY VARIABLE PREDICTORS

	FSP Prevalence Rate	Nonelderly Tax Nonfiler Rate	Expanded Categorical Eligibility in Previous Year
Alabama	11.761	14.482	0
Alaska	8.301	11.922	0
Arizona	9.245	19.337	0
Arkansas	13.438	15.488	0
California	5.532	15.614	0
Colorado	5.262	13.446	0
Connecticut	5.855	9.637	0
Delaware	7.327	11.401	1
District of Columbia	15.256	27.329	0
Florida	7.238	12.884	0
Georgia	10.079	16.926	0
Hawaii	7.380	9.609	0
Idaho	6.553	11.389	0
Illinois	9.106	11.995	0
Indiana	8.884	9.631	0
Iowa	6.993	9.801	0
Kansas	6.484	10.356	0
Kentucky	13.672	14.194	0
Louisiana	16.388	17.776	0
Maine	11.653	9.468	1
Maryland	5.184	11.193	1
Massachusetts	5.726	11.621	1
Michigan	10.364	12.868	1
Minnesota	5.083	8.951	0
Mississippi	13.371	18.041	0
Missouri	13.242	12.287	0
Montana	8.642	10.797	0
Nebraska	6.694	8.496	0
Nevada	5.052	13.979	0
New Hampshire	4.014	6.304	0
New Jersey	4.533	9.014	0
New Mexico	12.557	14.444	0
New York	9.110	15.820	0
North Carolina	9.215	13.602	0
North Dakota	6.636	7.901	1
Ohio	8.789	10.123	0
Oklahoma	12.003	14.915	0
Oregon	11.828	15.372	1
Pennsylvania	8.432	9.406	0
Rhode Island	7.133	12.677	0
South Carolina	12.247	15.137	1
South Dakota	7.191	9.469	0
Tennessee	14.171	12.655	0
Texas	10.589	14.850	1
Utah	5.320	11.409	0
Vermont	7.296	7.459	0
Virginia	6.463	10.945	0
Washington	8.108	11.769	1
West Virginia	14.535	13.997	0
Wisconsin	6.240	7.988	1
Wyoming	5.031	7.144	0

TABLE A.16

2006 VALUES FOR TEMPORALLY VARIABLE PREDICTORS

	FSP Prevalence Rate	Nonelderly Tax Nonfiler Rate	Expanded Categorical Eligibility in Previous Year
Alabama	11.735	13.799	0
Alaska	8.437	12.000	0
Arizona	8.771	18.731	0
Arkansas	13.532	15.046	0
California	5.516	15.128	0
Colorado	5.274	13.286	0
Connecticut	6.016	9.359	0
Delaware	7.704	11.544	1
District of Columbia	15.230	27.269	0
Florida	6.828	12.216	0
Georgia	10.023	16.554	0
Hawaii	6.878	8.767	0
Idaho	6.224	10.601	0
Illinois	9.588	11.534	0
Indiana	9.118	9.209	0
Iowa	7.593	9.206	0
Kansas	6.643	9.577	0
Kentucky	14.011	13.795	0
Louisiana	15.873	15.890	0
Maine	12.191	9.066	1
Maryland	5.452	10.910	1
Massachusetts	6.706	11.490	1
Michigan	11.223	12.572	1
Minnesota	5.121	7.447	0
Mississippi	14.055	16.543	0
Missouri	13.642	11.170	0
Montana	8.615	10.150	0
Nebraska	6.786	8.162	0
Nevada	4.731	12.840	0
New Hampshire	4.295	6.350	0
New Jersey	4.681	8.642	0
New Mexico	12.597	13.473	0
New York	9.262	14.913	0
North Carolina	9.633	13.522	0
North Dakota	6.679	7.286	1
Ohio	9.281	10.073	0
Oklahoma	12.174	14.403	0
Oregon	11.765	15.024	1
Pennsylvania	8.807	8.807	0
Rhode Island	6.894	11.415	0
South Carolina	12.339	14.902	1
South Dakota	7.415	8.916	0
Tennessee	14.218	12.212	0
Texas	11.001	14.252	1
Utah	5.108	10.470	0
Vermont	7.604	6.772	0
Virginia	6.631	10.601	0
Washington	8.404	11.468	1
West Virginia	14.797	13.475	0
Wisconsin	6.602	7.130	1
Wyoming	4.727	6.366	0

TABLE A.17

REGRESSION ESTIMATES OF FSP PARTICIPATION RATES,
ALL ELIGIBLE PEOPLE

	2004	2005	2006
Alabama	60.242	65.614	64.935
Alaska	62.685	69.298	65.324
Arizona	61.084	59.671	59.567
Arkansas	70.949	75.734	76.564
California	46.290	46.403	48.498
Colorado	53.879	54.609	55.238
Connecticut	59.346	63.952	64.650
Delaware	61.818	64.244	71.757
District of Columbia	75.436	70.847	83.491
Florida	58.120	58.601	62.651
Georgia	63.022	65.766	64.104
Hawaii	69.387	68.423	68.366
Idaho	55.386	55.609	53.873
Illinois	66.396	72.391	75.384
Indiana	68.766	74.069	75.076
Iowa	58.650	64.963	70.070
Kansas	54.457	58.504	58.762
Kentucky	72.633	76.790	78.783
Louisiana	71.472	76.755	72.164
Maine	76.947	81.413	91.154
Maryland	53.156	54.467	60.019
Massachusetts	47.976	51.622	61.242
Michigan	66.736	72.907	81.297
Minnesota	56.808	60.370	62.738
Mississippi	58.390	60.202	62.574
Missouri	81.058	89.111	92.862
Montana	56.974	58.878	60.858
Nebraska	58.792	61.982	62.522
Nevada	54.036	52.180	55.598
New Hampshire	62.346	64.595	68.986
New Jersey	54.543	58.476	60.042
New Mexico	64.061	68.176	69.789
New York	53.332	57.750	60.842
North Carolina	63.352	66.295	69.616
North Dakota	48.661	49.711	54.250
Ohio	64.310	69.459	71.926
Oklahoma	67.208	69.821	70.077
Oregon	76.876	76.849	82.310
Pennsylvania	63.590	68.861	73.250
Rhode Island	50.540	52.721	52.005
South Carolina	67.298	69.135	72.540
South Dakota	52.775	55.480	57.190
Tennessee	85.234	89.873	91.487
Texas	57.241	59.438	63.830
Utah	54.099	57.162	52.411
Vermont	68.260	71.548	77.064
Virginia	61.913	64.280	67.958
Washington	65.151	64.643	72.064
West Virginia	76.806	78.596	83.899
Wisconsin	57.519	60.422	68.250
Wyoming	50.999	51.797	51.936

TABLE A.18

REGRESSION ESTIMATES OF FSP PARTICIPATION RATES,
WORKING POOR

	2004	2005	2006
Alabama	52.711	61.069	56.013
Alaska	58.220	67.483	62.756
Arizona	41.464	41.342	42.197
Arkansas	61.709	72.066	68.797
California	30.558	31.699	32.543
Colorado	39.595	35.675	38.217
Connecticut	49.466	45.341	44.911
Delaware	52.663	54.876	60.361
District of Columbia	37.735	37.327	45.887
Florida	41.873	44.990	49.039
Georgia	50.268	53.891	50.637
Hawaii	60.088	63.770	61.981
Idaho	48.592	51.724	50.083
Illinois	56.148	60.523	61.322
Indiana	62.263	67.678	67.243
Iowa	49.770	55.394	61.709
Kansas	47.597	49.127	50.244
Kentucky	65.082	74.146	70.319
Louisiana	66.525	76.043	64.300
Maine	72.592	81.592	87.184
Maryland	44.979	41.678	45.908
Massachusetts	38.872	34.676	43.119
Michigan	59.631	65.200	70.772
Minnesota	48.056	46.784	51.093
Mississippi	52.084	58.334	55.395
Missouri	72.924	84.223	85.216
Montana	50.118	54.775	54.422
Nebraska	53.298	55.576	55.664
Nevada	36.514	35.470	41.335
New Hampshire	53.504	54.353	58.629
New Jersey	44.627	41.935	41.941
New Mexico	56.772	68.727	63.702
New York	39.134	42.059	42.661
North Carolina	51.627	56.548	58.421
North Dakota	48.887	49.360	51.768
Ohio	57.388	61.542	61.718
Oklahoma	59.012	64.512	61.817
Oregon	65.257	67.192	70.606
Pennsylvania	55.583	60.426	63.185
Rhode Island	40.528	36.735	36.012
South Carolina	61.299	66.507	65.218
South Dakota	48.187	51.718	51.749
Tennessee	77.004	87.608	83.972
Texas	53.184	59.667	58.596
Utah	49.407	54.264	50.260
Vermont	60.414	65.977	70.735
Virginia	49.774	52.036	55.070
Washington	52.706	56.213	61.272
West Virginia	67.015	76.289	75.101
Wisconsin	53.282	54.892	61.980
Wyoming	46.791	48.301	47.477

TABLE A.19

STANDARD ERRORS OF REGRESSION ESTIMATES OF PARTICIPATION RATES, ALL ELIGIBLE PEOPLE

	2004	2005	2006
Alabama	3.684	3.725	3.717
Alaska	4.072	4.326	4.310
Arizona	4.359	4.196	4.231
Arkansas	3.715	3.787	3.755
California	4.063	4.071	4.042
Colorado	3.862	3.884	3.929
Connecticut	4.488	4.349	4.466
Delaware	3.855	3.936	3.954
District of Columbia	5.593	5.379	5.936
Florida	3.914	3.949	4.021
Georgia	3.868	3.891	3.849
Hawaii	3.958	4.022	3.990
Idaho	3.797	3.884	3.925
Illinois	3.796	3.813	3.875
Indiana	3.706	3.734	3.737
Iowa	3.822	3.793	3.816
Kansas	3.827	3.773	3.784
Kentucky	3.731	3.808	3.747
Louisiana	4.289	4.453	4.378
Maine	4.165	4.308	4.303
Maryland	3.969	4.033	4.055
Massachusetts	4.162	4.248	4.236
Michigan	3.813	3.957	3.983
Minnesota	3.739	3.727	3.802
Mississippi	4.046	4.250	4.179
Missouri	3.974	4.170	4.135
Montana	3.822	3.907	3.887
Nebraska	3.690	3.696	3.735
Nevada	3.945	3.936	3.953
New Hampshire	4.343	4.233	4.196
New Jersey	4.512	4.332	4.441
New Mexico	4.041	4.154	4.106
New York	3.752	3.722	3.757
North Carolina	3.567	3.564	3.596
North Dakota	4.419	4.547	4.676
Ohio	3.635	3.627	3.643
Oklahoma	3.736	3.763	3.757
Oregon	4.253	4.241	4.216
Pennsylvania	3.675	3.696	3.708
Rhode Island	4.202	4.177	4.196
South Carolina	3.870	3.936	3.982
South Dakota	3.832	3.870	3.844
Tennessee	4.145	4.213	4.039
Texas	4.038	4.146	4.178
Utah	4.210	4.466	4.404
Vermont	3.944	4.014	4.043
Virginia	3.736	3.728	3.739
Washington	3.655	3.860	3.885
West Virginia	4.033	4.172	4.059
Wisconsin	3.836	3.922	4.007
Wyoming	4.006	4.093	4.129

TABLE A.20

STANDARD ERRORS OF REGRESSION ESTIMATES OF PARTICIPATION RATES, WORKING POOR

	2004	2005	2006
Alabama	5.125	5.332	5.283
Alaska	5.718	6.153	6.053
Arizona	5.996	5.907	6.005
Arkansas	5.190	5.385	5.279
California	5.619	5.797	5.757
Colorado	5.334	5.400	5.551
Connecticut	5.992	6.332	6.251
Delaware	5.428	5.723	5.763
District of Columbia	7.567	8.508	8.423
Florida	5.380	5.666	5.715
Georgia	5.401	5.463	5.433
Hawaii	5.534	5.806	5.643
Idaho	5.221	5.407	5.483
Illinois	5.178	5.456	5.433
Indiana	5.110	5.322	5.223
Iowa	5.230	5.318	5.367
Kansas	5.244	5.282	5.291
Kentucky	5.244	5.472	5.332
Louisiana	6.046	6.654	6.446
Maine	5.965	6.393	6.388
Maryland	5.547	5.790	5.844
Massachusetts	5.851	6.117	6.108
Michigan	5.421	5.788	5.855
Minnesota	5.099	5.251	5.266
Mississippi	5.699	6.325	6.114
Missouri	5.597	6.123	5.966
Montana	5.324	5.547	5.571
Nebraska	5.059	5.187	5.224
Nevada	5.397	5.527	5.575
New Hampshire	6.035	6.226	5.943
New Jersey	6.068	6.294	6.212
New Mexico	5.708	6.021	5.990
New York	5.183	5.333	5.293
North Carolina	4.914	4.954	4.996
North Dakota	6.116	6.525	6.821
Ohio	4.986	5.126	5.073
Oklahoma	5.190	5.320	5.281
Oregon	6.138	6.319	6.222
Pennsylvania	5.071	5.244	5.201
Rhode Island	5.803	6.067	6.004
South Carolina	5.489	5.711	5.714
South Dakota	5.316	5.491	5.477
Tennessee	5.897	6.206	5.817
Texas	5.657	6.007	5.987
Utah	5.908	6.337	6.117
Vermont	5.524	5.842	5.785
Virginia	5.151	5.301	5.218
Washington	5.026	5.574	5.623
West Virginia	5.775	6.085	5.877
Wisconsin	5.356	5.608	5.795
Wyoming	5.602	5.864	5.956

TABLE A.21

PRELIMINARY SHRINKAGE ESTIMATES OF FSP PARTICIPATION RATES,
ALL ELIGIBLE PEOPLE

	2004	2005	2006
Alabama	59.244	65.040	64.717
Alaska	59.156	65.949	62.234
Arizona	61.800	60.598	60.062
Arkansas	70.131	75.338	75.594
California	47.376	47.740	49.498
Colorado	51.957	52.383	53.462
Connecticut	58.473	63.202	64.206
Delaware	61.388	63.828	71.571
District of Columbia	76.585	71.571	84.686
Florida	56.338	57.536	60.928
Georgia	65.740	68.776	66.986
Hawaii	72.056	70.888	70.871
Idaho	57.510	57.723	56.041
Illinois	68.276	74.592	77.635
Indiana	65.978	70.889	72.383
Iowa	58.464	64.741	69.908
Kansas	53.551	57.613	57.691
Kentucky	70.847	75.120	77.246
Louisiana	72.889	78.177	73.667
Maine	80.363	84.547	94.535
Maryland	51.575	52.844	58.611
Massachusetts	47.462	50.887	59.887
Michigan	64.381	70.716	78.619
Minnesota	62.381	65.384	67.603
Mississippi	58.763	59.773	62.321
Missouri	84.962	92.966	96.732
Montana	57.631	59.557	61.400
Nebraska	61.211	64.605	65.503
Nevada	52.011	49.866	53.560
New Hampshire	60.616	62.574	67.117
New Jersey	54.029	58.140	59.049
New Mexico	63.915	68.024	69.946
New York	54.244	59.134	62.092
North Carolina	59.817	62.090	65.918
North Dakota	50.964	51.909	56.146
Ohio	60.988	65.595	68.492
Oklahoma	66.130	68.298	68.053
Oregon	77.864	78.161	83.457
Pennsylvania	64.190	69.695	74.056
Rhode Island	52.531	54.781	54.261
South Carolina	66.441	68.392	72.411
South Dakota	51.983	55.312	57.029
Tennessee	83.828	88.684	89.922
Texas	55.480	57.516	62.137
Utah	57.248	60.164	54.956
Vermont	69.722	73.057	78.548
Virginia	61.934	64.278	67.973
Washington	66.243	66.245	73.613
West Virginia	74.994	76.752	81.343
Wisconsin	54.706	57.544	65.463
Wyoming	50.642	51.276	51.706

TABLE A.22

PRELIMINARY SHRINKAGE ESTIMATES OF FSP PARTICIPATION RATES, WORKING POOR

	2004	2005	2006
Alabama	52.119	60.560	55.598
Alaska	55.233	64.469	59.989
Arizona	47.520	47.142	48.554
Arkansas	59.204	69.683	65.760
California	33.376	33.481	34.832
Colorado	40.505	34.786	38.354
Connecticut	47.137	43.390	43.426
Delaware	55.446	57.561	63.051
District of Columbia	33.130	33.266	41.611
Florida	41.268	44.757	48.517
Georgia	56.019	59.851	56.415
Hawaii	58.729	62.422	60.040
Idaho	48.407	51.600	50.162
Illinois	57.841	62.735	63.821
Indiana	63.615	69.363	69.233
Iowa	50.970	56.003	62.550
Kansas	46.126	48.011	49.138
Kentucky	63.540	72.385	68.701
Louisiana	69.513	78.800	67.068
Maine	74.648	83.712	89.894
Maryland	42.603	39.072	43.725
Massachusetts	37.695	33.352	40.672
Michigan	64.293	69.493	74.898
Minnesota	44.057	43.606	47.275
Mississippi	48.949	56.082	53.093
Missouri	75.828	87.471	88.538
Montana	49.575	54.056	54.121
Nebraska	50.001	52.290	52.792
Nevada	36.109	35.547	41.224
New Hampshire	51.895	52.923	57.116
New Jersey	47.071	43.781	43.640
New Mexico	59.358	70.975	66.363
New York	41.879	44.954	46.044
North Carolina	49.414	54.578	55.959
North Dakota	49.665	49.817	52.439
Ohio	57.086	60.980	61.472
Oklahoma	58.069	63.380	59.840
Oregon	65.917	67.697	71.184
Pennsylvania	57.549	62.586	65.372
Rhode Island	38.971	35.350	34.256
South Carolina	61.232	65.852	64.910
South Dakota	50.701	54.287	54.314
Tennessee	72.133	81.866	77.959
Texas	47.839	54.971	53.819
Utah	46.563	51.968	47.278
Vermont	60.418	65.934	70.729
Virginia	51.113	53.377	56.256
Washington	53.398	57.277	62.200
West Virginia	68.375	77.275	76.049
Wisconsin	49.363	51.942	58.880
Wyoming	51.310	52.619	51.425

TABLE A.23

FINAL SHRINKAGE ESTIMATES OF FSP PARTICIPATION RATES,
ALL ELIGIBLE PEOPLE

	2004	2005	2006
Alabama	59.855	66.390	65.760
Alaska	59.766	67.318	63.237
Arizona	62.438	61.856	61.029
Arkansas	70.854	76.902	76.812
California	47.865	48.731	50.296
Colorado	52.493	53.470	54.323
Connecticut	59.077	64.514	65.241
Delaware	62.021	65.154	72.724
District of Columbia	77.375	73.057	86.051
Florida	56.919	58.730	61.910
Georgia	66.419	70.204	68.065
Hawaii	72.799	72.359	72.013
Idaho	58.103	58.921	56.944
Illinois	68.981	76.140	78.886
Indiana	66.659	72.360	73.549
Iowa	59.067	66.085	71.035
Kansas	54.104	58.809	58.621
Kentucky	71.578	76.680	78.490
Louisiana	73.641	79.800	74.855
Maine	81.192	86.302	96.059
Maryland	52.107	53.941	59.555
Massachusetts	47.952	51.943	60.852
Michigan	65.046	72.184	79.886
Minnesota	63.025	66.742	68.692
Mississippi	59.369	61.014	63.325
Missouri	85.839	94.896	98.291
Montana	58.225	60.793	62.389
Nebraska	61.842	65.947	66.559
Nevada	52.547	50.902	54.423
New Hampshire	61.241	63.873	68.198
New Jersey	54.586	59.347	60.000
New Mexico	64.575	69.436	71.074
New York	54.804	60.362	63.093
North Carolina	60.434	63.379	66.981
North Dakota	51.489	52.987	57.050
Ohio	61.618	66.957	69.596
Oklahoma	66.812	69.716	69.149
Oregon	78.668	79.783	84.802
Pennsylvania	64.852	71.142	75.249
Rhode Island	53.073	55.919	55.136
South Carolina	67.126	69.811	73.578
South Dakota	52.519	56.460	57.949
Tennessee	84.693	90.526	91.371
Texas	56.053	58.710	63.138
Utah	57.839	61.413	55.841
Vermont	70.441	74.573	79.814
Virginia	62.574	65.612	69.069
Washington	66.926	67.620	74.800
West Virginia	75.767	78.345	82.654
Wisconsin	55.270	58.739	66.518
Wyoming	51.164	52.341	52.539

TABLE A.24

FINAL SHRINKAGE ESTIMATES OF FSP PARTICIPATION RATES,
WORKING POOR

	2004	2005	2006
Alabama	53.570	62.595	57.685
Alaska	56.771	66.635	62.241
Arizona	48.844	48.726	50.377
Arkansas	60.853	72.024	68.228
California	34.306	34.606	36.139
Colorado	41.634	35.955	39.793
Connecticut	48.449	44.848	45.056
Delaware	56.990	59.494	65.418
District of Columbia	34.053	34.383	43.173
Florida	42.417	46.261	50.338
Georgia	57.579	61.861	58.533
Hawaii	60.365	64.520	62.293
Idaho	49.755	53.334	52.045
Illinois	59.452	64.843	66.216
Indiana	65.386	71.694	71.831
Iowa	52.390	57.885	64.898
Kansas	47.411	49.624	50.983
Kentucky	65.310	74.817	71.279
Louisiana	71.449	81.448	69.585
Maine	76.727	86.524	93.267
Maryland	43.790	40.384	45.366
Massachusetts	38.745	34.473	42.199
Michigan	66.084	71.827	77.709
Minnesota	45.285	45.071	49.049
Mississippi	50.313	57.967	55.085
Missouri	77.940	90.410	91.861
Montana	50.956	55.872	56.153
Nebraska	51.394	54.047	54.773
Nevada	37.115	36.742	42.771
New Hampshire	53.341	54.701	59.260
New Jersey	48.383	45.251	45.278
New Mexico	61.011	73.360	68.853
New York	43.045	46.465	47.772
North Carolina	50.790	56.412	58.059
North Dakota	51.049	51.491	54.408
Ohio	58.676	63.029	63.779
Oklahoma	59.686	65.509	62.086
Oregon	67.753	69.972	73.855
Pennsylvania	59.152	64.689	67.826
Rhode Island	40.057	36.538	35.542
South Carolina	62.937	68.065	67.346
South Dakota	52.113	56.111	56.352
Tennessee	74.142	84.617	80.885
Texas	49.171	56.818	55.839
Utah	47.860	53.714	49.052
Vermont	62.101	68.149	73.384
Virginia	52.537	55.170	58.367
Washington	54.885	59.201	64.534
West Virginia	70.280	79.871	78.903
Wisconsin	50.738	53.687	61.090
Wyoming	52.740	54.387	53.355

TABLE A.25

STANDARD ERRORS OF FINAL SHRINKAGE ESTIMATES OF PARTICIPATION RATES, ALL ELIGIBLE PEOPLE

	2004	2005	2006
Alabama	2.341	2.339	2.512
Alaska	2.384	3.183	3.013
Arizona	3.453	2.855	3.028
Arkansas	2.542	2.875	2.663
California	1.428	1.378	1.112
Colorado	2.469	2.609	2.602
Connecticut	3.794	3.543	3.831
Delaware	2.946	3.155	2.936
District of Columbia	4.071	3.506	4.573
Florida	1.788	2.299	2.209
Georgia	2.842	2.593	2.281
Hawaii	3.556	3.780	3.475
Idaho	2.992	3.055	3.047
Illinois	2.225	2.590	2.647
Indiana	3.049	2.897	3.144
Iowa	2.685	2.338	2.741
Kansas	2.829	2.677	2.810
Kentucky	2.645	2.770	2.625
Louisiana	3.212	3.551	3.406
Maine	3.170	3.645	3.552
Maryland	2.728	2.895	3.085
Massachusetts	2.195	2.613	2.519
Michigan	1.936	2.227	2.156
Minnesota	3.123	3.488	3.332
Mississippi	2.034	2.843	2.762
Missouri	2.688	3.419	3.228
Montana	2.328	2.848	2.835
Nebraska	2.682	2.690	2.605
Nevada	3.010	2.809	3.151
New Hampshire	3.492	3.301	3.410
New Jersey	3.430	2.804	3.157
New Mexico	2.314	2.526	2.398
New York	1.849	1.610	1.867
North Carolina	2.377	2.418	2.455
North Dakota	3.427	3.296	3.492
Ohio	2.342	1.807	2.352
Oklahoma	2.736	2.646	2.071
Oregon	3.340	3.443	3.492
Pennsylvania	2.548	2.596	2.383
Rhode Island	2.767	2.449	2.473
South Carolina	2.248	2.552	2.807
South Dakota	2.279	2.686	2.741
Tennessee	3.533	3.448	3.146
Texas	1.839	2.188	2.202
Utah	2.328	3.334	3.087
Vermont	3.110	3.418	3.162
Virginia	2.666	2.533	2.691
Washington	2.834	3.222	3.268
West Virginia	2.588	3.024	2.674
Wisconsin	2.030	2.438	2.826
Wyoming	3.214	3.282	3.243

TABLE A.26

STANDARD ERRORS OF FINAL SHRINKAGE ESTIMATES OF PARTICIPATION RATES, WORKING POOR

	2004	2005	2006
Alabama	3.645	4.045	3.979
Alaska	3.859	4.814	4.558
Arizona	4.995	3.914	4.760
Arkansas	3.957	4.267	3.598
California	1.919	2.504	2.504
Colorado	3.210	2.942	3.501
Connecticut	4.134	4.933	5.235
Delaware	5.172	5.596	5.646
District of Columbia	5.285	6.993	6.746
Florida	2.692	3.749	3.636
Georgia	4.550	4.394	4.051
Hawaii	4.853	5.211	4.707
Idaho	3.808	3.641	4.132
Illinois	3.346	4.171	3.835
Indiana	4.288	4.628	4.529
Iowa	3.370	3.494	3.866
Kansas	3.478	3.622	3.788
Kentucky	3.556	3.984	3.926
Louisiana	5.229	5.708	5.852
Maine	5.026	5.640	5.768
Maryland	3.742	3.963	4.657
Massachusetts	3.797	4.296	4.233
Michigan	3.883	4.840	4.802
Minnesota	3.941	4.343	3.893
Mississippi	2.892	5.053	4.411
Missouri	4.139	5.363	5.385
Montana	3.452	4.086	4.477
Nebraska	3.201	3.532	3.838
Nevada	3.588	3.969	4.097
New Hampshire	5.091	5.071	5.171
New Jersey	4.500	4.679	4.424
New Mexico	4.019	4.539	4.606
New York	3.135	3.499	3.440
North Carolina	3.528	3.831	3.599
North Dakota	4.555	4.732	5.521
Ohio	3.237	3.522	3.621
Oklahoma	4.211	4.107	3.660
Oregon	5.400	5.410	5.584
Pennsylvania	3.683	4.155	3.874
Rhode Island	3.743	4.280	3.970
South Carolina	4.061	4.421	4.487
South Dakota	4.114	4.295	4.525
Tennessee	5.421	5.298	4.342
Texas	2.873	3.757	3.529
Utah	3.548	4.571	3.962
Vermont	4.682	5.237	5.091
Virginia	3.760	4.208	3.914
Washington	4.078	4.940	4.740
West Virginia	5.055	5.439	4.981
Wisconsin	2.639	3.768	4.305
Wyoming	4.678	5.148	4.816

TABLE A.27

FINAL SHRINKAGE ESTIMATES OF NUMBERS OF PEOPLE ELIGIBLE FOR THE FSP,
ALL ELIGIBLE PEOPLE

	2004	2005	2006
Alabama	809,912	787,090	808,701
Alaska	81,596	80,410	86,547
Arizona	829,126	859,161	851,587
Arkansas	479,918	477,305	480,942
California	3,837,841	4,018,314	3,931,239
Colorado	456,996	450,042	451,296
Connecticut	324,950	306,154	312,204
Delaware	83,248	86,025	81,721
District of Columbia	111,793	117,712	99,213
Florida	2,056,174	2,110,041	1,911,315
Georgia	1,264,057	1,277,988	1,337,335
Hawaii	132,957	126,719	120,998
Idaho	152,069	153,909	156,433
Illinois	1,514,314	1,499,101	1,519,059
Indiana	762,515	744,820	762,703
Iowa	296,171	303,973	309,072
Kansas	304,724	294,889	302,438
Kentucky	745,614	731,745	732,641
Louisiana	933,868	886,423	834,891
Maine	163,252	166,142	155,544
Maryland	500,882	507,787	482,712
Massachusetts	678,742	670,180	678,066
Michigan	1,375,319	1,327,575	1,291,902
Minnesota	374,049	370,100	371,386
Mississippi	627,463	621,326	638,595
Missouri	783,108	787,647	797,171
Montana	129,759	129,886	125,050
Nebraska	179,452	175,857	176,850
Nevada	222,471	235,459	213,489
New Hampshire	76,696	79,102	80,788
New Jersey	670,349	649,829	661,668
New Mexico	339,097	340,454	335,181
New York	2,864,836	2,851,879	2,777,909
North Carolina	1,233,532	1,236,471	1,257,071
North Dakota	76,715	75,675	70,148
Ohio	1,500,237	1,459,801	1,476,481
Oklahoma	599,363	581,356	609,784
Oregon	482,200	491,423	455,633
Pennsylvania	1,458,714	1,432,963	1,421,263
Rhode Island	138,439	131,772	130,092
South Carolina	728,016	729,039	708,067
South Dakota	98,999	97,599	99,846
Tennessee	927,365	913,145	920,502
Texas	3,896,479	3,931,916	3,836,954
Utah	211,449	211,238	230,481
Vermont	59,481	56,716	56,162
Virginia	758,474	722,246	711,790
Washington	649,384	743,387	701,832
West Virginia	327,391	327,355	310,588
Wisconsin	561,935	535,297	498,948
Wyoming	49,078	48,089	45,336

TABLE A.28

FINAL SHRINKAGE ESTIMATES OF NUMBERS OF PEOPLE ELIGIBLE FOR THE FSP, WORKING POOR

	2004	2005	2006
Alabama	371,365	331,136	345,695
Alaska	42,922	37,797	40,227
Arizona	446,709	456,092	521,002
Arkansas	221,471	220,094	235,276
California	2,107,702	2,087,456	2,171,149
Colorado	253,914	232,998	220,384
Connecticut	104,212	126,772	128,920
Delaware	39,712	40,137	41,324
District of Columbia	30,419	37,704	29,599
Florida	1,007,142	996,889	877,681
Georgia	582,177	621,235	704,377
Hawaii	68,871	57,266	58,065
Idaho	91,317	84,892	87,949
Illinois	677,174	673,675	697,010
Indiana	328,981	333,462	336,426
Iowa	143,210	150,857	158,779
Kansas	141,324	136,887	163,517
Kentucky	296,010	266,081	299,142
Louisiana	453,048	391,955	382,750
Maine	58,585	58,805	60,809
Maryland	181,467	208,607	223,296
Massachusetts	212,280	237,023	217,749
Michigan	586,103	591,374	570,114
Minnesota	175,208	191,054	167,925
Mississippi	294,172	285,302	299,192
Missouri	350,669	410,358	464,474
Montana	64,934	63,630	63,786
Nebraska	91,069	77,416	94,128
Nevada	110,068	104,202	108,992
New Hampshire	28,675	32,080	32,917
New Jersey	236,058	257,911	299,747
New Mexico	173,866	162,621	176,277
New York	1,052,182	1,115,884	1,267,140
North Carolina	546,861	533,664	550,595
North Dakota	37,178	36,177	33,319
Ohio	647,369	640,569	644,953
Oklahoma	298,324	276,016	292,650
Oregon	249,304	224,197	202,258
Pennsylvania	584,332	579,337	573,048
Rhode Island	46,072	56,180	38,748
South Carolina	330,481	304,056	325,651
South Dakota	47,664	44,215	51,705
Tennessee	431,996	336,521	375,838
Texas	2,115,616	2,101,338	2,096,288
Utah	121,514	121,806	125,997
Vermont	23,118	23,472	22,318
Virginia	363,041	310,972	324,218
Washington	281,171	317,953	314,349
West Virginia	124,403	116,457	122,298
Wisconsin	284,227	242,545	245,190
Wyoming	26,311	24,503	21,821

TABLE A.29

STANDARD ERRORS OF FINAL SHRINKAGE ESTIMATES OF NUMBERS OF PEOPLE ELIGIBLE FOR THE FSP, ALL ELIGIBLE PEOPLE

	2004	2005	2006
Alabama	31,678	27,732	30,887
Alaska	3,254	3,802	4,124
Arizona	45,847	39,658	42,251
Arkansas	17,218	17,847	16,676
California	114,523	113,612	86,891
Colorado	21,492	21,962	21,613
Connecticut	20,867	16,813	18,334
Delaware	3,954	4,166	3,299
District of Columbia	5,881	5,650	5,273
Florida	64,606	82,587	68,188
Georgia	54,085	47,212	44,814
Hawaii	6,495	6,620	5,839
Idaho	7,832	7,980	8,371
Illinois	48,851	51,000	50,977
Indiana	34,883	29,824	32,603
Iowa	13,463	10,752	11,927
Kansas	15,932	13,422	14,497
Kentucky	27,548	26,431	24,506
Louisiana	40,732	39,443	37,991
Maine	6,375	7,016	5,751
Maryland	26,225	27,251	25,005
Massachusetts	31,069	33,717	28,065
Michigan	40,942	40,967	34,861
Minnesota	18,533	19,344	18,015
Mississippi	21,492	28,948	27,855
Missouri	24,526	28,374	26,179
Montana	5,188	6,085	5,682
Nebraska	7,782	7,174	6,921
Nevada	12,746	12,995	12,362
New Hampshire	4,373	4,088	4,039
New Jersey	42,118	30,700	34,818
New Mexico	12,151	12,384	11,311
New York	96,639	76,082	82,205
North Carolina	48,524	47,165	46,082
North Dakota	5,105	4,708	4,294
Ohio	57,015	39,407	49,901
Oklahoma	24,547	22,067	18,261
Oregon	20,472	21,204	18,763
Pennsylvania	57,317	52,286	45,013
Rhode Island	7,217	5,771	5,834
South Carolina	24,376	26,646	27,012
South Dakota	4,295	4,642	4,723
Tennessee	38,687	34,777	31,691
Texas	127,812	146,514	133,831
Utah	8,510	11,467	12,740
Vermont	2,626	2,599	2,225
Virginia	32,313	27,885	27,729
Washington	27,495	35,416	30,667
West Virginia	11,183	12,634	10,048
Wisconsin	20,641	22,214	21,199
Wyoming	3,083	3,015	2,799

TABLE A.30

STANDARD ERRORS OF FINAL SHRINKAGE ESTIMATES OF NUMBERS OF PEOPLE ELIGIBLE FOR THE FSP, WORKING POOR

	2004	2005	2006
Alabama	25,268	21,396	23,846
Alaska	2,917	2,731	2,946
Arizona	45,685	36,634	49,230
Arkansas	14,403	13,039	12,406
California	117,931	151,026	150,430
Colorado	19,580	19,067	19,392
Connecticut	8,892	13,944	14,979
Delaware	3,604	3,775	3,567
District of Columbia	4,721	7,668	4,625
Florida	63,919	80,794	63,400
Georgia	46,000	44,125	48,748
Hawaii	5,537	4,625	4,388
Idaho	6,988	5,795	6,982
Illinois	38,112	43,338	40,366
Indiana	21,574	21,527	21,213
Iowa	9,211	9,105	9,459
Kansas	10,368	9,990	12,150
Kentucky	16,118	14,169	16,476
Louisiana	33,154	27,470	32,188
Maine	3,838	3,833	3,761
Maryland	15,506	20,471	22,923
Massachusetts	20,804	29,540	21,842
Michigan	34,437	39,849	35,231
Minnesota	15,247	18,409	13,328
Mississippi	16,909	24,872	23,956
Missouri	18,624	24,340	27,229
Montana	4,399	4,654	5,086
Nebraska	5,672	5,059	6,596
Nevada	10,640	11,257	10,441
New Hampshire	2,737	2,974	2,872
New Jersey	21,954	26,670	29,288
New Mexico	11,454	10,063	11,791
New York	76,638	84,022	91,232
North Carolina	37,988	36,246	34,128
North Dakota	3,317	3,324	3,381
Ohio	35,708	35,796	36,616
Oklahoma	21,047	17,304	17,253
Oregon	19,871	17,335	15,292
Pennsylvania	36,386	37,207	32,732
Rhode Island	4,306	6,581	4,329
South Carolina	21,325	19,751	21,699
South Dakota	3,763	3,384	4,152
Tennessee	31,585	21,071	20,174
Texas	123,621	138,956	132,482
Utah	9,008	10,366	10,178
Vermont	1,743	1,804	1,548
Virginia	25,984	23,717	21,744
Washington	20,893	26,534	23,089
West Virginia	8,948	7,931	7,720
Wisconsin	14,786	17,023	17,277
Wyoming	2,334	2,319	1,970

TABLE A.31

NUMBER OF PEOPLE RECEIVING FSP BENEFITS, ADJUSTED FOR PAYMENT ERRORS, ALL ELIGIBLE PEOPLE

	2004	2005	2006
Alabama	484,773	522,547	531,801
Alaska	48,767	54,130	54,730
Arizona	517,692	531,438	519,719
Arkansas	340,042	367,056	369,420
California	1,836,986	1,958,168	1,977,260
Colorado	239,889	240,639	245,158
Connecticut	191,970	197,511	203,685
Delaware	51,632	56,048	59,431
District of Columbia	86,500	85,997	85,374
Florida	1,170,356	1,239,233	1,183,286
Georgia	839,573	897,195	910,256
Hawaii	96,792	91,693	87,134
Idaho	88,357	90,684	89,079
Illinois	1,044,589	1,141,418	1,198,325
Indiana	508,287	538,954	560,961
Iowa	174,940	200,880	219,548
Kansas	164,868	173,421	177,291
Kentucky	533,697	561,101	575,052
Louisiana	687,712	707,369	624,953
Maine	132,547	143,384	149,413
Maryland	260,995	273,906	287,481
Massachusetts	325,470	348,111	412,613
Michigan	894,583	958,297	1,032,046
Minnesota	235,743	247,010	255,113
Mississippi	372,519	379,096	404,389
Missouri	672,212	747,448	783,545
Montana	75,553	78,961	78,018
Nebraska	110,977	115,972	117,709
Nevada	116,902	119,852	116,187
New Hampshire	46,970	50,525	55,096
New Jersey	365,919	385,651	397,002
New Mexico	218,972	236,397	238,225
New York	1,570,048	1,721,448	1,752,660
North Carolina	745,478	783,664	841,992
North Dakota	39,500	40,098	40,020
Ohio	924,409	977,440	1,027,566
Oklahoma	400,449	405,295	421,661
Oregon	379,336	392,073	386,386
Pennsylvania	946,008	1,019,440	1,069,491
Rhode Island	73,474	73,685	71,727
South Carolina	488,691	508,952	520,979
South Dakota	51,994	55,105	57,859
Tennessee	785,416	826,629	841,072
Texas	2,184,089	2,308,444	2,422,580
Utah	122,299	129,728	128,703
Vermont	41,899	42,295	44,825
Virginia	474,605	473,880	491,624
Washington	434,609	502,681	524,967
West Virginia	248,056	256,466	256,713
Wisconsin	310,583	314,427	331,888
Wyoming	25,110	25,170	23,819

TABLE A.32

NUMBER OF PEOPLE RECEIVING FSP BENEFITS, ADJUSTED FOR PAYMENT ERRORS, WORKING POOR

	2004	2005	2006
Alabama	198,942	207,274	199,414
Alaska	24,368	25,186	25,038
Arizona	218,189	222,235	262,463
Arkansas	134,772	158,521	160,525
California	723,058	722,385	784,625
Colorado	105,713	83,775	87,698
Connecticut	50,490	56,855	58,086
Delaware	22,632	23,879	27,033
District of Columbia	10,358	12,964	12,779
Florida	427,199	461,168	441,803
Georgia	335,213	384,305	412,290
Hawaii	41,574	36,948	36,171
Idaho	45,435	45,276	45,773
Illinois	402,596	436,830	461,529
Indiana	215,109	239,071	241,660
Iowa	75,028	87,323	103,044
Kansas	67,003	67,929	83,365
Kentucky	193,324	199,072	213,225
Louisiana	323,698	319,238	266,335
Maine	44,950	50,881	56,715
Maryland	79,464	84,244	101,300
Massachusetts	82,248	81,708	91,887
Michigan	387,319	424,768	443,030
Minnesota	79,342	86,109	82,366
Mississippi	148,006	165,379	164,810
Missouri	273,312	371,003	426,668
Montana	33,088	35,551	35,818
Nebraska	46,804	41,841	51,557
Nevada	40,851	38,285	46,617
New Hampshire	15,295	17,548	19,506
New Jersey	114,211	116,708	135,720
New Mexico	106,077	119,298	121,372
New York	452,914	518,491	605,336
North Carolina	277,749	301,049	319,668
North Dakota	18,979	18,628	18,128
Ohio	379,847	403,745	411,343
Oklahoma	178,059	180,816	181,694
Oregon	168,910	156,875	149,378
Pennsylvania	345,641	374,765	388,672
Rhode Island	18,455	20,527	13,772
South Carolina	207,996	206,954	219,312
South Dakota	24,839	24,810	29,137
Tennessee	320,289	284,752	303,995
Texas	1,040,270	1,193,928	1,170,552
Utah	58,156	65,427	61,804
Vermont	14,356	15,996	16,378
Virginia	190,731	171,564	189,236
Washington	154,320	188,231	202,863
West Virginia	87,430	93,015	96,497
Wisconsin	144,211	130,216	149,787
Wyoming	13,876	13,327	11,643