

Why Grandma May Stay at Home

Property taxes and home ownership in rural Minnesota

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Job vacancies in Greater Minnesota continue to rise, and at a [faster rate](#) than in the seven-county metropolitan area. Attracting workers to more rural parts of the state is a complex problem, but housing plays a major role. Encouraging workers to relocate to Greater Minnesota depends on the availability of housing.

That availability is a product of turnover, or “churn,” where residents transition through different types of housing at different points in their lives. The rate of housing churn can be different in rural communities than in metropolitan areas. Previous work [from CRPD](#) has shown that rural housing stock is more likely to be occupied by older residents who are less likely to move. The result is slower churn, which leaves fewer single-family homes for new workers and their families.

Here we identify factors that may contribute to rural areas’ slower housing churn. These factors vary significantly across the rural-urban spectrum in Minnesota and may influence residents’ economic incentives regarding housing:

- 1) Property taxes. Rural areas have lower median property tax burdens than metro areas. People who own their homes outright pay less tax in rural areas because property values are lower, of course, but effective tax rates are lower, too.
- 2) Non-tax ownership costs. Other costs of outright home ownership (e.g., utilities, fuels, insurances, and fees) are slightly higher in rural areas, but these costs are easily offset by the lower tax burdens mentioned above.
- 3) Higher rates of outright home ownership. Rural homeowners are more likely to own their homes outright, with no mortgage, compared to metro homeowners. Outright homeownership rates correlate strongly with population size, and decrease by about half from the most rural to the most metropolitan counties.

Overall, housing churn may be especially low in rural areas because outright homeownership is both cheaper and more common there. Further, because demographics in rural areas skew older, residents of rural areas are probably more likely to be on fixed incomes and may be more sensitive to the economic incentives of staying in their homes, especially considering the alternatives of moving to other forms of housing. The data presented here outline why rural residents may be especially likely to remain in their homes, slowing housing churn.

Approach

This report compares county-level property taxes in Minnesota in several ways. First, we broadly compared the effective residential property-tax rates in “metro” counties (i.e., those within the Census’s metropolitan statistical areas) vs. those same rates in “non-metro” counties (Figure 1). The comparison (by two-tailed t test) showed a slightly higher rate in metropolitan areas.

We then determined whether effective property-tax rates correlated to county population itself, or merely to metro/non-metro status (Figure 2). Controlling for metropolitan status via multiple linear regression reveals that being in a metropolitan area is a better predictor than population of a higher tax rate. In fact, population doesn’t meaningfully predict tax rate when we consider metropolitan status at the same time.

Our focus then moved from tax rates (the percentage paid) to tax burden (the dollar amount paid). Using the median home value in each county (Figure 3), we estimated a typical tax burden in each county and demonstrated how that burden increases alongside both population and metropolitan status (Figure 4). Multiple linear regression demonstrates that homeowners in higher-density areas pay more in taxes because a) their homes are worth more and b) their effective tax rates are also higher, compounding the effect.

We next considered other ownership costs beyond a mortgage. The costs of owning a home outright, or without a mortgage, include several categories beyond taxes, such as utilities, insurance, and other fees. After showing that total ownership cost increases in metropolitan counties (Figure 5), we show that property taxes are the main drivers of that increase (Figure 6). Other ownership costs are a bit higher in rural areas, but are more than offset by the especially low property taxes there.

Finally, we show that ownership rates are different in rural and metro areas by correlating counties’ rates of outright home ownership with their population and metropolitan status. Among Minnesota’s counties, lower percentages of households own their homes outright in metropolitan areas, even while controlling statistically for county population, which compounds the effect (Figure 7).

Results

Property Tax Rates vs. County Population and Metro Status

Property tax rates vary by county in Minnesota. [In 2020](#), the effective tax rate for residential homesteads (i.e., the net tax divided by the estimated market value) spanned a full percentage point across the state’s 87 counties, from 0.7% to 1.7%. In general, the 27 counties within Minnesota’s [eight metropolitan statistical areas](#) averaged higher effective property tax rates than the 60 non-metro

counties, by a difference of about 0.1% (1.3% vs. 1.2%; see Figure 1). This small difference is statistically significant by two-tailed t test ($p << 0.001$).



Figure 1. Effective Property Tax Rates for Residential Homesteads vs. Metro Status. Metropolitan counties have higher effective property tax rates than non-metro counties. Each dot represents one county, and the thick horizontal line shows the median of each group, surrounded by colored blocks representing the range of the second and third quartiles. The “notches” along the sides of the blocks correspond to 95% confidence intervals. (Sources: [MN Dept. of Revenue](#) [Tax Rate] and [MN Dept. of Administration](#) [Population])

Interestingly, while residential property tax rates correlate with metropolitan status, they do not correlate with [county population](#) per se. Plotting tax rates vs. county population reveals no significant linear relationship (Figure 2, gray dotted line; $p > 0.1$ by simple linear regression against both log-transformed and untransformed county population). Further, counties’ tax rates do not correlate with population within each Metro and Non-Metro subgroup (Figure 2, green and brown lines; $p > 0.5$ in each case, as well as against both log-transformed and untransformed population).

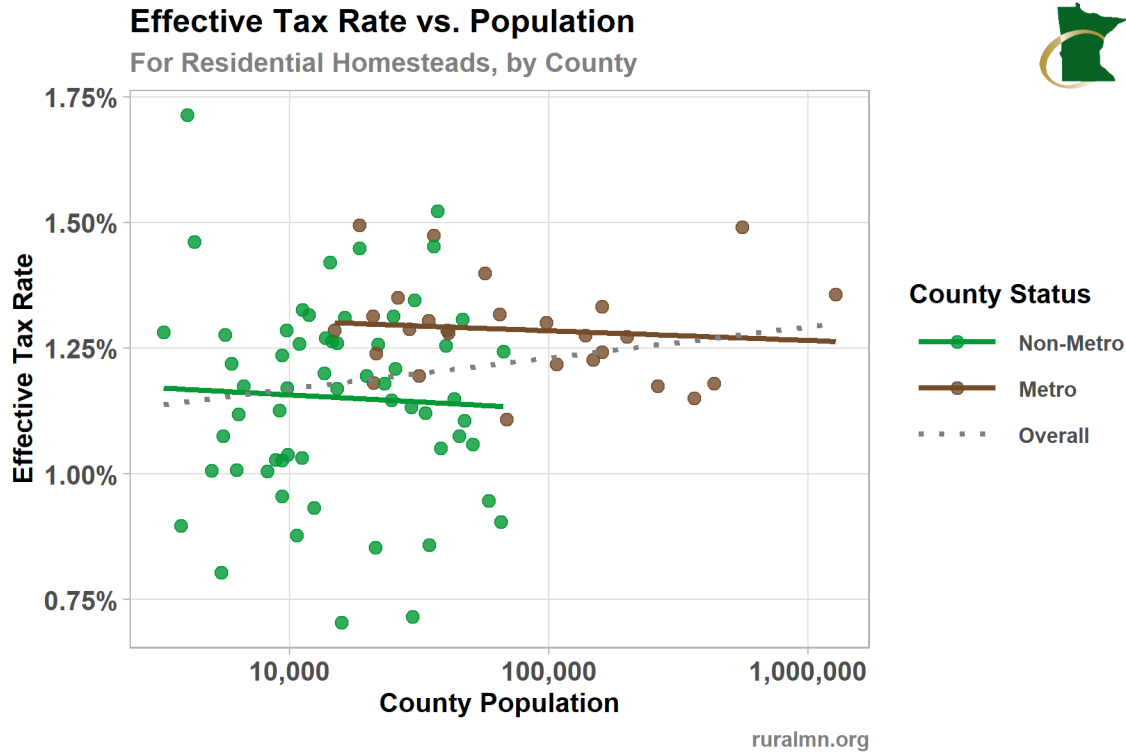


Figure 2. Effective Property Tax Rate for Residential Homesteads vs. County Population. Tax rate does not correlate (linearly) with log-transformed population, even though it correlates with metro status (see text). Each dot represents one county, and the gray dotted line represents the linear trend of all counties regardless of metropolitan status (“Overall”), while the linear trend within each subgroup is depicted by a line of corresponding color. No linear trend depicted here has a slope that is statistically different than zero (see text). Note: because the distribution of counties by population is right/positively-skewed, all scatterplots and regression analyses in this report consider log10-transformed population, except where noted. (Sources: [MN Dept. of Revenue](#) [Tax Rate] and [MN Dept. of Administration](#) [Population])

However, in multivariate models that regress against both county population and metropolitan status, population remains an insignificant predictor of tax rates ($p > 0.5$ in each case), while metropolitan status remains statistically significant ($p < 0.01$ against both log-transformed and untransformed population, with a coefficient of $\sim 0.1\%$ in each case). In general, then, residential property tax rates are slightly higher in metropolitan counties, but that increase does not correspond to increased population per se (whether overall or within each metro/non-metro subgroup), and instead corresponds only to metropolitan status itself.

Of course, the actual amount of property tax paid – the tax burden – is related to both the tax rate and the value of the property. Unsurprisingly, counties’ median home values (American Community Survey, 5-year estimates, Table DP04, 2019) are strongly positively correlated with counties’ populations (Figure 3, gray dotted line; $p = \sim 0$, $R^2 = 0.58$). When all counties are considered as a single group, a doubling of county population corresponds to an increase in median home value of over \$22,000, while overall value also increases by a total of \$23,000 if the county is in a metropolitan area. Within Metro and Non-Metro subgroups, a doubling of the population corresponds to increases in median home values of about \$18,000 and \$19,300, respectively (Figure 3, brown and green lines; $p < 0.001$ in each case).

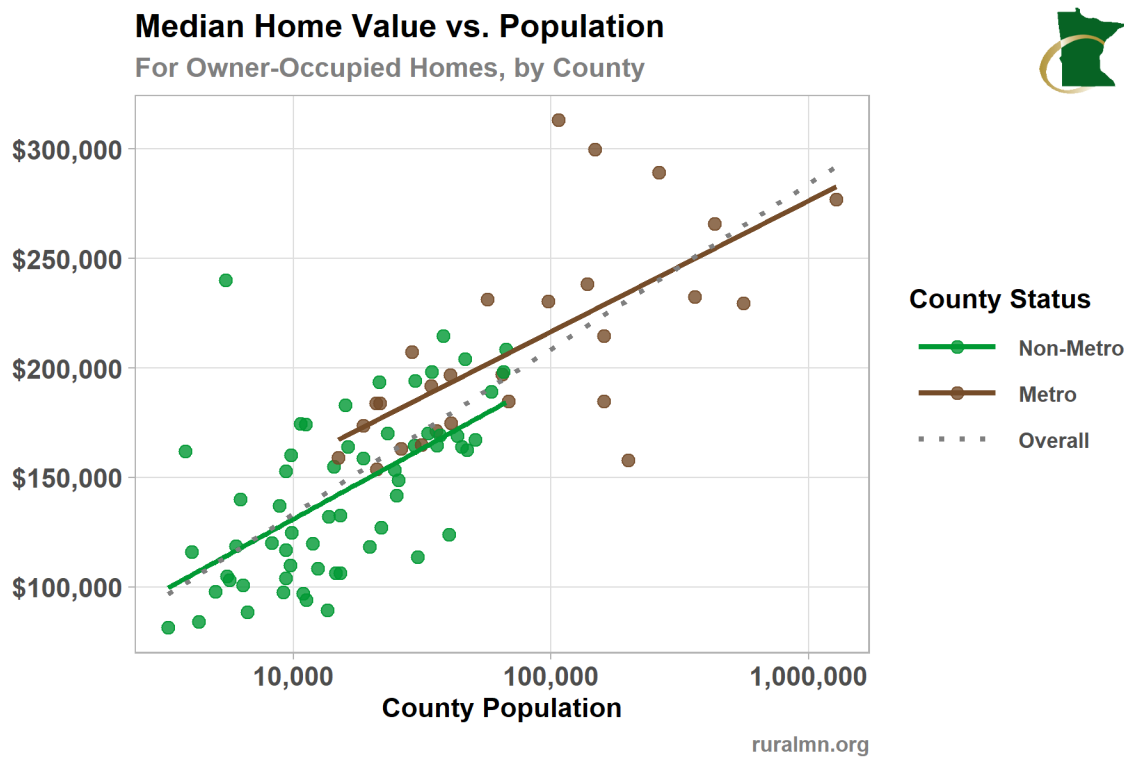


Figure 3. Median Home Value vs. County Population. Home values increase with population statewide, as well as in metro counties themselves. All three positive linear trends depicted in this figure are statistically significant (see text). (Sources: American Community Survey 5-Year Estimates Table DP04 [Home Value] and [MN Dept. of Administration](#) [Population])

Because home values increase with both population and metropolitan status, and because effective tax rates also increase with metropolitan status, it should come as no surprise that tax burden similarly increases (Figure 4). Across all counties in Minnesota, an increase in county population corresponds to

an increase in a proxy for “typical” tax burden: a calculated “median” property tax burden (effective tax rate x median home value). For each doubling of county population, this calculated burden increases by about \$220 annually, plus another \$560 to the annual total if the home is in a metropolitan area ($p \approx 0$, $R^2 = 0.71$).

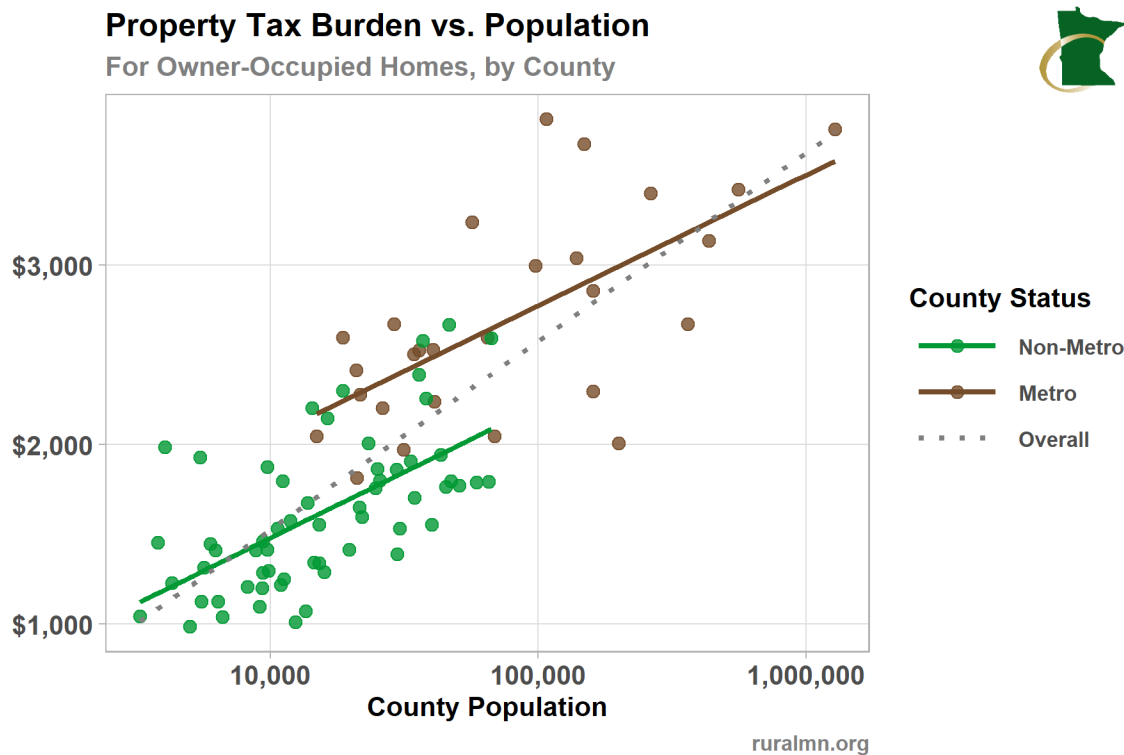


Figure 4. Property Tax Burden for Residential Homesteads vs. County Population. “Median” property tax burden (see text) increases with population across all counties, as well as in Metro and Non-Metro subgroups. All linear trends depicted in this figure have slopes that are significantly above zero. (Source: [MN Dept. of Administration](#))

In general, then, property tax burden for residential homesteads is lower in non-metro areas because tax rates and property values are lower there. However, modeling statewide trends in tax burden as a function of county population and metropolitan status reveals both an effect of living in a metropolitan area at all, as well as another more curious observation: by percentage, living in a metropolitan area affects property taxes more than it affects home values.

Unsurprisingly, home values and residential tax burdens vary similarly – by about a factor of four – across Minnesota’s 87 counties: median home values range from about \$81,000 to about \$313,000, and median tax burdens range from about \$1,000 to about \$3,800. However, the impact of a county’s metropolitan status is different in these otherwise parallel increases. As we’ve seen, a county’s metropolitan status accounts for about a \$23,000 difference in median home value, or 10% of the statewide range, while metro status represents a \$560 difference in median property tax burden, which is 20% of the statewide range.

This larger jump in property taxes than in home values aligns with the findings in Figures 1 and 2, which show that metro counties have higher effective tax rates than non-metro counties. Importantly, the increase seems to depend on factors related metro status itself, rather than on changes in population. (This is unlike home value, which increases more linearly as population increases, with an added bump in value in metro areas.) As a result of this jump in tax rates across metro/non-metro boundaries, the effect of living in a metropolitan area impacts tax burden by double the percentage by which it impacts home values (20% of the statewide range vs. 10%).

Property Taxes vs. Other Costs of Living

Property tax burden is lower in non-metro areas, but property taxes are just some of the costs of homeownership. Do other costs (e.g., utilities and insurance), also scale across the metro/non-metro spectrum in Minnesota? Further, how does any trend in other costs align with changes in property taxes – do they counteract them, balancing the cost of homeownership, or do they match them, making the rural/metro divide even greater?

The American Community Survey (5-year estimates, Table DP04, 2019) provides a measure of “Selected Monthly Ownership Costs” (SMOCs) for each county. These costs include “real estate taxes” like the property taxes discussed above, as well as various insurances, utilities (“electricity, gas, water, and sewer”), fuels (“oil, coal, kerosene, wood, etc.”), and fees (e.g., for condominiums and mobile homes). SMOCs are presented separately from mortgage costs and therefore do not reflect home values directly.

SMOCs increase with population and are higher in metropolitan areas (Figure 5). A multivariate linear model reveals that general costs of outright homeownership increase by \$190 per year each time county population doubles, with an added yearly increase of \$460 if the county is in a metropolitan area ($R^2 = 0.56$, $p \approx 0$). The correlation with population persists within metro and non-metro counties, but is much weaker in the latter group (Figure 5, green line; $R^2 = 0.10$, $p < 0.01$).

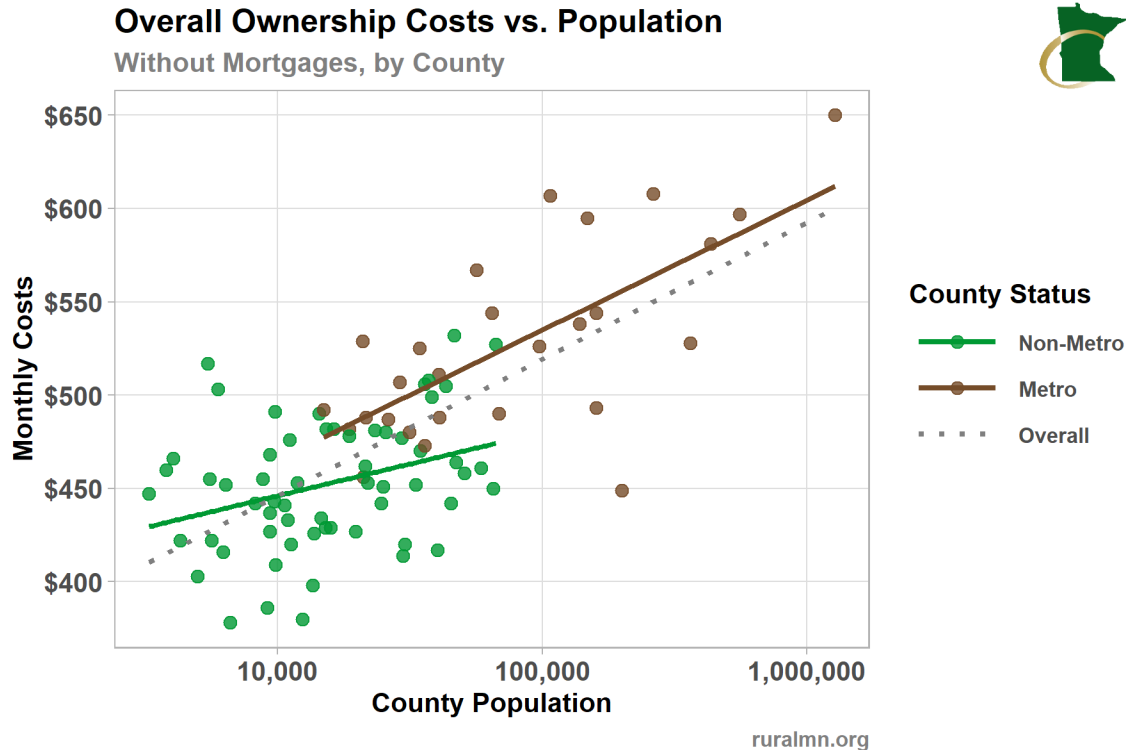


Figure 5. Selected Monthly Ownership Costs (SMOCs) vs County Population. All trendlines shown here represent trends that are significantly positive (see text). Note that this chart reflects monthly costs, while the figures given in the text have been converted to annual costs. (Sources: American Community Survey 5-Year Estimates Table DP04 [Monthly Costs] and [MN Dept. of Administration](#) [Population])

To determine how much of the population- and metropolitan-dependent increases in overall ownership costs were driven by “real estate taxes,” we subtracted the calculated “median” property tax burden mentioned above from the SMOCs given by the American Community Survey; we then regressed the remaining costs against county population (Figure 6). Removing property taxes from SMOCs reveals that other costs of outright home ownership correlate *negatively* with population, albeit weakly. Among all counties statewide, a doubling of the population loosely corresponds to a \$50 decrease in ownership costs throughout the year ($R^2 = 0.10$, $p = 0.002$). Metropolitan status is not a significant predictor of costs statewide, though the negative trend persists weakly in non-metro counties, at a rate of about a \$100 decrease per year per doubling in population (Figure 6, green line; $R^2 = 0.17$, $p = 0.001$).

Non-Tax Ownership Costs vs. Population Without Mortgages, by County

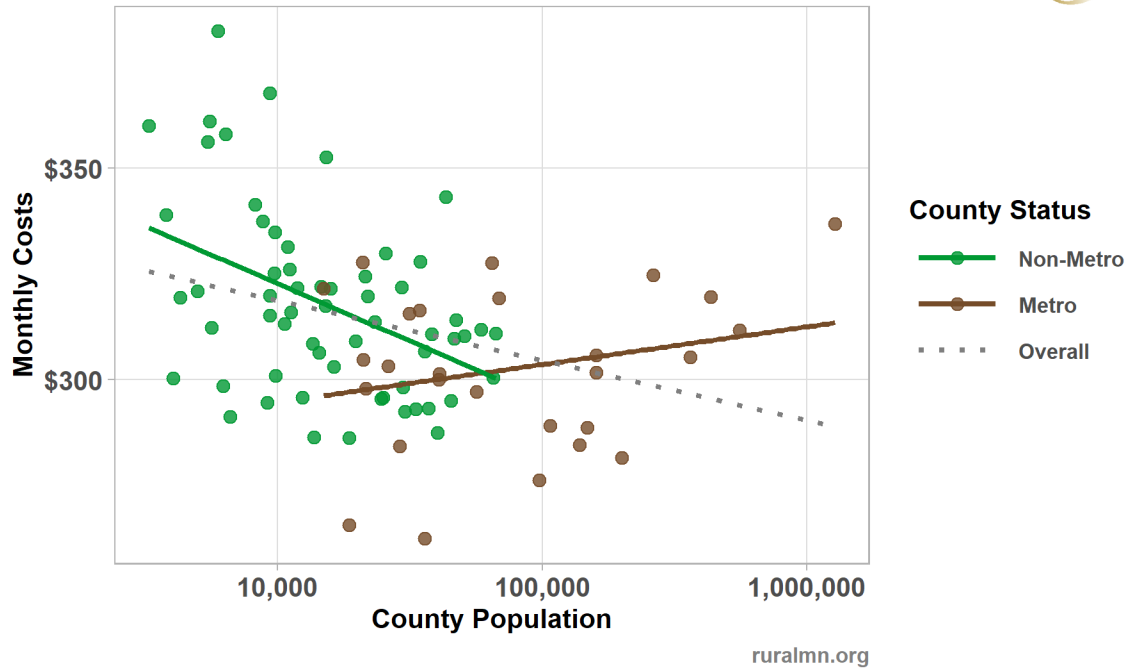


Figure 6. Selected Monthly Ownership Costs (Minus Property Taxes) vs. County Population. Like Figure 5, this Figure shows monthly costs, though the text refers to annual costs. Only the slopes of the Overall (gray) and Non-Metro (green) trends are significantly different than zero (see text). (Sources: American Community Survey 5-Year Estimates Table DP04 and [MN Dept. of Administration](#) [Population])

These results demonstrate that property taxes are the principal driver of the positive correlation between ownership costs and population in Minnesota’s counties. That is, the weak negative trends in other, non-tax ownership costs do not fully offset the stronger positive trends in tax burden. As a result, general ownership costs across metro/non-metro counties resemble the positive trend seen in property taxes alone, even if more weakly (Figure 5).

Overall, residents who own their homes outright in non-metro areas have lower homeownership costs than their counterparts in metro areas, and that trend owes largely to a difference in property taxes, which is itself due to both lower effective tax rates and lower property values.

Prevalence of Outright Ownership

Another important feature of any housing market, especially with regard to housing turnover and availability, is the percentage of owners vs. renters. The American Community Survey also reports the percentages of households that own with a mortgage, own without a mortgage, and rent (Table DP04, 2019). In Minnesota's counties, do percentages of outright homeownership change with population, or across metro/non-metro areas?

Outright homeownership is more frequent in non-metro counties than in metro counties (Figure 7). Among Minnesota's 27 metro counties, the mean percentage of owner-occupied homes without a mortgage was 34% in 2019, compared to 46% in non-metro counties – a significant difference ($p = \sim 0$ by two-tailed t test). Multivariate linear regression reveals a 3.0% decrease in outright homeownership among homeowners for each doubling of a county's population, with an additional 5.5% total decrease within metro counties ($R^2 = 0.67$, $p = \sim 0$). Significant trends persist in each subgroup (see Figure 7), with a sharper decrease per population doubling in non-metro counties (3.9%, $R^2 = 0.52$, $p = \sim 0$) versus metro counties (2.1%, $R^2 = 0.25$, $p < 0.01$).

Owners without a Mortgage As Percentage of Owners, by County

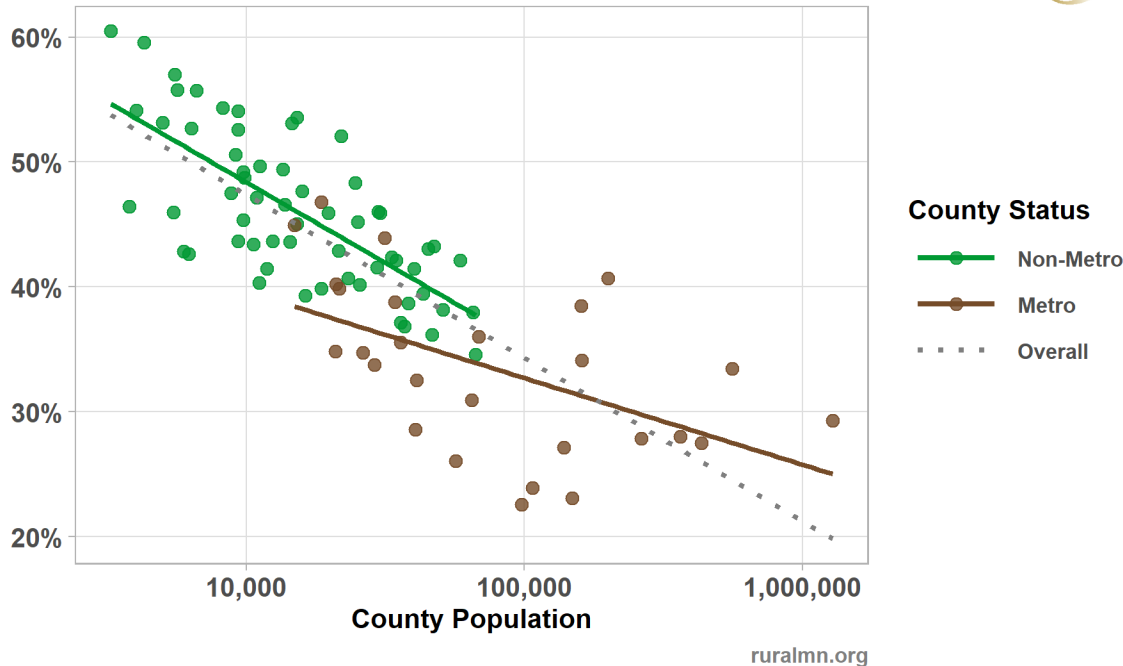


Figure 7. Outright Owners as Percentage of Owners, by County. Frequency of owning a home without a mortgage, expressed as a percentage of all households that own (but not rent), decreases as population grows, as well as in metropolitan counties themselves. The slopes of all linear trends shown here are significantly less than zero (see text). (Sources: American Community Survey 5-Year Estimates Table DP04 [Ownership] and [MN Dept. of Administration](#) [Population])

Discussion

Taken together, the data presented here demonstrate that property tax burden for outright homeowners increases with population, especially in metropolitan areas. Also, this tax burden drives a positive relationship between costs of outright ownership and county population throughout the state. Finally, a higher percentage of households enjoy the lower costs of outright ownership in non-metro areas – ownership without a mortgage becomes more common as county population decreases.

Of course, the increased rate of home ownership in rural areas is not entirely separate from the higher percentage of older residents. After all, older people may be more likely to own their homes outright regardless where they live, and having both an older population and more homeowners is not surprising. However, the magnitude of the effect of population on home ownership – having twice as

many homeowners in the smallest counties compared to the largest – strongly supports the intuitive conclusion that age is not the only explanation.

The results presented here outline a rational, economic incentive for each individual resident to remain in his or her home, regardless of age. Because the costs of outright home ownership (e.g., taxes and utilities) are lower in rural areas than in metro areas, people may be less likely to want to move into newer, more expensive housing in their communities.

This last point may give pause to advocates for construction of new housing in rural areas, especially transitional, multi-unit housing for seniors. In theory, construction of such housing should increase churn and open up single-family homes for new working families. However, as we've seen, senior citizens in rural communities may feel different economic pressures than their counterparts in metro areas. Specifically, they are able to live in their homes more cheaply, disincentivizing moving at all, but especially to facilities that charge monthly rent and other fees. Further, because home values are lower in rural areas, residents who move receive less money for the sale of their existing homes – a major consideration when calculating how long they could live in higher-priced transitional housing.

What kind of housing should rural areas build? These results uncover another layer of complexity in an already complex question. Future policy proscriptions from lawmakers and community leaders, whether regarding housing directly or workforce issues more generally, may need to reconsider a wider range of economic incentives across the rural-urban spectrum.

About the author

Phil Jensen, PhD, is a freelance data analyst and technical writer. A former professor and college administrator, he has written data-driven reports on topics including education, molecular biology, taxation, and college athletics. Phil is a born-and-raised Minnesotan and lives in Greater Minnesota with his wife and son.