Income Inequality in Connecticut: A Statistical Thought Experiment

Prepared by: Stephen Adair, Professor
Department of Sociology
Central Connecticut State Univ.
New Britain, CT 06050

In 1970, Connecticut was 36th among the 50 states in the US in terms of the degree of income inequality; today it is second. While income inequality has increased over the last 45 years across the US and in all 50 states, no state compares to Connecticut in terms of the rate of the increase. This report reviews the data and methodology for measuring income inequality in the US and Connecticut and then presents and assesses a statistical “thought experiment” to consider what Connecticut might look like if the state’s current pool of income was distributed as it had been in 1970.

A Brief Overview of Income Inequality in the US and Connecticut

In the “Golden Age” that followed the Second World War in the US, the rising tide did indeed lift all boats. Through the 1950s and 1960s, the size of the middle-income group expanded, the poverty rate was cut in half, and while the rich did get richer, the rate of growth in family income for the upper 20 percent of the population was less than the rate for the other four quintiles. Since the mid-1970s, there has been a dramatic reversal of fortunes with nearly all of the productivity gains being accumulated by upper earners. The line drawing to the left illustrates the percentage of total taxpayer income that was earned by the top ten percent and the top one percent of earners. Through much of the latter half of the twentieth century, the top 10 percent of earners captured about a third of the total income (i.e. 32.6 percent in 1970), but by 2015, this had risen to just over half (50.47 percent). Most of that increase is due to the gains of the richest 1 percent whose portion of the income pie rose from 9.0 percent in 1970 to 22.0 percent in 2015 (in 2015, a taxpayer would need to earn more than $442,900 to be included in the top 1 percent).

The Gini coefficient (or the Gini index) is the most commonly used measure of income inequality. It ranges from 0, a condition of perfect equality where all members of a population have identical amounts of some resource, to 1, a condition of perfect inequality, where one member of a population receives everything. The 2014 American Community Survey (the latest available) compiled by the US Census calculates the Gini coefficient for the US at .469.
Between 1970 and 2014, the Gini coefficient for Connecticut increased from .337 to .501 – the largest increase among the fifty states. Over this period, Connecticut went from the 36th most unequal to the 2nd most unequal, and had a rate of increase that was more than fifty percent greater than the average increase for the fifty states. 

The line graph tracks the changes for a few representative states against the US average for the fifty states. Since state-level Gini coefficients have been calculated, New York State has been well above the national average, and has had the most amount of income inequality since the mid-1980s. Massachusetts and Rhode Island (not shown) have experienced changes similar to Connecticut and are second and third in terms of their overall increase in the degree of inequality over this period. Alaska has experienced the smallest change in inequality. In 1970, Mississippi was the most unequal state.

**A Statistical Thought Experiment**

The bar graph below presents the results of a statistical thought experiment that is conducted to illustrate the consequences of the increase in income inequality in Connecticut.

The black bars in the graph present the distribution of household income based on the American Community Survey in 2014 for Connecticut’s 1.36 million households. The red bars (Scenario A) represent a hypothetical redistribution of income keeping the overall mean ($104,200) the same, but changing the Gini coefficient from the actual 2014 value of .501 to what the Gini coefficient had been in 1970 (.337). Achieving this change required a dramatic drop in the percentage of households making below $30,000 coupled with increases in the number of households around the mean. Scenario A shows fairly significant increases in the percentage of households making between $100,000 to $150,000, and even a small increase in the number of households making over $200,000. In short, Scenario A depicts a Connecticut in which the overall size of the income pool is the
same, while hundreds of thousands of people experience significant upward mobility. All of this structural mobility is “purchased” by lowering the mean value of those making over $200,000 from $429,285 to $244,160. There is not a single unique solution to this statistical thought experiment. It is, however, not mathematically possible to keep the household mean income the same and reduce the Gini to .337 without significantly reducing levels of poverty and lowering the average income of the top earners. Scenario A illustrates a zero-sum game in which the overall size of the income pie is kept constant, but inequality is reduced to 1970 levels, such that a dramatic decline in the incomes of the richest 10 percent offsets the significant upward mobility for hundreds of thousands of Connecticut households.

Scenario B reverses the assumptions and maintains the Gini coefficient of 2014, but imagines a real (i.e. not inflationary) 10 percent increase in income levels by raising the household mean income to just over $114,621. Given the current degree of inequality, roughly half of the new income would be accumulated by the top 10 percent so that the remaining half is dispersed across the remainder of the population. In scenario B, the mean income of those making over $200,000 increases to $489,000.

Scenario C supposes an annual two percent real growth in income over 20 years (an increase in the mean income for households from $104,200 to $185,043 with a continuing increase in the degree of income inequality leading to a Gini coefficient of .620. As the green bars indicate, if the rate of growth in the degree of inequality continues, a real growth rate of two percent per year would lead to a roughly 80 percent increase in the total pool of income earned, but the state would see only modest gains in the number of people in poverty and low income. The mean income in this scenario for those making over $200,000 would be $1.1 million.

The results in the bar graph are summarized in the table below, which shows the number of households and the percentage of total households in broad income categories. The table
Collapsed Table of the Distribution of Household Income in Connecticut in 2008 and Hypothetical Distributions

<table>
<thead>
<tr>
<th>Household Income in 2014</th>
<th>Scenario A: Gini = .337; Mean = $104,200</th>
<th>Scenario B: Gini = .501; Mean = $114,620</th>
<th>Scenario C: Gini = .620; Mean = $185,043</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Households</td>
<td>Percent of Households</td>
<td>Number of Households</td>
<td>Percent of Households</td>
</tr>
<tr>
<td>Less than $30,000</td>
<td>296,578</td>
<td>111,620</td>
<td>242,471</td>
</tr>
<tr>
<td>$30,000-$59,999</td>
<td>299,571</td>
<td>282,879</td>
<td>303,735</td>
</tr>
<tr>
<td>$60,000-$99,999</td>
<td>304,583</td>
<td>377,800</td>
<td>320,909</td>
</tr>
<tr>
<td>$100,000-$199,999</td>
<td>332,323</td>
<td>447,500</td>
<td>361,380</td>
</tr>
<tr>
<td>$200,000 and over</td>
<td>122,794</td>
<td>136,050</td>
<td>127,354</td>
</tr>
<tr>
<td>Total</td>
<td>1,355,849</td>
<td>1,355,849</td>
<td>1,355,849</td>
</tr>
</tbody>
</table>

demonstrates that under scenario A, there would be many of thousands fewer households making under $30,000. In addition, over 90 percent of households in Connecticut would be more likely to experience an improved economic condition by returning to the rates of inequality in 1970, which is far higher than under the growth scenarios B and C. Moreover, a larger share of Connecticut households would have incomes over $100,000 in Scenario A even though the overall pool of income resources is greater in scenarios B and C.

In Connecticut today, where roughly half of any gross increases in real income would be amassed by 10 percent of the population, it is difficult to conceive how economic growth could translate into addressing issues of poverty and lack of opportunity that plague many parts of this rich and prosperous state. By contrast, if we imagine a society where tens of thousands of households are lifted from poverty into the middle class (as illustrated in Scenario A and B), it is easy to imagine that many small businesses – restaurants, dry cleaners, auto dealers, masons, and the like – would find new entrepreneurial opportunities and new markets to create businesses and to grow. Finally, a Gini coefficient of .337 (the number for CT in 1970) is hardly a model of equality or a socialist ideal. It simply represents a return to the capitalist reality of the previous generation.


2 The chart and the figures below were created based on data collected by Picketty, T. and Saez, E, 2003, “Income Inequality in the United States, 1913-1998.” *Quarterly Journal of Economics* 118(1):1-39. The data have been updated to 2015 and are available at [http://emi.berkeley.edu/~saez](http://emi.berkeley.edu/~saez). Picketty and Saez collect their data by compiling Internal Revenue Service data. In recent years, they have provided some of the most reliable and most cited data on income distributions.

3 The Gini coefficient is a measure of variation or dispersion that was named after Corrado Gini. The coefficient could be used to measure how equally or unequally any quality or resource is distributed through a population, but it is most typically used for the dispersion of income. A perfectly adequate discussion of the multiple methods of calculating a Gini coefficient is available at the entry for the “Gini Coefficient” on Wikipedia at [http://en.wikipedia.org/wiki/Gini_coefficient](http://en.wikipedia.org/wiki/Gini_coefficient) (retrieved on September 13, 2016).

4 American Community Survey (ACS), see [http://factfinder.census.gov/faces/nav/jsf/pages/searchresults.xhtml?refresh=t](http://factfinder.census.gov/faces/nav/jsf/pages/searchresults.xhtml?refresh=t) (retrieved on September 12,
The data for the UN Report were collected in the early 2000s. The ACS provides a robust data source for the calculation of a Gini coefficient.


The American Community Survey presents the income distribution in these categories and truncates the highest earners in the last category ($200,000 or over). The calculation of a Gini coefficient requires knowing the percentage of the total income earned among the households within each category. For all but the last category, I used the midpoint of the income range to calculate the total income earned. The calculation necessary to yield the Gini coefficient of .501 was approximated by finding the areas of a series of trapezoids under the Lorenz curve, which yielded $409,000 as the unique value for the mean income for those making over $200,000. This, in turn, produced an overall mean of $99,152 for the 1.3 million households in Connecticut.

To create this statistical thought experiment, a dynamic Excel spreadsheet was created so that as people are “moved” from one income category to another, the mean income and Gini coefficient are immediately calculated. Smaller and smaller iterative “adjustments” were made until the predetermined mean and Gini values were reached. An electronic copy of this dynamic spreadsheet is available on request from the author at adairs@ccsu.edu