THE UNIVERSITY OF CHICAGO
HARRIS SCHOOL
OF PUBLIC POLICY
CENTER FOR MUNICIPAL FINANCE

Mansueto Institute
for Urban Innovation

University
of Chicago

2024
An Analysis of Property Tax Assessments in Detroit

March 20, 2024 (expanded update to study released March 11, 2024)

This report provides an analysis of tentative 2024 property assessments in Detroit, Michigan. Because this analysis utilizes tentative data, please note that these findings are preliminary as final assessments are released in April.

The sample consists of 3,452 recent residential property sales in Detroit occurring between 2023-04-01 to 2024-03-14.[1] We restrict to transactions considered "arm's length" according to the assessor's definitions (refer to the Data and Code Availability for more detail). Because state law requires that assessments be no more than 50 percent of the property's market value, we adopt 50 percent as the threshold to indicate over (or under) assessment. In the Supplemental Analysis section we provide the same ratio study for sales occurring between 2021-04-01 to 2023-03-31 following recommendations from the State Tax Commission.

Our key findings are as follows:

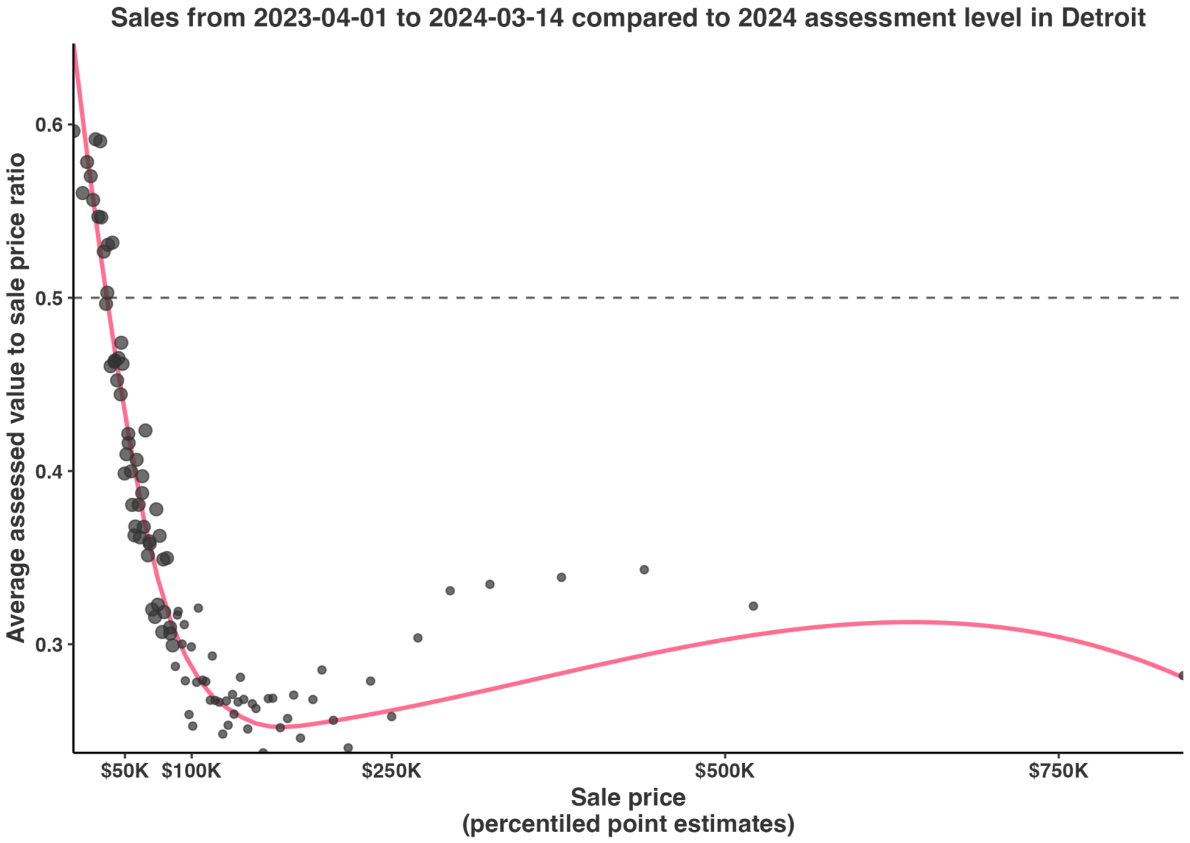
- **We found that 65 percent of the lowest value homes (residential properties sold between $3.4K to $34.7K are assessed over 50 percent of their market value.** However, it is important to note that the majority of residential properties sold for more than $35K were not over-assessed. This represents a notable improvement over prior years in which the rate of over assessment was substantially higher. We also find that the highest value homes sold in the $210K to $2.4M range were more likely to be over-assessed relative to moderately high value homes selling in the range of $84K to $210K.
- **We find evidence of systematic regressivity: high-priced homes are more likely to be underassessed and low-priced properties are more likely to be overassessed.** Assessments are said to be regressive when ratios of assessed values to sale prices are higher for low-priced properties than for high-priced ones. According to two standard measures of regressivity, the Price-Related Differential and coefficient of Price-Related Bias, Detroit's assessments did not meet the IAAO standards and demonstrate higher than acceptable levels of regressivity.
- **We find a high degree of variation in assessments for properties that were sold at a similar price.** Horizontal equity means properties with a similar fair market value should be similarly assessed. Detroit's assessments did not meet IAAO horizontal equity standards, demonstrating less than acceptable levels of uniformity according to the Coefficient of Dispersion measure.

For a more detailed discussion of the results and analysis of sales between 2023-04-01 to 2024-03-14, please review the attached Research Appendix.

[1] The specified time period follows guidance in Section 4.1 of the IAAO's Standard on Ratio Studies, which states that ratio studies should strive to use sales taking place after the assessment date to ensure the independence of assessments and sales prices. For a ratio analysis that utilizes the two year study interval of 2021-04-01 to 2023-03-31 outlined in the Bulletin 18 of 2023 see the Supplemental Analysis section at the end of the study.

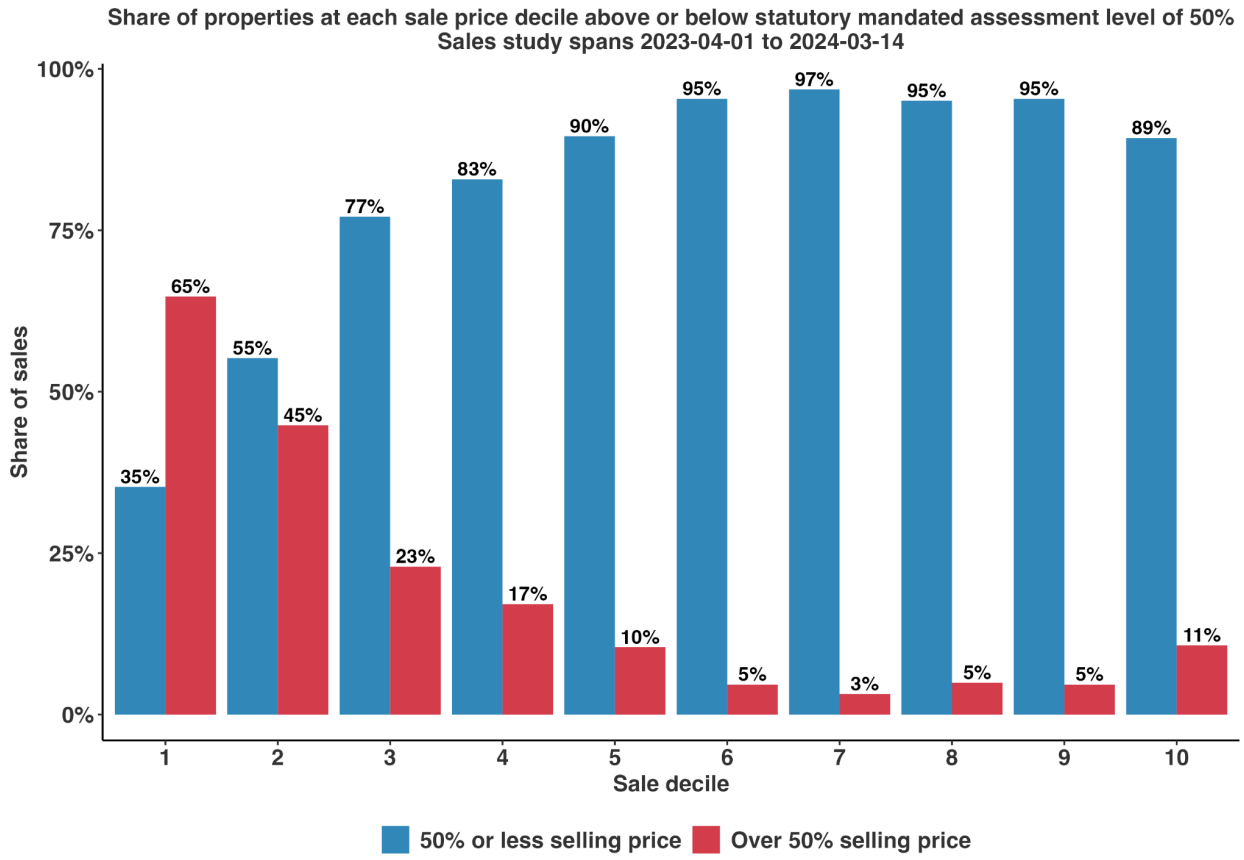
Research Appendix:

The relationship between assessments and sale prices is regressive if lower-priced homes are assessed at higher rates than higher-priced homes. **In the chart below we show a downward sloping line indicating that less expensive homes are more likely to be over-assessed compared to more expensive homes. This is evidence of regressivity**. Under a neutral scenario that is neither progressive or regressive, we would expect a flat line indicating that assessment to sales ratios do not vary systematically according to sale price. In the below chart each point represents 1 percent of all properties sold in the last year with the vertical axis showing the average assessment to sales ratio and the horizontal axis showing the sale price.



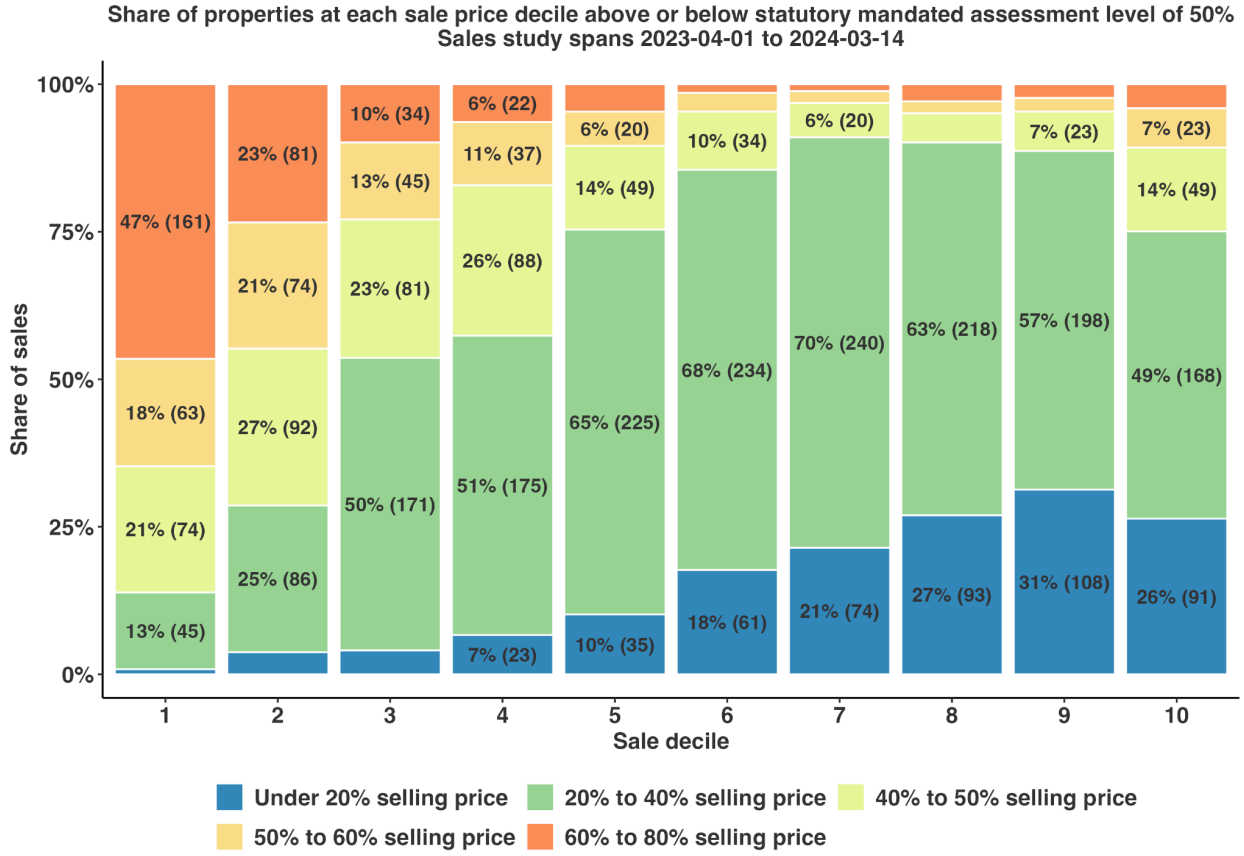
We show the proportion of homes that are over-assessed with the below figure, which shows the share of properties in each sale price decile that were assessed above 50 percent their selling price (red) or below 50 percent their selling price (blue).

In Detroit, 65 percent of the lowest value homes, those in the bottom sale price decile, are assessed above 50 percent their selling price, however the majority of homes in each of the other sale price deciles were not over-assessed.



In the next chart below, we have a more detailed version of the previous chart and it illustrates *the extent to which* properties were under (or over) assessed in each sale price decile. **We can see as the sale price increases the share of properties assessed under 40 percent of the selling price increases (blue and light green), thus indicating regressivity. For properties in the top five deciles in terms of selling price (those sold for over $84K), 24.7 percent were assessed under 20 percent of their fair market value and 61.3 percent were assessed between 20 and 40 percent of their fair market value.** For these high value homes in the top five deciles, only 11.5 percent were assessed between 40 and 60 percent of their selling price.

On the other hand, relatively fewer lower value homes are significantly under-assessed. This chart also demonstrates the high degree of assessment variability, or lack of horizontal equity, within each sale price decile. Note, the number in parentheses in each bar indicates the number of sales in the sample.



The table on the below shows the average value of homes in each sale price decile as well as the average assessment to sale price ratios.

Sale Quintile	Median Sale Price	Mean Sale Price	Median assessment to sale price ratio	Mean assessment to sale price ratio	Sample Size
1	$34,650	$33,211	52.6%	52.5%	691
2	$57,750	$57,882	37.9%	39.4%	691
3	$84,000	$83,321	30.1%	31.8%	690
4	$123,038	$122,988	24.8%	27.1%	690
5	$210,000	$274,812	24.8%	28.1%	690

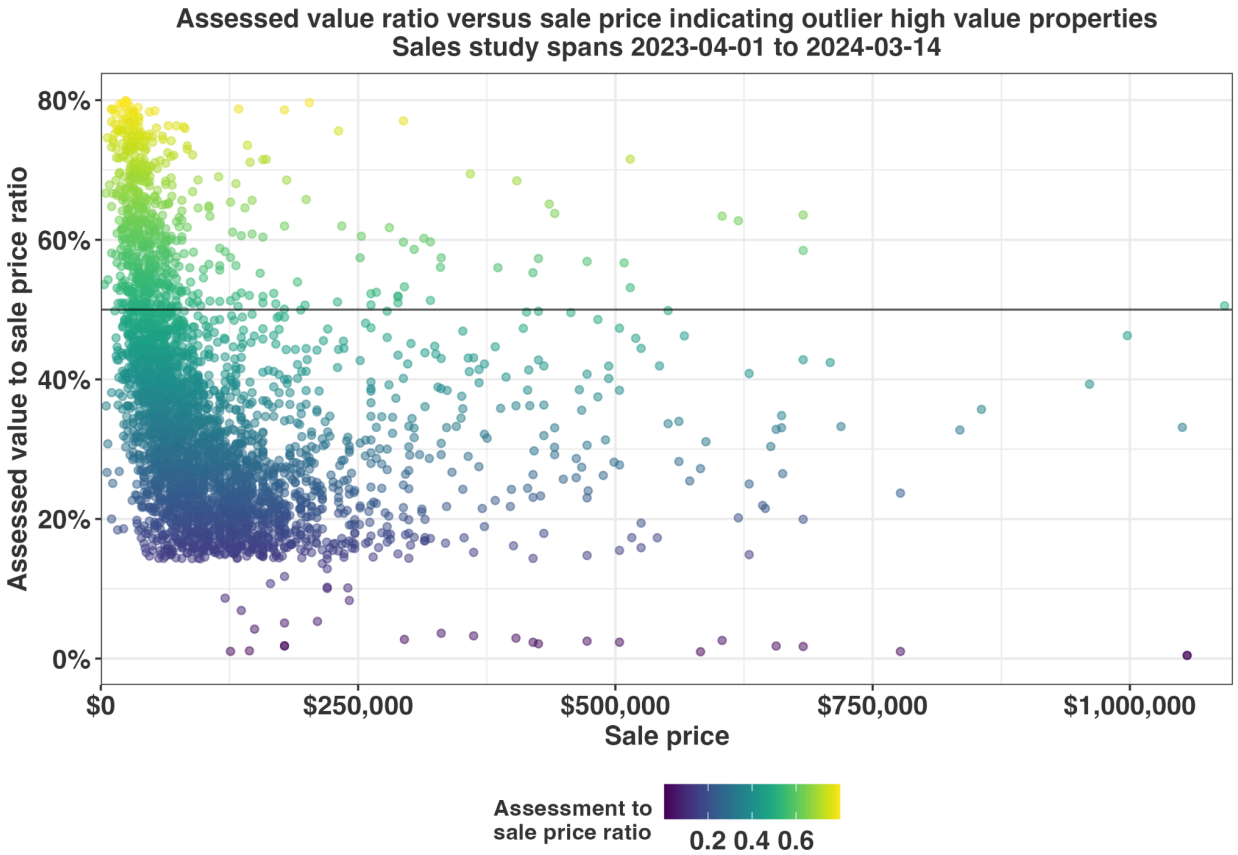
Sale Decile	Median Sale Price	Mean Sale Price	Median assessment to sale price ratio	Mean assessment to sale price ratio	Sample Size
1	$26,250	$25,661	57.9%	56.8%	346
2	$41,423	$40,801	47.6%	48.3%	346
3	$52,500	$52,318	38.8%	40.9%	345
4	$63,000	$63,476	37.1%	37.9%	345
5	$75,600	$75,951	31.8%	34.0%	345
6	$89,250	$90,692	27.8%	29.7%	345
7	$110,250	$110,674	26.8%	27.8%	345
8	$135,450	$135,301	23.4%	26.4%	345
9	$173,250	$175,078	22.7%	26.0%	345
10	$301,350	$374,547	28.4%	30.3%	345

Sales in Detroit occurring between 2023-04-01 to 2024-03-14 compared to tentative 2024 assessments.

Tests of vertical equity: The coefficient of price-related bias (PRB) is a quantitative measure of regressivity, or vertical equity. PRB is a measure of how assessed values change as a property's market value increases. The IAAO specifies that the acceptable range for PRB is between -0.05 and 0.05. The PRB is calculated by regressing the percentage difference from the median ratio on percentage differences in assessed value. **The PRB for Detroit is -0.1215, indicating regressivity and means that on average, assessment ratios decrease by 12.15 percent whenever values increase by 100 percent (e.g., double or double again).**

The price-related differential (PRD) is another measure of regressivity. PRD is calculated by dividing the mean sales ratio by the weighted mean sales ratio, where sale price is used as the weight. Price-related differentials above 1.03 tend to indicate assessment regressivity; price-related differentials below 0.98 tend to indicate assessment progressivity. **In the case of Detroit, the PRD is 1.1516, indicating regressivity.** It is worth noting that the PRD is highly sensitive to sale price outliers and should be interpreted with some caution.

The scatter chart below shows the sale price versus assessment to sale price ratio for all the data used in this study.



Measuring horizontal equity: The coefficient of dispersion (COD) measures assessment uniformity, or horizontal equity, which means taxpayers with equal property values pay equal property taxes. COD is calculated by taking the average absolute percentage difference from the median sales ratio. For instance, a COD of 10 means that properties have ratios that on average deviate by 10 percent from the median ratio. The IAAO specifies that the acceptable range for COD is below 15. **The COD in Detroit, Michigan was 39.58 and did not meet the IAAO standard for uniformity.**

Data and Code Availability

Data source: The following study uses 2023-04-01 to 2024-03-14 using current sales data and assessment data available on the City of Detroit Open Data Portal.

Code source: https://github.com/mansueto-institute/michigan-assessments/tree/main/detroit

Sales universe:

- Transactions considered arm's length based on the following classes "03-ARM'S LENGTH", "19-MULTI PARCEL ARM'S LENGTH", "03-ARMS LENGTH", "11-FROM LENDING INSTITUTION EXPOSED", "11-FROM LANDING INSTITUTION EXPOSED"
- For residential property classes where "RESIDENTIAL-IMPROVED" or "RESIDENTIAL CONDOMINIUMS" and tax status is 'TAXABLE'
- Sales happening between 2023-04-01 to 2024-03-14.
- For properties that sold for more than $1,000 and were assessed over $1,000
- Excludes properties with an assessment value to sales ratio more than 1.5 times the interquartile range following IAAO outlier removal guidelines.
- Applied inflation multipliers outlined in Bulletin 16 of 2023**.**

Supplemental Analysis

Bulletin 18 of 2023 from the State Tax Commission recommends that ratio studies use sales occurring between 2021-04-01 to 2023-03-31 and must use Detroit sale data available in the "2024 valuation sales used" file which limits to arm's length transactions. As noted above, we believe out-of-sample testing is more appropriate. However, because this time frame may be of interest, we include the below analysis as a companion to the main findings. There are 11,914 total sales in this sales time frame. The results in this supplement are consistent with the findings in the main section.

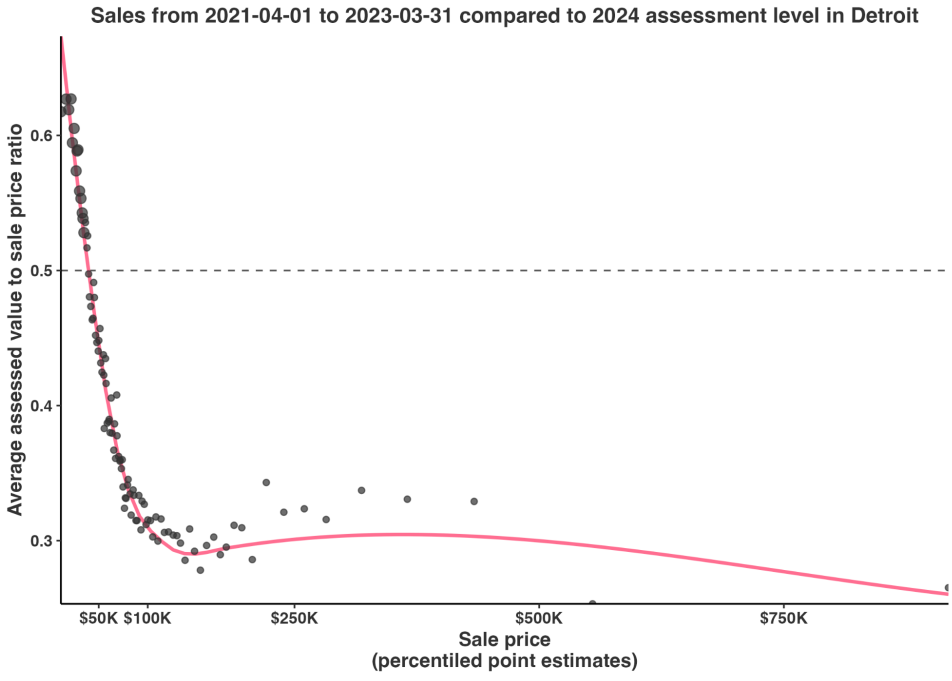
A few notes on adjustments to prepare the data for analysis:

- We limit to residential property classes where "RESIDENTIAL-IMPROVED" or "RESIDENTIAL CONDOMINIUMS" and tax status is 'TAXABLE'
- Only consider properties that sold for more than $1,000 and were assessed over $1,000
- Excludes properties with an assessment value to sales ratio more than 1.5 times the interquartile range following IAAO outlier removal guidelines.
- Applied inflation multipliers outlined in [Bulletin 16 of 2023](#).

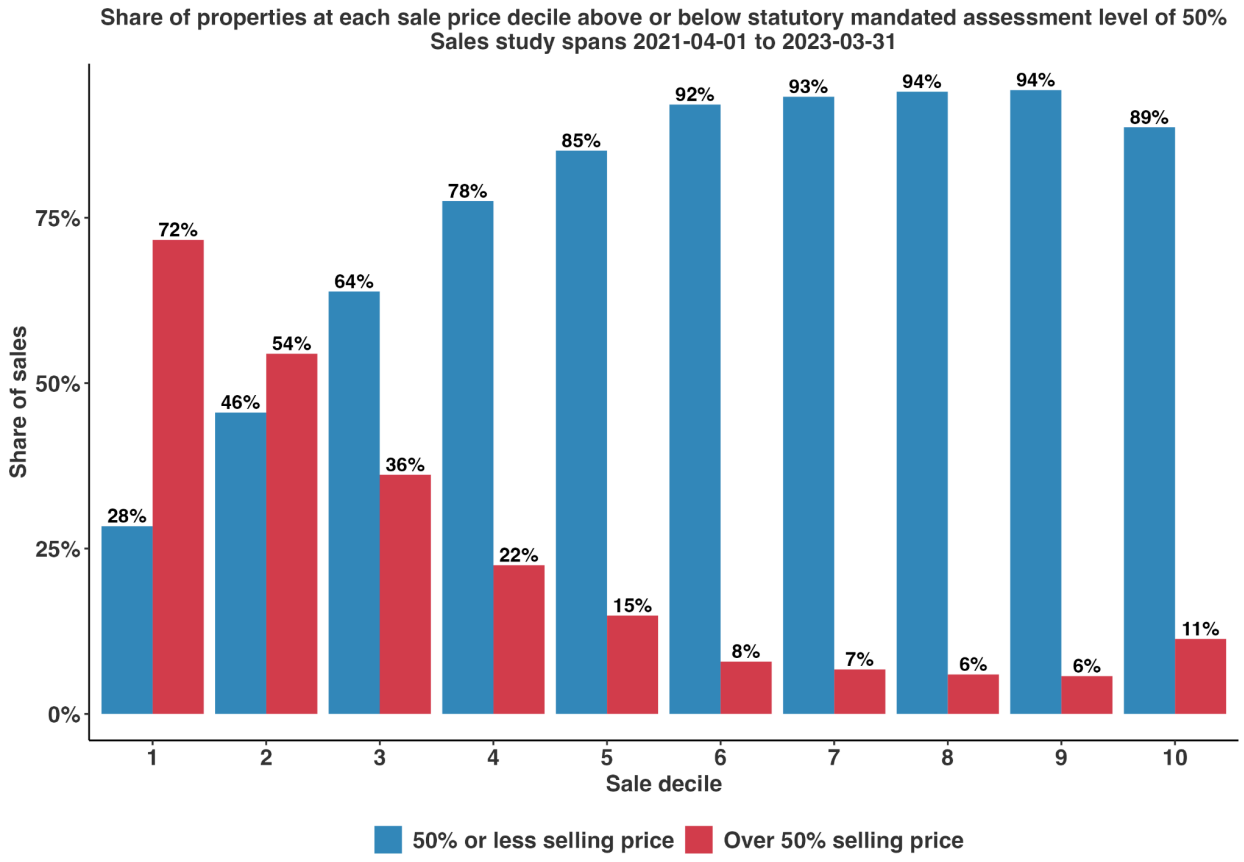
To quickly review the results:

Detroit fails three IAAO tests on regressivity and uniformity: The price-related bias (PRB) for Detroit is -0.1161, indicating regressivity (the IAAO specifies that the acceptable range for PRB is between -0.05 and 0.05). This means that on average assessment ratios decrease by 11.61 percent whenever values increase by 100 percent (e.g., double or double again). The price-related differential (PRD) for Detroit is 1.1736, indicating regressivity (PRD above 1.03 tends to indicate assessment regressivity and below 0.98 tends to indicate assessment progressivity). The coefficient of dispersion (COD) in Detroit was 37.05 and did not meet the IAAO standard for uniformity (the IAAO specifies that the acceptable range for COD is below 15).

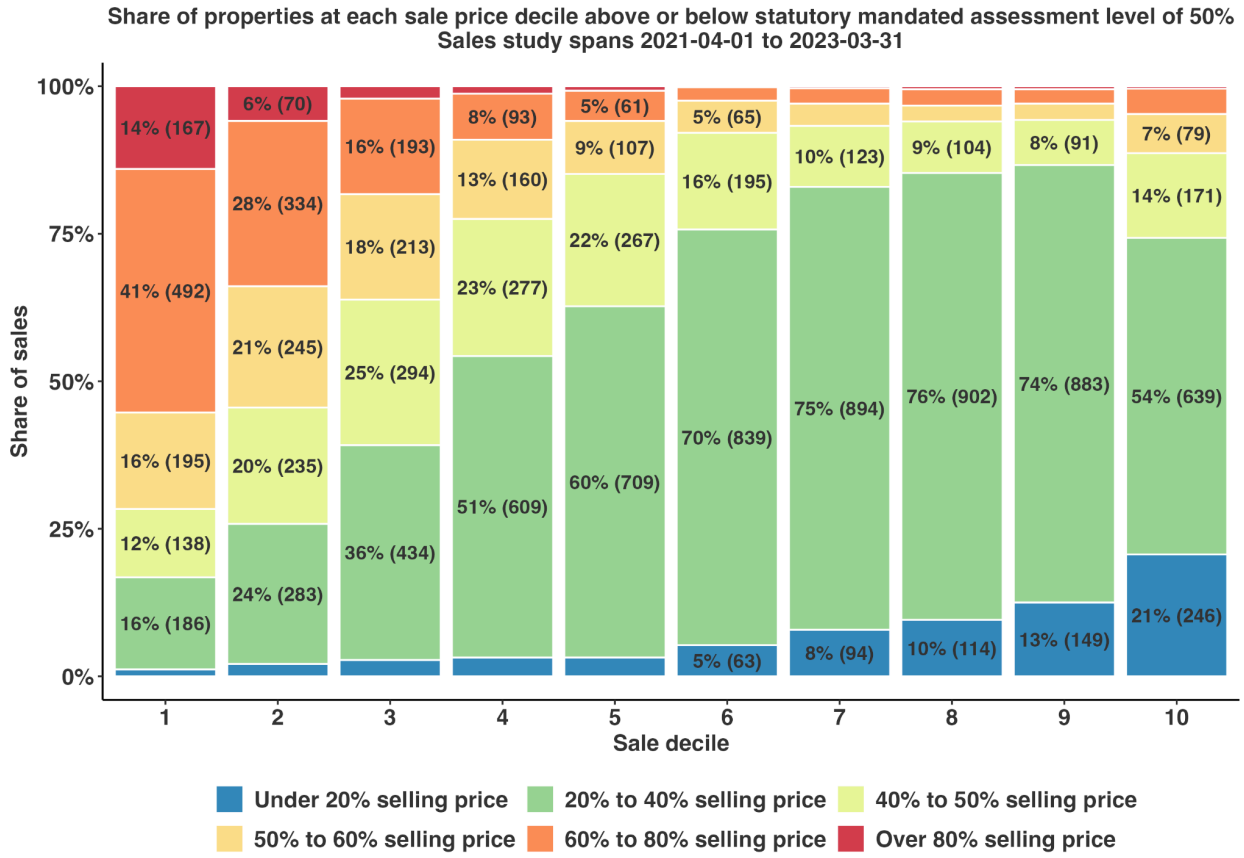
Ratios are negatively correlated with home value: the relationship between assessments and sale prices is regressive if lower-priced homes are assessed at higher rates than higher-priced homes. In the chart below we show a downward sloping line indicating that less expensive homes are more likely to be over-assessed compared to more expensive homes.



The majority of homes in the bottom two deciles of selling price are over-assessed: 72 percent of the lowest value homes, those in the bottom sale price decile, are assessed above 50 percent their selling price, and 55 percent of homes in the second lowest decile are assessed above 50 percent their selling price. The bottom two deciles cover homes that sold for $4.4K to $42.14K in 2024 dollars.



As sale price increases the share of properties assessed under 40 percent of the selling price increases, which indicates regressivity. For properties in the top five deciles in terms of selling price (those sold for over $72.5K), 11.18 percent were assessed under 20 percent of their fair market value and 69.81 percent were assessed between 20 and 40 percent of their fair market value.



The table on the below shows the average value of homes in each sale price decile as well as the average assessment to sale price ratios.

Sale Quintile	Median Sale Price	Mean Sale Price	Median assessment to sale price ratio	Mean assessment to sale price ratio	Sample Size
1	$31,237	$29,999	56.70%	55.70%	2301
2	$52,920	$52,510	40.90%	42.90%	2301
3	$72,765	$72,726	33.90%	35.70%	2301
4	$102,387	$104,700	29.30%	31.50%	2301
5	$201,758	$272,911	29.20%	30.40%	2301

Sale Decile	Median Sale Price	Mean Sale Price	Median assessment to sale price ratio	Mean assessment to sale price ratio	Sample Size
1	$24,202	$23,116	62.10%	59.70%	1151
2	$37,014	$36,892	51.70%	51.60%	1151
3	$47,408	$47,584	43.90%	45.30%	1151
4	$56,945	$57,463	38.50%	40.50%	1151
5	$68,250	$67,644	35.60%	37.60%	1151
6	$77,175	$77,849	32.00%	33.80%	1150
7	$92,251	$92,382	30.40%	32.30%	1150
8	$115,762	$117,080	28.20%	30.70%	1150
9	$165,140	$165,250	27.30%	29.60%	1150
10	$300,323	$380,689	32.00%	31.20%	1150

Sales in Detroit occurring between 2021-04-01 to 2023-03-31 compared to tentative 2024 assessments.

References

International Association of Assessing Officers. 2013. Standard on Ratio Studies. https://www.iaao.org/media/standards/Standard_on_Ratio_Studies.pdf.