Procedure for Calculating Regional Gini Coefficients in the NZAVS

Sibley, C. G., Osborne, D. O. (2014) Procedure for calculating regional Gini coefficients in the NZAVS. *NZAVS Technical Documents, 1, e09.*

Available at: http://www.psych.auckland.ac.nz/uoa/NZAVS

Document last updated 8 February 2014

Data from the 2006 New Zealand census were used to estimate a Gini coefficient for each regional-level area unit in New Zealand based on a Lorenz curve approximation (see Chaudhary, 2009). Specifically, we used data from the census to determine the number of people in each census area unit whose household income fell within each of the following household income bands: (a) less than \$5,000, (b) \$5,001-\$10,000, (c) \$10,001-\$20,000, (d) \$20,001-\$30,000, (e) \$30,001-\$50,000, and (f) \$50,001 and above. Because the census only provides information on income bands, we took the lower value within each band and treated these points as known values when interpolating a Lorenz curve using trapezoids, as outlined in Equation 1.0 (see Chaudhary, 2009, p. 126):

$$G_1 = 1 - \sum_{k=1}^{n}(X_k - X_{k-1})(Y_k + Y_{k-1}) \quad (1.0)$$

Where, X_k is the cumulated proportion of the population variable, for $k = 0,...,n$, with $X_0 = 0$, $X_n = 1$; and Y_k is the cumulated proportion of the income variable, for $k = 0,...,n$, with $Y_0 = 0$, $Y_n = 1$.

This formula provides an *approximate* estimate of income inequality, as we do not employ advanced techniques such as approximating a quadratic function or other smoothing procedures. Also, because income values above \$50,001 were rounded down to \$50,001, our estimate systematically *underestimates* the actual level of inequality in each region. Despite these limitations, our Gini estimate offers a reasonable Lorenz curve approximation of inequality given the available data from the census on household income for each area unit of the country. As with a standard Gini coefficient calculated at the level of the nation, scores on our Gini estimate could range from 0 (complete equality) to 1 (complete inequality). Thus, higher scores reflect greater levels of regional-level inequality.

Chaudhary, S. (Ed.). (2009). *Global encyclopaedia of welfare economics*. New Delhi, India: Global Vision Publishing.