

Gregory S. Burge  
Associate Professor of Economics  
University of Oklahoma  
Norman, OK. 73019

Drafted at the request of  
Maidenbaum & Sternberg, LLP  
132 Spruce Street  
Cedarhurst, New York 11516

**Review of “Ratio Study of Certain Nassau County Assessment Reforms”  
& “Estimated Tax Savings and effect on Tax Bills of  
Certain Nassau County Assessment Reforms”**

The purpose of this report is convey my independent assessment of the two drafts mentioned above, having been contracted to do so by Maidenbaum & Sternberg, LLP.

My professional background is that of an academic Economist. I have spent the last eleven years serving in the Economics Department at the University of Oklahoma, first as an untenured Assistant, and more recently as a tenured Associate Professor. I have considerable expertise in the area of property tax assessment practices, having published academic research in the leading professional outlet covering that subject – the *National Tax Journal*. I have frequently published research on other topics in many of leading professional journals including *Journal of Urban Economics*, *Journal of Labor Economics*, *Real Estate Economics*, *Journal of Regional Science*, and *Housing Policy Debate*. In the time since publishing my work on property tax assessment practices, I have continued to follow the various advancements in the field of property tax administration, property assessment practices, and techniques for conducting sales ratio studies. I consistently serve as a reviewer for the top journals focusing on local public finance and real estate. As such, I am aware of the ‘best practices’ associated with ratio studies (i.e., standards suggested by the IAAO and ORPTS groups). Additionally, I am familiar with various academic commentaries that have been made about certain aspects/shortcomings of those standards. Knowledge of both bodies of work gives me a balanced perspective to comment of the current scenario.

The statements that follow reflect my professional reactions to the drafts composed by the Newsday team. In doing so, I avoid what is perhaps the most interesting question at stake; namely, were the policy changes implemented as part of the 2010 overhaul of the Nassau property tax system socially desirable or undesirable? My choice to avoid this question was not driven by lack of opinion, but rather respects the fact that my opinion is involved. When a policy creates distinct groups of citizens who gain and lose resources as a result of a policy shift, the overall desirability (or lack thereof) of the policy can only be addressed by introducing a set of normative assertions. Instead of doing this, I have stayed closely associated with statements of fact – pointing out certain ideas that I believe can add value to the overall discussion that is currently playing out.

Before turning to my formal analysis, it is worth noting that public policies like this “assessment freeze”, and the underlying property tax assessment system in Nassau, can (and should!) be consistently held up to public scrutiny, preferably with a clear focus on

pursuing equitable and fair treatment under the law for all citizens. **For the taxpayers of Nassau County, it is worth noting that this includes both the right to be taxed by a fair underlying property tax system and the right to legal recourse through a fair assessment appeals process.** I have organized my analytical comments into two sections – first considering the “Ratio Study” report itself and then moving to my comments on the “Estimated Tax Savings” report.

### **The Ratio Study**

Numerous elements of the work conducted by Matt Clark and the Newsday team are to be commended. After reviewing this report in a great level of detail, I can safely say that a considerable amount of thoughtful work went into preparing this report, and that I agree with the spirit of the study and the important of the issues the Newsday team is investigating. However, my goal is not to mechanically revisit each reasonable aspect of the study, but to highlight a few serious points of deviation between the approach taken and the approach that I believe would have been most appropriate. I recognize there are certain differences between the traditional set of “IAAO best practices”, what has been settled on in the academic community of scholars as “best practices” in more general terms, and finally what the IAAO would identify as “best practices” in a relatively unique situation such as the one that has been created in Nassau County. My goal is not to undermine the validity of the traditional IAAO techniques, nor is it to undercut the important role played by the ORPTS, but simply to offer what I think are ways the work could have been improved given the current environment in Nassau and how the IAAO standard approach would – by their own recommendation – need to be adjusted in this case, given the stated goals of the Newsday project.

I begin by introducing and defining “Sales chasing” as the common practice of property assessors to use systematically different procedures to generate year-to-year valuations for sold versus unsold properties in a property tax roll. Often, this involves allowing valuations for sold properties to rely heavily upon observed sales prices while unsold properties are reassessed using other more blunted procedures.

Since IAAO standards were invoked within the Newsday study, it may be best to adopt their own formal definition of “sales chasing”, which is as follows:

“Sales Chasing (IAAO Definition) Sales chasing is the practice of using the sale of a property to trigger a reappraisal of that property at or near the selling price. If sales with such appraisal adjustments are used in a ratio study, the practice causes invalid uniformity results and causes invalid appraisal level results, unless similar unsold parcels are reappraised by a method that produces an appraisal level for unsold properties equal to the appraisal level of sold properties.”

**In this case the “freeze” implemented by Nassau County created a situation where rampant “sales chasing” was occurring by definition.** That is to say, value assessments for residential properties were locked into their 2012-13 levels, and were only updated for one of three reasons. These were: 1. a successful assessment appeal, 2. a sale/transfer of the property, and 3. a serious modification of the property occurred.

As such, it logically follows that sales chasing (i.e., treating sold and unsold properties differently as year-to-year new assessments are generated) was occurring by design in this case. **The question is not whether sale chasing was occurring, since it was forced by design, the relevant question is how to best conduct an unbiased ratio study in the presence of such obvious sales chasing behavior.**

Sales chasing plagues the accuracy of traditional ratio studies methodologies (e.g., precisely the approach used in the Newsday study) in a number of ways that are well documented by the academic literature on this topic (e.g., Burge & Ihlanfeldt 2005; Ihlanfeldt, 2004; Goolsby, 1997; Clapp, 1990). I agree with the Newsday report that calculating sales ratios in the manner they carried out, which is to take a property sale and then to compare it to a *subsequent* assessment of the property's value, falls within IAAO standards *in situations where sales chasing is not occurring*. In cases where "sales chasing" is occurring – either legally or illegally – these traditional methodologies are subject to systematic bias.

Page 7 of the Newsday report indicates that "One year of sales was selected leading up to the valuation date for each study year", so they are clearly following the IAAO standard intended for cases where sales chasing is not present. The academic literature on this topic (which I have published work in) is in uniform agreement that a more unbiased way to calculate accurate sales ratios from a tax roll is to compare observed market sales prices to assessments that were decided upon *prior* to the arms-length open market sale occurring, thus assessors would not yet know which properties were going to sell in the future and which ones would not. Because assessors do not yet know which properties will and will not sell in the future year, one can more easily believe that sold and unsold properties are being assessed in similar ways (e.g., in the previous year, not the subsequent year where they will in fact be treated differently on the basis of sales chasing). When reaching back to these prior assessments, using sold properties as a sample to calculate sales ratios is then still defensible.

The importance of this aspect being missed by traditional sales ratio studies conducted using simple IAAO (assessment/sales) techniques cannot be overstated. We know that the **vast** majority of residential properties do not sell during a given year. As such, for any given roll, the overall distribution of the tax burden across different groups depends much more heavily on properties that do not sell than it does on properties that sell in a given year. Thus, estimating a sales ratio using *backward looking approach* (i.e., sales occur first, valuation date occurs next) is subject to estimation bias that would not occur in a *forward looking approach* (i.e., the valuation date occurs and then properties either sell or do not sell). The superior accuracy of ratios conducted in this forward looking manner is well documented in the work of the four academic studies mentioned earlier.

Turning to a somewhat related limitation of the Newsday analysis, my understanding is that properties with assessments that changed for the 2<sup>nd</sup> or 3<sup>rd</sup> reasons listed above (selling and/or being significantly remodeled, which is reported in the draft as being roughly 20% of the sales) were actually excluded from their calculations. That choice only makes sense in light of the previously criticized choice to use assessments that follow the sales date – this would not be an issue at all if the approach I outlined above was taken. According to the academic literature, the most accurate approach to testing

whether or not any two distinct groups of properties (e.g., minority communities relative to majority white communities or the comparison between properties that filed for assessment appeals relative to those that did not) had different aggregate assessment ratios would have been to calculate the ratios using sales occurring *after* the valuation date and to then include **all properties** that sold. Thus, there are two distinct problems (albeit somewhat related to one another) that are occurring simultaneously. The sales window is generating bias from sales chasing *and* the sample of included properties in the calculation is incomplete. Since I have not analyzed any of the actual sales & assessment data for the Nassau County Roll for the tax rolls and sales data in question, any comments on my part about how this would affect the eventually obtained sales ratios for the two groups would be purely speculative, and is thus does not belong in a comment of this nature. To stick with the relevant facts, I can only say that there is no *a priori* reason to believe that an approach correcting for these two issues would produce the same results as one that did not.

Beyond the potential for bias in the estimated sales ratios, another concern regarding the ratio study involves the way the result itself is currently framed. Specifically, I am referring to the statement that “Properties that have not appealed their assessments are assessed at a level 18.4 percent higher than those that have.” (page 3) Based on my knowledge of the academic literature concerning the determinants of property tax appeals, and having seen some of the issues that are involved with the underlying sales ratio calculations in this application, I would not interpret the difference of 18.4% between these two groups as evidence that those who have appealed actually carry an 18.4% lower effective tax rate than others who have not appealed. The reason is simple. I will tell a story involving “two paths” to illustrate my point.

“Path 1” is precisely the story the Newsday report claims. It assumes the following chain of events led to the 18.4% difference in ratios between the two groups.

- We begin with fully accurate/uniform property assessment for all parcels in Nassau County. Essentially, assessment is perfect in every way – all properties are valued at precisely what they would sell for on the open market at a given moment in time. This goes **far beyond** something like having a tax roll that is within IAAO compliance standards. In fact, while this perfection would be impossible to attain in reality, it is still useful for illustrative purposes, since it guarantees that all properties (including both those that will appeal in the future and those that will not) **start with the same assessment ratio**.
- We next assume the likelihood of appealing one’s assessment is random. For ease, assume taxpayers flip a standard coin and appeal on heads.
- We then assume the appeals process itself does not generate accurate assessments, but instead that successful appeals take the assessment to a value lower than the true market value. Again for simplicity, assume the appeals officer flips a coin, only lowering the assessment on heads.

In this simple model, “Path 1” creates three groups of taxpayers:

1. Type 1 (50% of taxpayers) never appealed and has accurate assessments.
2. Type 2 (25% of taxpayers) appealed but lost. They also still have accurate assessments.

3. Type 3 (25% of taxpayers) appealed and won. They now have inaccurately low assessments.

Here, it is obvious that the appeals process *generated* the difference in the ratios between the two groups. The 25% in Type 3 now have a lower ratio than all others and they get a tax break. Type 2 individuals do not get a tax break even though they appealed and Type 1 individuals also do not get a tax break. Whether we lump Type 2 and Type 3 together (as the Newsday study does), or whether we separate Type 3 out as a smaller group – the group they are in should show a lower ratio. [Also, please note that the Newsday report does make it clear that something more like 80% of appeals are successful, I only used the 50/50 split to illustrate the point with easier math!]

“Path 2” however provides a different interpretation of how the appeals process modifies the distribution of the property tax burden.

- Here, we begin with a distribution of assessment that is not accurate. Instead, for illustrative purposes, assume that 50% of all properties are assessed with accurate market values, but that now 50% are assessed with valuations that are higher than the properties true market value.
- We next assume the likelihood of appealing one’s assessment is NOT random. Instead, assume the chance of appealing is 100% for the group that is over-assessed, but 0% for the group that is accurately assessed.
- We then assume the appeals process leads to accurate market-based assessments if the claimant wins their appeal, but leaves the assessment alone if the claimant loses. Again for simplicity, assume the appeals officer flips a coin and gives the claimant a “win” on heads.

“Path 2” also creates three groups of taxpayers:

1. Type 1 (50% of taxpayers) never appealed and have accurate assessments.
2. Type 2 (25% of taxpayers) appealed but lost. They now have inaccurately high assessments.
3. Type 3 (25% of taxpayers) appealed and won. They now have accurate assessments.

Under “Path 2”, we can see that the appeals process *mitigated* the starting difference in the ratios between the two groups. Put another way, it removed unfairness that was there to start with. The 25% in Type 2 that appealed and lost now unfairly have a higher ratio than the other two groups. The 25% of Type 3 taxpayers end up with the same tax burden as Type 1, but they had to pay money to obtain that fair treatment (i.e., the costs of the appeals process).

I introduced these hypothetical “dueling paths” only to highlight the two example paths that could possibly, under the most extreme assumptions, could flavor discussions over the current situation in Nassau. Those who advocate for taxpayers in the appeals process would, for understandable reasons, likely view the appeals process primarily through the lens of the second path. At the same time, those looking to challenge the purpose that industry serves (which would be my interpretation of the narrative in the Newsday draft), for equally understandable reasons, may view the appeals process

through the lens of the first path. My own opinion (and I will qualify this as just an opinion, but I think it is reasonable), is that the truth lies somewhere in between.

Jumping back into my formal critique – **the academic literature is concludes that the likelihood of filing an appeal is highly nonrandom** (e.g., at least partially favoring the “Path 2” story). In fact, Weber & McMillen (2010) found that a higher property tax assessment, controlling for the estimated market value of the property coming from post-dated sales data, actually increased both the likelihood of appealing and the likelihood of success in the appeal. Both of these are intuitive results. The incentives to file an appeal should clearly be increasing as a property owner believes their assessment is too high relative to their self-perception of the value of the property. Conversely, the other side of this coin means that property owners with starting assessment that are lower than market value are less likely to appeal.

A reasonable reaction to this reality would be to point out that, so long as a ratio study is conducted in an unbiased manner, the ratio study should help reveal which path is occurring in a given environment and/or the extent to which the truth lies somewhere in the middle. For example, if the “have appealed” group comes out with lower ratios in accurate sales ratio studies by the fraction of value reduced through the appeals process, then Path 1 has dominated. If the reverse is true, and the ratios of both groups are similar even after appeals, then Path 2 dominated. Of course, if the sales ratio studies are based on methodologies that do not fully account for the issues present (i.e., sales chasing), then it is hard to use those results as fair evidence that sorts out the impact of each of these potentially simultaneously occurring channels.

Finally, I have two other minor points of concern with the estimated sales ratios.

- The report outlined the underlying problems associated with the state-qualification method differing from the County-qualification method, but I did not see much attention paid to the bias this likely introduced into the ratio estimations. The fraction of “qualified” arms-length sales changed **dramatically** from the 2002-03 baseline tax roll to the more recent (i.e., post-reform) tax rolls. I think it is highly improbable that the prevalence of true arms-length sales declined this rapidly in Nassau County in less than a decade. More likely, the fraction of sales that would be accurately defined as arms-length was probably quite stable over the period, but the practices used by the county and/or state experienced meaningful changes. Given that likelihood, I think more reasonable choices could have been made here. Since this is an aggregate ratio study the proper technique would have been to develop a simple data-driven method of internally defining a qualified sale that was consistently applied across sales from all time periods. The goal should be to use property samples across all periods that are equally representative of the pool of true arms-length transactions. It is hard to believe the relatively large group from the early tax roll is comparable to the much smaller groups of sales from the later tax rolls. More likely, they differ from one another in at least some systematic ways. Please note that this is a separate issue than the sales that were eliminated after the pool of ‘valid’ sales was formed – those eliminations were all intuitive.
- Time-trending sales adjustments (i.e., the process of accounting for the role of changing price levels over time) were conducted at the annual level. Again,

while the Newsday approach does meet typical IAAO requirements, it is also well documented in the academic literature on this topic that monthly adjusted estimations are preferable to annually adjusted.

### **The Estimated Tax Savings Study**

To begin, it goes without saying that the accuracy of the estimated “tax savings” felt by taxpayers who filed appeals is closely linked to my previous points concerning the accuracy of the estimated sales ratios. Since the **VAST MAJORITY** of properties do not sell during a given year – any process that estimates the tax savings to taxpayers who appeal (i.e., those whose homes eventually sell, but also those whose homes do not sell) is subject to the critique that the “aggregate tax savings” estimate is only as good as the accuracy of the underlying estimated tax rates driving the calculation.

The Newsday report makes this exact point when they accurately state that “Newsday estimated the \$1.7 billion in savings achieved through appeals by calculating effective tax rates for the entire county and then multiplying them by the assessed value of appeal properties before and after they appealed”, going on to also say later that “Newsday calculated tax bills as closely as they would have been **had each property not filed an appeal**” (bold added by author of this report).

Again, the two unstated implicit assumptions here are that the higher (no appeal – no modification) tax bill would have in fact been a fairer tax bill – a point that is only valid if we take the giant leap of faith that those who appeal and those who do not appeal begin with starting assessment rates that are equal on average – and secondly that there is no correlation between the “selling” and “appealing” properties. I do not have the actual tax rolls in question to check, but neither of these assumption is supported by the academic evidence investigating this possibility. **Instead, it suggests that, *ceteris paribus*, those with preexisting unjustly high assessments are more likely to appeal and more likely to win their appeal.** Framed in this light, at least a portion of the “tax savings” that is being negatively framed in the report is actually a step towards a more equitable/just taxation system.

At the same time, I certainly think the Newsday report produces AMPLE evidence to convince me that the appeals process is creating a benefit for that group of taxpayers relative to other taxpayers who do not file – this is to be expected in the environment the county has created. One serious question that must be asked is “to what extent is it fair to frame the taxpayer representatives as a part of the problem, when in fact they are simply helping citizens act on their pre-existing legal rights in a situation where Nassau County has created an environment where tax appeals are so fruitful?”

My own opinion, and this is one place where I will deviate from my previous claim of avoiding normative issues, is that it is not fair to negatively implicate an industry that is simply honoring its legal responsibilities in situations where taxpayers are reacting predictably to the incentives created by the 2010 “freeze”. Pointing an admonishing finger at the public policy is perhaps reasonable given the findings of the reports, whereas selecting a group of individuals and trying to lay blame, is quite counter-

productive. Why not attack the judges/officers who hear the appeals? Why not blame the taxpayers themselves for simply acting in their own best interest? My point is simple – I believe it is better to stick with the facts, noting the observed outcomes as being shaped by the incentives present in Nassau County, rather than to go further.

Shifting gears, one very specific inaccuracy of the calculations estimating the “tax savings vs. fees paid to the taxpayer representation firms” is that the assumption is made that no tax savings will be experienced by taxpayers who successfully appeal *in the future moving forward from now*. Presumably, if a taxpayer wins an appeal, they pay their representative one time only, but then still receive a portion of the benefits of the new lower assessment moving into the future. Put another way, even if no new appeals are filed from this moment forward, the taxpayer savings will continue to grow larger over time. Therefore, the taxpayer savings – which the report consistently frames as a conservative estimate – is actually a VAST understatement of the true savings to taxpayers. In a normal setting, this claim would only be a conjecture. However, in this environment (i.e., the freeze is present), the position that this tax savings estimate is too small is actually a fact, because once the appeal is won, the new lower assessment is subject to the freeze policy, so it must persist and produce additional tax savings.

Another questionable aspect of the “tax savings vs. fees paid to the taxpayer representation firms” calculation is the assumption that the policy did not shift the number of tax appeals that would have been filed. This “counterfactual” outcome is not directly observed, nor is any attempt made to estimate it. Instead, the year 2006-07 is simply used as an anchor. 2006-07 does not seem like a reasonable choice. The Newsday report states that appeals peaked in the 2006-07 cycle – meaning they are basing the calculation off a high point. They push back on this obvious problem by saying that as the number of appeals declined, the size of the assessed value reductions grew. However, they also then mention these larger reductions could have been due to the Great Recession and the dip in property values that led up to the Great Recession. At the end of the day, when the report says “the 2006-07 tax year was representative of what might have happened in the years since 2011-12 had the new assessment policies not been adopted”, we are dealing with a claim that is highly speculative.

Also, I take issue with the statement on page 12 that “to estimate how much was saved by all those who appealed – and therefore the tax burden that was shifted onto other property owners – it is necessary....” This makes the huge leap of faith that the policy, and the appeals process itself, have not impacted the overall levels of property taxes collected. [i.e, the implicit assumption of the statement is that the tax bill is fixed in size, and that a zero-sum game is being carried out] I did not see any evidence to support this assumption. To the contrary, I saw several occasions where the only way to interpret the findings included in the report was that at least some overall tax reduction occurred (after all, that was an explicitly stated goal of the policy).

The most obviously misleading statistic presented in this report comes on page 2, where it states that

“Nearly half (45.7 percent of \$789.1 million) of the savings went to properties appraised by the county at \$1 million or more for the 2010-11

tax year before their values were reduced through the program, even though such properties **make up less than 8 percent of county** property.”

This comment actually made me a little upset. For the most part, I was very impressed that the Newsday report did not purposely misrepresent/manipulate statistics to tell deceptive stories – a common and unfortunate occurrence in modern journalism/media reporting. [Recall the famous quote from Mark Twain, saying that “There are three kinds of lies: lies, damned lies, and statistics.”]

While the technical issues I described above with the sales ratio calculations are valid academic concerns – it was still clear to me that the analysis **aimed** to follow a straight-shooting manner of fairness. Thus, even if I take issue with the techniques used, I do not take issue with the goal of the writer. However, in this specific case, it is very difficult for me to believe that presenting these two statistics paired together is even in the ballpark of being fair reporting. Let me explain.

I do not have the current tax rolls – but I do have in my possession several older tax rolls from Nassau County from previous work I have conducted. I was curious to see what happened if I took the most valuable 8% of the tax roll, and then compared the total property tax burden of that group (the 8%) to the entire roll.

Low and behold, that top 8% paid.....wait for it.....almost exactly 45% of the overall property tax bill in Nassau County! If one reports that 8% of the properties received nearly half the benefits of appeals – that is perhaps technically true, **but it is also extremely misleading given that most readers are not particularly savvy when it comes to interpreting statistics.** If I say, a group of taxpayers who are responsible for paying approximately 45% of the overall tax burden also received approximately 45% of the tax savings from the appeals process (again, an equally true statement) – then I have made a FAR more accurate/fair depiction of the situation. However, I do not think this second approach is as “attention-grabbing”, nor does it serve the underlying narrative the Newsday Report works to develop.

I cannot understate how important it is to remove this misleading framing. My understanding is that, at least in part, the purpose of estimating the tax savings for “appealers” and “non-appealers” is to then link up these conclusions in a more general context to “the rich” and “the non-rich”. Perhaps I am assuming too much, but I know a thing or two about framing a particular result in a way that captures people’s attention – a common goal of both journalists and academics. **In this case though, if one wants to talk about the fairness/equitableness of the policies impact, or of the impact of appeals, the ONLY fair way to present these tax savings estimations is as a fraction of the overall tax bill paid.** Yes, the wealthiest households who appealed seem to have saved a large amount of taxes. However, they also PAY a lot of property taxes. The relevant question is – would a middle or lower income appellant (relative to a typical wealthy appellant) save similar percentages on their tax bills on average when they appeal?

If that answer is yes, then the appeals process itself, as well as those involved with it (the county, taxpayer representatives, the judges and so on) should not be framed in a

negative light based on these results over concerns of equity and/or social justice. In fact, if these results are sensationalized to paint a picture that the appeals process is only catering to the wealthy, then I am convinced a huge disservice is being done to the general public. Assume I am a middle or low income homeowner. I read the statistic as presented by the Newsday report. I think, "Wow, if 8% of the folks are getting nearly half the gains, and I'm not in that 8% (or perhaps even close), why should I bother to appeal? What could it get me if the common man isn't getting a fair share?" Compare that to what the same taxpayer might think if the information were conveyed more impartially. They might think "Wow, since the appeals process creates similar proportional benefits/reductions for both expensive and inexpensive properties – I should take advantage of this opportunity!"

In closing, I would simply stress that lower income and/or minority households in Nassau County have not appealed their property tax assessments at the same rates as wealthy and/or white residents. The report itself documents this difference, and also claims there are considerable benefits associated with appealing. Logically then, it follows that it would be desirable for minority groups and lower income taxpayers to more frequently seek legal representation to challenge assessments in this environment. My interpretation of the way the Newsday report is framing their "tax savings" result is that it could potentially have the opposite (counterproductive) impact. It seems like an attempt to incite anger and/or frustration in general, rather than to more objectively point out an opportunity that could benefit groups of citizens who may not have benefitted from the appeals process in the past as much as other groups in Nassau County have. It is plausible, and even likely in my opinion, that if the framing of the tax savings were driven more toward the idea that it represented a relatively stable fraction of a given taxpayers average liability, regardless of their income, that it would more effectively advocate for this improved outcome.

At any rate, I appreciate the opportunity from all sides of this situation to be able to contribute my ideas. Please let me know if I can be of further service.

Sincerely,

Gregory S. Burge

## Works Cited

Burge, Gregory, and Keith Ihlanfeldt, "Estimating aggregate levels of property tax assessment within local jurisdictions: An extension of the Ihlanfeldt model to multiple land uses." *National Tax Journal*, Vol. LVIII, No. 1, 2005.

Clapp, John. "A new test for equitable real estate tax assessment." *The Journal of Real Estate Finance and Economics*, Vol. 3, No. 3, 1990.

Goolsby, William, "Assessment error in the valuation of owner-occupied housing." *Journal of Real Estate Research*, Vol. 13, 1997.

Ihlanfeldt, Keith, "The use of an econometric model for estimating aggregate levels of property tax assessment within local jurisdictions." *National Tax Journal*, Vol. LVII, No. 2, 2004.

Weber, Rachel, and Dan McMillen, "Ask and Ye Shall Receive? Predicting the Successful Appeal of Property Tax Assessments." *Public Finance Review*, Vol. 38, No. 1, 2010.