Taxes and the Distribution of Income: Understanding the Debate

To the Editor:

Recent research from the U.S. Census Bureau may help us understand the debate between Tom Daley (Tax Notes, Sept. 26, 2005, p. 1585) and Prof. Deborah Geier (Tax Notes, June 6, 2005, p. 1308) about the effect of the tax system on the distribution of income.

At the outset, the overall effect of government tax and transfer policies on the market’s distribution of household income can be seen in the table and figure on the next page. The first row of the table shows the Census Bureau’s estimates of the distribution of household income before government taxes and transfers in 2001, by quintiles of population. Before government taxes and transfers, the richest 20 percent of American households got 55.6 percent of “market” income, and the poorest 20 percent got less than 1 percent.

In that regard, one popular measure of inequality is the so-called Gini index. Basically, the Gini index is a mathematical measure of inequality that can range from 0, indicating perfect equality, to 1, indicating perfect inequality. As you can see from the table, the Gini index for the pretax, pretransfer household income distribution in the United States in the year 2001 was a sizeable 0.510.1

The table also shows how government taxes and transfers reduce economic inequality. Row 2 of the table shows that after taxes and transfers in the year 2001, the bottom 60 percent of households picked up some income, and the top 40 percent lost some income — and the Gini index fell to 0.407.

The figure uses so-called Lorenz curves to illustrate those concepts. The horizontal axis in the figure shows the cumulative percentage of households, and the vertical axis shows the cumulative share of income earned by those households. An egalitarian society — that is, one with a perfectly equal distribution of income — is represented by the 45-degree, upward-sloping diagonal line. In such a society, the cumulative share of income would equal the cumulative population share. For example, 40 percent of the households would have 40 percent of the income.

The bottom curve in the figure (with triangles) is a Lorenz curve based on the pretax, pretransfer household income data from row 1 of the table. That curve shows, for example, that the poorest 20 percent of households had just 0.9 percent of household income in 2001 and that the bottom 40 percent of households had just 7.8 percent of cumulative household income that year (7.8 = .09 + 6.9).

The higher Lorenz curve in the figure (with hatch lines) is based on the posttax, posttransfer household income data from row 2 of the table. That curve is significantly closer to the diagonal line of perfect equality. After taxes and transfers, the poorest 20 percent of households had 4.7 percent of household income in 2001, and the bottom 40 percent of households had 15.1 percent of household income that year (15.1 = 4.7 + 10.4).2

All in all, transfers and taxes reduce inequality in household income by more than 20 percent, and transfers reduce inequality by more than taxes. In 2003, for example, the Census Bureau estimated that subtracting taxes and including the earned income tax credit lowered the Gini index of household income inequality by 4.6 percent, and transfers lowered the Gini index by another 17 percent.3

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2Of note, the Gini index actually measures the size of the area between the Lorenz curve and the diagonal line of perfect equality. More specifically, the Gini index is the ratio of that area to the entire area of the triangle under the diagonal line. Hence, in an egalitarian society, the Gini index would be 0 since the Lorenz curve would match the diagonal line. On the other hand, in a perfectly unequal society in which all the income was held by one person (Bill Gates?), the Lorenz curve would look like a backwards “L”, and the Gini index would have a value of 1.

<table>
<thead>
<tr>
<th>Definition of income</th>
<th>Quintiles</th>
<th>Quintiles</th>
<th>Quintiles</th>
<th>Quintiles</th>
<th>Quintiles</th>
<th>Gini Index</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lowest</td>
<td>Second</td>
<td>Third</td>
<td>Fourth</td>
<td>Highest</td>
<td></td>
</tr>
<tr>
<td>Income before taxes and transfers</td>
<td>0.9</td>
<td>6.9</td>
<td>13.7</td>
<td>22.8</td>
<td>55.6</td>
<td>0.510</td>
</tr>
<tr>
<td>Income after taxes and transfers</td>
<td>4.7</td>
<td>10.4</td>
<td>15.6</td>
<td>22.7</td>
<td>46.5</td>
<td>0.407</td>
</tr>
</tbody>
</table>

Note: “Income before taxes and transfers” is Census definition of income number 4 (money income less government transfers plus capital gains and employee health benefits). “Income after taxes and transfers” is Census definition of income 15 (definition 4 minus federal and state taxes, plus government transfers, and plus return on home equity).