Supporting Materials for CDBG Block Level Eligibility

Methodology for estimating income distribution at block level

The methodology used is described here and illustrated with the audit formats. The (#) references in the methodology refer to "array" #'s in the audit formats.

A) Obtain for each block group the distributions of family income (#11) and income to unrelated individuals (#12) and the aggregate income to each group (#13-14). This data at block group level is the data to be estimated at block level and when estimation is complete block level data will add back to these numbers (#27-28).

B) Assume that all blocks within a block group have a similar relationship between income and the cost of housing (#22). This relationship will be described by graphical plots and will be unique to each block group (common to blocks within a block group).

C) Put housing costs into common terms by converting housing value to monthly debt service. Define total housing cost as aggregate monthly owner debt service plus aggregate contract rent (#16). Distribute aggregate family income and aggregate income to unrelated individuals from block groups to blocks in accord with aggregate total housing cost by block (#18-21).

D) Assume that the shape of curves of income distribution for families and for unrelated individuals are the same in each block as they are in the block group of which they are a part. Determine income distribution for each block by shifting these curves upwards or downwards so that aggregate income from the curve matches aggregate income estimated in step C. Verify that these distributions add back to the block group level data and document any discrepancies (#20-21 vs. #13-14).

E) Spot check randomly selected blocks producing graphical plots for visual review. Verify that the curves and relationships look reasonable. A demonstration will be arranged in HCD offices showing how a block can be selected and five graphical plots for that block will appear in succession on the screen or on a printer. The GISLIB database will be used for this demonstration.

F) Determine the numbers of families or unrelated individuals falling into low, very low, and extremely low categories in each block in the following manner:

a) Determine county-wide threshholds for median family income and median income to unrelated individuals from actual census data using HUD methodology (#23).

b) Draw a horizontal line on the plot of income distribution at the threshhold levels (for both families and unrelated individuals). Draw additional horizontal lines at 30%, 50%, 80% and 95% of median income.

c) Find the point at which the income curves cross the horizontal lines. The scale at the bottom of the page will then tell the percentage of families or unrelated individuals who are below the threshhold percentages.

These calculations and the mathematical equivalents of the plots are done in computer memory, and are, in all cases, done separately for families and for unrelated individuals. An audit report can be produced showing the calculations. Verification is possible for any block, block group, county-wide, or any other geography provided for in the database.

Analysis of Error in Calculating the Number of Low-Mod Persons

The methodology used for estimating the number of people qualifying for CDBG eligibility at the block level has also been applied at the county-wide level. When all blocks are added up through the summary levels, they differ very slightly from the results of applying the methodology at the county-wide level. This error, shown below, is so small that it is affirming of the methodology.

County-wide Results of Data variable Calculations Adding Geog Error

Error in Calculating the Number of Low-Mod. Persons

Polk County (countywide)

	County-wide calculations	Results of adding geography	Difference
Extremely low income families (0-30%)	7673	7650	-23
Low income families (30-50%)	9317	9330	13
Moderate income families (50-80%)	18916	18914	-2
Middle income families (80-95%)	10289	10289	
Extremely low income unrelated individ'ls(0-30%)	10195	10202	7
Low income unrelated individuals (30-50%)	9066	9058	-8
Moderate income unrelated individuals (50-80%)	10442	10426	-16
Middle income unrelated individuals (80-95%)	3914	3918	4
Extremely low income persons (0-30%)	33871	33792	-79
Low income persons (30-50%)	36698	36736	38

	County-wide calculations	Results of adding geography	Difference
Moderate income persons (50-80%)	66777	66782	5
Middle income persons (80-95%)	34792	34795	3
Persons (total inc. in CDBG eligibility analysis)	389552	389459	-93
Comm. Dev. Block Grant (CDBG) Area Income Qual. %	0.3526	0.3526	
Persons for whom poverty status is determined	389551	389527	-24
Persons living in poverty (pov status determined)	48450	48432	-18
Persons living in poverty (pov status determ.) (%)	0.1244	0.1243	-0.0001

The following codes are used as possible data notes for each geography.

1 = one or more family groups reported with no family income reported
2 = no basis for decile distribution
4 = our model indicates no families while detail is provided in data
8 = our model indicates no families while detail is provided in data
16 = no data to estimate decile ceiling
32 = total in our model differs from detail from data
64 = no income is reported for any families
128 = STF3A lacks data to provide income data where STF1A has data
256 = income groups do not add to correct total
512 = our model reports data while source data detail indicates no data

The actual code in the "Data Notes" field is the result of adding all of the above codes that are relevant to the particular geography. All codes used in the database are listed at the left in the table below; to the right are shown the codes which when added produced that composite "Data Note" code.

1 = 1
3 = 1 2
4 = 4
5 = 1 4
7 = 1 2 4
8 = 8
11 = 1 2 8
12 = 4 8
13 = 1 4 8
15 = 1 2 4 8
64 = 64
65 = 1 64
128 = 128
129 = 1 128
131 = 1 2 128
132 = 4 128
384 = 128 256
388 = 4 128 256
499 = 1 2 16 32 64 128 256
576 = 64 512
577 = 1 64 512