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What's Happened to Properties with Expired Tax Abatements?

Part III

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This is the third and final paper in a series examining previously tax-abated properties in Philadelphia. The first part of the series examined their turnover rate in their post-abatement period. The second part examined what has happened to their values following the expiration of their abatements. This final part examines the fiscal implications of the abatement, focusing on how much the abatement is actually worth versus how much the market is actually pricing it.

As noted in previous installments to this series, 10,404 residential properties have seen their abatements expire since the program's original inception in 2000. All of these were abated and purchased in the 2000-2009 period. Of the original 10,404 dwellings that have since seen their abatements expire, only 3,530 have since subsequently sold. And, of these 3,530 units, only 1,175 met the conditions[1] listed in the second installment to this series to be used for further empirical analysis. This constitutes only 11% of all previously abated units.

According to the program's proponents, the general rationale for Philadelphia's tax abatement is that it helps promote development that wouldn't happen otherwise by increasing the final value (e.g. price) of the finished project by a margin large enough to cover Philadelphia's generally high cost of construction[2]. It does this by conferring a significant tax advantage to the property (e.g. very low real estate taxes for 10 years) that increases its market value.

But just how large is this advantage? And, how accurately do buyers and investors value it? This is important in order to promote the efficient administration and successful continuation of the program for several reasons. First, if the value that the abatement confers is "excessively" large—in that it results in above-market returns to real estate investment—then the program is unnecessarily expensive to the taxpaying public and can be curtailed. Second, if developers, investors and buyers are not accurately pricing the value of the abatement into the sale and purchase of the finished product, then the program's efficiency can be improved via either modifications to the program or by better educating the public on its benefits.

This paper will endeavor to empirically calculate both the _value_ and the _price_ of the abatement for individual units, and then draw some larger policy-oriented inferences about the program based upon the results. We begin by defining some terminology:

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[1] These conditions were: 1) The initial purchase price of the abated unit had to occur within one year of it being granted an abatement, when the abatement's benefits were still large; and 2) The subsequent sales price of the abated unit had to occur either in the year its abatement expired or after that; and 3) Both the original purchase price and subsequent sales price had to occur under arms-length conditions[1]; and 4) No unit could transact in between its initial purchase and its subsequent post-abatement sale.

[2] According to ENR.com, Philadelphia has the fourth-highest cost of development of any city in the U.S.

Let:

> **AV=the value of the abatement.** This is the total dollar value of the foregone property taxes, adjusted for time.

> **AP=the price of the abatement.** This is the dollar premium that individual investors and buyers actually paid for newly abated properties. Since it is impossible for anyone to forecast their property tax bills ten years out with complete accuracy, this is their estimate of AV.

> **P=the fundamental price of a property.** This is the market price that a property would command if it did not have an abatement.

Now, conceptually, the total value of an abated property (TV) is simply the value it would have without the abatement (P), plus the value of the abatement (AV):

> **TV = P + AV**

In a perfectly efficient world, buyers of abated properties would have a 100% accurate estimate of AV, and they would pay TV for an abated property. But, they must estimate or guess AV, based upon their current expectations of future property tax bills. As a result, AP can (and almost always does) differ from AV. So the actual price they pay for an abated property (represented by TV*) is calculated as follows:

> **TV* = P + AP**

Since P is the same in both equations, then when the recorded purchase price TV* differs from the property's equilibrium price of TV, it can only be because the buyer's estimated value of the abatement AP differs from the true value of the abatement AV.

The values of each of the above variables were computed for each previously abated property in Philadelphia as follow: AV is computed as the present discounted value of each property's tax bill over the ten years it has an abatement by applying the city's taxation formula to the property's assessed and exempt values in its purchase year and sale year[3]. AP is then computed as the difference between an abated property's actual purchase price (TV*) and its counterfactual purchase price (P), where P is determined by discounting the property's post-abated sales price back to the year of its original purchase utilizing a price index for residential properties in Philadelphia.

Since the formal math behind this exercise may seem somewhat complicated, we show how this is done using an example from one of the 1,175 properties that meet the necessary conditions for this analysis: consider 503 Governor's Court in the exclusive and historic townhome community of Naval Square. This is a Toll Brothers project located in the revitalized neighborhood of Gray's Ferry at the edge of Center City. The dwelling is a 3.5 story brick townhome that has the legal status of being a condo, due to its location in a gated HOA community.

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[3] We recognize that the city went through several re-assessments, changes in its assessment practice and changes in its statutory real estate tax rate from between 2000 and 2018. The appropriate assessed value, taxation formula and tax rate were applied for the respective years. The author is grateful to Marisa Waxman of Philadelphia's Revenue Department for providing some guidance in identifying the correct taxation formula for past years.

Naval Square

This unit was purchased in 2007 for $679,975. Since it was 100% new construction, the value of the structure was fully abated and the owner paid taxes only on the land. According to OPA's property file from 2008, the total assessed value of the property was $540,000, with $15,900 of this being allocated to the value of its land. Because the structure was fully exempt, a whopping 97% of the property's value was spared from taxation due to its abatement. The property's tax bill in its first year was a mere $420[4]. In the absence of the abatement, it would have been $14,280[5].

In 2016, the last year of the property's abatement, its taxable value had risen to $564,300, with $56,430 (10%) being allocated to land. Its tax bill in this year was $790. Minus the abatement, it would have been $7,899[6].

The abatement's value is computed by taking the present discounted value[7] of the abated portion of the property's annual tax bill in each year of the ten years it was abated. In year one of the property's abatement, the tax savings to the owner were $14,280-$420=$13,860. In year ten of the property's abatement, the tax savings to the owner were $7,899-$790=$7,109. The total value of the abated income stream is then computed as follows[8]:

$$AV = \sum_{t=1}^{10} \frac{\$13,860}{(1+0.05)^t} + \cdots + \frac{\$7,109}{(1+0.05)^{10}} = \$87,124$$

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[4] $420=$15,900 x 0.32 x 0.08264. This was the city's real estate taxation formula in 2008, before the implementation of the Actual Value Initiative that eliminated fractional assessment and also decreased the tax rate.

[5] All revenue numbers are rounded to the nearest dollar.

[6] $564,300 x .013998 = $7,899. This was the city's real estate taxation formula in 2016.

[7] A 5% discount rate was used.

[8] The terms representing the years between the first and last year of the property's abatement are omitted from the formula for brevity's sake, but they are included in the calculation.

Adjusted for the time value of money, the owner of the unit was spared a total of just over $87,000 in taxes due to the property's abatement status. So, in a perfectly rational world with complete foresight, the dwelling would have commanded an $87,000 premium in its first year of purchase due to the abatement; i.e. AV=$87,000. Conversely, absent the abatement, the property could be expected to sell for $87,000 less than what it actually sold for. This implies that the tax advantages conferred by the abatement constituted 13% of the property's total market value[9]. Note that this is very close to the average of 12% that was estimated by the City Controller's recent report analyzing the value of Philadelphia's abatements[10].

While it is reasonable to expect a buyer to pay a premium for a property with favorable tax treatment, it is equally unrealistic to expect them to be able to predict their future tax bills with complete accuracy, which would be required to accurately arrive at the $87,124 value. However, it is possible to be able to estimate what they thought their future tax bills would be by computing what the owner *actually* paid for the abatement; i.e. AP. To do this, a counterfactual purchase price was computed by discounting the property's post-abatement sales price back to its original date of purchase, and then taking the difference between the actual purchase price and the counterfactual price as the abatement's price AP. Since the property's post-abatement sales price represents its market value once the abatement has expired, then adjusting this price for the general fluctuations in local real estate values over time yields the price that the property would have originally sold for if it did not have an abatement.
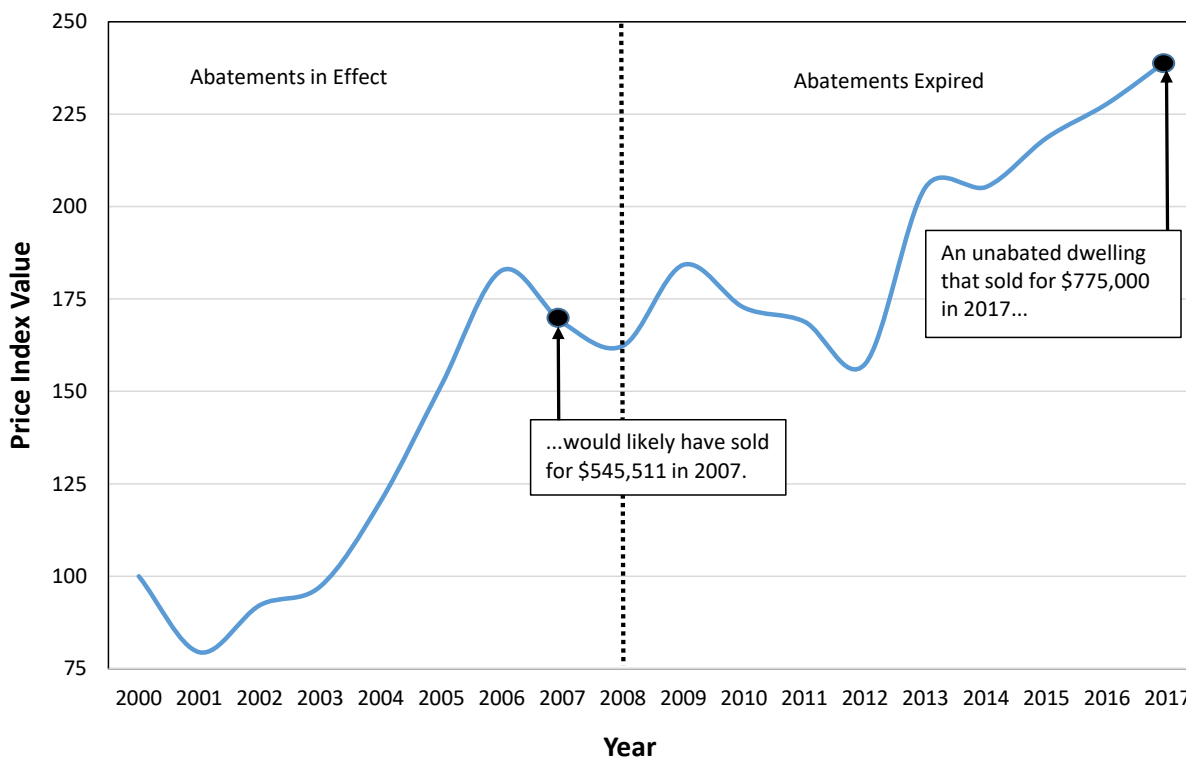
The previous chapter in this report estimated a repeat-sales property price index for Philadelphia using all paired sales between 2000 and 2017[11]. The index is analogous to a "Dow Jones" index for Philadelphia's housing: the percent change in the level of the index between any two periods reflects the average percent change in the value of local residential property values. A chart showing the index is below:

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[9] 13%=$87,000/$679,975.
[10] An Analysis of Tax Abatements in Philadelphia, Office of the Controller, City of Philadelphia, April 23, 2018.
[11] See: https://houwzer.com/blog/what-happens-when-philadelphia-tax-abatement-expires-part-2 for details.

Philadelphia Residential Property Price Index 2000-2017
2000=100

The value of the index in the year that the post-abated property sold (2017) is 239.58[12]. The value of the index in the year that the same property was originally purchased (2007) is 168.64. To obtain the counterfactual price (P) of the property, the 2017 sale price is deflated using the value of the index as follows:

$$P = \$775,000 \times (168.64/239.58)$$

$$= \$545,511$$

This price is ~30% less than its subsequent sales price, which is exactly the same as the percent change in the level of the index between 2007 and 2017; i.e. average residential property prices in Philadelphia rose 30% from 2007 to 2017. So, to predict the likely purchase price of a property in 2007 when only its 2017 sale price is available, the 2017 sale price is simply deflated by 30%.

The $545,511 price represents our best counterfactual estimate of what this property would have been purchased for in 2007 if it didn't have an abatement. However, the actual purchase price of the property in 2007 (with an abatement) was $679,975. The difference between these two numbers, $134,464, represents the actual price (AP) that the buyer "paid" for the abatement.

Since the actual value of the abatement was $87,124, these numbers imply that the buyer overpaid for the abatement by $47,340, which added a 20% premium (rather than a 13% premium) to the base price of the property. Such a higher premium could be rationalized if the buyer expected to see their assessed

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[12] The actual index values were computed to 7 decimal places. So, for brevity's sake, some rounding is involved in reporting these numbers here.

value (and hence, tax bill) increase by a faster and higher amount than it actually did. The 13% premium that represents the actual value of the abatement reflects the actual appreciation rate of its assessed value, which was an average of 1.4% per year. Based upon the 20% premium that the buyer paid, they would have expected the property's assessed value to increase by significantly more than 1.4% per year.

The above exercise was carried out for all 1,175 abated properties that have since seen their abatements expire and have also since sold under arms-length conditions[13]. For each property, four variables of interest were computed:
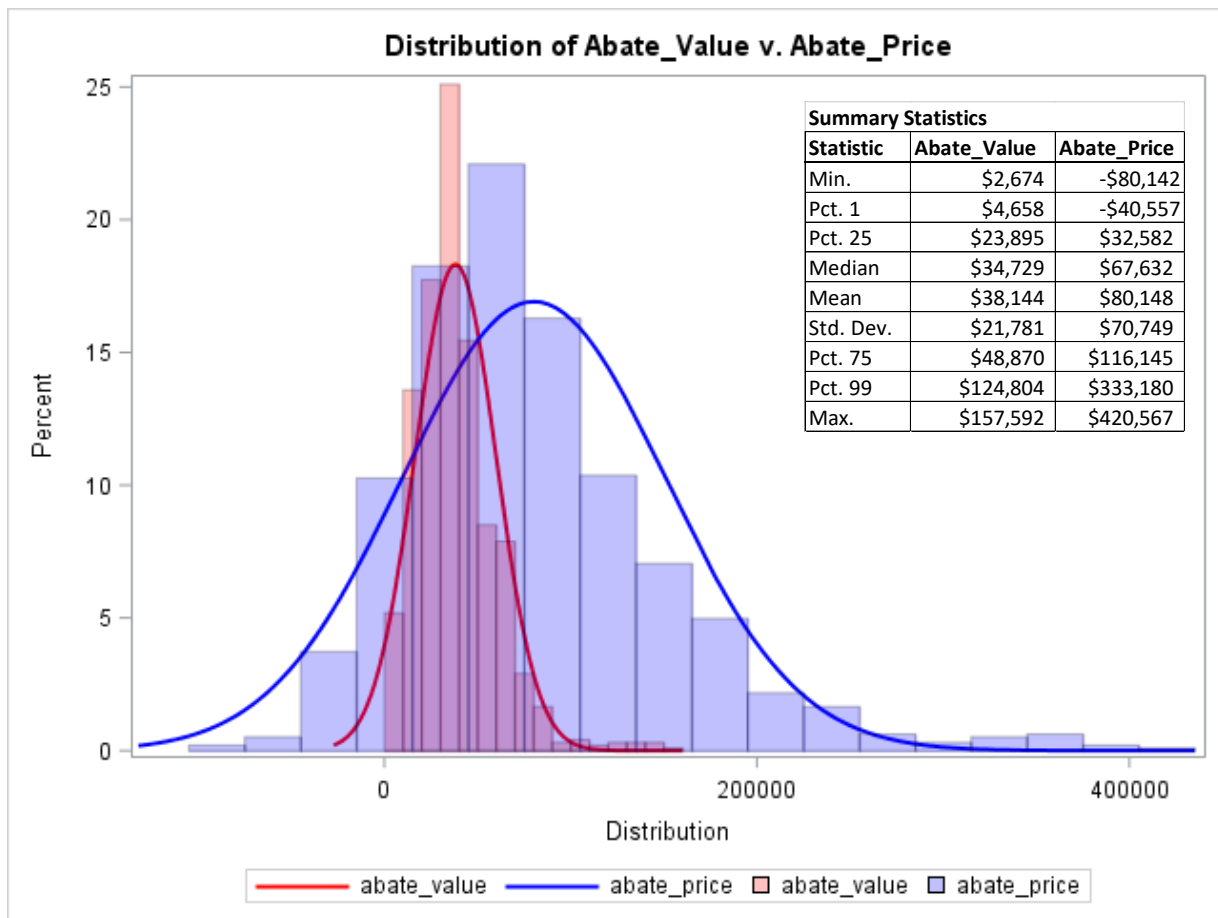
Abate_Value (AV) = the $ value of the abatement

Abate_Price (AP) = the $ price premium that the buyer paid for the abated property

Pct_Abate_Value = the % premium that the abatement should add to the original purchase price of the property. It is computed as: Abate_Value/Purchase Price

Pct_Abate_Price = the % premium that the abatement actually added to the original purchase price of the property. It is computed as: Abate_Price/Purchase Price

The following chart compares the distribution of Abate_Value to Abate_Price across all post-abated properties, with red representing Abate_Value and blue representing Abate_Price:

Distribution of Abate_Value v. Abate_Price

Summary Statistics		
Statistic	Abate_Value	Abate_Price
Min.	$2,674	-$80,142
Pct. 1	$4,658	-$40,557
Pct. 25	$23,895	$32,582
Median	$34,729	$67,632
Mean	$38,144	$80,148
Std. Dev.	$21,781	$70,749
Pct. 75	$48,870	$116,145
Pct. 99	$124,804	$333,180
Max.	$157,592	$420,567

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[13] This latter condition is necessary in order to obtain a post-abatement market price, and hence a counterfactual (non-abated) price. As noted in a previous installment to this series, most abated properties remain in the hands of their original buyers, even after their abatements expire.
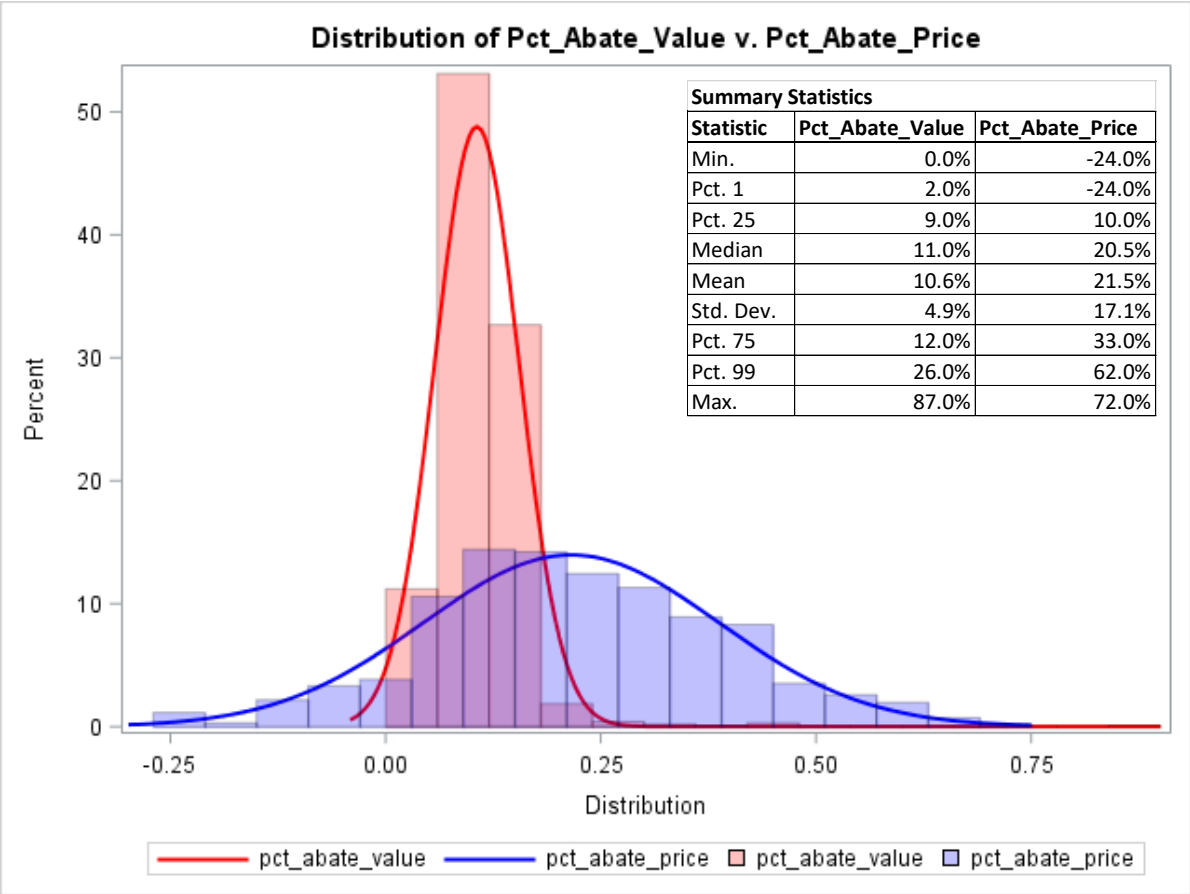
The following inferences can be made from the data presented in the chart:

- **The price that buyers paid for the abatement typically exceeded the actual value of the abatement:**
  - The price premium that buyers paid for their abatement was greater than the actual value of the abatement for 70% of these post-abated properties.
  - The median abatement price is $67,632, while the median abatement value is $34,729.
  - The average abatement price is $80,148, while the average abatement value is $38,144.
  - The 25% lowest-priced abated properties had an abatement price of $32,582 or less, but an abatement value of only $23,895 or less.
  - The 25% highest-priced abated properties saw their buyers pay a price premium of $116,145 or higher for their abatement. But, the actual value of their abatement started at just $48,870.

- **The variation in what buyers paid for the abatement is significantly greater than the variation in the actual value of the abatement:**
  - It is easily discernible that the red bars (Abate_Value) exhibit a significantly tighter cluster than the blue bars (Abate_Price).
  - The standard deviation of abatement values is $21,781, while it is a much larger $70,749 for abatement prices.
  - This result shouldn't be surprising, since abatement values can be calculated with the benefit of perfect hindsight (i.e. with perfect precision), while abatement prices are computed with highly imperfect foresight (i.e. the buyer must guess at what their future assessed values and tax bills will be).

- **Abatement prices can have negative values, while abatement values are always positive:**
  - Mathematically, this occurs when the property's (post-abatement) sales price is discounted back to the year of its original purchase, and its resulting imputed value is less than the property's actual purchase price.
  - However, abatement values are always positive since they are simply the present discounted value of a positive cash flow; i.e. tax payments.
  - An empirical examination of these properties with negative abatement prices revealed that most of them were purchased in the 2000-2003 period, before the significant inflation of the housing boom/bubble. But, they were also disproportionately sold in the 2009-2012 period, after the bubble had burst and prices were in a significant deflationary cycle. Hence, when the post-bubble low sales prices were discounted even further to obtain pre-bubble purchase prices, a negative difference between the implied purchase price and actual purchase price resulted.
  - Thus, rather than characterizing the owner of these properties as "shrewd buyers" (negotiating a purchase price that was less than the abatement's value), it would be more appropriate to characterize them as "panicky sellers" (they sold their unit at a significant discount at a time when the market was also in a downturn).
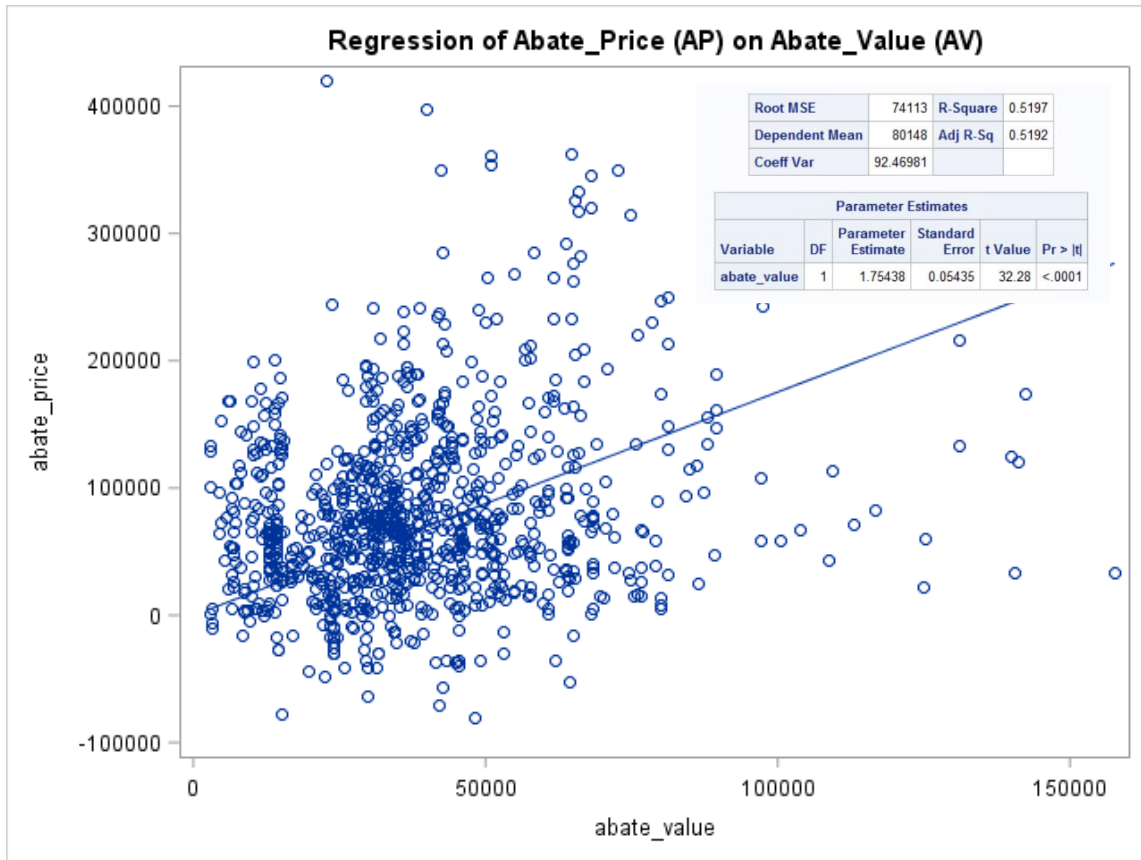
To examine the percent premium that the abatement contributes to property prices the next chart compares the distribution of Pct_Abate_Value to Pct_Abate_Price across all post-abated properties. These numbers were computed by simply dividing Abate_Value and Abate_Price into the original purchase price of each property:

Distribution of Pct_Abate_Value v. Pct_Abate_Price

Summary Statistics

Statistic	Pct_Abate_Value	Pct_Abate_Price
Min.	0.0%	-24.0%
Pct. 1	2.0%	-24.0%
Pct. 25	9.0%	10.0%
Median	11.0%	20.5%
Mean	10.6%	21.5%
Std. Dev.	4.9%	17.1%
Pct. 75	12.0%	33.0%
Pct. 99	26.0%	62.0%
Max.	87.0%	72.0%

The information in the chart gives the following results:

- **The price premium that buyers paid for the abatement was typically greater than its actual value:**
  - The typical (i.e. median) abated property carried a price premium of 20.5%, while the actual value of the abatement should only add 11% to the value of the property.
  - Similarly, the average price premium was 21.5% while the average value was only 10.6%.
  - The overwhelming majority of abated properties had abatement values ranging from 1% to 26%, but the actual price premiums that these properties were purchased for ranged as high as 72%.

To empirically quantify the relationship between the prices that buyers paid for the abatement versus the abatement's actual value, a regression of the former against the latter was computed. The next chart shows a scatterplot of abated prices against abated values, with the fitted regression line showing the explicit mathematical equation between these two variables fitted to the data:

Regression of Abate_Price (AP) on Abate_Value (AV)

The regression yields the following findings:

- **Despite abatement prices generally exceeding abatement values, the correlation between the two is still very strong.** The R-squared of the regression (a measure of the correlation's strength) is nearly 52%, out of a possible maximum of 100%. And the t-value of the regression line's slope (a measure of the validity of the correlation) is 32.28, which easily exceeds the threshold of 1.96 to be considered "statistically significant". These results would be considered by most statisticians to be quite strong for a simple bivariate regression.

- **For every $1 in a property's abate values, buyers paid an average of $1.75 in a higher price for that property.** This can be inferred from the slope of the regression line. Its value of 1.75438 implies that every $1 increase in an abatement's intrinsic value is correlated with an increase of $1.75 (rounded) in abatement prices.

Lastly, using both the historical and current assessed values of these properties, we can calculate what revenue they have and are generating in real estate-related taxes[14]:

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[14] This assumes a 100% collection rate; i.e. no delinquencies.

- While their abatements were in effect, these approximately 10,000 properties have collectively generated $103.7m in tax revenues to the city[15], most of which is from their (unabated) land values.

- In 2017, when all of their abatements had expired, these properties generated $44.8m in tax revenues.

- With their 2018 assessed values, they are projected to generate $50.2m in tax revenues.

- If both the the recently released assessments and proposed real estate tax rate of 1.4572% are adopted, then they will generate $52.3m in tax revenues in 2019.

- Due to the overpayment for the abatement, the city is estimated to have reaped a $15m windfall in additional transfer taxes during the 2000-2009 period when these properties were first purchased[16]. If this same condition also applied to currently abated properties, this number would be approximately double that.

The numbers clearly show that abatement has both a very real and very significant value in the marketplace, typically adding 11-20% to a property's value. **And, the improvement/construction of these properties has contributed significantly to the city, with over $100m in direct tax revenue to date and approximately half of that in each year since their abatements have expired.**

However, what are the larger implications of these results for the abatement program and its fiscal costs/benefits to Philadelphia? In particular, what is to be made of the result that buyers have typically "overpaid" for the abatement?

From the short-term and narrow perspective of city government, having the abatement priced at a number greater than its intrinsic value may not necessarily seem like a bad thing. It results in both real estate transfer tax revenues and real estate tax revenues being higher than they would be otherwise, since both are indexed to market values. However, this myopic view ignores several key facts:

- **First, every unnecessarily additional dollar spent on the abatement by Philadelphia households is a dollar that has been wasted and can't be spent elsewhere.** This results in both a lower standard of living for these households due to foregone purchases on other items, as well as lower tax revenues to the city if these purchases would be subject to city taxes; e.g. the sales tax. So, additional revenues from real estate taxes are offset at least partially by lower revenues from other taxes.

- **Second, paying an excessive premium for the abatement can have distortionary effects on both the overall real estate market and assessed values.** In areas with high concentrations of abated properties, such as Center City and the revitalized neighborhoods surrounding it, the general level of real estate values will be higher than what they should be since the premium placed upon

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[15] This number covers the years 2000-2016, and is not an annual number.

[16] This was computed by summing the difference between Abate_Price and Abate_Value across all 1,017 properties and multiplying the resulting number times the city's (then) 3.0% transfer tax rate. This number was then multiplied times ten to adjust for the fact that these 1,017 sales represent only ~10% of all properties which received their abatements in the 2000-2009 period.

abated properties will skew average prices upwards. This can mislead households and investors who are buying non-abated properties to also pay a higher price than they would otherwise, which results in the same loss in both personal welfare and city tax revenues that the previous paragraph pointed out. Longer-term, it can also result in a more inequitable and inefficient distribution of property taxes, since both abated and non-abated households in these neighborhoods will have higher assessed values than they should.

- **Thirdly—and importantly—it should be pointed out that all of the analysis in this paper used property sales from 2000-2009, when property prices were rising very rapidly, and that this may explain why most abatement prices surpassed their values.** The primary economic justification for paying a relatively high price for the abatement is that it is a shield against future property tax increases. If the buyers of these properties expected their assessments—and hence, tax bills—to continue to rise quite rapidly in the years following their purchase, then this could lead them to value the benefit of the abatement as being higher than its intrinsic worth. Since the majority of these abated properties were built and constructed at or near the peak of the housing bubble in 2005-2008, it seems reasonable that many of these buyers were subject to the "irrational exuberance" that marked the spirit of the times. If so, then the fact that abatement prices exceeded abatement values may be just a transitory and outlying artifact of that particular period, with minimal implications for the current debate over the abatement program's future.

Lastly, it could be quite tempting—but also quite possibly incorrect--to interpret these results as evidence that the abatement program could be scaled back with minimal adverse effects on housing production and sales in Philadelphia. After all, if the abatement is generally overpriced, then curtailing its benefits would seem to intuitively work to bring its market price back into line with its intrinsic value. But, any reduction in the program's scope or duration will also result in a decline in the abatement's intrinsic value in addition to a decline in its market price. So, the gap between price and value would still persist. Moreover, this reduction would drop the overall return on housing development in Philadelphia. If this resulting return is lower than a developer's typical cost of capital (i.e. the return they must offer lenders and investors to raise financing for new projects), then this would result in a dramatic decline in new housing production and investment in Philadelphia, even if the abatement still had a positive market value. Hence, these results should be understood and applied with caution.