

Graphic Detail

Geographic Information Systems (GIS) organize and clarify the patterns of human activities on the Earth's surface and their interaction with each other. GIS data, in the form of maps, can quickly and powerfully convey relationships to policymakers and the public. This department of Cityscape includes maps that convey important housing or community development policy issues or solutions. If you have made such a map and are willing to share it in a future issue of Cityscape, please contact rwilson@umbc.edu.

Comparative Micromaps and Changing State Homeownership Rates

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Micromaps display multiple maps on the same exhibit, with different geographic units highlighted in each map. A comparative micromap (hereafter, referred to as a CM; for examples, see Carr and Pickle, 2010) is a type of micromap with a series of indexed maps designed to convey change in a statistic; the index is typically time.

In this article, I demonstrate how to use CMs to visualize changing homeownership rates in the 50 states and Washington, D.C. The homeownership rate equals owner-occupied housing units as a percentage of total occupied housing units. I analyze American Community Survey homeownership data for 3 years: 2006, 2009, and 2012. My dataset consists of 153 observations, where an observation is the homeownership rate in a state in a given year (hereafter, referred to as a state-year).

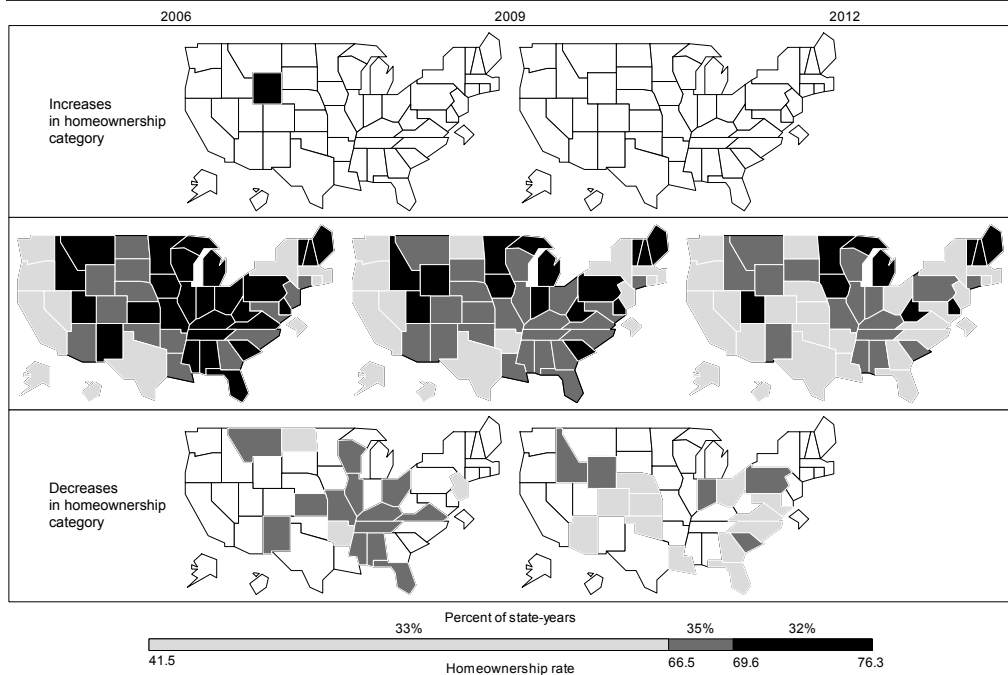
State homeownership rate estimates varied from 41.5 percent for Washington, D.C., in 2012 to 76.3 percent for Minnesota in 2006, with a median of 68.1 percent for Virginia in 2009 and a mean of 67.1 percent. In 2006, the median rate was 69.7 percent for New Mexico and the mean rate was 68.4 percent. In 2009, the median rate was 68.1 percent for Virginia and the mean rate was 67.3 percent. In 2012, the median rate was 66.5 percent for Maryland and the mean rate was 65.5 percent.

Exhibit 1 displays a CM¹ mapping homeownership rates for 2006, 2009, and 2012. States in exhibit 1 are shaded according to the three homeownership rate categories indicated by the bottom horizontal slider. Cut points for the homeownership rate categories in exhibit 1 are roughly the 33rd and 66th percentiles. Cut points are reported below the slider, and the percentages of state-years in the categories are reported above the slider. I will refer to the lowest homeownership rate category as “low,” the middle category as “medium,” and the highest category as “high.” In exhibit 1, the 51 state-years in the low category with homeownership rates less than or equal to 66.5 percent are shaded light gray; the 53 state-years with medium rates greater than 66.5 percent and less than or equal to 69.6 percent are shaded medium gray; and the 49 state-years with high rates greater than 69.6 percent are shaded black.

Exhibit 1 displays micromaps in three rows. The three maps in the middle row of exhibit 1 correspond to years 2006, 2009, and 2012 from left to right, respectively. Homeownership rates fell dramatically between 2006 and 2009 and between 2009 and 2012. In 2006, 11 states were in the

Exhibit 1

State Homeownership Rates: 2006, 2009, and 2012



Notes: The three maps in the middle row correspond to, from left to right, years 2006, 2009, and 2012. The two maps in the top and bottom rows correspond to changes in homeownership categories, from left to right, between 2006 and 2009 and between 2009 and 2012. In the top and bottom rows, states that experienced changes in categories are shaded according to their new category.

Sources: 2006, 2009, and 2012 American Community Survey 1-year data

¹ The CMs in the article were produced with R programs (available upon request) based on Carr’s (2014) programs.

low category, 14 were in the medium category, and 26 were in the high category. In 2009, 14 states were in the low category, 23 were in the medium category, and 14 were in the high category. In 2012, 26 states were in the low category, 16 were in the medium category, and 9 were in the high category.

The two maps in the top and bottom rows of exhibit 1 correspond to changes in homeownership categories. The top row highlights states that experienced increases in homeownership categories, and the bottom row highlights states that experienced decreases. Wyoming is the only state that experienced an increase in homeownership rate categories during the 3-year period; between 2006 and 2009, its category increased from medium to high. In the middle row of exhibit 1, Wyoming is shaded medium gray in 2006 and black in 2009. In the top left micromap of exhibit 1, Wyoming is shaded black to indicate that its category increased to high in 2009.

In the bottom left micromap of exhibit 1, the 16 states that experienced a decrease in categories between 2006 and 2009 are highlighted; 13 are shaded medium gray to indicate that their category decreased to medium in 2009, and three are shaded light gray to indicate that their category decreased to low.

In the bottom right micromap of exhibit 1, the 17 states that experienced a decrease in categories between 2009 and 2012 are highlighted; 5 are shaded medium gray to indicate that their category decreased to medium in 2012, and 12 are shaded light gray to indicate that their category decreased to low.

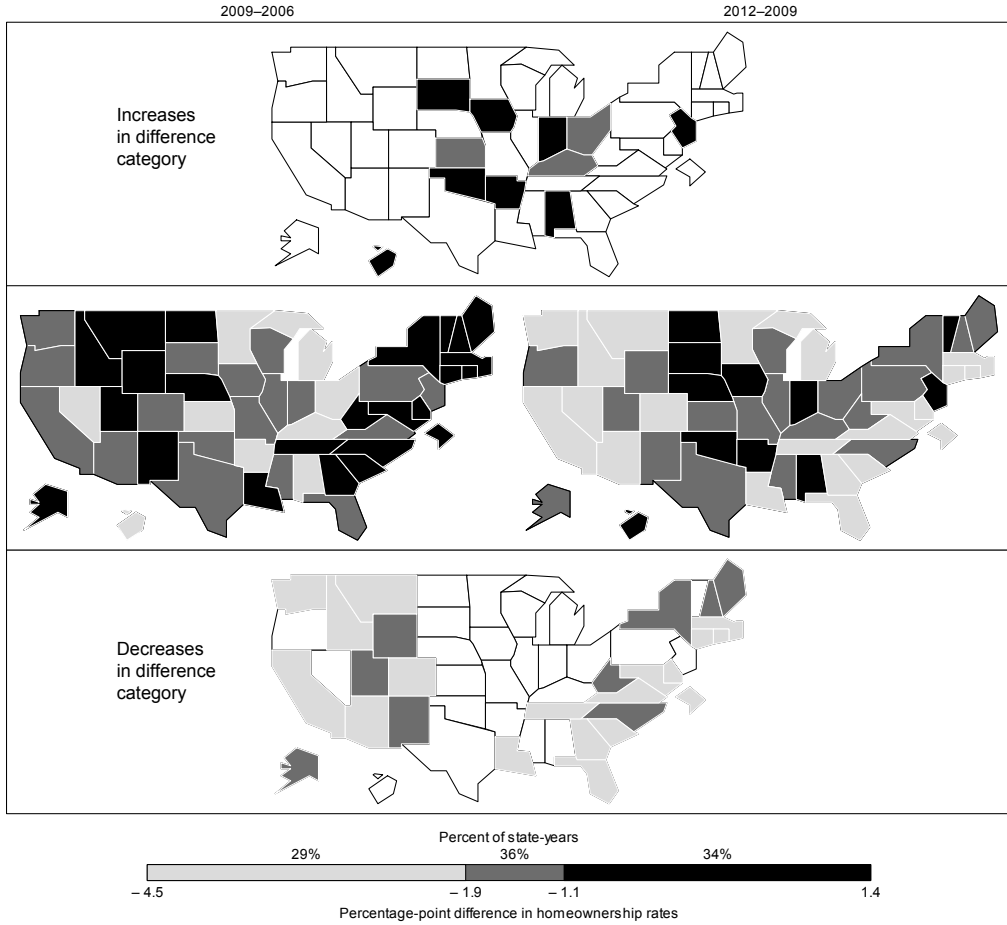
Differences between the 2009 and 2006 homeownership rates varied from -2.9 percentage points in Hawaii to 1.4 percentage points in Wyoming, with a median of -1.2 percentage points in Pennsylvania and a mean of -1.1 percentage points. Differences between the 2012 and 2009 rates varied from -4.5 percentage points in Arizona to 0.2 percentage points in Hawaii, with a median of -1.8 percentage points in Ohio and a mean of -1.8 percentage points.

Exhibit 2 displays a CM mapping percentage-point differences in homeownership rates between 2009 and 2006 and between 2012 and 2009. States in exhibit 2 are shaded according to the three categories of percentage-point differences in homeownership rates indicated by the bottom horizontal slider. Cut points for the percentage-point difference categories in exhibit 2 are roughly the 33rd and 66th percentiles. Cut points are reported below the slider, and the percentages of state-years in the categories are reported above the slider. I will refer to the lowest percentage-point difference category as “low,” the middle category as “medium,” and the highest category as “high.” In exhibit 2, the 30 state-years in the low category with differences less than or equal to -1.9 percentage points are shaded light gray; the 37 state-years in the medium category with differences greater than -1.9 percentage points and less than or equal to -1.1 percentage points are shaded medium gray; and the 35 state-years in the high category with differences greater than -1.1 percentage points are shaded black.

Like exhibit 1, exhibit 2 displays micromaps in three rows. The two maps in the middle row of exhibit 2 correspond to 2006-to-2009 and 2009-to-2012 differences, respectively. Between 2009 and 2006, 9 state differences were in the low category, 18 were in the medium category, and 24 were in the high category. Between 2012 and 2009, 21 state differences were in the low category, 19 were in the medium category, and 11 were in the high category.

Exhibit 2

Changes in State Homeownership Rates: 2006 to 2009 and 2009 to 2012



Note: In the top and bottom rows, states that experienced changes in difference categories are shaded according to their new category.

Sources: 2006, 2009, and 2012 American Community Survey 1-year data

The maps in the top and bottom rows of exhibit 2 correspond to changes in categories of percentage-point differences in homeownership rates. The top map highlights the 11 states that experienced increases in categories; 3 are shaded medium gray to indicate that their category increased to medium, and 8 are shaded black to indicate that their category increased to high. The bottom map highlights the 27 states that experienced decreases; 9 are shaded medium gray to indicate that their category decreased to medium, and 18 are shaded light gray to indicate that their category decreased to low.

The CM is a useful tool for visualizing changes in geographic data. In this article, CMs clearly demonstrate a downward trend in state homeownership rates since 2006.

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