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Vincent C. Gray, Mayor　　　　　*Jeffrey S. De Witt, Chief Financial Officer*　　　　*Fitzroy Lee, Deputy CFO & Chief Economist*

Income inequality in DC from 2001 to 2012: tax data show an upward trend and significant business cycle effects fluctuations

Inequality was highest right before the Great Recession

In recent years, income inequality has risen to the top of most economic policy discussions. Many studies have concluded that the income differences between the wealthiest and poorest households in the nation are growing. For example, the OECD concluded that from between the mid-1980s to the late-2000s, U.S. income inequality increased by 24.8 percent.* Annual District of Columbia individual income tax data for years 2001 to 2012 also finds income inequality for the city has trended slightly upwards. But, it also finds the business cycle exerts a stronger year-to-year effect on the city's income inequality than other underlying economic trends. In addition, the neighborhoods with the highest income inequality within the city are the neighborhoods that tend to have the households with city's greatest income and wealth.

This analysis is based on one of the most commonly used measures of income inequality, called the Gini coefficient. The coefficient varies from 0, complete equality (everyone has the same income), to 1, complete inequality (one person with all the income). The coefficient is explained in the Appendix.

Using federal adjusted gross income data for all individual income tax taxpayers in the District of Columbia for years 2001 to 2012, this analysis finds that the troughs in the Gini coefficient time series for years 2002 and 2009 correspond with the last two national recessions (2002 and 2009). And, the peak the time series corresponds with the peak of the economy just prior to the most recent recession that began in December 2007. Over the last business cycle the District's Gini coefficient went from 0.595 in 2002 to 0.655 in 2007 and back to 0.605 in 2009. While the time series is cyclical in recent years, there also appears to be a slight upward trend. The 2009 trough in the Gini coefficient series (0.605) is slightly higher (1.7 percent) than the 2002 trough (0.595) in the time series.

The District of Columbia Gini Coefficient: 2001 to 2012

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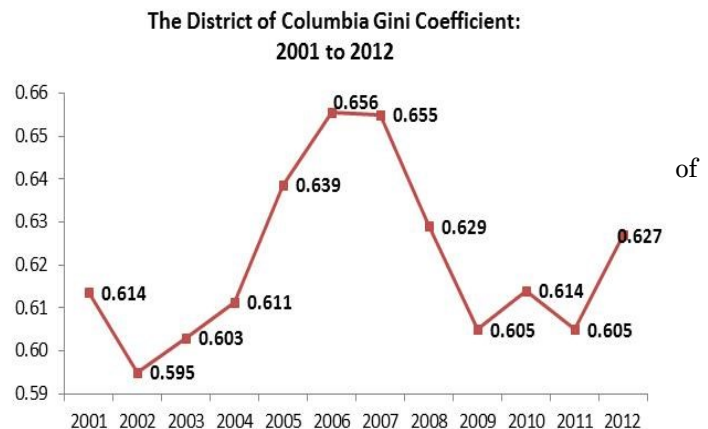
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This briefing document was prepared by *Henry Liu, Candidate for Master of Public Policy, The University of Chicago Harris School of Public Policy, and Daniel Muhammad, DC Office of Revenue Analysis.*
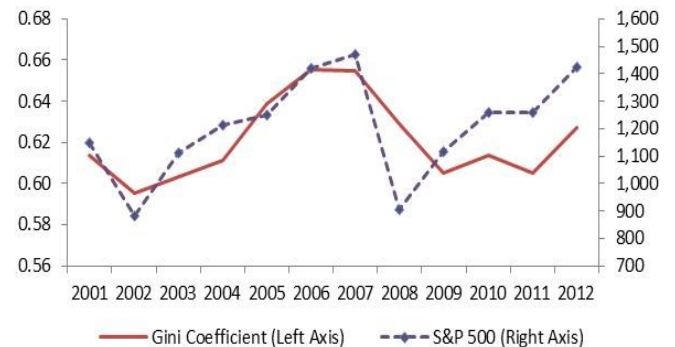
The following two charts show how the cyclical pattern of the Gini coefficient correlates with real estate and capital markets. The first chart shows that income inequality in the city peaked in 2006 and 2007, about the same time the local housing bubble peaked. In the chart real estate activity is measured by the value of real property transfers in the District of Columbia (calculated from Deed transfer and economic interest taxes on all taxable residential and commercial property sales). The second chart shows that the Gini coefficient also peaks and bottoms out around the time when the S&P 500 Index peaks and bottoms out. It should be noted that the income measure used from DC income tax data, federal adjusted gross income, includes capital gains as well as income from earnings, pensions, and other sources.

When a correlation coefficient is calculated for the city's Gini coefficient and time, the coefficient is 0.157. But when calculated against selected local and national economic variables, the S&P 500 and the local property sales market, respectively, there are significantly stronger correlations as shown in the following table.

The Correlation Coefficient for The District of Columbia Gini Coefficient and Selected Variables: Years 2001 to 2012	
Time	0.157
S&P 500	0.641
Value of real property sales and transfers	0.879

Note: Positive values for the correlation coefficient denote a positive linear correlation, and negative values denote negative linear correlation, and a value of 0 denotes no linear correlation. The closer the value is to 1, the stronger the positive linear

Thus, over the period 2001 to 2012, DC income tax data shows that while income inequality has trended slightly upward over the period, the effect of the business cycles appears to have exerted a greater influence on the year-to-year fluctuations in the Gini coefficient in the District of Columbia.

Neighborhood inequality

The map on the next page shows the 20 neighborhoods with the highest Gini coefficient in 2011 and the 20 with the lowest. The 20 neighborhoods highlighted by red stripes, mostly in the western half of the city, are the neighborhoods with the city's highest income inequality; they are also among the city's wealthiest neighborhoods. The blue-shaded neighborhoods, mostly in the eastern half of the city, are the 20 neighborhoods with the city's lowest income inequality. Whereas the city wide Gini coefficient was 0.605 in 2011, the average Gini coefficient in the 20 neighborhoods with the highest inequality was 0.644. (The coefficients for these 20 neighborhoods ranged from 0.557 to 0.769.) In contrast, the average Gini coefficient in the 20 neighborhoods with the lowest inequality was 0.434. (The coefficients for these 20 neighborhoods ranged from 0.370 to 0.460.)

 —*Henry Liu, Candidate for Master of Public Policy, The University of Chicago Harris School of Public Policy, and Daniel Muhammad, Office of Revenue Analysis.*

DC income inequality by neighborhood in 2011.

Of the 70 assessment neighborhoods used by the Office of Tax and Revenue- Real Property Tax Administration (OTR-RPTA), 59 neighborhoods have income tax records for the study period. This map shows the 20 that have the highest and the 20 that have the lowest Gini-coefficients in 2011. The highest, shown in red stripes, have the most income inequality, and the lowest, shown in solid blue, have the lowest.
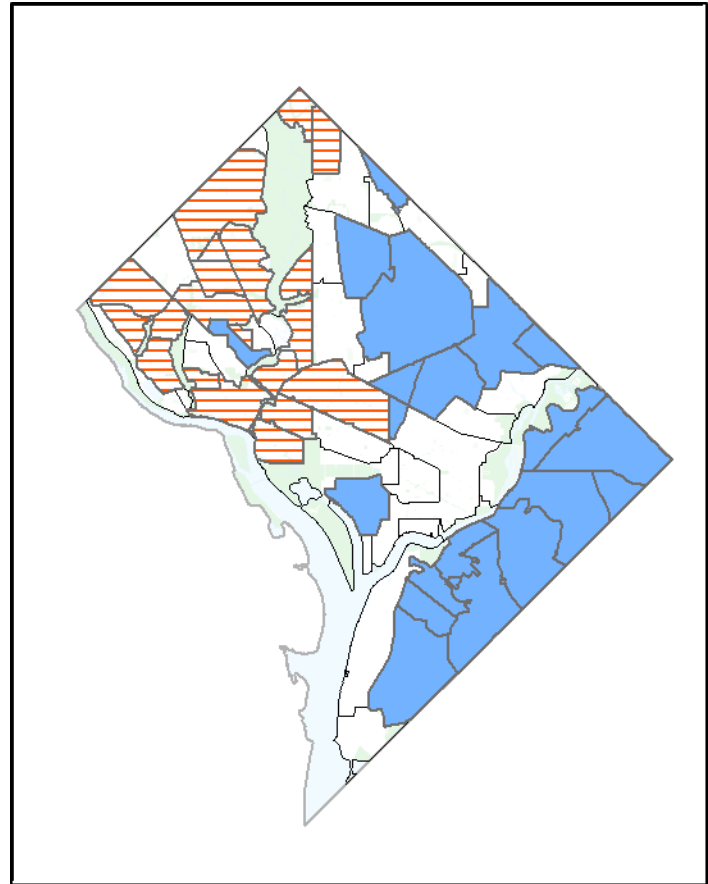
Appendix

The Gini coefficient, a commonly used measure of income distribution, is defined as a ratio of areas on what is known as the Lorenz Curve diagram. If the area between the line of perfect equality and the Lorenz Curve is A, and the area under the Lorenz curve is B, the Gini coefficient is A/(A+B). The more unequal the income distribution, the larger the area A.
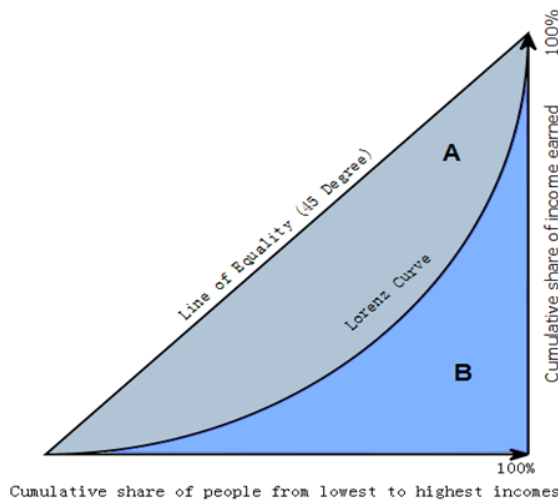
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