Durham's High-end Commercial Properties are Undervalued & Undertaxed:
Why this matters for all of Durham

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Introduction

For six months last year, I mined Durham County's property tax data (and a few other NC counties) as part of broader research into the vertical and racial equity of property valuations (the equity of county assessments from low to high value properties and by racial demographics). I started focused on residential properties, where I imagined Durham's assessment would serve as one of the less regressive counties given recent national data[1] and could help me parse out key differences with more inequitable counties. In this process, I stumbled upon a set of large commercial sales in the combined residential/commercial qualified sales lists, in the $50-$100 million sale price range, that had an assessed value of roughly half of what they sold for. These seemed vastly undervalued compared to the properties I had been focused on. I knew there were differences in how commercial and residential properties are assessed and that outliers were always possible, but it struck me that if there were patterns of undervaluation at this high value of properties, these differences could have major property tax implications, especially if these patterns were not simply in comparison to residential properties.

Were these a few outlier sales or were these signs of broader patterns of inequity? Are owners of higher value commercial properties and luxury apartment buildings paying their fair share of property taxes? If not, are the differences significant enough that the assessors and County Commissioners should care? Even if so, could they even do anything about it? What about the average homeowners in Durham: is there any potential impact that undervaluation of these high-end properties would have on their tax burden and/or benefit? Can this be estimated both individually and collectively?

This report looks at vertical equity within the commercial and apartment property sales and valuations.
My research finds that Durham's multi-million-dollar commercial properties and apartment complexes appear to be underassessed by ~$3 billion. $3 billion of assessed value in Durham generated ~$35 million in property taxes in 2022-2023. In other words, high-end commercial properties are functionally receiving a $30+ million discount in property taxes annually.

Acknowledgements:

[1]An Evaluation of Property Tax Regressivity in Durham County, North Carolina, Center for Municipal Finance, Harris Center for Public Policy, University of Chicago, accessed online.

Executive Summary

Durham County's residential valuations have not shown marked patterns of regressivity in recent years. But does this hold true for its commercial property valuations? In an analysis of the qualified commercial sales for the three years since the previous revaluation, there seems to be a discernible pattern of vertical inequity within the commercial properties (including apartment complexes) -- meaning that highest sale price commercial properties are consistently under-valued and under-assessed compared to lower-sale price commercial properties. These high-end properties are also substantially undervalued compared to the overall commercial sales each year. This disparity appears to be both significant enough and consistent enough to have implications for the entire county property valuation, and, in effect, the distribution of property tax burden for the whole county of Durham.

The undervaluation of high-end commercial properties appears to be both significant enough and consistent enough to have implications on Durham's entire property tax distribution.

Key Findings:

- **High Levels of Vertical Inequity/ Regressivity in Commercial Sales**
  Durham's commercial properties show extremely high levels of statistical regressivity each year, far outside of the International Association of Assessing Officers' (IAAO) acceptable range (p. 5)

- **Significant gap between sales ratios at high-median-low sale values**
  High value commercial properties (top 25% of sale price) have average sales ratios* that are 16% below the average sales ratios for all commercial properties and 32% below the low price sales (p. 7). Disparities increase at the extremes (p. 9)

- **Not skewed by a few extreme values**
  Nearly three times as many individual properties in the highest quartile of sales are underassessed compared to lowest quartile of sale properties across the years (p. 8)

- **Consistent disparities across years**
  The disparities are consistent starting in the year of the last revaluation, showing that unequal sales price growth has not been the primary cause (p. 6)

- **Large enough undervaluation to impact Durham's property tax distribution and tax rate**
  Systemic undervaluation of high-value commercial properties appears to have significant implications on entire tax base. The undervaluation of high end properties is estimated to be ~$3 Billion, or $35 million per year in property taxes at Durham's current rate. The undervaluation amount is large enough to effectively shift the overall tax distribution, lowering the tax burden on other Durham City taxpayers with a revenue neutral tax rate by 9% (p. 10-11)

Median differences are nearly as large as average/mean differences and are shown in some graphs below.

Methodology

For this research, I relied on qualified sales data from 2019-2021 provided directly by Durham County's Tax Office [1]. 2019 was the year of the last revaluation, meaning sales in this year happened soon after the new assessed values were released. Durham's assessors had not yet finalized the list of 2022 qualified sales when I began my research, so these three years are the most complete lists available of **qualified** sales data, meaning sales deemed to be arms-length transactions.

What are Sales Ratios?

Sales ratios compare the assessed values of properties to their actual sale price (assessed value/sale price= sales ratio). In North Carolina, all properties are supposed to be valued at 100% of their market value. Analyzing sales ratios is one of the primary methods used to explore the relationship between the assessment value and market rate value, as arms-length sales are one of the best indicators of actual market value. Higher sales ratios (over 1.10) point to potential overvaluation while lower sales ratios (below .90) point to potential undervaluation.

For example, if a property has an assessed value at $100,000 but sells for $200,000, it's sales ratio would be 0.50, signaling potential undervaluation, while a property that is assessed for $100,000 but sells for $50,000 would have a sales ratio of 2.00, pointing to potential overvaluation of this property. One property's sales ratio doesn't say much, as no macro estimate of value is going to be totally correct, and there are many complex factors influencing sale price. But if large segments of properties in a county (a neighborhood or all low price sales, for instance) have persistently higher or lower sales ratios, this could point to inequities in assessment and, as a result, inequitable property tax burden.

How can sales ratios be used to highlight potential inequity?

Sales ratio studies can explore patterns in the data: differences across whole counties and between segments of properties. In this current real estate market, NC counties' median sales ratios are nearly all low, especially in hot markets like Durham where the median sales ratio in 2021 for over 7,500 sales was just 0.72. But patterned differences between segments of the market may still point to issues in the valuation process or inequities that could be addressed in the next revaluation. Moreover, patterned differences matter: higher sales ratios generally mean higher property tax burden while a lower sales ratio would generally mean a higher tax benefit with a lower burden, especially if these ratios were consistently higher or lower across a segment of the real estate data, like in a neighborhood, a census tract, a property type, or all the lowest or highest value properties.

[1] The sales samples from Durham included vacant commercial properties. Additional analysis confirmed that removal of vacant properties would have slightly altered each year's findings, but in ways that off-set each other.

Methodology Continued

For this report, I utilized both median and mean/average sales ratios by quartile (25% segments), quintile (20% segments), and decile (10% segments) based on sales price with each year's qualified commercial (including apartment) sales. I used these different segments to ensure that the patterns were consistent, that I had adequate samples for the different analysis, and to see how disparities changed towards greater degrees of the extremes. I used ArcGIS Insights to explore geographic and statistical patterns. I utilized some of the simpler vertical equity assessment tools, primarily the price related differential (explained on page 4) and scatterplot regression charts, to identify statistical trends in relationship to IAAO standards. I also identified individual sales as over/under valued in relationship to the median commercial sales ratio of that sale year, to give a sense of the quantity of properties in each segment impacting the averages. I looked at the consistency of the patterns between the three years and, when those patterns were consistent, combined the statistics in some graphs to show the combined impact across all commercial sales.

For the last section on the impact for the whole county valuation, I quantified the extent of undervaluation for each year's highest quartile of sales in relationship to each year's average sales ratio for all commercial properties and then to the average sales ratio for the commercial properties without the highest quartile, which gave me two viable estimates of undervaluation for each year.
I then combined the total undervaluation estimates across the years for each approach and compared them to the total assessed value of the quartile to provide a percent of undervaluation for each approach. I then used several methods to estimate the implications on the overall valuation, primarily relying on a conservatively smaller number of taxable high-end commercial properties (with an assessed value equal to the 75% sale value instead of the much lower average assessed value of the quartile). I also used one approach that looked at a larger number of implicated properties using nearly the high quartile of all taxable commercial properties with value proportions to the whole sample that matched the sales sample. I applied the estimated amounts of overall undervaluation to the current Durham city/county tax rate at the proportions for overall real property revenue (and commercial location) to get an estimate of the tax implications, as well as added the undervaluation amount to the total property valuation amount to see what, if any, shifts in the effective tax rates would occur were these properties to be valued at the commercial averages.

A note about commercial valuations:

While commercial properties are assessed differently than residential properties (using primarily income-based rather than sales comparison approach), sales ratios are still one of the most commonly used methods for analyzing and comparing mass commercial appraisals [1]. This study focuses solely on comparing segments of commercial properties, so the differences between commercial and residential valuations do not apply. Sales ratios across segments of commercial properties should theoretically be relatively equal, or at least not have significant patterned differences.

Additionally, the analyzed data does not include business personal property taxes. While these can be a significant contributor to the economic benefit of a commercial project, these taxes should not impact the sales ratio analysis of the underlying commercial real estate assessments, especially given the high quantity of apartment complexes in the highest quartile. Just to be sure, I conducted analysis which showed that inclusion of these would not have impacted the findings.

[1] See Propublica's commercial valuation report: https://projects.propublica.org/graphics/the-tax-divide-analysis. Or the IAAO commercial sales ratio analysis here: https://prodassets.cookcountyassessor.com/s3fs-public/reports/CookCounty_CSRS.pdf

Regressivity of Commercial Properties

There seems to be a consistent pattern of vertical inequity within Durham County's commercial properties (including apartments) that has significant implications for the overall sales valuation, and, in effect, the distribution of property tax burden for the whole county. This regressivity is first highlighted on a macro-scale by looking at the price related differentials (PRD's) of each year's ~200 qualified commercial sales, which are 1.18 (2019), 1.15 (2020), and 1.19 (2021).

What is the Price Related Differential (PRD)?

PRD's are widely used in mass assessment as a measure of vertical equity, or the equity of valuation at different price levels. To find the PRD, one takes the mean sales ratio of a sample and divides it by the weighted mean sales ratio (total assessed value over total sale value) of the same sample. PRD's above 1.00 point to some measure of vertical regressivity, meaning lower valued properties are overvalued in the assessment sample compared to higher value properties. Values below 1.00 point to some measure of progressivity, meaning higher value properties are overvalued compared to lower valued ones. According to the IAAO, a PRD of 0.98-1.03 is acceptable.

0.92	0.94	0.96	0.98	1.00	1.03	1.05	1.07	1.09
← Progressive: Higher Sale Price Properties **Over** Valued Compared to Lower Sale Price			IAAO Acceptable Range			Regressive → Higher Sale Price Properties **Under** Valued Compared to Lower Sale Price		

Is there vertical inequity?

Yes. Durham's commercial PRD of 1.15-1.19 shows significant regressivity, meaning that higher price properties appear to be significantly undervalued compared to lower price properties. That said, in a sample that has a large range of values, like commercial sales in Durham ranging from less than $50,000 to more than $50 million, the prd can be skewed by a few extreme sales/sales ratios on either end. Is this what is happening? Or is there an actual pattern of vertical inequity within the commercial sales? Next, I look at the sales ratios by sales price across segments to see if there are consistent patterns.

Commercial Sales Year	IAAO "Acceptable" Range	Price Related Differential
2019	.98-1.03	1.18
2020	.98-1.03	1.15
2021	.98-1.03	1.19

Consistency of High-end Property Undervaluation

Durham Commercial Properties
Sales Ratio to Sales Price
Averages from 2019-2021

What does this mean?
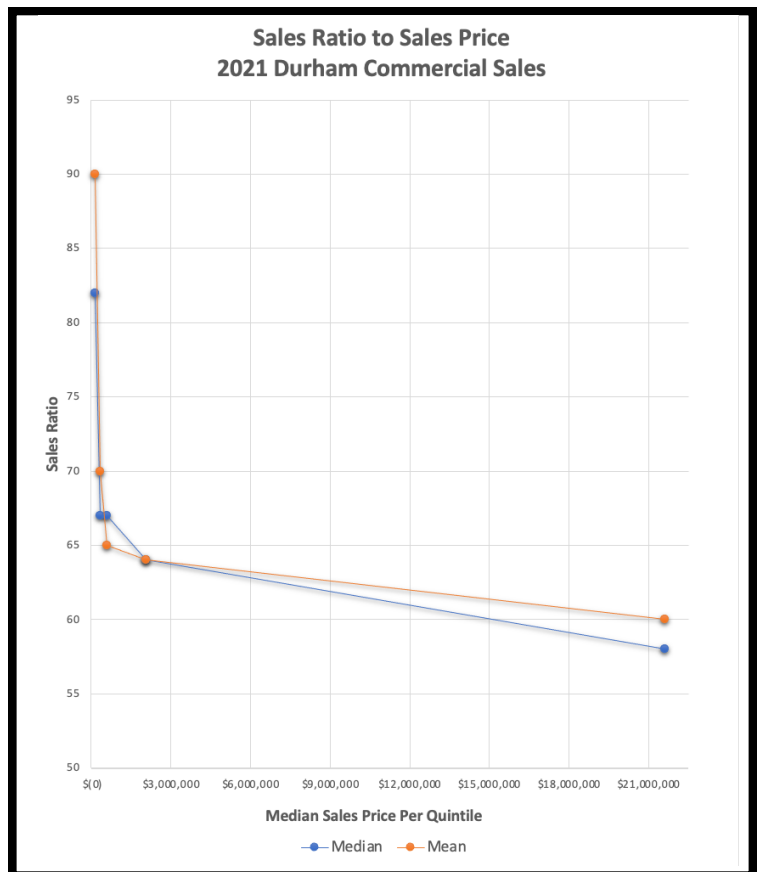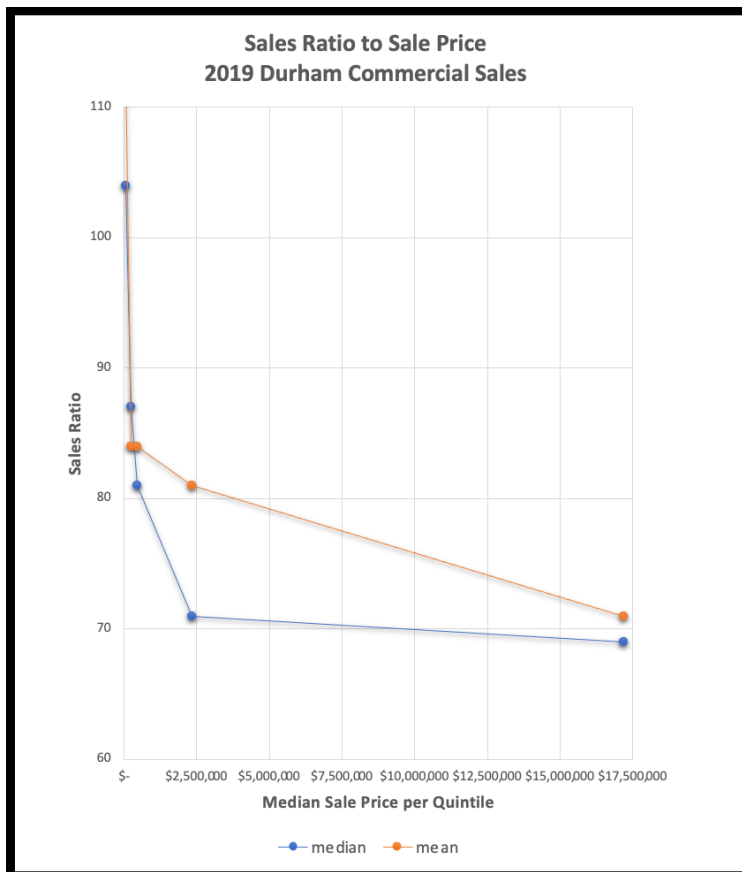The statistical pattern of regressivity is not simply caused by a few extremes: it appears systemic.
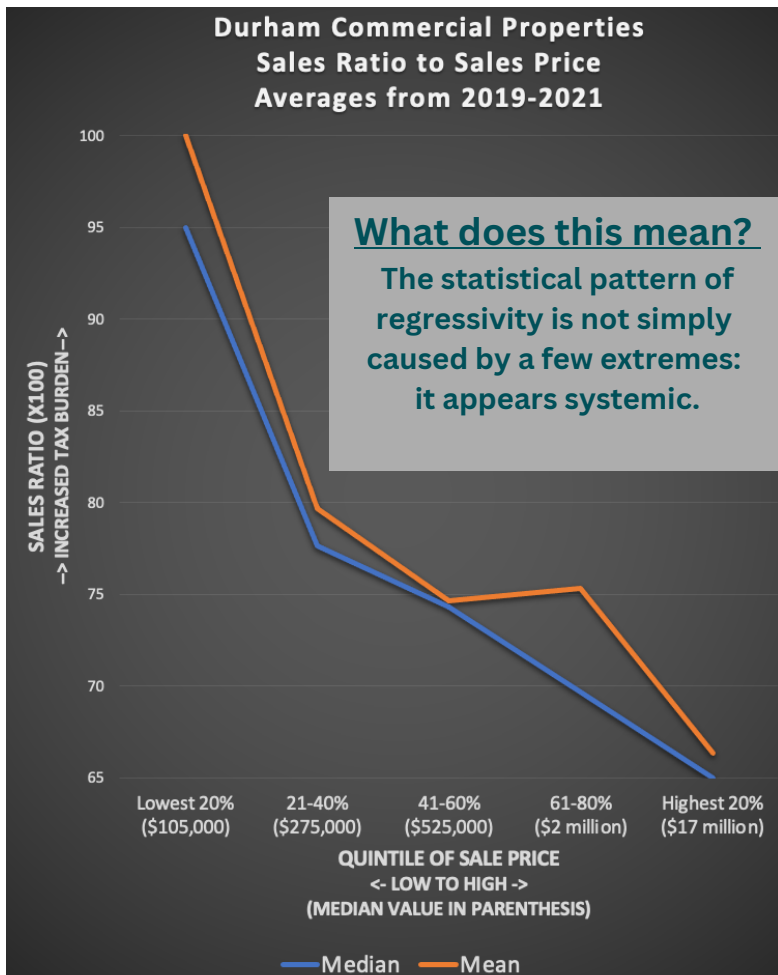
These charts look at what happens to sales ratios as sales prices rise. In a perfectly equitable system (impossible), both the red and blue lines on the graphs would be horizontal. If there were no discernible patterns, these lines would look more like a heart monitor, with little rises and dips. Instead, there's a clear regressive pattern (a downward slope in the black graph and a reverse-J in the annual graphs below), most noticeable at the high and low quintiles. The higher price sales have a much lower sales ratio, and in effect, a much lower tax burden by value.

**These charts use sale quintiles (20% segments) each year to provide a consistent distribution and number of sales. Each dot on the white graph represents ~40 sales. The black chart averages the quintile statistics from the three years, meaning each represents ~120 sales. Both median and mean values are represented to show that the patterns are reflected in both. Sales ratios are multiplied by 100 for legibility.

Sales Ratio to Sale Price
2019 Durham Commercial Sales

Sales Ratio to Sales Price
2021 Durham Commercial Sales

Extent of high-end undervaluation

Average Sales Ratio by Sale Price

Sales Ratio ---> Increased Tax Burden

	2019 COMMERCIAL SALES	2020 COMMERCIAL SALES	2021 COMMERCIAL SALES
Sale Price Lowest 25%	1.09	0.93	0.89
Sale Price Middle 50%	0.83	0.82	0.65
Sale Price Highest 25%	0.7	0.68	0.6

■ Sale Price Lowest 25%   ■ Sale Price Middle 50%   ■ Sale Price Highest 25%

32%
lower sales ratio for high value over low value properties

16%
lower average sales ratios for high value commercial properties than the commercial average

The graph above shows the average sales ratios for the 25% lowest sale price properties (blue), the middle 50% of sale price properties (orange), and the highest 25% sale price properties (gray). The table below compares these to the overall average of the commercial properties each year. The highest sale price properties are substantially undervalued (14-19%) every year compared to the overall average of those years. Given the sale price of these highest value properties ($100 million for some), a difference of this scale would seem to have serious implications.

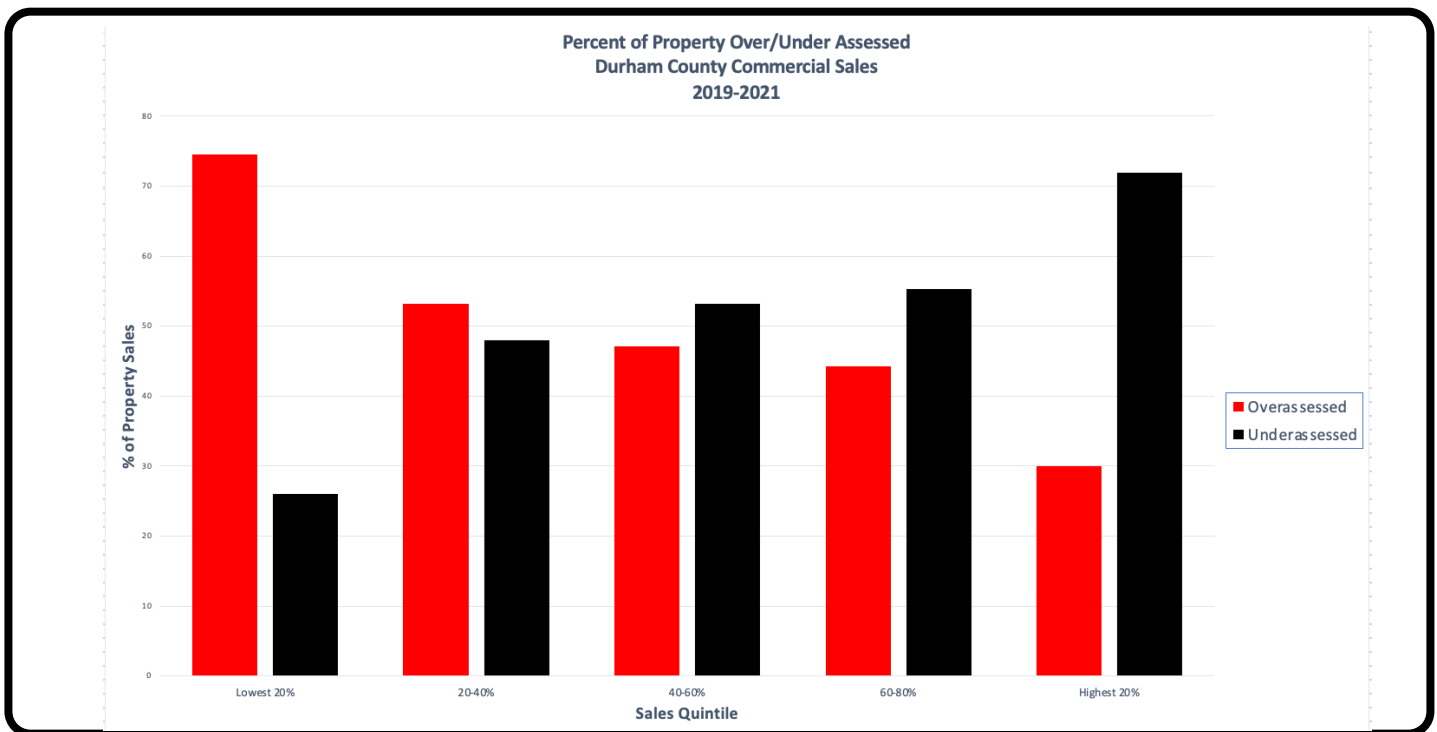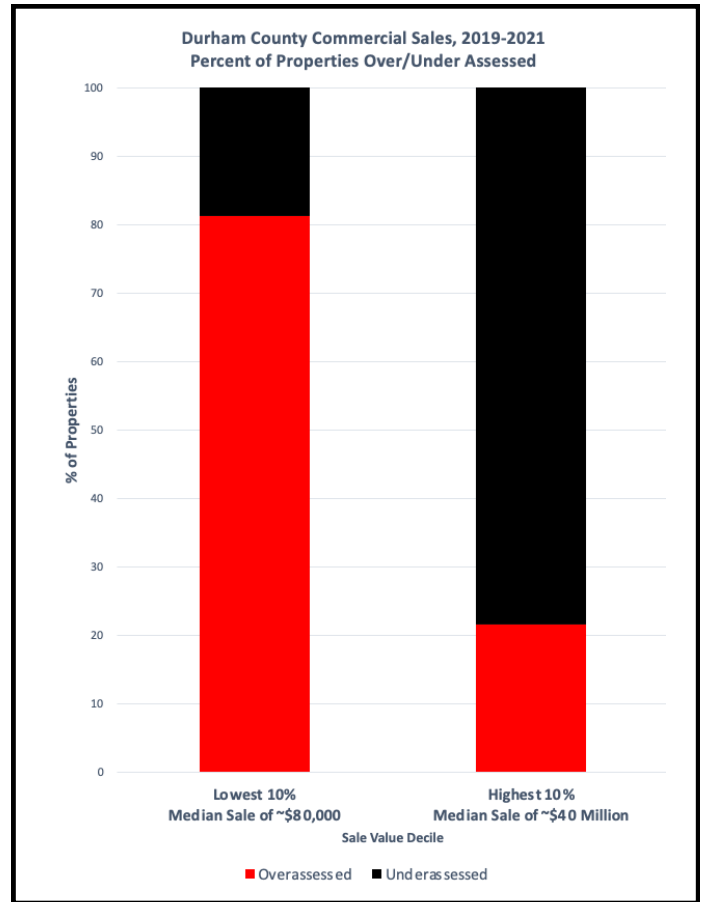| Sale Price	2019 Avg Sales Ratio	2020 Avg Sales Ratio	2021 Avg Sales Ratio
All Commercial	.87	.81	.70
Lowest 25%	1.09	.93	.89
Middle 50%	.83	.82	.65
Highest 25%	.70	.68	.60

~$500,000,000
Estimated Undervaluation of Highest Quartile Sales

*Median differences average 12% less for the highest quartile, a similar difference. Averages are used here both for ease of understanding and for implications on property tax revenue

Persistence of Vertical Inequity

Another way to analyze the extent of vertical inequity is to quantify the percent of individual properties in a given sales price range that are over or under assessed as compared to the median sales ratio of that year. In other words, is the actual number of individual high-end commercial properties that are undervalued significantly greater from the other commercial properties as these other metrics seem to show? This helps ensure that there are not extreme sales ratios skewing the numbers and further the argument that identified sales trends have broader implications for the overall tax valuation. The graph below shows the trends by quintile, with the percent of overvalued properties falling as sale price rises -- and nearly **three times as many undervalued sales at the high end as the low end.** The graph to the right shows that these differences are even more dramatic at the extremes (deciles), where commercial sales undervaluations will have the most significant tax implications.

Durham County Commercial Sales, 2019-2021
Percent of Properties Over/Under Assessed

Percent of Property Over/Under Assessed
Durham County Commercial Sales
2019-2021

$40 million properties are nearly 4 times as likely as $80,000 properties to be undervalued

What do the very highest dollar properties pay compared to the lowest?

Another test I performed was the 95/5, a simple analysis meant to show what, on average, the owner of a property in the highest decile of sale values pays compared to the average property owner in the lowest decile of sale values. Just for orientation purposes, the average sale price in the highest decile of 2021 commercial sales was just over $50 million while the average sale price in the lowest decile of 2021 commercial sales was just under $100,000.

95/5	2019	2020	2021
% highest decile pay compared to lowest	54%	63%	62%

From 2019-2021, the highest decile commercial property owners on average are only paying 54-63%, or just 60% combined, of the lowest value commercial properties per $1 of value, just more than half the tax burden. To translate that, an owner of a tiny store valued at $100,000 is paying, on average ~$1,375 in property taxes today, while the owner of the luxury apartment building or hotel that sells for $50,000,000 is paying, on average, just ~$825 per $100,000 of sale value. **For that $50 million value apartment or hotel owner, that comparative difference amounts to savings of $275,000 a year at the current combined Durham tax rate [1].**

*Example of Durham apartment complex that sold for over $100 million in 2021 and has an assessed value of ~$60 million

60%

The owner of a $50 million property in Durham has had less than 60% of the tax burden compared to the owner of a $100,000 shop by value these last three years.

What are the implications?

All signs point to a systemic undervaluation of high-end commercial properties with significant implications on the distribution of Durham's property tax burden. The undervaluation of high-end property sales across each of the three years has been shown in terms of: 1) statistical regressivity, 2) disparity of mean/median sales ratio values from the overall commercial properties, 3) persistence of the patterns of undervaluation within individual properties, and 4) rising gaps toward the highest extremes (where the difference matters most for tax purposes). This consistency of undervaluation provides justification to estimate the impact of these patterned differences on similarly high-end commercial properties that have not sold and what this would mean for the overall property tax distribution. Taking three different approaches to this estimate [1], it appears that high-end taxable commercial properties are underassessed by a collective $3 billion. This amount of untaxed value has serious implications. This is functionally a discount of $35 million of property taxes per year [2].

> **High-end commercial properties and apartment complexes are underassessed by an estimated $3 Billion.**
> **This is equivalent to ~$35 million of property taxes per year at the current tax rate, or enough to reduce the combined effective property tax rate in Durham by 9%.**

Assessors will quickly remind me that the property tax rate is revenue neutral, so this would not be additional tax revenue. **But what would have precluded Durham from adding $35 million for affordable housing each year into the budget covered by a correction to this undervaluation? Durham would have the same tax rate.** Or, to think about it a different way, the extra $3 billion of additional assessed value could make up a significant enough portion of the overall property tax value to shift the property tax burden for all. This undervaluation amount is significant enough to functionally lower Durham's combined tax rate by 9%.

For an owner of a $295,000 home, this would mean ~$335 less per year in property taxes. That may not sound like much, but consider that in the six years between revaluations, this is over $2,000. Or for a low-moderate income neighborhood of $150,000 homes, that's over $1,000,000 in essential community dollars overpaid while providing effective tax breaks for the investors of $50,000,000 luxury apartment buildings. Equitable valuation could correct this.

Over $1 Million

The amount saved by owners in a low-moderate income neighborhood in Durham between valuations if high-end properties were valued more equitably

[1] See appendix for details on methodology for these approaches. Estimates of undervaluation range from $2.6-$3.5 Billion, with property tax implications of ~$31-$41 million depending on method, all of which take a relatively conservative approach to implicated high-end properties.
[2] Using the 2022-2023 tax rate. Given we are in the middle of the two valuations, this should be a relatively accurate estimate of the annual impact over the 6 years. I applied Durham County's tax rate to 100% of the estimated undervaluation and the city's additional tax rate to 88% of this value. In 2022, Durham County revenue estimates compared to tax rates show ~88% of assessed taxable property value of the county has the city's added tax rate. Additionally, a similar proportion of the high end properties by value are located inside of the city in the parcel data, though I did not apply other tax rates (like Chapel Hills or Raleighs), so this tax value should be on the conservative side for property tax implications.

Putting this into perspective...

Durham's multi-million commercial properties &
apartments effectively receive
an annual property tax <u>discount</u> **that equals**...

The total property taxes of **15,000** Durham homes like the above **(valued at $182,500)**

OR

The total property taxes of **10,000** Durham homes like the above **(valued at $275,000)**
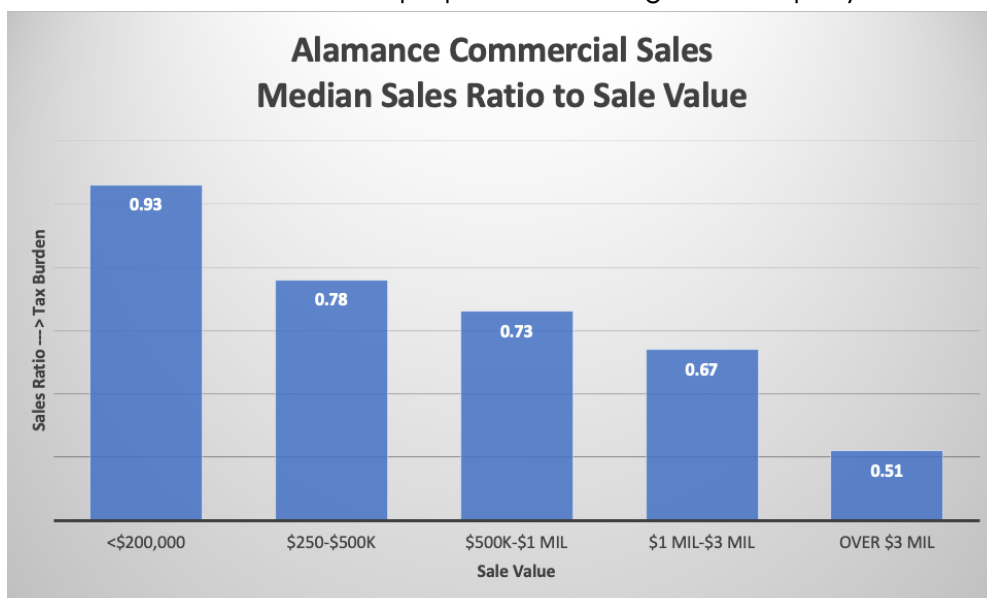

The property taxes of **ALL the rest of Durham's** **6,000** commercial properties combined

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Photo credits: The top left and bottom photos are from Durham County Tax Administration Record Search Website

What can be done?

Once I started to ask a range of assessors and property tax experts about the possibilities of high-end commercial properties and apartment complexes being undervalued, their responses were forthright. One immediately described a pattern to me of luxury apartment owners sending a half dozen out-of-town lawyers to appeal values they don't like – and threatening to go all the way to the state if the county doesn't change their valuation or come up with a compromise. Given boards of equalization are volunteer boards with relatively limited time and mixed expertise, and the county attorneys are limited in their capacities to confront such high-powered appeals, most assessors seem to avoid these confrontations when possible, as they are mostly a losing battle. Furthermore, another appraiser described to me the extensive time and resources it takes to accurately appraise commercial properties, given they don't use the sales comparison approach and often require outside consultants and ongoing struggles to get accurate income data from developers. If assessors invest these resources to improve their valuations and then still lose appeals, it's more drained resources with no added benefit.

These are all valid responses with current realities, but given the implications of such vast undervaluation, one must ask whether it is worth the larger counties beefing up their commercial valuation capacity and their legal teams to combat high-dollar appeals. And whether it is worth county leaders and neighborhood organizers paying attention to this inequity given its disparate impact on lower income homeowners and business owners. Our state law requires that all property be valued at market rate. In addition to looking at Durham, I have begun looking at Alamance, Orange, and Northampton Counties. Initial results suggest similar disparities in other counties, maybe to an even greater degree in counties with less assessment capacity. This raises the question: is this a state-wide problem? If so, what could our state be doing to help counties more accurately assess large commercial properties and to provide a more equitable response to high-dollar appeals? After all, the very largest taxpayers, many of them who live outside the state, seem to be getting significant property tax breaks in a state that claims that properties are being valued equally.
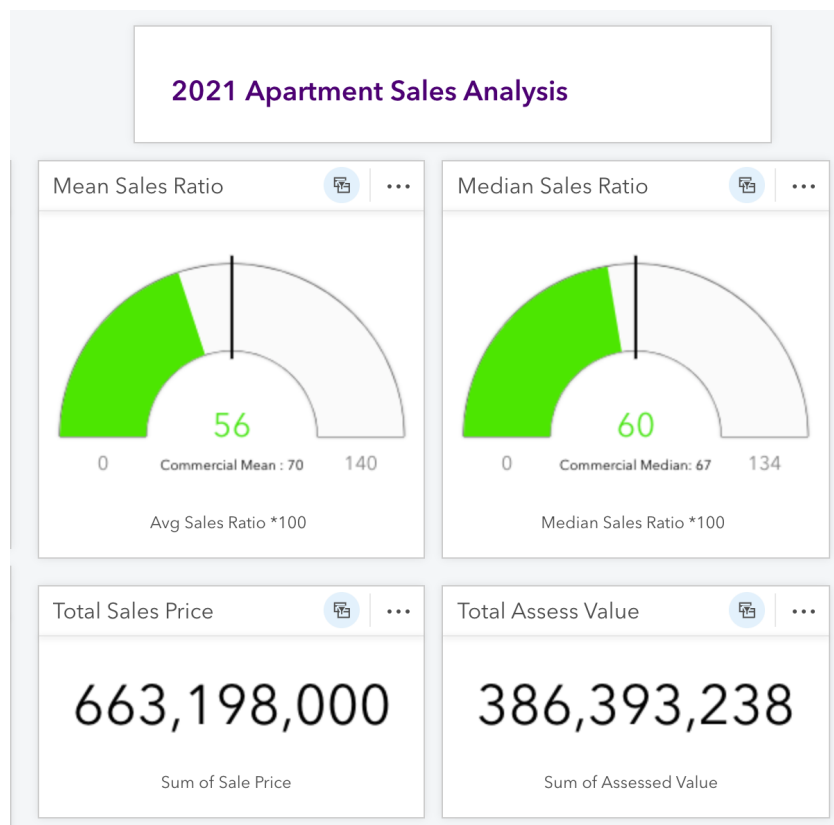
Alamance Commercial Sales
Median Sales Ratio to Sale Value

Sales Ratio ---> Tax Burden

<$200,000	$250-$500K	$500K-$1 MIL	$1 MIL-$3 MIL	OVER $3 MIL
0.93	0.78	0.73	0.67	0.51

Sale Value

Is this happening elsewhere? Is it limited to Durham?

Initial research suggest this high-end commercial undervaluation is happening in other counties like Alamance, even ones with significantly fewer high-end commercial properties Above is a glimpse…

For Further Analysis

In the process of this research, several additional questions arose that beg further and more comprehensive analysis:

- Are there specific types of commercial properties that are especially prone to over/undervaluation? In initial research, apartments, especially garden-style and luxury apartments seem especially prone to undervaluation. Take a look at the apartment sales from 2021 in Durham compared to the mean and median sales ratios (below)-- and the nearly $300,000,000 gap between total sales value and assessed value. Many luxury apartments in Durham are valued very closely to their sale price from 2012-2014, despite the fact that rents rose over 35% between then and the 2019 valuation. Is the income data being submitted accurate? Should apartments be able to use income-based approach if they are clearly not being transparent about the relationship between income and sale value?

2021 Apartment Sales Analysis

Mean Sales Ratio	Median Sales Ratio
56	60
0 Commercial Mean : 70 140	0 Commercial Median: 67 134
Avg Sales Ratio *100	Median Sales Ratio *100

Total Sales Price	Total Assess Value
663,198,000	386,393,238
Sum of Sale Price	Sum of Assessed Value

Additional Questions:

- Are different segments of age of commercial properties contributing to the disparities? From a few basic tests, there are no easily observable patterns.
- Are there components of the valuation that contribute most to the undervaluation of high-end properties? For instance, many of the commercial properties that sold for over $25 million seem to have strikingly low value per acre of land compared to overvalued commercial properties. Is the land value itself part of the issue?
- How much are appeals impacting this data? Given high-value properties may be more likely to appeal, this would be an additional layer of analysis that could prove helpful.
- This research also shows that lower value commercial properties are significantly over-valued. What are the implications of this overvaluation?

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