



National Center for Food & Agricultural Policy

## Social Security Policy and Rural Communities, with Comparisons to Urban Communities

A Report of the National Center for Food & Agricultural Policy  
by Karl G. King, Glenn L. Nelson, and Jill Long Thompson

Detailed Methodology And References

June 22, 2007

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## A Word on Levels and Ratios

The primary motivation of this study was the analysis of the relative size of impacts of Social Security changes on communities across the rural-urban spectrum and also by state and region. Assumptions for variables that affect all counties with an equal proportional effect tended not to have a major effect on the findings. For example, projections of GDP, total personal income and the CPI had major effects on the absolute size of impacts in 2034. However, the effects on ratios of rural to urban effects were much smaller than on levels. Put differently, our conclusions with respect to rural-urban differences in potential policies are not likely sensitive to our particular assumptions with regard to the levels of GDP, income and the CPI because we maintained internal consistency among these variables.

## Methodological Procedures Applicable to Two or Three of the Policy Proposals

### Population

The analysis required projections of the total population, people aged 65 or older, and the number of 68 year olds by gender and county in 2034. In addition, to gain insight and confidence in the projections for 2034, we also compiled estimates for 2006. The latter have the advantage of not being a function of the many assumptions inherent in population projections for a period almost thirty years into the future. The similarities and differences between the two sets of estimates provided insights into the projections.

The analysis utilized Bureau of the Census projections as benchmarks for 2034 (U. S. Bureau of the Census, March 2004). Census projects the nation's population by single year of age and sex, as well as other features, for all years through 2050. This analysis incorporated their projections for total population, for people aged 65 or older, and for the number of 68 year olds, by male and female in all cases, in 2034. The use of Census projections ensured consistency with the work of the Social Security Administration (SSA) that utilizes Census projections.

The county projections by age and sex were based on the work of Woods & Poole (Woods & Poole). Their projections for 2006 were used without adjustment. The case of 2034 is more complex. The projections of Woods & Poole are limited to 2030 and prior years. We used the distribution of people across counties in 2030 in the Woods & Poole file as our measure of the distribution across counties in 2034. We applied this distribution to the national

benchmark totals from Census. This work was done for all counties in the United States. For example, Lamar County, Alabama, contains 0.005759 percent of the nation's female 68 year olds in 2030 in the Woods & Poole projections. We projected the number of female 68 year olds in Lamar County in 2034 by multiplying 0.005759 percent times 1,935,537, which was the Census projection of the number of female 68 year olds in the nation in 2034.

#### Average Benefit of Retired Workers by Gender by County

This analysis focused on retired workers. It did not include other Old Age, Survivors, and Disability Insurance (OASDI) beneficiaries such as those with disability benefits, survivors' benefits, and benefits as a spouse or child of a retired worker. SSA typically reports the data on beneficiaries and benefits for December of each year.

Beneficiaries reside outside of the United States as well as in the U.S. SSA provides data for those in "outlying areas" and foreign countries separate from those for the United States. The distinction can be important in helping to rationalize small differences in tables that appear on the surface to represent the same population. For example, in late 2005 the average monthly benefit for all retired worker beneficiaries (including those outside the U.S.) was \$1002.00 while the average monthly benefit for those in the U.S. was \$1009.75 and for those in outlying areas and foreign countries was \$630.07 (U. S. SSA, September 2006, Tables 2 and 3). The average benefit for all retired worker beneficiaries (including those outside the U.S.) in December 2006 was \$1044.39 (U. S. SSA, January 2007a). This analysis focused on beneficiaries in the U.S.

SSA provides information for all retired worker beneficiaries, including those outside the U.S., on number of beneficiaries, total benefits, and average benefits by sex (see multiple tables starting from [www.socialsecurity.gov](http://www.socialsecurity.gov)). Average benefits for females and males in December 2006 were \$904.66 and \$1177.42 respectively (U. S. SSA, January 2007a). The average female benefit was only 77 percent that of males. Distinguishing between females and males was an important feature of the analysis.

SSA does not provide data on benefits of retired workers by county and gender. This analysis developed estimates that enabled the results to reflect gender differences with a high degree of confidence.

SSA provides the number of beneficiaries and total benefits paid by county in the U. S. for December 2005 for retired workers (U. S. SSA, September 2006). In the same report SSA provides the number of beneficiaries and total benefits by gender for all beneficiaries aged 65 or older. "All beneficiaries" includes survivors, disabled persons, and spouses and children of retired workers in addition to retired workers. SSA reports show 99 percent of all male beneficiaries aged 65 or older are retired workers and, similarly, 99 percent of the benefits paid to all male beneficiaries aged 65 or older are paid to retired workers (U. S. SSA, 2006). The analogous percentages for females are much smaller, i.e., 68 and 70 percent respectively. Some retired workers are younger than 65, and the analysis took this into account.

The analysis used data for all male beneficiaries, including those outside the U.S., to derive factors used to adjust county data. As of December 2005 the number of male retired workers was 15,646,407, and they received an average benefit \$1129.43 (U.S. SSA , 2006). Multiplying the number of male retired workers times their average benefit (i.e.,  $15,646,407 \times \$1129.43$ ) yielded \$17,671,563,670 as the total amount of benefits received by male retired workers. The number of male beneficiaries of all types, i.e., including but not restricted to retired workers, aged 65 or older was 14,393,511; they received total benefits of \$16,267,962,000 and received an average benefit of \$1130.23 (U. S. SSA, September 2006). These data under gird two ratios:

Number of Male Retired Workers relative to Number of Male Beneficiaries of All Types equals  $15,646,407 / 14,393,511 = 1.08704589172162$

Benefits of Male Retired Workers relative to Benefits of Male Beneficiaries of All Types equals  $17,671,563,670 / 16,267,962,000 = 1.08628011732508$

The number of male retired workers and their monthly benefits were estimated as follows for every county and county equivalent.

1. Number of Male Retired Workers =  $1.08704589172162 \times$  Number of All Male Beneficiaries Aged 65 or Older
2. Total Benefits of Male Retired Workers =  $1.08628011732508 \times$  Total Benefits of All Male Beneficiaries Aged 65 or Older
3. Average Monthly Benefit of Male Retired Workers = Total Benefits of Male Retired Workers / Number of Male Retired Workers

The number of female retired workers and their monthly benefits were estimated as a residual for every county and county equivalent as follows.

1. Number of Female Retired Workers = Number of Retired Workers - Number of Male Retired Workers
2. Total Benefits of Female Retired Workers = Total Benefits of Retired Workers – Total Benefits of Male Retired Workers
3. Average Monthly Benefit of Female Retired Workers = Total Benefits of Female Retired Workers / Number of Female Retired Workers

Females were chosen as the residual category because the “Female Aged 65 or Over” group is much more diverse than that of males with respect to beneficiary status, as was noted above.

### Total Personal Income

The analysis required estimates of total personal income in 2034 by county. These estimates served as a base of comparison in the assessment of the importance of the consequences of policy changes relative to total income, that is, the relative importance of

policy changes in different communities. We estimated national total personal income by noting that it was approximately 83 percent of GDP in 2004 and 2005 (U. S. Bureau of Economic Analysis, January 2007).

The analysis updated the SSA GDP estimate for 2034 to maintain consistency between SSA's projections of benefits and GDP; the discussion of the update of the projection of benefits occurs later in the section "Raising the Retirement Age". SSA projected nominal GDP of \$12,359 and \$45,930 billion in 2005 and 2034 respectively (U. S. SSA, March 23, 2005, Table VI.F). Actual nominal GDP in 2005 was \$12,456 billion (U. S. Bureau of Economic Analysis, January 31, 2007). The ratio of the projection for 2034 to the projection for 2005 is 3.71632009. The study applied this ratio to the actual GDP for 2005 to yield an updated projection of nominal GDP for 2034 of \$46,290 billion.

The study's estimate of nominal national total personal income in 2034 was 83 percent of the updated SSA GDP estimate, which yielded \$38,421 billion.

Woods & Poole projects total personal income by county in 1996 dollars (Woods & Poole). The most distant year in their projections is 2030. We used the distribution of the Woods & Poole projections by county in 2030 to distribute the benchmark national total for 2034 over all counties. For example, Woods & Poole project total personal income of Clark County, Nevada, in 2030 will be 0.77079 percent of national total personal income. We calculate our projection for Clark County for 2034 as 0.77079 percent of \$38,421 billion; the resulting projection is \$296.1 billion.

### Methodological Procedures Particular to a Single Policy Proposal

#### Raising the Retirement Age

The work on this policy proposal incorporated the methods described above in the section "Methodological Procedures Applicable to Two of Three of the Policy Proposals". Specifically, the following description is in addition to the earlier account regarding population, average benefits, and total personal income.

#### Projected Benefits

The analysis required a projection of average benefits in 2034. SSA provided, by special request, information on the average benefit by gender consistent with the "intermediate assumptions" case in the 2005 Trustees Report (Board of Trustees); this series appears to correspond to all beneficiaries rather than only those in the U. S. The average monthly benefits for female and male retired workers in the projection for December 2006 were \$703.82 and \$1,135.68 respectively. As noted in the preceding section, actual average monthly benefits for females and males in December 2006 were \$904.66 and \$1,177.42 respectively. The fact that actual data for late 2006 as computed in 2007 differs from projections done nearly three years ago for the 2005 Trustees Report should come as no surprise; projections depend on assumptions that almost never prove to be completely accurate. The projected average monthly benefits of females and males in late 2034 were \$2,388.03 and \$3,227.63 respectively.

The inconsistency of the actual and projected average benefits for December 2006 was handled as follows. The actual data were assumed accurate. The adjustment applied to the projection. This analysis applied the rate of increase, by gender, in the projections to the 2006 to 2034 period. Specifically, the projection for females shows an increase from \$703.82 in December 2006 to \$2,388.03 in December 2034. The ratio of the latter to the former is 3.3929556. Using the actual female average benefit of \$904.66 in December 2006 as a benchmark, this study projected the female average benefit in December 2034 as:

$$3.3929556 \times \$904.66 = \$3,069.47$$

Because the most recent county estimates are for the period December 2005, we needed the ratio of 2034 to 2005 which is

$$\$3,069.47 / \$867.30 = 3.5391099$$

The analysis multiplied the average female retired worker benefit for each county in 2005 by the factor 3.5391099 to compute the estimated average female retired worker benefit in 2034.

Similarly for males, the projection shows an increase from \$1,135.68 in December 2006 to \$3,227.63 in December 2034. The ratio of the latter to the former is 2.8420242. Using the actual male average benefit of \$1,177.42 in December 2006 as a benchmark, this study projected the male average benefit in December 2034 as:

$$2.8420242 \times \$1,177.42 = \$3,346.26$$

The ratio of 2034 to 2005 is:

$$\$3,346.26 / \$1,129.43 = 2.9627865$$

The analysis multiplied the average male retired worker benefit for each county in 2005 by the factor 2.9627865 to compute the estimated average male retired worker benefit in 2034.

### Reduction in Benefits

The reduction in benefits due to an increase in the full retirement age to 68 is the sum of the reduced benefits to males and females in each county. The reduction for males is the product of 12 times the average monthly benefit for males in late 2034 times the number of 68 year old males in the county. The calculation for females is strictly analogous. The population portion of the formula is an over-estimate because not every person is eligible for Social Security retired worker benefits. The benefit portion of the formula is an under-estimate because recent retirees have higher benefits than those who retired earlier. For example, in December 2005 the average monthly benefit for all retired workers was \$1,002; the average monthly benefit for those who retired in 2000-2005 was \$1,032 (U. S. SSA, forthcoming February 2007, Table 5.B4).

The projected reduction in benefits of \$142.2 billion in 2034 dollars seems reasonable, based on a comparison to the work of the U. S. Congressional Budget Office (CBO). As noted earlier, our update of the SSA projection of gross domestic product in 2034 equals \$46,290 billion (nominal dollars). Our estimate of reduced benefits equals 0.307 percent of GDP. When CBO examined the consequences of hastening the rise of the retirement age to 67 and then continuing the rise to 68 (which is not exactly the same scenario as our case but is similar), they concluded outlays would fall by 0.29 percent of GDP in 2040 (U. S. CBO, May 25, 2005, Table 1).

### Raising the Cap on Taxable Earnings

The work on this policy proposal incorporated the methods described above in the section “Methodological Procedures Applicable to Two of Three of the Policy Proposals”. Specifically, the following description is in addition to the earlier account regarding population and total personal income.

The analysis of this proposal proceeded on two complementary paths. First, the study simulated the consequences of no ceiling in 2003. Second, the study projected the consequences of no ceiling in 2034. The two approaches are discussed separately here.

### Simulation of No Ceiling in 2003

SSA publishes data on taxable earnings by county and gender for both OASDI (“Social Security retirement”) and Medicare Part A, a.k.a. Hospital Insurance (U. S. SSA, April 2006). SSA assigns earnings to counties based on the residence of the employee as of the end of the year with some exceptions (U. S. SSA, January 30, 2007). The exceptions are cases where W-2 forms are filed in paper rather than electronic form. These cases are allocated to the county where the employer is located. The exceptions consist of small businesses with few employees. SSA’s use of residential assignment is best for the purposes of this study, which focused on the consequences of policy changes on the communities where people live. Residential assignment is consistent with the procedures used for assigning benefits and income, which were also key facets of this analysis.

There is no ceiling on earnings subject to the Hospital Insurance (HI) tax. This study used the difference between HI taxable earnings and OASDI taxable earnings as the added earnings that would have been taxed under OASDI if there had been no ceiling on OASDI taxable earnings in 2003. The added tax was estimated by multiplying the added earnings by the tax rate of 12.4 percent (sum of employee and employer shares).

The added tax was compared to total personal income, by county, as one measure of relative importance across communities. Total personal income for 2003 was obtained from the U. S. Bureau of Economic Analysis (U. S. BEA, April, 2006a).

### Projection with a Higher Ceiling in 2034

Congressional Budget Office (CBO) Benchmark: The projection utilized the work of CBO as a benchmark estimate for the nation. The contribution of this analysis was to estimate the share of the impact borne by each county. The CBO benchmark used in this study was CBO’s analysis of the impacts of increasing the inclusion of taxable earnings from the current level of 83 percent to 90 percent. This scenario was included among many options

in CBO's documents of May 25, 2005; the two documents with identical titles differ in their use of a SSA or CBO baseline. More recently, CBO updated its analysis of this policy option in its report on the "Liebman-MacGuineas-Samwick (LMS) Proposal" requested by Congressman Jim Kolbe (U. S. Congressional Budget Office, February 8, 2006). This study took its benchmark from the analysis of the LMS Proposal. The LMS Proposal includes a phasing in of the increase from 83 percent in 2014 to 90 percent in 2021 (page 4). The data in Table 1 in the report (page 11) and in the more detailed Figure 1 worksheet in the supplemental file indicate the increase in the taxable maximum increases Social Security revenue by about 0.37 percent of GDP in 2034 (inferring an estimate from the 0.36 percent for 2025 in Table 1 and the wider spread between current law and proposal revenues for 2034 in the supplemental data).

In order to maintain consistency among the analyses, this study used the updated projection of GDP in 2034 for this policy option as well as for the other options. The derivation of this projection was discussed above in the section on "Total Personal Income". The projection for 2034 was \$46,290 billion. Thus, the increased tax of 0.37 percent of GDP is estimated to be \$171.27 billion in nominal dollars in 2034. The remaining task is to describe how this increase was allocated to counties.

Allocation To Counties: SSA data show that in 2005 six percent of workers had net compensation of \$90,000 and over (U. S. SSA, January 2007b). Because the ceiling on taxable earnings was \$90,000, the data indicate six percent of earners had earnings above the ceiling. These people would be affected by an increase in the ceiling.

The distributional data available for counties report households by income (U. S. Bureau of the Census, 2002). In order to use these county data to assess where those with higher earnings live, we needed an assumption as to the cut-off point for households. This study used the intuitively obvious choice that the geographic location of the top six percent of households is the best proxy for the location of the top six percent of earners.

Woods & Poole project numbers of households by income bracket and county. The projection shifts each county distribution so the median is consistent with the model's projection of the median by county. The distribution within each county, taken from the 2000 Census, does not change shape. Thus, the projection includes the impacts of a changing distribution of households among counties and a changing distribution of median incomes among counties. The projection does not attempt to estimate a changing distribution of household income within the county.

The Woods & Poole household income brackets of \$150,000 to \$199,999 and of \$200,000 or more (in year 2000 dollars) contain 3.8 and 4.0 percent, respectively, of all households with money income in the projection for 2030. This study used the geographic distribution of households in the \$200,000 or more bracket in 2030 as the measure of the distribution of earners who would be affected by an increase in the cap on taxable earnings in 2034. The choice of a lower bound of \$200,000 rather than \$150,000 resolved the tradeoff between imperfect options in favor of a clearer identification of counties highly likely to be affected. Specifically, the analysis calculated the ratio of the number of households in the \$200,000 or more bracket in each county to the total number of households with money



income in 2030. This ratio was multiplied times the national impact of increasing the ceiling on taxable income to estimate the county's share of the national impact in 2034.

#### Reducing Benefits for Those Subject to the 15 Percent Replacement Factor

The work on this policy proposal incorporated the methods described above in the section "Methodological Procedures Applicable to Two of Three of the Policy Proposals". Specifically, the following description is in addition to the earlier account regarding population, average benefits, and total personal income.

This analysis blended two sets of estimates for two different periods in order to estimate effects of the policy change as of 2034. The estimates regarding the relative importance of the policy change across counties were based on the pattern of benefits that existed in December 2005. This pattern was then applied to projections of the population as of 2034 to estimate the impact of the policy as of 2034.

#### Distribution of Benefits

We required estimates of the distribution of benefits by the size of benefit for all counties for the purpose of identifying those with higher benefits. Table 5.B9 in the Annual Statistical Supplement for 2006 (U. S., SSA, forthcoming February 2007) provides the distribution of monthly benefits of retired workers by sex for the nation in December 2005. As noted previously, the average benefit for women is significantly lower than that for men. In addition, the shape of the distribution of benefits is markedly different for women and men. This study analyzed women and men separately, which added precision.

This study assumed the shapes of the distributions in Table 5.B9 apply to all counties. The county distributions differ only with respect to the means of the distributions.

#### Choice of Proxy for the Second Bend Point

As of December 2005 the "bend points" were \$627 and \$3,779; the sum is \$4,406 (U. S. SSA, October 18, 2006). A person with an Average Indexed Monthly Earnings (AIME) of \$4,406 would have had a primary insurance amount (PIA) of \$1,573 (90 percent of \$627 plus 32 percent of (\$3,779 minus \$627)). Any person with benefits higher than \$1,573 had an AIME sufficiently high to be subject to the 15 percent bracket beyond the second bend point.

The bend points are not constant over time but grow at the rate of the average wage index. After the initial determination of benefits based upon the AIME, benefits grow with the consumer price index (CPI). Benefits paid as of December 2005 reflected the accumulated mix of the workings of these factors over prior years. The choice of benefit level to use as a proxy for those most likely to be affected by a decrease in the 15 percent replacement factor was a matter of some judgment.

This study used \$1,550 as the line of demarcation for purposes of identifying the beneficiaries as of December 2005 who would have been most affected by a lowering of the 15 percent replacement factor. Table 5.B9 shows 3.7 percent and 12.5 percent of female and male retired worker beneficiaries, respectively, above this line of demarcation.

The analysis computed the percent of beneficiaries, by county and gender, above \$1,550 in December 2005 using the distribution of benefits described above.

#### Average Benefits of Those Affected by the Policy

For the nation as a whole, the average benefits of those with benefits equal to or greater than \$1,550 in December 2005 were \$1,696.07 and \$1,741.25 for females and males respectively (U. S., SSA, forthcoming February 2007). The average benefit of those affected in each county differs from national figures because the proportion of the distribution of benefits that exceeds \$1,550 differs among counties. Counties with relatively low benefits have a smaller proportion of their beneficiaries above \$1,550, which is associated with a smaller average benefit for those whose benefits exceed \$1,550. This study, using the national distribution as a guide, developed estimates of the needed adjustment. Relative to the national average, the average benefits of females and males affected by the policy in each county were raised by \$0.18 and \$0.16 for each dollar that the county mean benefit of retired workers exceeded the national mean benefit of retired workers. Similarly, relative to the national average, the average benefits of females and males affected by the policy in each county were lowered by \$0.53 and \$0.40 for each dollar that the county mean benefit of retired workers exceeded the national mean benefit of retired workers. The algorithm included a floor of \$1,550 for the average benefit of those affected because, by construction of the policy, the average benefit of those affected could never be less than this.

Thus, this study included two important adjustments to county estimates relative to national benchmarks. Those counties with higher relative benefits had a larger proportion of beneficiaries affected by the policy, and those affected had a higher average benefit. Those counties with lower relative benefits had a smaller proportion of beneficiaries affected by the policy, and those affected had a lower average benefit. The asymmetry in the adjustment of the average benefit is not a surprise. For counties with a higher average benefit, the increasingly “fat” part of the distribution moves just beyond \$1,550 and this tends to retard the growth of the mean of those affected. For counties with a lower average benefit, the portion of the distribution beyond \$1,550 is relatively small and shrinks towards zero as the county’s mean benefit declines.

#### Proxy for the Total Number of Beneficiaries and for the Total Benefits Affected by the Policy

The analysis used the total population aged 65 or older in 2034, by gender, as a proxy for the total number of beneficiaries (see the prior section on “population”).

The proxy for the total benefits affected by the policy change, by county and gender in 2034, was the product of a) the proxy for the total number of beneficiaries times b) the percent of beneficiaries affected by the policy times c) the average benefit of those affected by the policy.

#### Fiscal Impact

The analysis summed over both genders and all counties the proxy measure of the total benefits affected by the change in policy. The next step was to compute each county’s

share, by gender, of the total. The shares, by gender, were used to allocate the CBO estimate of national impact to individual counties.

The study used the work of CBO as a benchmark estimate for the nation. The benchmark used in this study was CBO's analysis of the impacts of reducing the top replacement factor from 15 percent to 10 percent in 2012 (U. S. CBO, May 25, 2005, option 2.3). Extrapolating between CBO's estimates for 2020 and 2040, the reduction in benefits would equal about 0.08 percent of GDP in 2034.

As discussed earlier, this study used the updated projection of GDP in 2034 for this policy option as well as for the other options. The derivation of this projection was discussed above in the section on "Total Personal Income". The projection for 2034 was \$46,290 billion. Thus, the increased tax of 0.08 percent of GDP was estimated to be \$37 billion in nominal dollars in 2034. This was the reduction in benefits that was allocated to counties by gender.

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