



Community Development Block Grants – Distress Score Index

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S:/projects/Distress Grid

The Community Development Block Grants Distress Score Index was developed by the IBRC in the early 2000s as a tool to measure economic distress at the city/town, township, and county level. Its purpose was (and continues to be) to aid OCRA in its processes of grant review and the distress scores are made available to any community wanting to apply for those grants.

With the advent of the American Community Survey, which provides data to the census tract and block group levels, we have developed a new scoring method based on those data, which will be updated annually. The benefit to this is certainly the ability to obtain consistent data on an annual basis all in one fell swoop each fall and allow communities to rely on the consistency of the scores.

The Data

Beginning in 2009, the Census Bureau began its annual release of the ACS 5-year estimates. Our CDBG Distress Tool uses the following tables from ACS:

Table Number	Data Description
C17002	Ratio of income to poverty level in the past 12 months
B19013	Median household income in the past 12 months (in 2009 inflation-adjust dollars)
B23001	Sex by age by employment status for the population 16 years and over
B25002	Occupancy status
B25077	Median value of owner-occupied housing units

The IBRC at Indiana University obtains these ACS data each year, throughout the year, as they are made available from the Census Bureau. The numbers are also released on the Census Bureau’s American FactFinder.

Importantly, ACS data is a sample, and so has margins of error attached to point estimates. **Margins of error have been ignored for the purposes of this tool.** I highly recommend that users of the Distress Score Index read ACS documentation at <http://www.census.gov/acs/www/>.

Methodology

Using the data above, I calculate six different distress variables:

Variable name	Data used	Explanation
POV	C17002	Percentage of population with income under poverty level
MHI	B19013	Median household income
VHR	B25002	Percent of housing units that are vacant, a.k.a. vacant housing rate
MHV	B25077	Median household value
UER	B23001	Unemployment rate = (unemployed persons)/(labor force)
LFPR	B23001	Labor force participation rate = (labor force)/(pop. 16 years and over)

Table B23001 must be aggregated across sex and age before UER and LFPR can be calculated. The other calculations are very simple. Entitlement places are not included in the city/town spreadsheet. (See comment in cell A4.)

After calculating the above variables, I calculate the mean, standard deviation, maximum and minimum values. The maximum and minimum values are adjusted for outliers. The adjusted max is defined as the minimum of (1) the largest observation and (2) the mean plus three standard deviations. The adjusted min is defined as the maximum of (1) the smallest observation and (2) the mean minus three standard deviations. The range is the adjusted max minus the adjusted min.

For each variable, a variable distress score is calculated so that the score takes values from zero to the desired maximum variable distress score. The maximum variable distress scores can be changed in the spreadsheet; see the green highlighted cells. Figure 1 graphs the desired function for MHI, MHV, and LFPR. For these variables, a relatively low variable value corresponds to relatively high distress. Figure 2 graphs the function for POV, VHR, and UER; here, a relatively low variable value corresponds to relatively low distress. The functions have the desirable property of being linear and continuous on the open interval between the adjusted min and adjusted max.

It is straightforward to check that the function drawn in Figure 1 is given by:

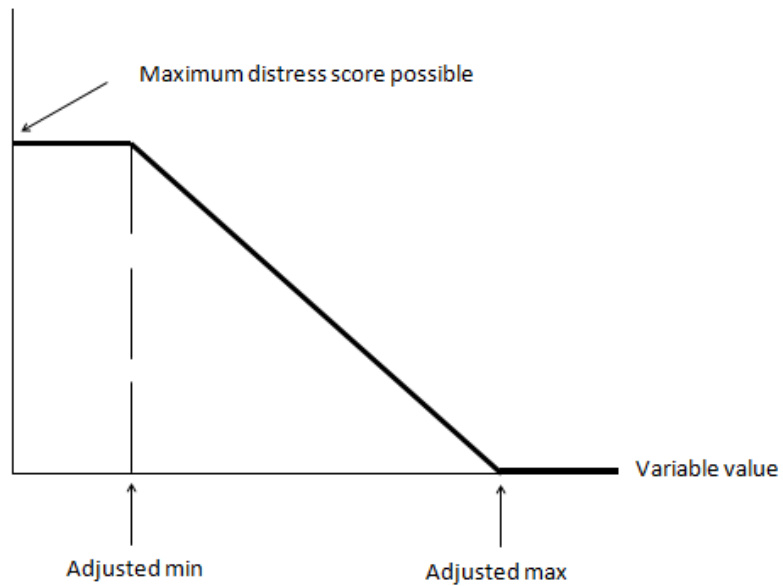
$$(1) \quad \text{Var distress score} = (-\text{max distress score}) * (\text{var value}) / (\text{range}) + (\text{max distress score}) + (\text{max distress score}) * (\text{adjusted min}) / (\text{range})$$

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FIGURE 1

Variable distress score

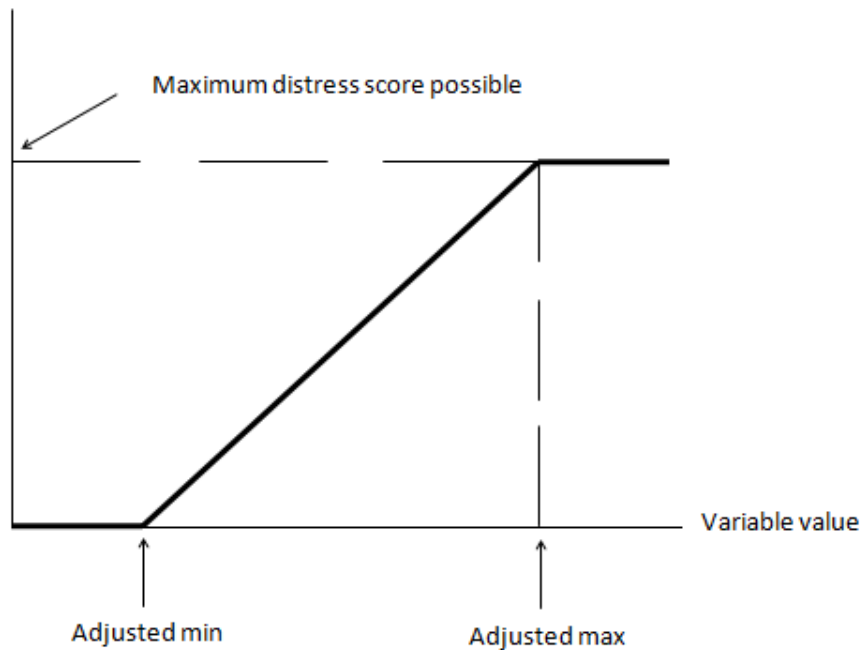


The function in Figure 2 is given by:

$$(2) \quad \text{Var distress score} = (\text{max distress score}) * (\text{var value}) / (\text{range}) - (\text{max distress score}) * (\text{adjusted min}) / (\text{range})$$

FIGURE 2

Variable distress score



Equations (1) and (2) are included in the variable score columns of the spreadsheet.

The (overall) distress score is the sum of the six variable distress scores. In the spreadsheet, one can adjust the weights attached to each variable by changing the maximum variable distress scores. One potential formulation is:

Variable score	Maximum distress score (equal to implied weight as % of total)
POV	16
MHI	16
VHR	16
MHV	16
UER	20
LFPR	16
Total Distress	100

Note: The OCRA determined that the weighting should reflect a max total of 175 points, so the weighting has been modified in the latest excel file (october 2011) to reflect that. – C. Rogers January 2012

Counties AVG 49.24

Crawford	87.92
Orange	80.02
Parke	76.86
Fayette	74.98
Delaware	73.86
Starke	73.81
Grant	73.06
Miami	72.02
Blackford	69.40
Vigo	68.05
Greene	67.29
Lawrence	64.93

Cities/Towns AVG 48.32

Laurel	Franklin	90.78
Mauckport	Harrison	86.55
Mount Ayr	Newton	79.49
Bicknell	Knox	76.83
Greensboro	Henry	76.79
Leavenworth	Crawford	74.65
Mitchell	Lawrence	73.39
Alton	Crawford	73.30
Marengo	Crawford	72.84
Bass Lake CDP	Starke	72.67
Shoals	Martin	72.66
Clifford	Bartholomew	72.57

Townships AVG 39.66

Boone	Crawford	93.58
Cass	Clay	81.26
White Post	Pulaski	74.25
Center	Marion	73.49
Northeast	Orange	71.84
Calumet	Lake County	70.59
Rich Grove	Pulaski	70.41
Franklin	Grant	70.38
Smith	Greene	70.36
North Bend	Starke	69.69
Troy	DeKalb	69.12
Jefferson	Washington	68.95