How Accurate is ACS Data on Rental Housing?

May 18, 2021

American Community Survey Data Users Conference

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# Why study data accuracy for rental units?

Housing policy interest

- Rising rents, high cost-burden rates

- Growing need for rental units with many bedrooms

- Preservation of existing "naturally occurring affordable housing"

Shortage of existing studies

- Focused mostly on the homeownership market

- Limitations of administrative data: low match rate, less detail

- Address-level discrepancies versus higher-level discrepancies

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Scope of this analysis

All housing units

— Ownership

— Rental
  — Apartments
  — "Shadow market"
    • Single-family
    • Duplex/triplex/quadplex
    • Condominiums

Year structure built

Units in structure

Number of bedrooms

Rent ($)

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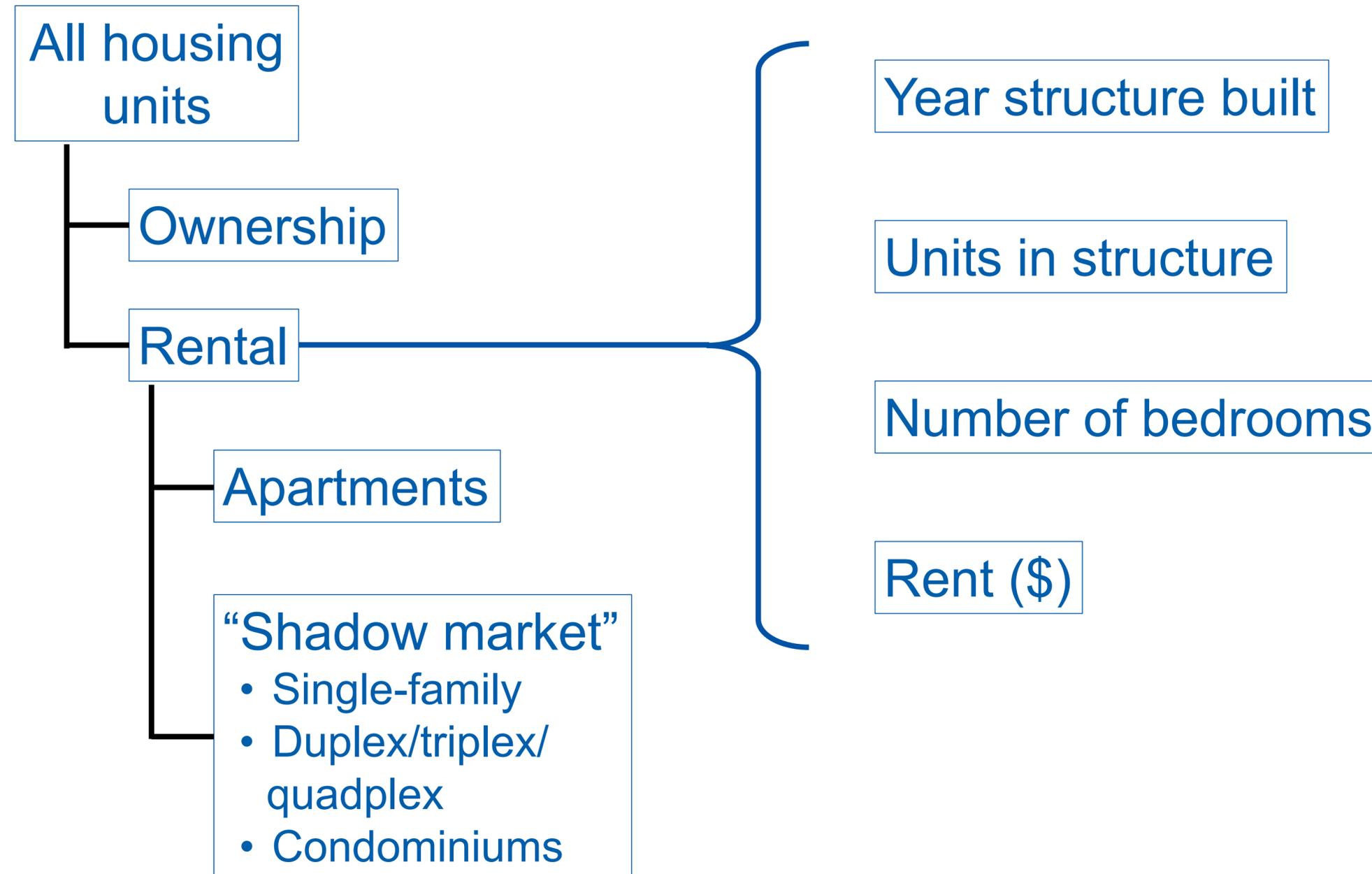
Data on nearly all rental units

	County parcel data	ZTRAX (Zillow)*	CoStar	HousingLink's Twin Cities Rental Revue
Market segment	Shadow	Shadow	Apartment	Only new rental listings
Whether owned or rented	✔	✔	[covers only rentals]	[covers only rentals]
Year structure built	✔	✔	✔	
Units in structure	[incomplete]	✔	✔	
Number of bedrooms		✔	✔	✔
Rent (contract, not gross)			[batch downloads have only current rents]	✔

Hereafter: "Alternative estimates" (ALT)

- Data provided by Zillow through the Zillow Transaction and Assessment Dataset (ZTRAX). More information on accessing the data can be found at http://www.zillow.com/ztrax. The results and opinions are those of the author and do not reflect the position of Zillow Group.

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Estimating rents for the shadow market

Interpolate between points

$$\longrightarrow$$

$$$
$
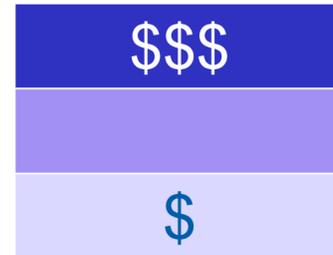
Repeat for 2015-2019, 1-4 bedrooms

2017 listings for 3BR units (shadow market)

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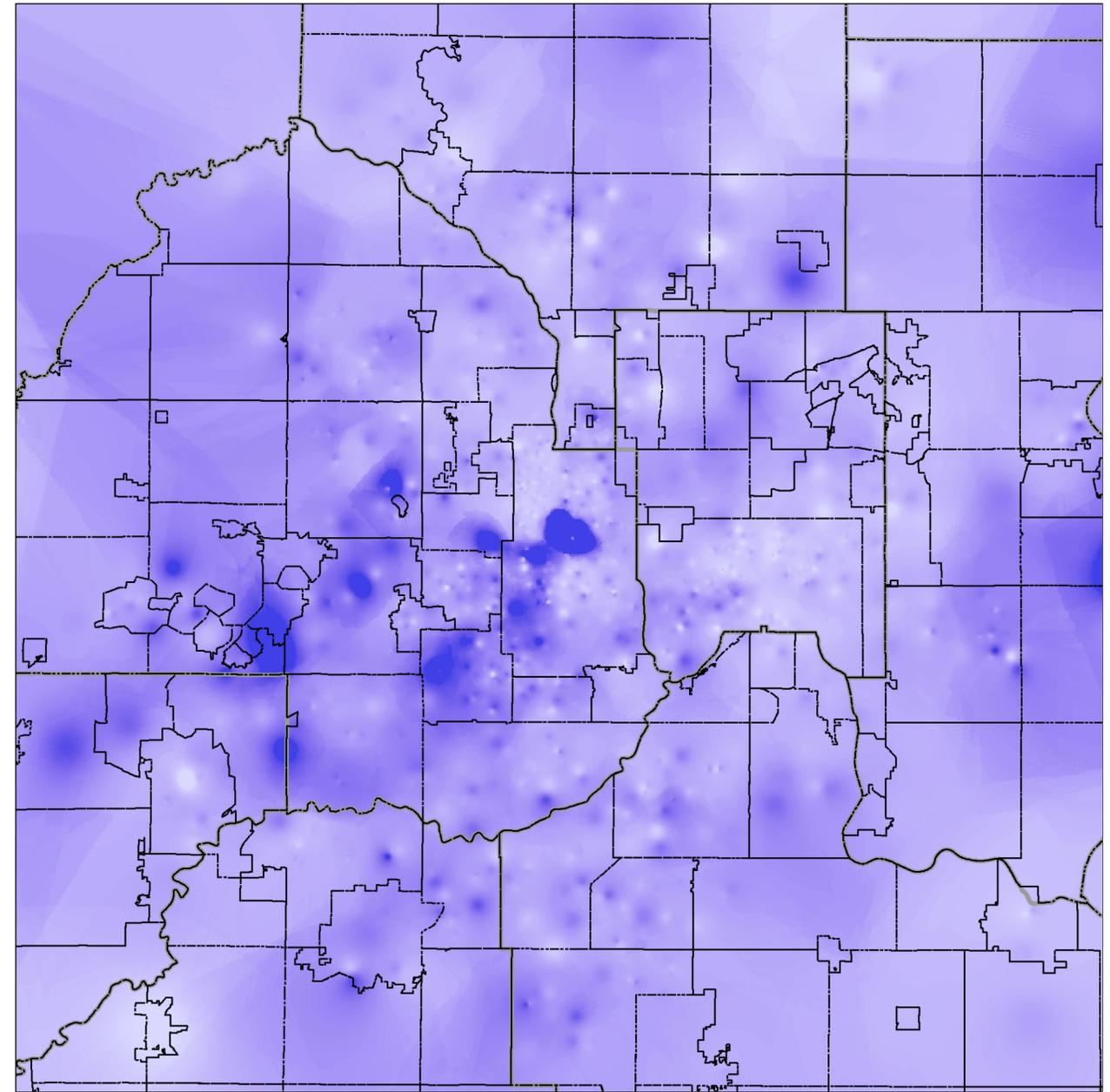
Estimating rents for the apartment market

CoStar:
2020 rent =
$1,000

×

≈

Chart 1 (left):
- 2015: 90%
- 2016: 93%
- 2017: 95%
- 2018: 100%
- 2019: 105%
- 2020: 100%
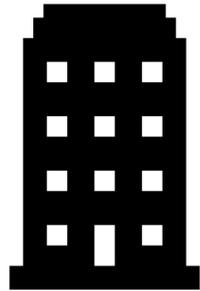
Chart 2 (right):
- 2015: $900
- 2016: $930
- 2017: $950
- 2018: $1,000
- 2019: $1,050
- 2020: $1,000
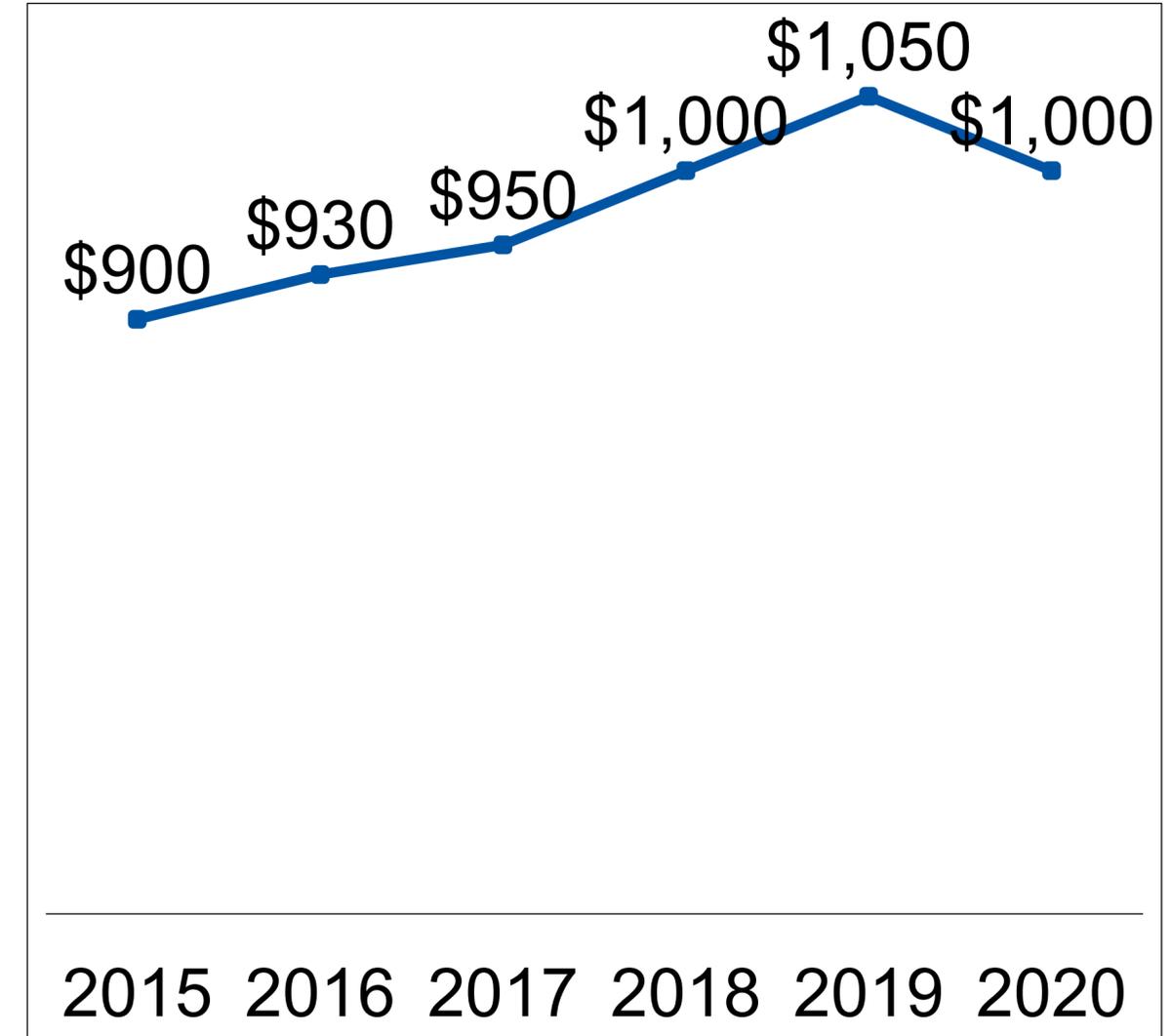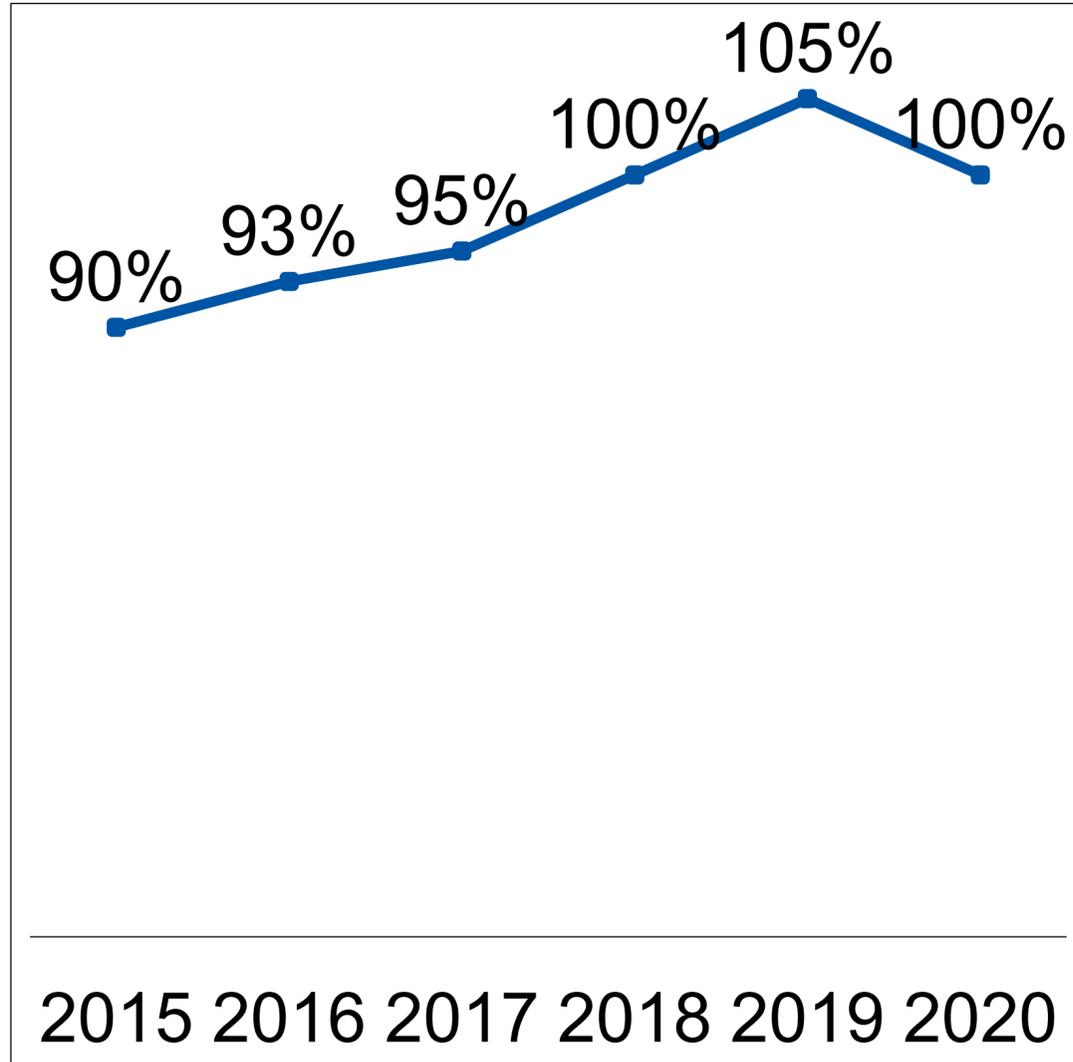
Rental Revue:
Average rents for 3BR apartment units
(2020 = 100%)

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    - Condominiums

Year structure built

Units in structure

Number of bedrooms

Rent ($)

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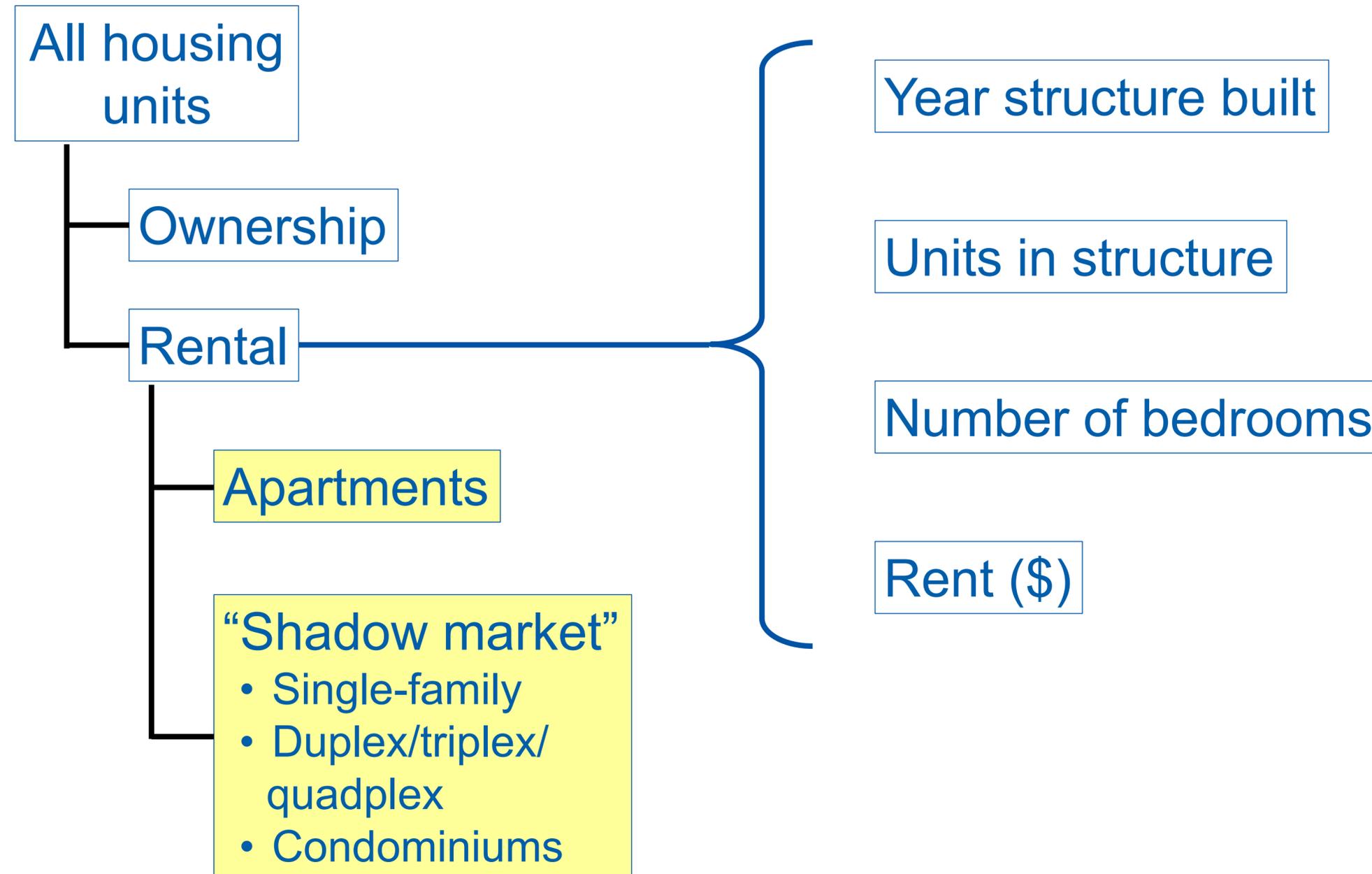
Region-wide:
~ 1/3 "shadow"
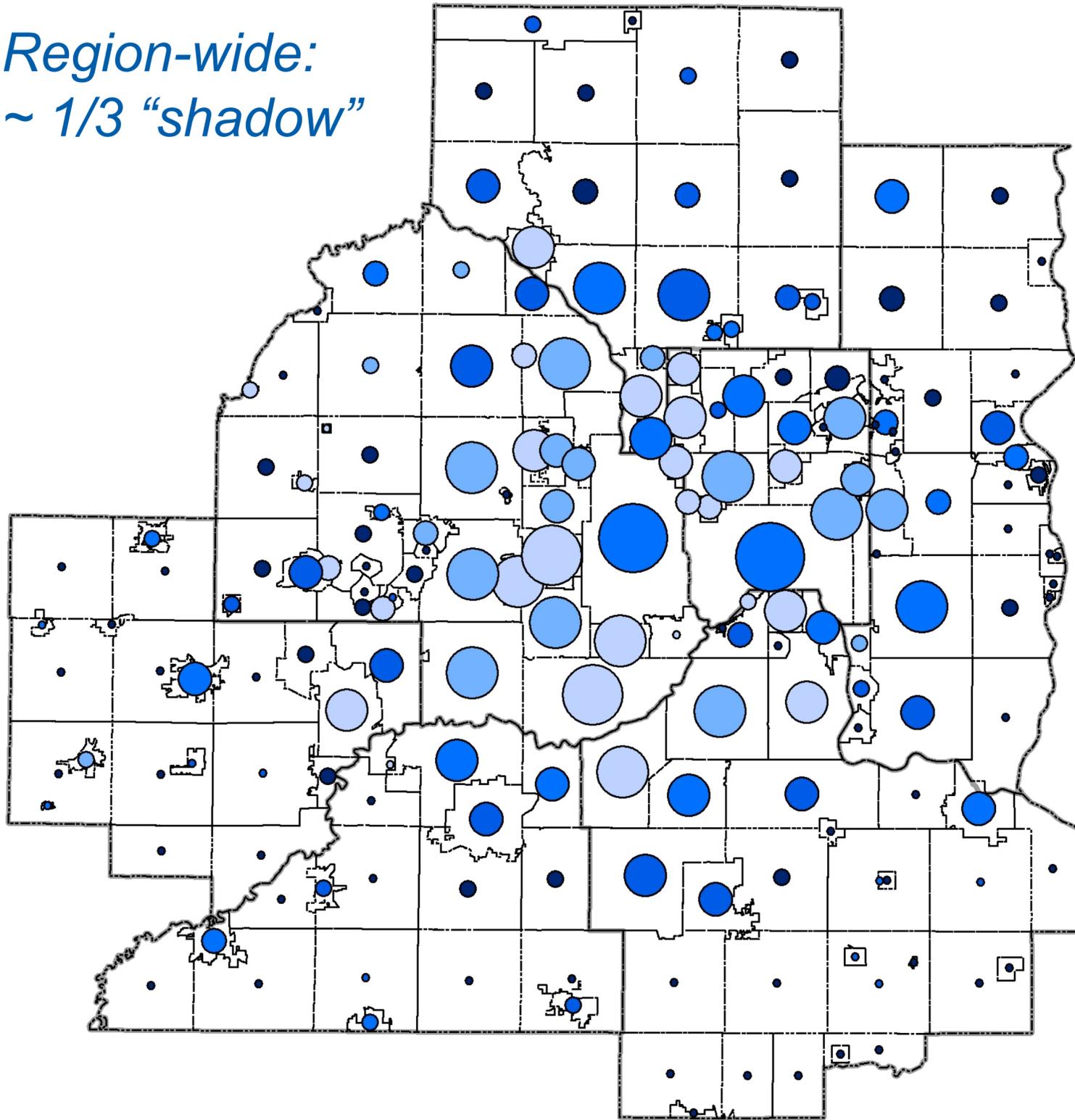
"Shadow market" units are common

Cities/townships with larger circles have more rental units.

The shading of the circle shows the proportion of these rental units that are *not* apartments:

75% or more
50% to 74%
33.3% to 49.9%
25.0% to 33.2%
Under 25.0%

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Year structure built

Units in structure

Number of bedrooms
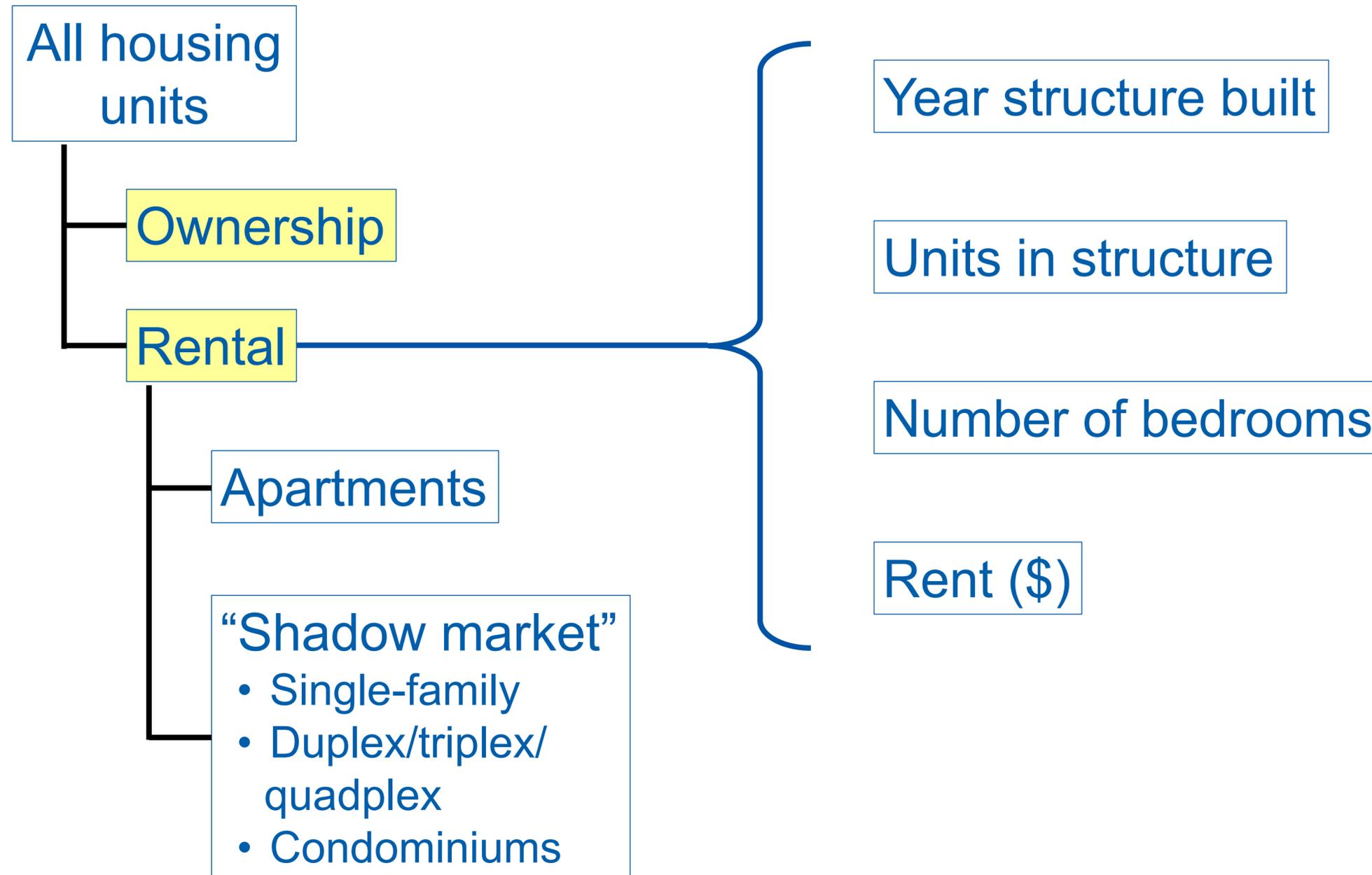
Rent ($)

All comparisons are based on the 2015-2019 period (using the simple average of the alternative estimates for the five years)

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Percent rentals: 2015-2019 ACS

Cities/townships
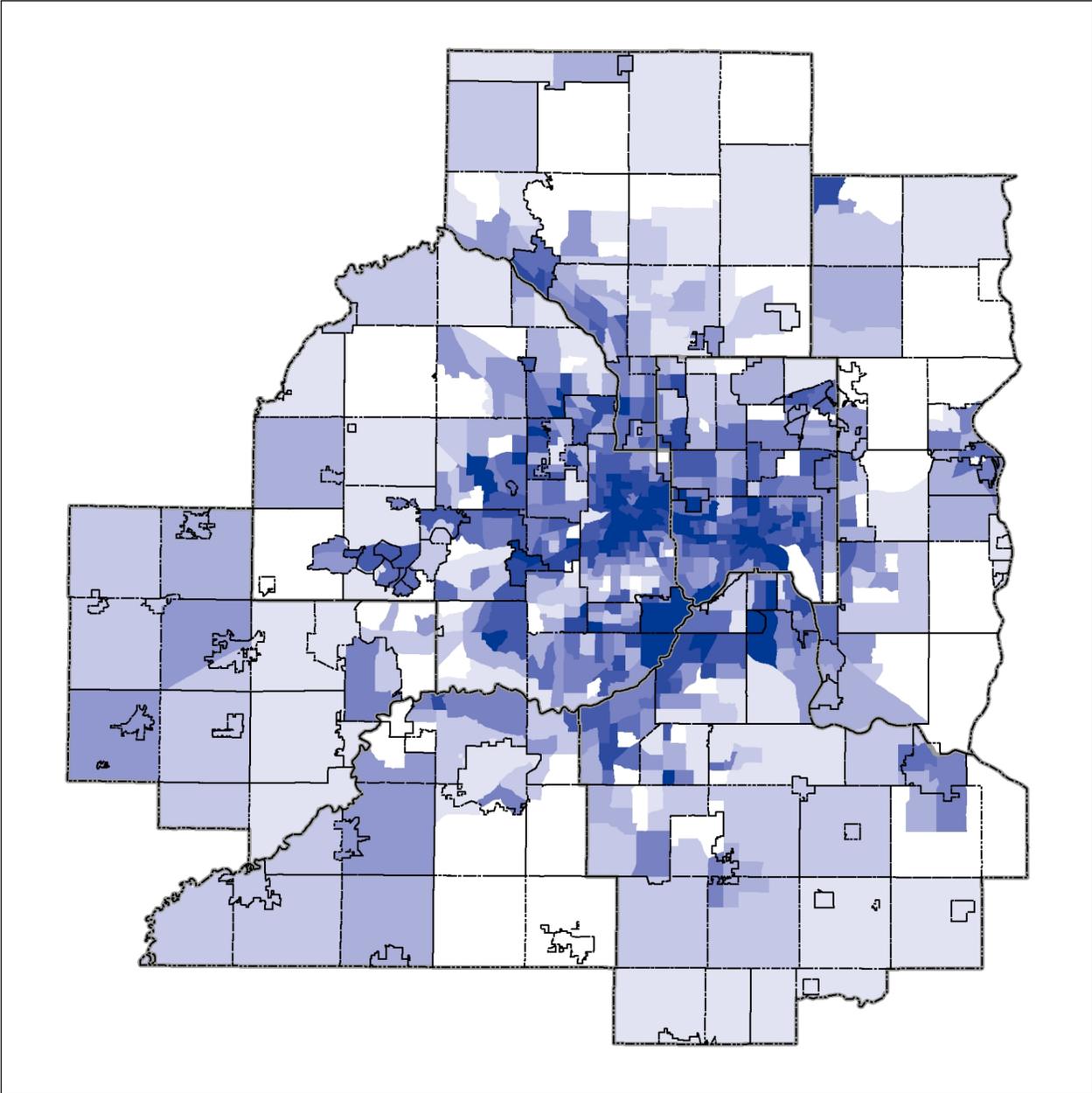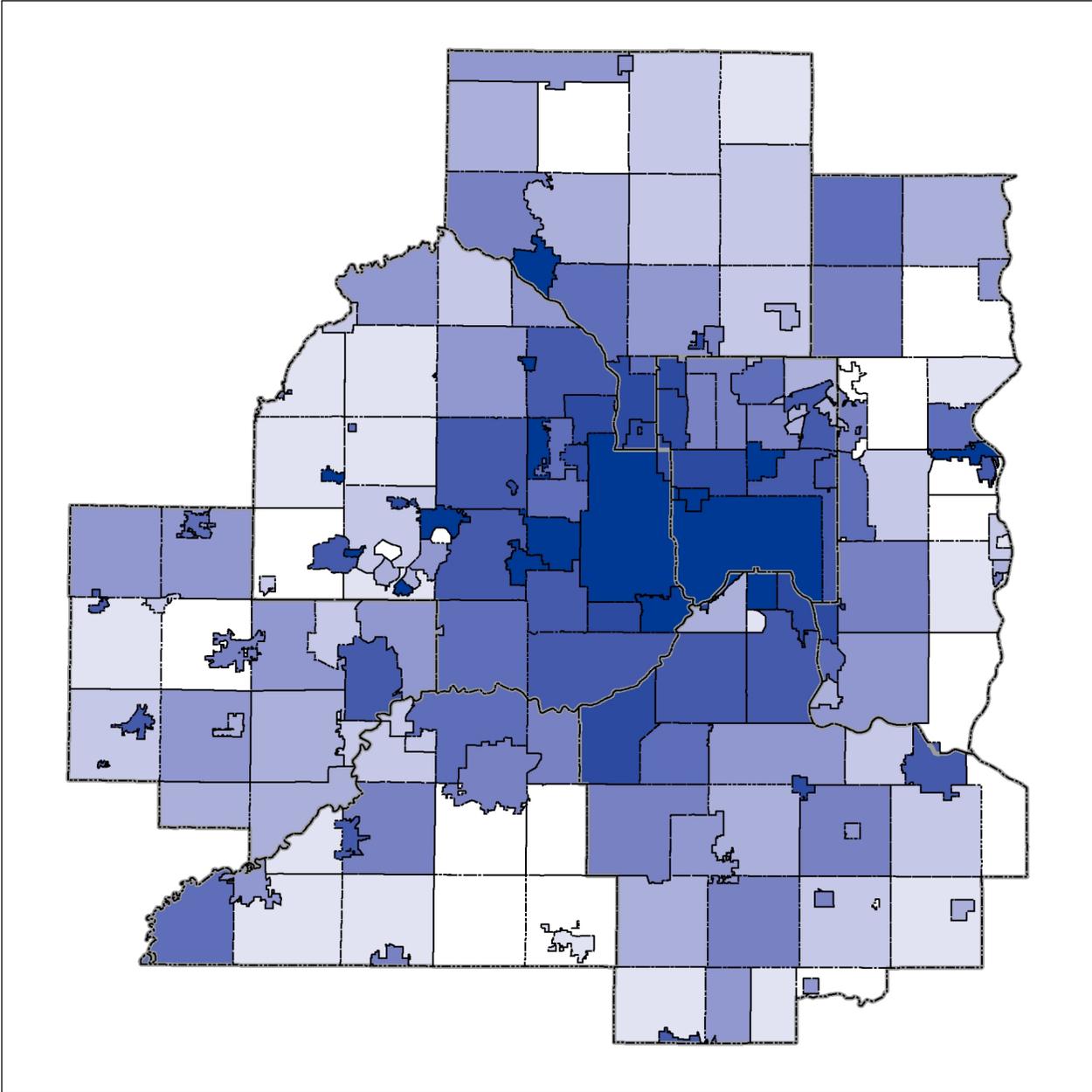
Census tracts

Highest decile

Lowest decile

Percent rentals: 2015-2019 ALT

Cities/townships
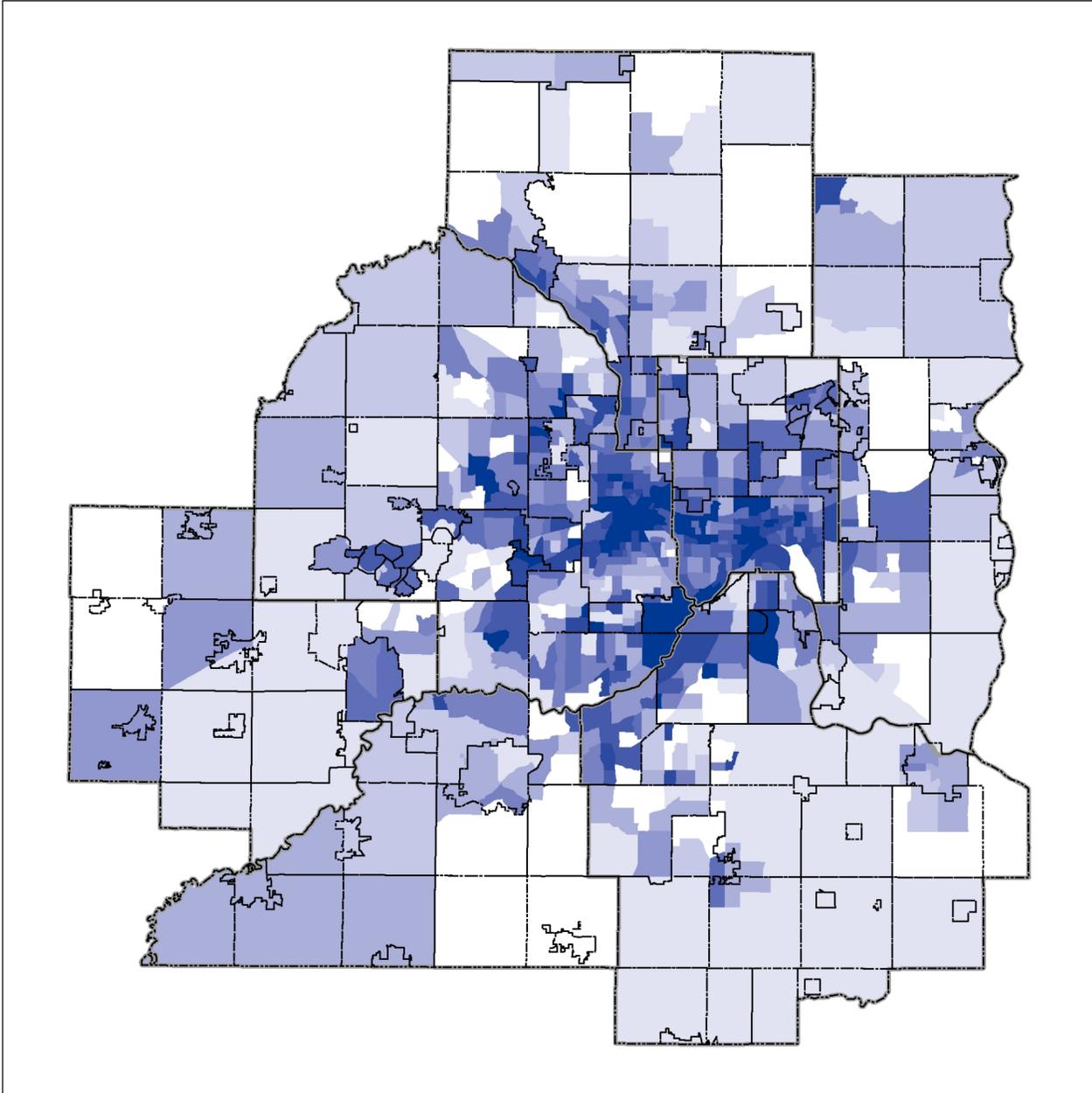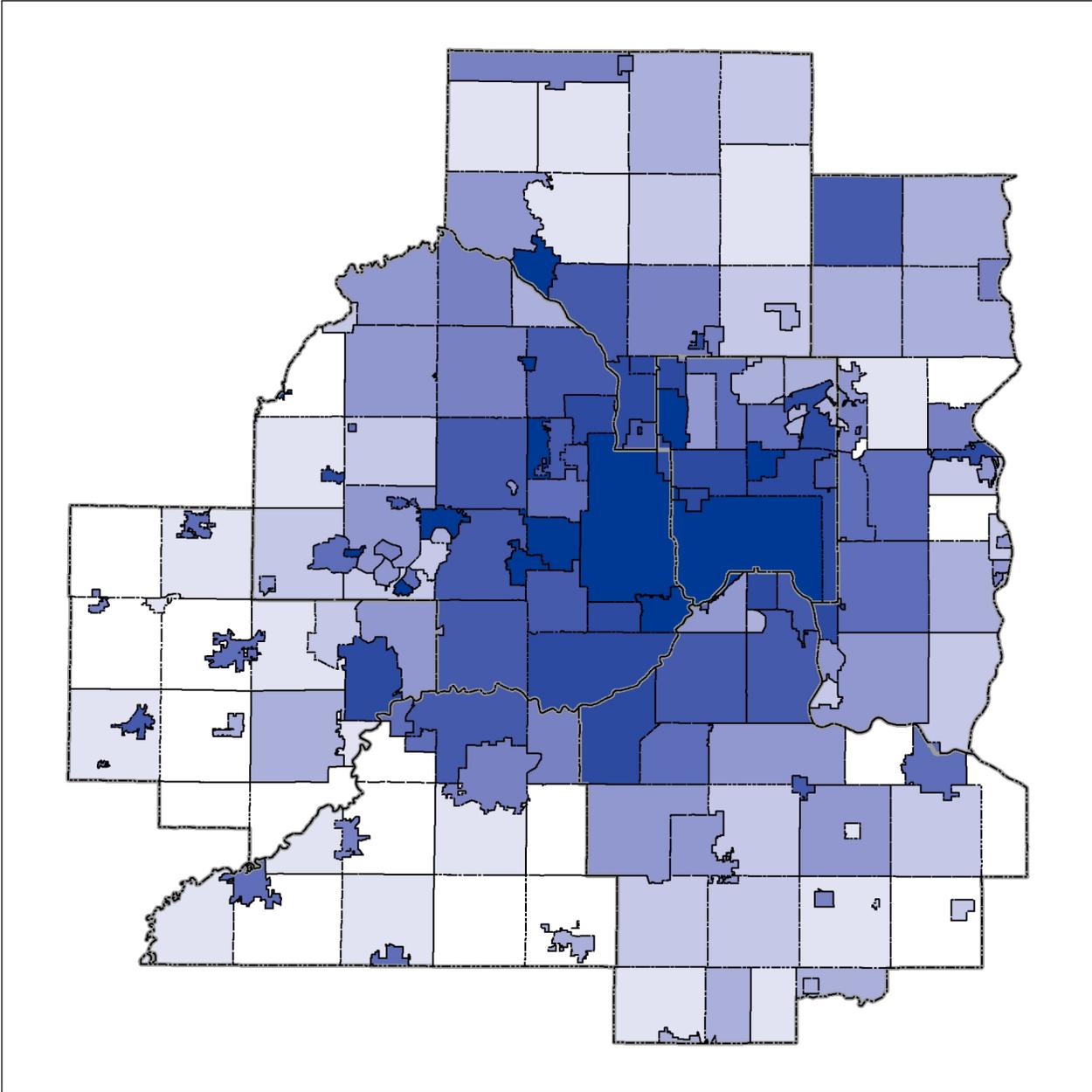
Census tracts

Highest decile

Lowest decile

Difference in percent rentals: ALT - ACS

Cities/townships

Census tracts


ALT > ACS

% point diff
+10 or more
+5.0 to +9.9
+2.5 to +4.9
+0.1 to +2.4
No difference
-0.1 to -2.4
-2.5 to -4.9
-5.0 to -9.9
-10 or more

ALT < ACS

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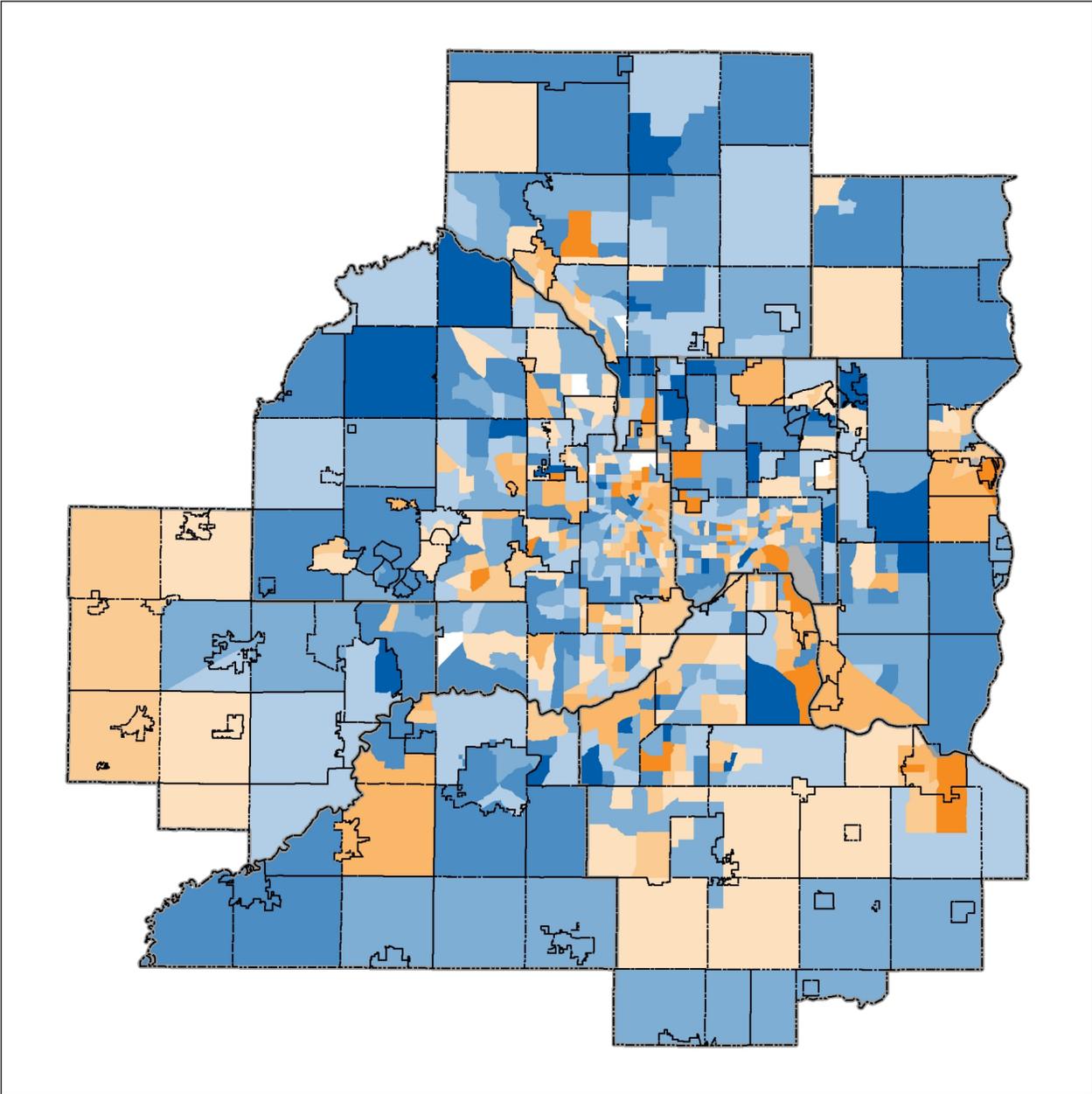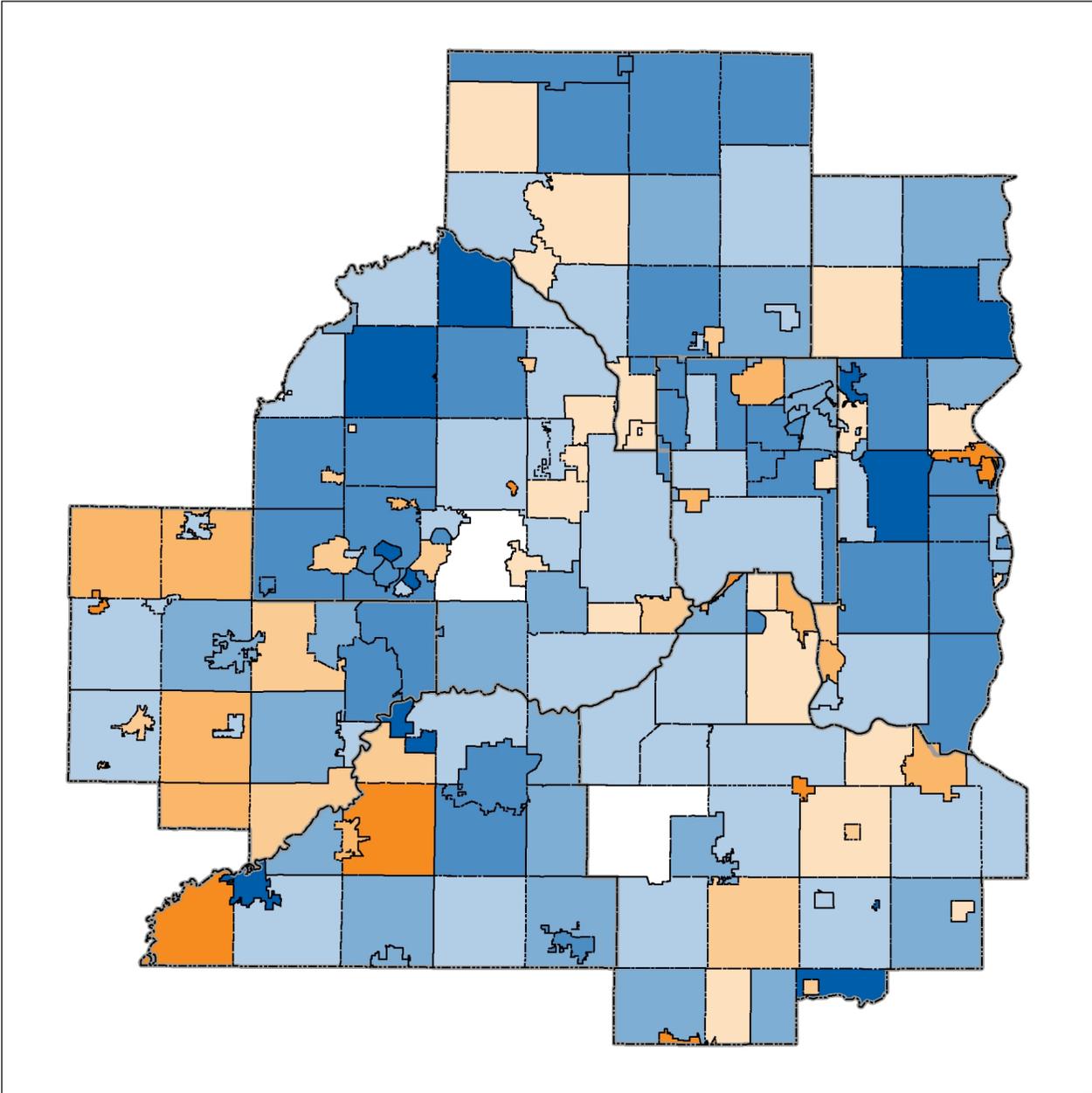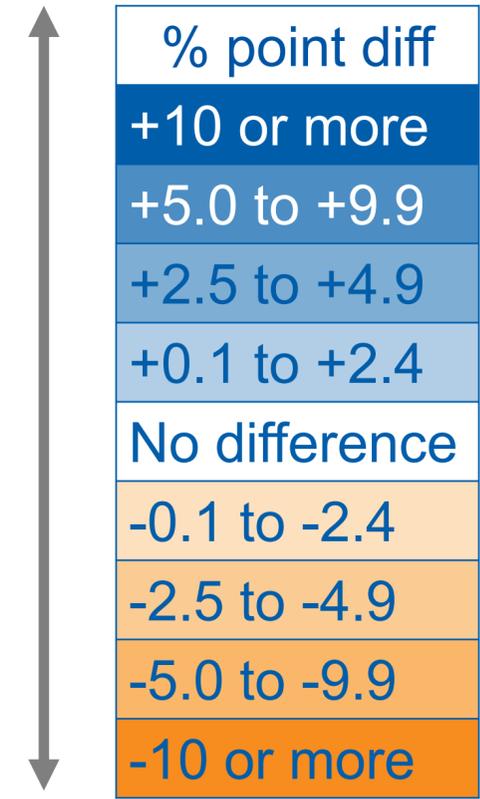
Four main questions

1 If I had alternative estimates, would they tend to show higher or lower values than ACS estimates?

2 By how much would those alternative estimates differ from ACS data?

3 Could I approximate what the alternative estimates would be if I used ACS confidence intervals?

4 If a given geography has a relatively high value of some characteristic in ACS data, can I trust that it would also have a relatively high value of that characteristic in alternative estimates?

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1. Difference in % rentals

ALT > ACS

Cities/townships

Census tracts

Category	Cities/townships	Census tracts
+10 or more	8%	4%
+5.0 to +9.9	18%	18%
+2.5 to +4.9	16%	20%
+0.1 to +2.4	26%	19%
No difference	1%	1%
-0.1 to -2.4	12%	13%
-2.5 to -4.9	8%	12%
-5.0 to -9.9	6%	9%
-10 or more	5%	3%

ALT < ACS
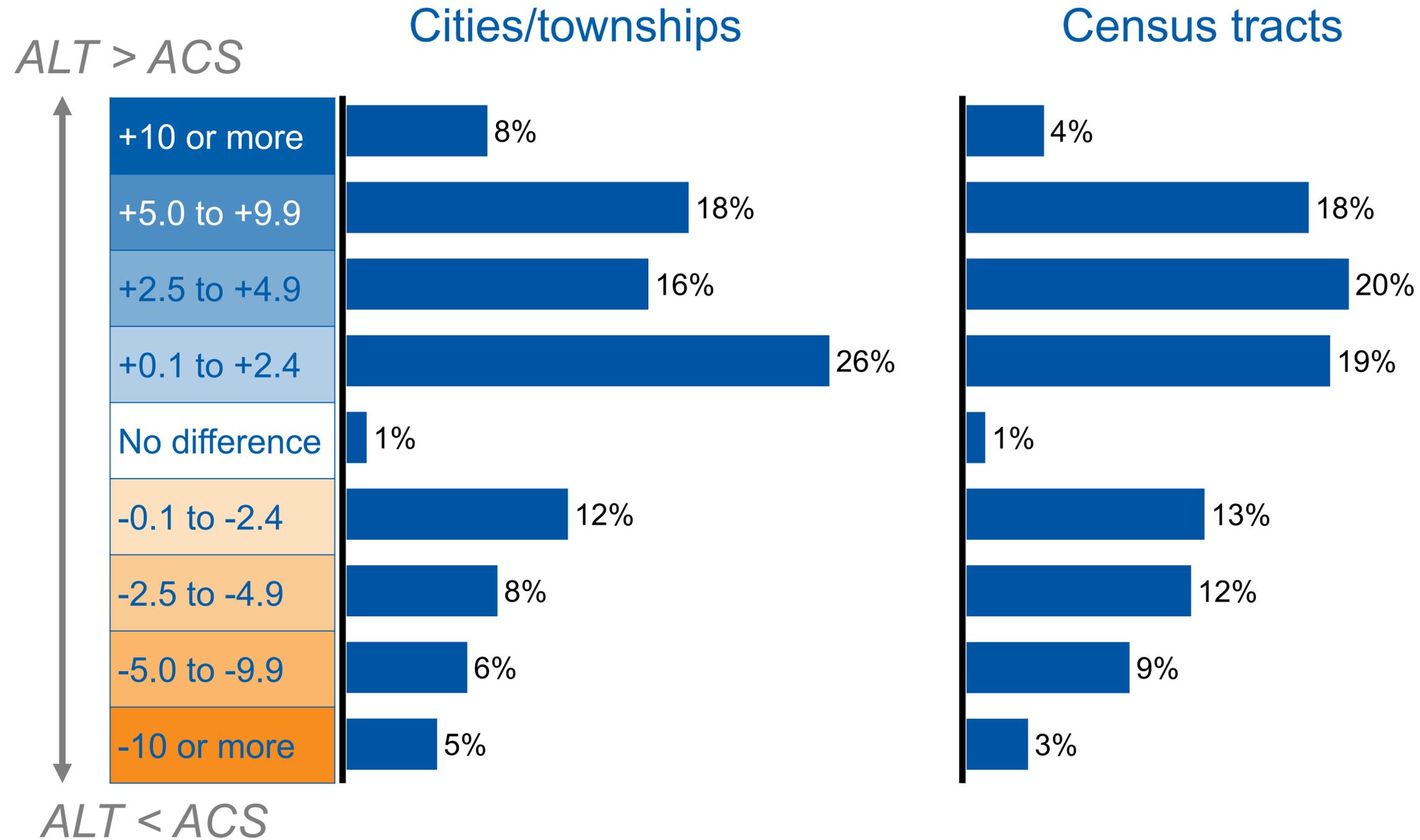
Alternative estimates tend to show higher proportions of rental units than ACS data

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2. **Absolute** difference in % rentals

Cities/townships

Census tracts

Alt higher

| Alt higher	Cities/townships	Census tracts
+10 or more	12%	7%
+5.0 to +9.9	25%	27%
+2.5 to +4.9	24%	32%
+0.1 to +2.4	38%	32%
No difference	1%	1%

Alt lower
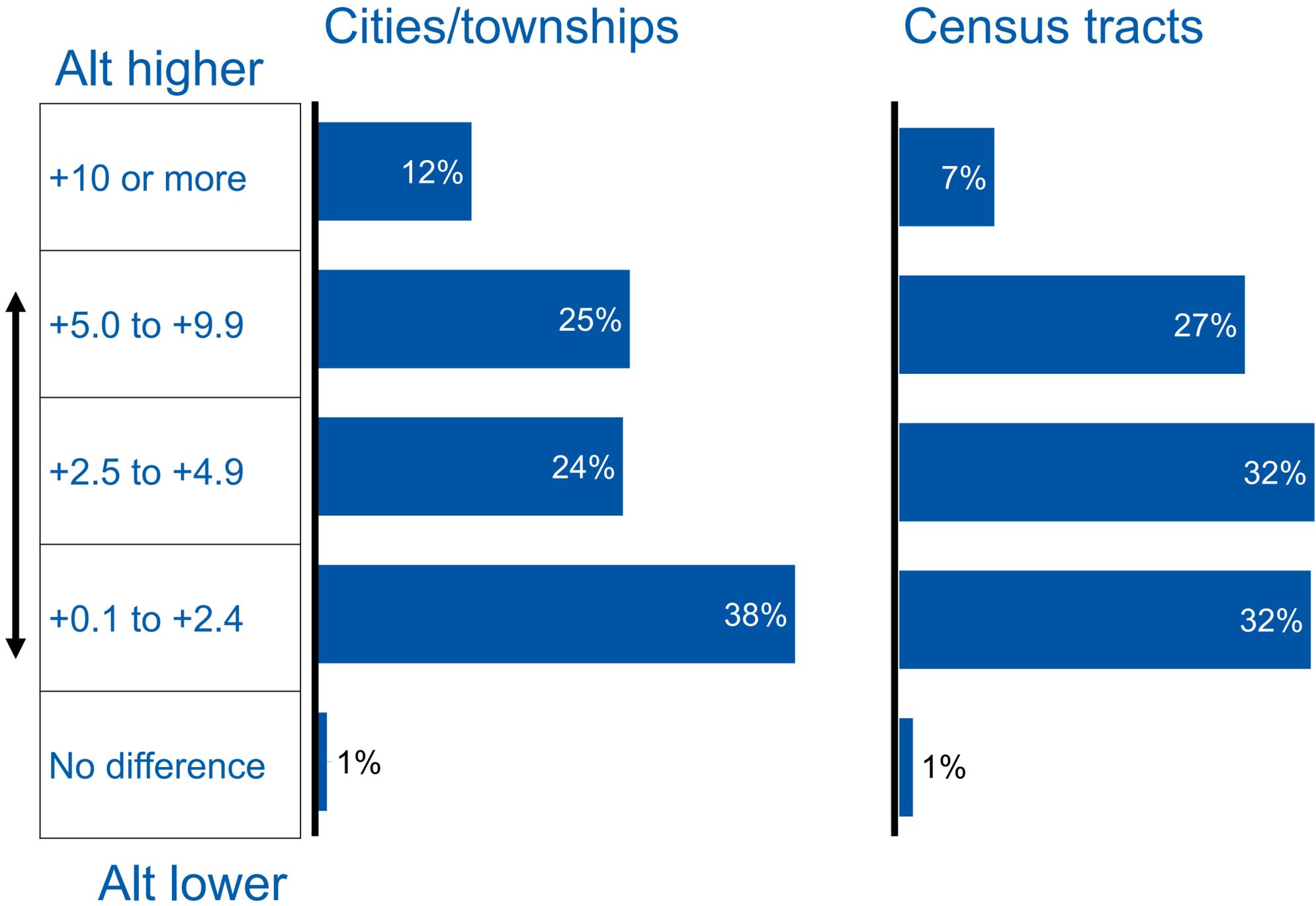
For a typical (median) geographic unit, the ALT estimates are __ percentage points away from ACS estimates:
- *3.2 (cities/townships)*
- *3.6 (tracts)*

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3. Do ACS confidence intervals contain ALT estimates?

ALT: 20%

ACS: 15% (11%, 19%)

| 0% | 8% | 16% | 24% |

ACS: 15% (8%, 22%)

| 0% | 8% | 16% | 24% |

Cities and townships: 48%, 52%
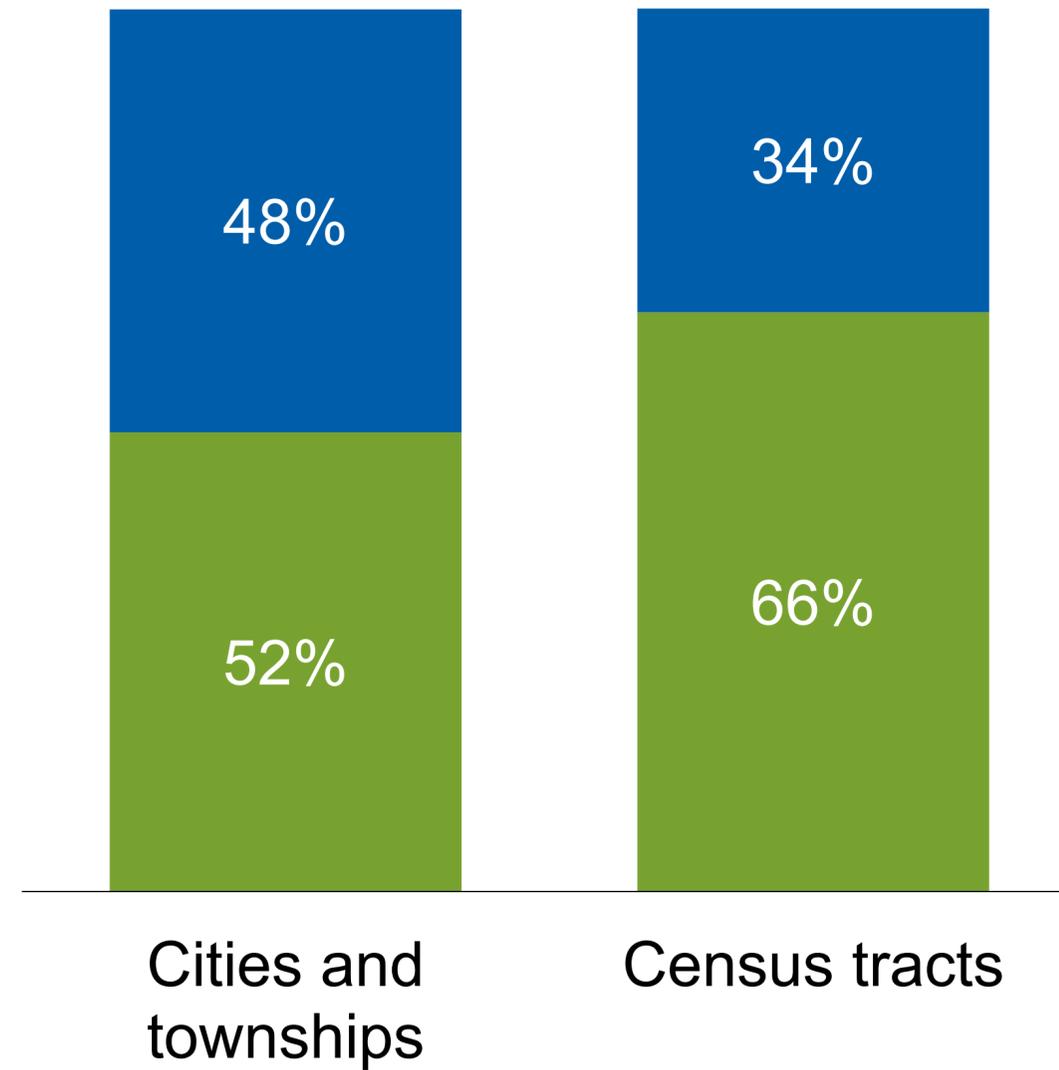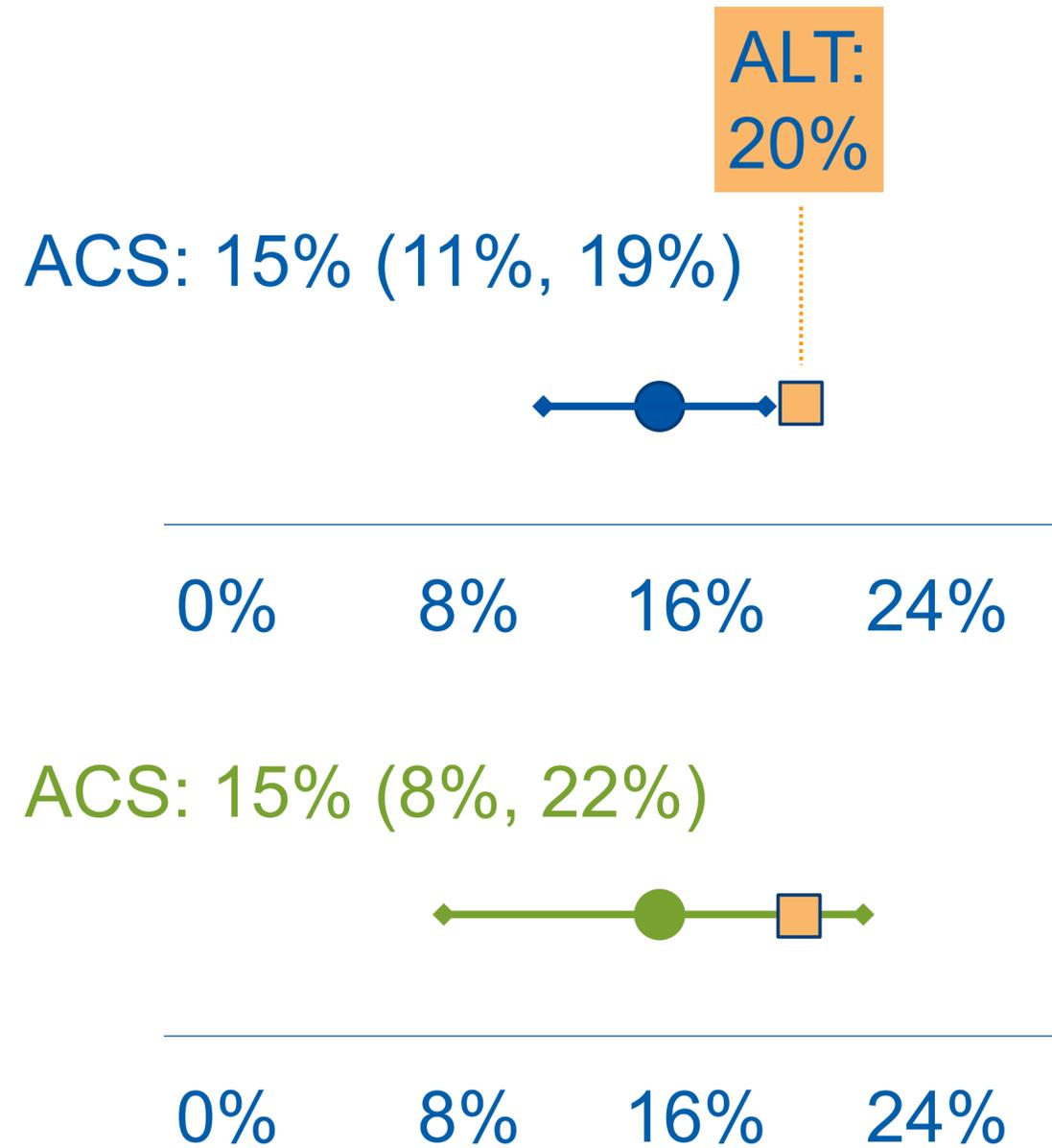
Census tracts: 34%, 66%

A minority of ACS 90% CIs DO NOT contain the ALT estimates.

A majority of ACS 90% CIs DO contain the ALT estimates.

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4. How much do the ALT & ACS estimates covary?

Cities/townships

R = 0.89

Census tracts

R = 0.96
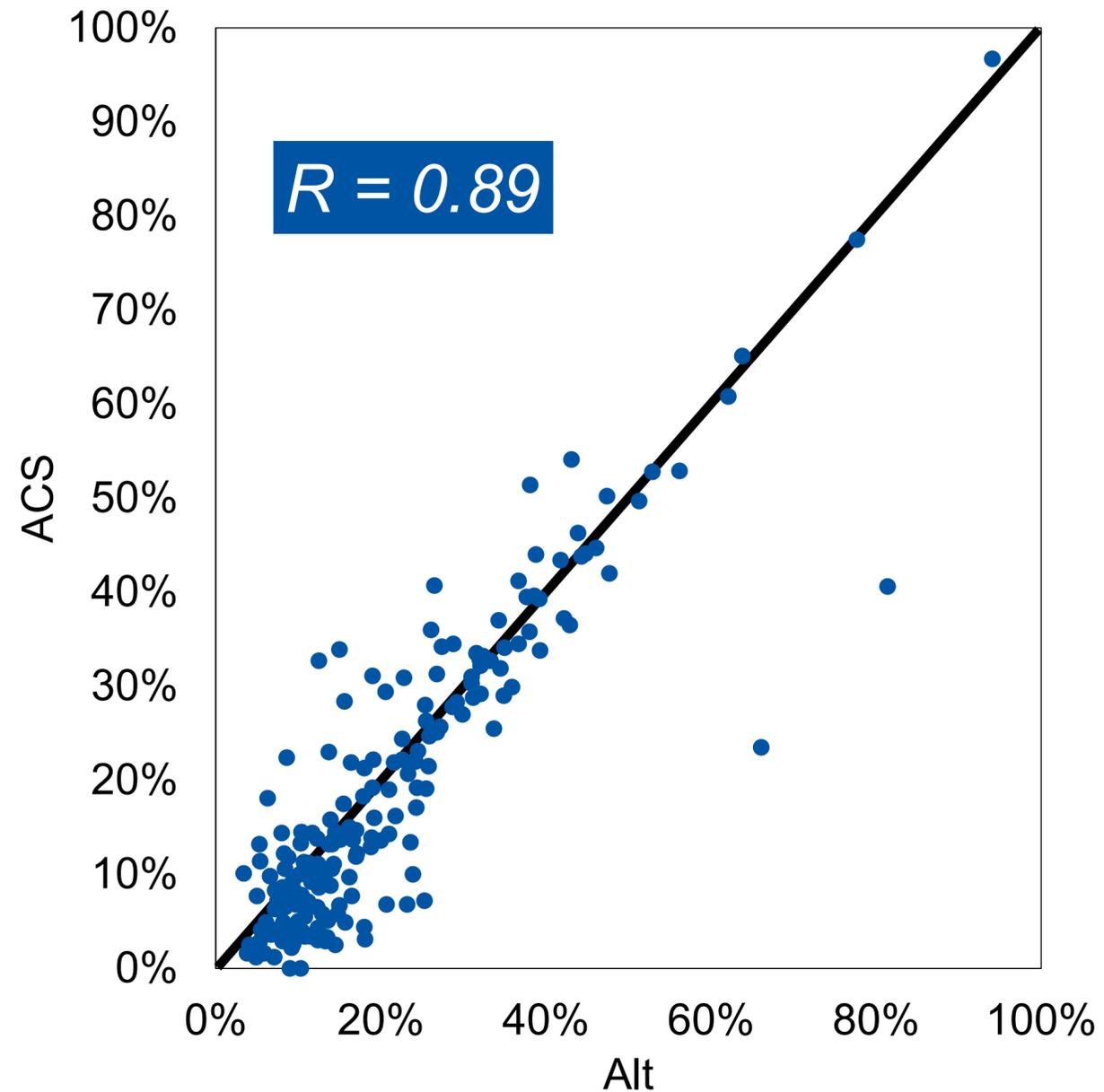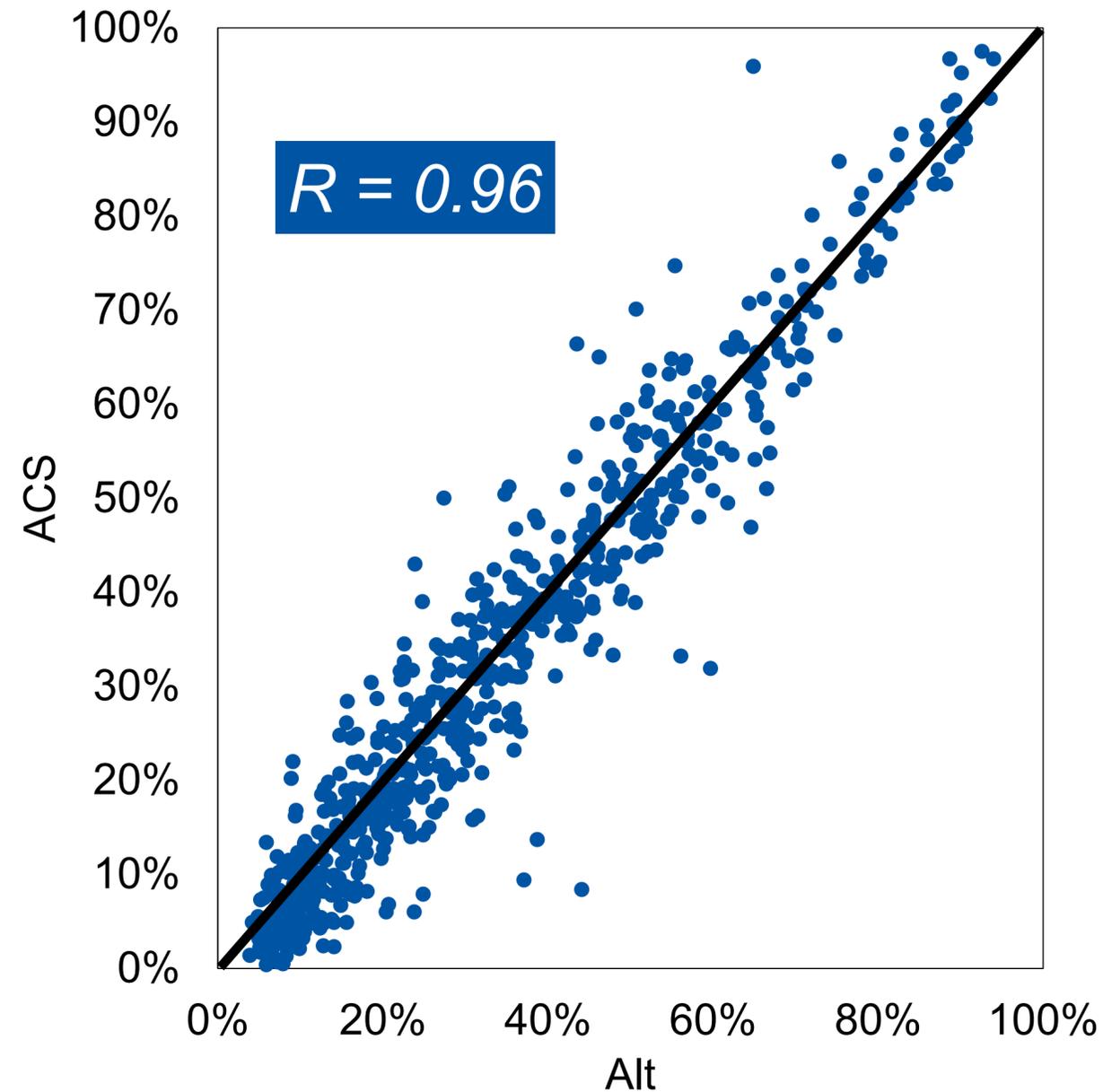
The (Pearson) correlations between the ALT and ACS estimates are pretty high.

Scope of this analysis

All housing units

— Ownership

— Rental ——————————————————— Year structure built (% before 1950)

      — Apartments   Units in structure (% single-family detached)

      — "Shadow market"   Number of bedrooms (% with 3+ BRs)
- Single-family
- Duplex/triplex/   Rent (Median contract rent)
  quadplex
- Condominiums
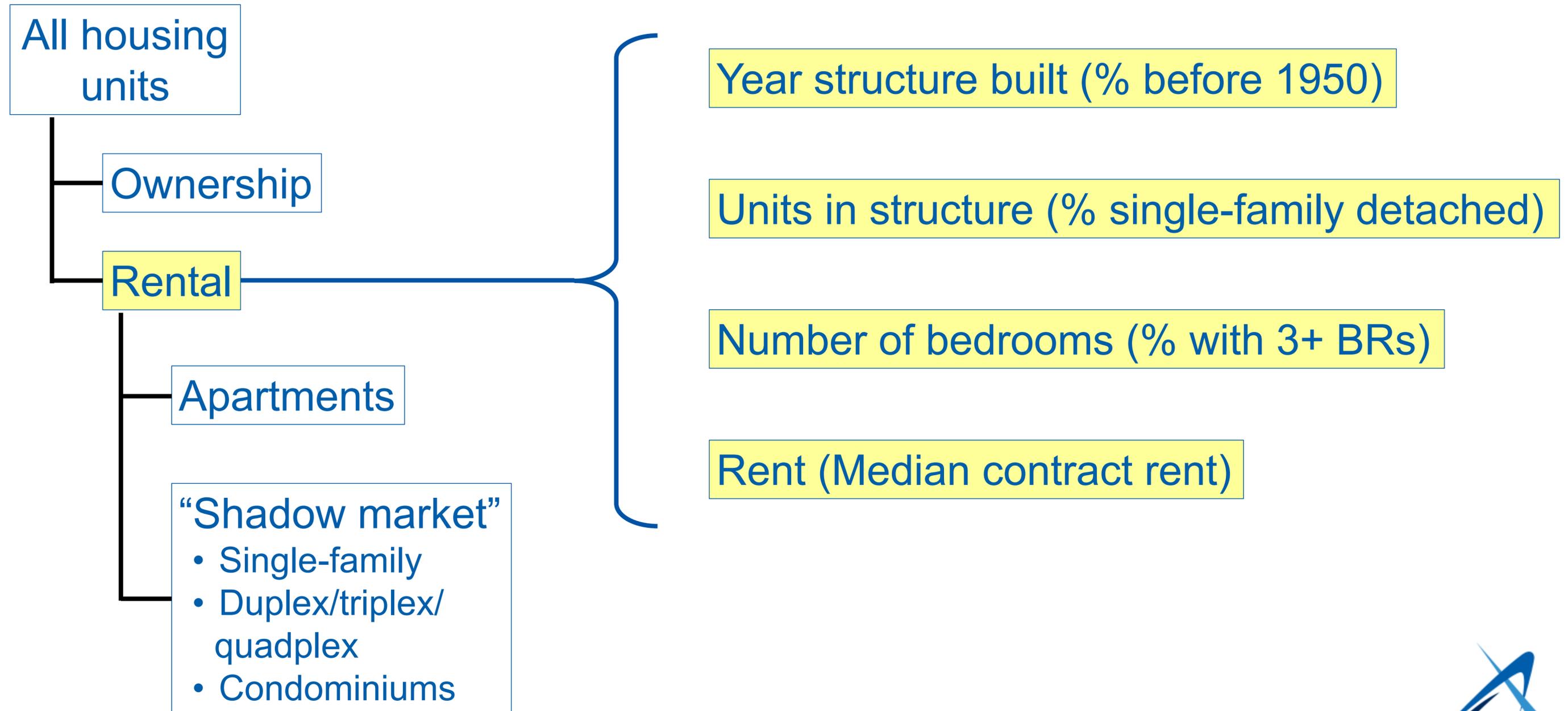
Cities and townships

	1. ALT estimates tend to be ____ than ACS estimates.	2. The two estimates are this far apart for a typical (median) city/township:	3. This share of ACS 90% confidence intervals contains the ALT estimates:	4. The Pearson correlation between the ALT and ACS estimates is:
% of all units that are rentals	Higher	3.2 percentage points	52%	0.89
% of rental units built before 1950	Lower	11.4 percentage points	56%	0.68
% of rental units that are single-family detached	Higher	7.7 percentage points	51%	0.85
% of rental units with 3+ bedrooms	Higher	9.2 percentage points	73%	0.75
Median contract rent*	Higher	$218	27%	0.56

* - excludes 20 cities/ townships for which median rent is suppressed

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Tracts

	1. ALT estimates tend to be ___ than ACS estimates.	2. The two estimates are this far apart for a typical (median) tract:	3. This share of ACS 90% confidence intervals contains the ALT estimates:	4. The Pearson correlation between the ALT and ACS estimates is:
% of all units that are rentals	Higher	3.6 percentage points	66%	0.96
% of rental units built before 1950	Lower	8.2 percentage points	62%	0.83
% of rental units that are single-family detached	Higher	7.1 percentage points	61%	0.81
% of rental units with 3+ bedrooms	Higher	7.4 percentage points	72%	0.76
Median contract rent	Higher	$150	42%	0.72

Summary

- It's possible to construct alternative estimates for rental units (but it's not quick or simple).

- Those alternative estimates largely agree with ACS estimates on the tenure mix. Those alternative estimates align less closely with ACS estimates on the *characteristics* of rental units (particularly age of buildings and contract rents).

- Next: examine potential correlates of ALT-ACS alignment (number of rental units, housing stock diversity largely unrelated)

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