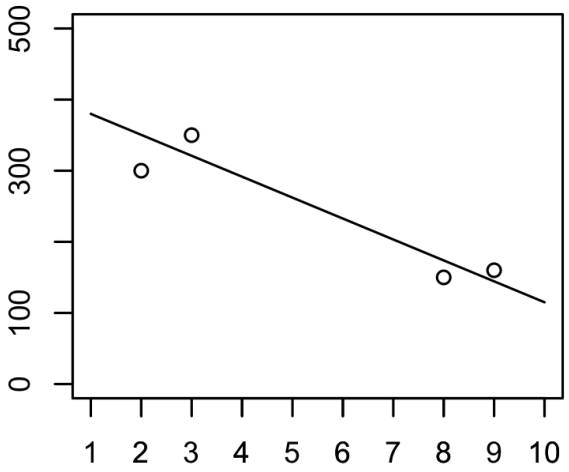
To: Councilor JoAnn Ryan and members of the Providence Tax Commission
From: Tom Sgouros
Date: February 15, 2024
Re: Reval article

Adapted from the August 2004 issue of the Rhode Island Policy Reporter, a newsletter I used to publish. Back issues are archived at http://whatcheer.net.

**Taxes: A Re-appraisal of Re-appraisal** We recently had the value of the sprawling RIPR campus reassessed as part of our town's mandated revaluation. We noted the many scientific factors the appraisal company puts into its scientific formula. There are numbers for the "quality" of our land, the quality of the street we live on, the age of our house, and the condition of our house. There's even a number for the size of our lot, which is different from the number that *is* the size of our lot. (This number increases as the lot size decreases.) When you inquire, you're told that the data are supported by sales data from hundreds of houses. What they don't tell you is that this can be quite true and the results can still be garbage. You're supposed to remember this from that statistics class in high school you maybe didn't take. But for those who indeed didn't take it, as well as for those who've forgotten, here's a recap.

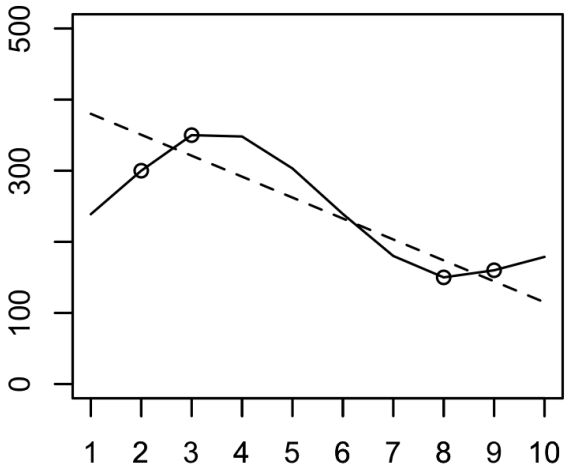
Data are just a bunch of numbers. You might imagine that they represent some trend: maybe they should be more or less in a straight line, or maybe some kind of curve. You can try to figure out what kind of curve or line is the best approximation of your data, but you usually get that from somewhere else, not from the data itself. Entire scientific articles are devoted to determining—and justifying—the proper shape to be fitted to some data. These factors are derived by observation, by judgment, and sometimes by guess. This is as true of fitting curves to frog population data or measurements of rainfall as it is of finding trends in real estate sales numbers. What you can get from the data is a confirmation that your guess is right, but even that is dangerous, especially if you're going to use that fitted curve to estimate missing values. This, of course, is exactly what real estate appraisal companies do.

Here's an example: Suppose we have a town that consists of only of ten more-or-less identical houses on a single street, like some wild west movie set town. Our street has a lake at one end, and we expect the value of each house to be related to its position on the street, with the ones near the water the most expensive. Imagine we have some sales data from four of those houses, indicated by the points in the graph to the left. (The position of each house on the street is its number, with the low numbers on the fancy end of the street.) We know the values of the houses will roughly correspond to their position on the street, so one approach would be to draw a straight line, and figure that the buyers of houses number 2 and 8 were better bargainers than the buyers of 3 and 9. So we could use this line to determine values for houses 1, 4, 5, 6, 7, and 10.




*There's always a little random variation in data. You have to decide whether to use it or ignore it.*

But the line we've created doesn't actually go through the data points (in fact it can't). We could just chalk that up to the vicissitudes of the market, saying perhaps that Mr. 3 secretly had a crush on the real estate agent or that the 8 family actually bought the house from Mrs. 8's brother. But another approach—the one apparently taken by professional appraisal companies—would be to say that the data clearly show that a straight line can't do justice to the complexity of the situation. So we add parameters, or fit curves instead of lines, alternatives which, for the present argument, amount to pretty much the same thing. For example, we could invent a "B factor" to account for the condition of a house's basement, or we could fit a third-degree polynomial curve (a curve with two wiggles) to the data, and thereby try to fit each point perfectly. Here's that attempt.

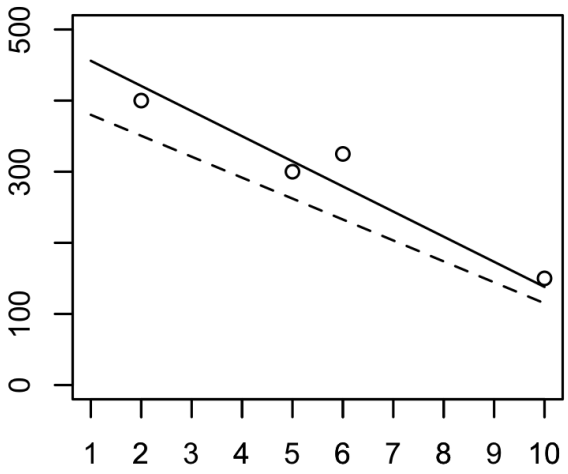



Now the curve hits all the data points right on, and we can boast to the town council (and to nosy newsletter editors who ask) how precisely we fit the data, effectively ending any debate on the subject. The curve is a little peculiar at each end, where it seems to deny

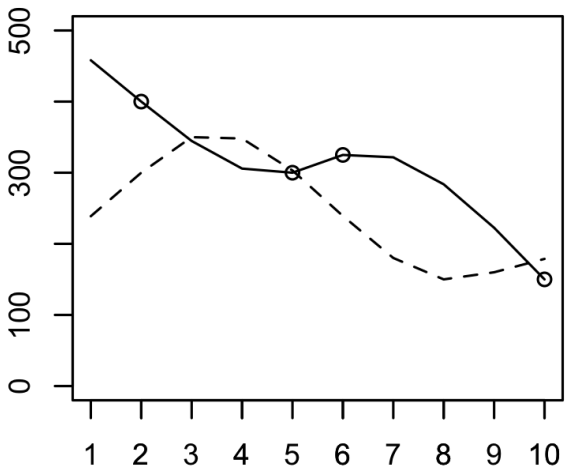
what we know about the value of houses on the street (Mr. 1 gets a bargain and the 10 family is hit hard compared to the straight line) but the quality of the fit to the data is superb and claims of the "scientific" nature of the technique are usually all that is needed to overcome qualms like this. Especially since the appraisal company can usually count on the town council not being composed of statisticians.

But the qualms, in this case, are actually correct. For some curve fit to data, the quality of the fit has little to do with the quality of the interpolations you make from that curve. In fact, the *more* precise the fit is, the more likely that the curve fitters are allowing spurious effects (the quality of the real estate agent's perfume, the weariness of the sellers) to affect the interpolations. Too much precision can be the enemy. The reason why will become clear at the next revaluation.

Now imagine that three years have passed, and the town suffers its legislatively mandated revaluation. In the intervening three years, prices have risen around 20%, but perhaps they've risen a bit more in the expensive neighborhoods. New sales data, and the straight line fit might look like the points on the graph below (the straight line assessment from last time is shown dotted). The data still more or less preserve our idea that the expensive houses are on the left end of the street, and so does our new straight line.




But again, our straight line doesn't actually go through the new data points, so our professional assessor's standards demand we call it inaccurate and that we use another complicated curve to fit the new data. So we put the sales data into our equations and we get a wonderful new curve that precisely fits that data. This new curve might look like the one below.




The good part about this new curve is that it looks more like what we wanted in the first place, with values rising as you move into the tony parts of the street. But compare this curve with the one from the previous revaluation (the dotted line). Pity the poor 1 family, who have seen their assessments rise from $238 to $458. The 7 and 8 families also see their assessments almost double, while the 3 and 4 see little change, or a small decline. According to these curves, the average property values in the town have risen 27%. If the tax rate declines by this much, and the town budget remains unchanged, the poor 1 family will see their taxes rise by over 50%. On the other hand the 9 family and the new owner of the 6 house will see little change in their taxes, and the 3,4,5 and 10 families will see slight declines. Does this sound familiar? It should. This is exactly the kind of hardship visited on thousands of Rhode Island families every year by arbitrary and bizarre revaluations done "scientifically."

Imagine, though, that the town had relied on the much cruder analysis of the straight line (shown in the previous figure). The assessment isn't as "accurate" in that the fit of the curve to the data isn't as good, but look at the impact on the town residents: across the spectrum, the impact is consistent. Everyone is affected in the same modest way. Once the rates are adjusted, no one's taxes will change by any more than the increase in the town budget. It is perfectly true that the assessed value will understate slightly the sale price of the 6 family's house, but so what? Perhaps the price was high because the new Mr. 6 is an idiot. Should his neighbors suffer for that?

In other words, the precision claimed by appraisal companies is nothing to be proud of. That precision *guarantees* the creation of dramatic discontinuities like the ones shown here. "Dramatic discontinuities" is, of course, a technical term for personal disasters, where families are driven from their homes by arbitrary increases in their taxes. More important, this is not an occasional bad side-effect; this is the necessary outcome of an over-precise statistical analysis foisted upon our municipalities by people who don't understand statistics. In other words, if ever there were an argument for improving the

quality of math education in our state, this would be it.

**OK, so what?** No town is as simple as our wild-west example, but the principle is the same in real towns: complex assessment formulae, that take into account every possible factor in a house's value, are guaranteed to produce arbitrary swings in value from one revaluation to the next. But what to do instead? Rhode Island towns could make a giant step toward decreasing the impact of property tax revaluations by *de*professionalizing the practice of appraising property.

Professional appraisal companies have only one duty, to assess properties in as "accurate" a fashion as possible. But the municipal governments that employ them have a different duty. They are supposed to seek a fair allocation of the burden of supporting the town's services. By delegating their responsibility to appraisal companies who have different duties, our state government and our towns have implicitly decided that adherence to a wholly imaginary high standard of "accuracy" in assessment is more important than the catastrophic effects on many citizens. We reintroduce the *Rhode Island Policy Reporter* razor: any government policy that has the effect of turning people out of their homes faces a very high burden of justification.

The ideal of accuracy is obviously worth striving for; this isn't a plea to rely on the seat of the assessor's pants. We shouldn't ditch the math. But we should use simpler formulae to assess values, and we should change the formulae only with great circumspection and concern for the impact of the changes, which is not how things work now.

Furthermore, the standard of accuracy in this case is not at all obvious. How do you calibrate an assessment, except by selling the house? The true value of your house is whatever you can get for it. But that price depends not only on the conditions of the market and the condition of your house, but also on the acumen of your agent, your patience, the bargaining prowess of the buyer, and on whether their banker slept well the night before reviewing their loan application. Without actually selling the house, you'll never know how these factors will affect the price you might get. Whatever assessment the town puts on it is only an educated guess of that price. Educated guesses can vary a lot and still be educated guesses. Accuracy is important, of course, but the "value" of real property is not objective. Is strict adherence to an imaginary standard of accuracy important enough to price someone out of their home?

There are profound problems with the way that Rhode Island towns assess taxes on their citizens. The towns need a way to raise the funds necessary to operate, but it must be a way that does not depend on the vicissitudes of the real estate market which are, as anyone with eyes can see, pretty bizarre. But this depends on changes in state law, and will not happen soon. In the meantime, the first step in finding a way to improve the situation is for town councils to cease delegating all their discretion in the matter to professional appraisers whose duty is only to the standard of accuracy, and who feel no counterposed duty to avoid destroying what is valuable in a town by their actions.