What's Happened to Properties with Expired Tax Abatements?

Part II

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This is the second in a series examining previously tax-abated properties in Philadelphia. The first part of the series examined their transactions volume in the post-abatement period. This second part examines what has happened to their market values following the expiration of their abatements.

Since the current abatement program's inception in 2000, 10,404 residential properties have seen their abatements expire. All of these were abated and purchased in the 2000-2009 period. Because the key rationale for the program is that it is an incentive to improve and expand Philadelphia's stock of real estate—and thus grow its tax base—it is reasonable to examine what has happened to the values of these properties once their favorable tax treatment has expired. If their values have dropped significantly, then this provides support to those critics of the abatement who have asserted that the program's long-term benefits are low relative to its high short-term costs. Alternatively, if abated properties have held their value or even grown in value, then this provides support to the program's supporters, who have contended that the program's short-term costs are more than offset by the long-term benefits of a permanently expanded tax base that would not have occurred but for the abatement. This paper will endeavor to provide some empirical analysis to inform this debate.

It is first necessary to identify those post-abated units that sold under reasonable market conditions, and hence whose sales prices reflect reasonable market values. Of the original 10,404 dwellings that have since seen their abatements expire, only 3,530 have since subsequently sold. However, in order for this data to be useful in effecting an accurate analysis of how the abatement may affect the value that buyers may place on it, the transactions of these abated dwellings had to meet all of the following conditions:

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.

Of the original 3,530 units that transacted more than once, only 1,175 met all of the above conditions for further analysis. This constitutes only 11% of all previously abated units, which may seem like an

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[1] Sheriff sales, nominal sales, blanket sales, bank sales and inter-family transfers are not considered arms-length transactions. Such sales were dropped from the dataset used in this analysis.

unexpectedly small sample to both critics and proponents of the abatement program. The following map shows the location of these 1,175 previously abated dwellings:

The Location of Previously Abated Residential Properties in Philadelphia
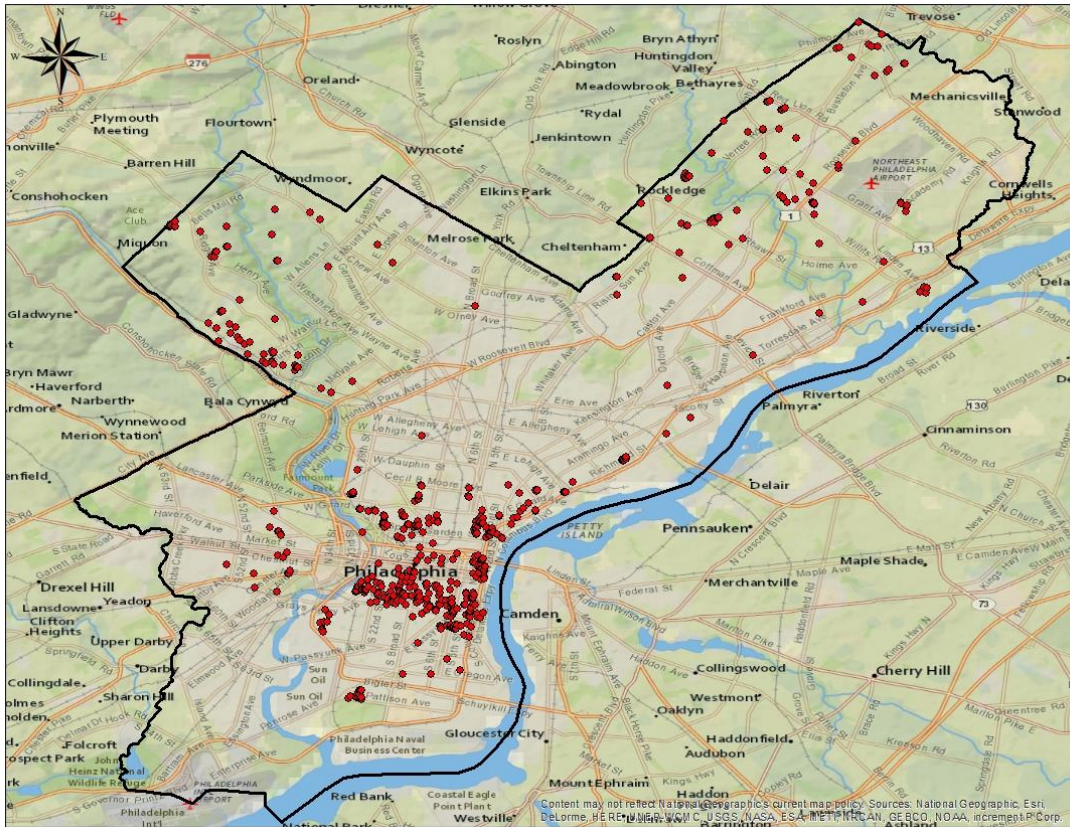
The greatest concentration of post-abated properties is in and around the downtown area of Greater Center City. However, (perhaps surprisingly to critics and skeptics of the abatement) there are also significant concentrations of formerly abated residences in University City, Northwest Philadelphia and Northeast Philadelphia.

We begin our analysis by providing some general summary statistics on the transaction prices of previously abated properties both before and after their abatements expired. The following table gives some summary statistics on both the initial purchase prices and subsequent (post-abatement) sales prices of these 1,175 dwellings:

Summary Statistics on Prices of Previously Abated Units

	Initial Purchase	Post-Abatement Sale	%Change
#Sales	1,175	1,175	N/A
25% Quartile Price	$252,000	$255,000	1.2%
50% Median Price	$347,000	$360,000	3.7%
Mean Price	$400,000	$425,000	6.3%
75% Quartile Price	$471,000	$505,000	7.2%

In general, it can be observed that the prices of formerly abated units generally increased between their initial purchase and their subsequent post-abatement sale:

- The lowest-priced 25% of previously abated units were purchased at a price of $252,000 or less, but then sold for a price of $255,000 or less.
- The median (50%) purchase price of an abated property between 2000 and 2009 was $347,000. But after their abatements expired, and they sold in the post-2009 period, their median sale price was $360,000.
- The average purchase price of an abated property was $400,000. But the average sales price of these same properties in their post-abatement period was $425,000.
- The highest-priced 25% of previously abated units were purchased at a price of $471,000 or more, but they then later sold for a price of $505,000 or more, following expiration of their abatements.
- Across all previously abated properties, the median price change was $8,800 and the mean price change was $25,600[2].
- Lastly, the higher a property's initial purchase price, the greater the typical price appreciation it experienced, in both dollar and percent terms. The bottom 25% of previously abated properties experienced a typical price gain of just $3,000 (or 1.2%) in the 10+ years between their original acquisition and their post-abatement sale. By contrast, the top 25% experienced a typical price gain of $34,000 (or 7.2%) during the same period.

Although these summary statistics indicate that these post-abated properties collectively experienced positive price appreciation, the same may certainly not be true of individual properties. To examine to what extent this may or may not be true, the dataset of 1,175 sold units was divided into "Gainers" and "Losers", depending on whether the difference between the original purchase price and post-abatement sale price was positive ("Gainers") or negative ("Losers"). The following bar chart shows the number of sales in each category during the post-2009 period, by year:

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[2] The "price change" for each property was computed as the sale price minus the original purchase price. The median (or mean) price change is not the same as change in the median (or mean price) because the difference in medians (or means) is not the same thing as the median (or mean) difference. This is because the distribution of prices is not perfectly symmetric, and skewness in the data causes these numbers to diverge.

Formerly Abated Units Selling for Absolute $Loss v. $Gain by Year

Year	# Sold for $Gain	# Sold for $Loss
2010	13	0
2011	15	4
2012	16	8
2013	43	29
2014	60	44
2015	121	108
2016	186	162
2017	180	183
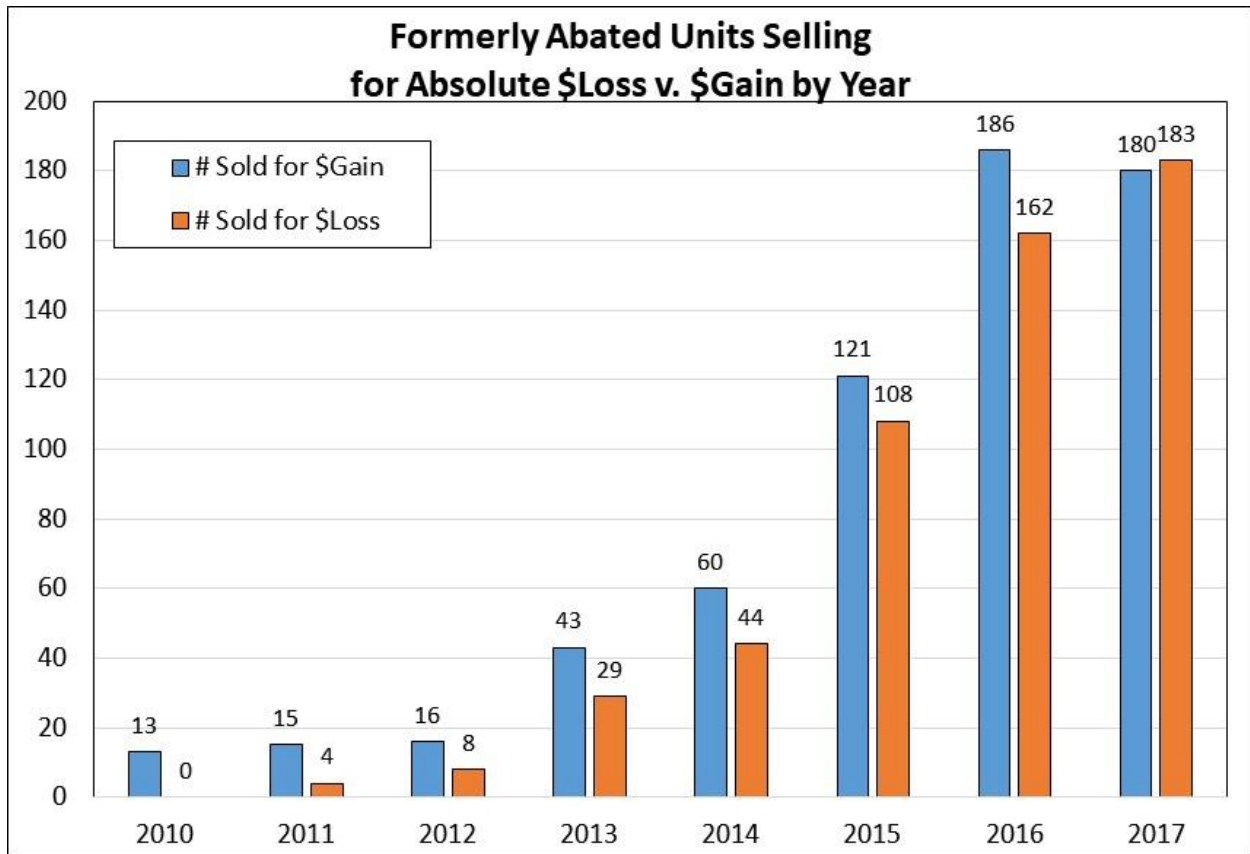
The blue bars indicate gainers while the orange bars indicate losers. For example, in 2010 (the first year in which previously abated properties began to sell), 13 sold for a positive gain while there were 0 sales at a loss.

In general, it can be noted that the gainers outnumber the losers, but not by especially large margins:

- In seven of the eight years since abated units have returned to the tax rolls at full value, the number of gainers has outnumbered the number of losers.
- Across all eight years, 637 units have sold at prices higher than their original purchase price, while 538 have sold at less than their original purchase price.
- However, the ratio of gainers to losers is not especially large: 54% of sales were for an absolute gain, while 46% were for an absolute loss.

Hence, the data indicate that the price of most abated properties increased between the period of their original sale and in their subsequent sale after their abatement expired.

However, it should also be considered that this increase in value is in absolute terms, and not relative terms since it does not adjust for overall movements in dwelling prices during that period. First, it should be noted that there was enormous volatility in house prices during the 2000-2017 period since both the largest housing bubble and then the deepest postwar recession occurred during this period. Simply computing the number of increases v. decreases without adjusting for this volatility risks over-simplification of the issue. Second, If the general level of house and/or condo prices in Philadelphia

increased by a larger margin than value of abated properties during a given period, then this could reasonably be considered a relative loss, despite being an absolute gain. Conversely, if the value of abated properties fell by less than overall house prices during a given period, then that could be considered a relative gain for abated properties, despite being an absolute loss. Just as equity fund managers evaluate the performance of their particular portfolio by comparing it to the overall performance of the stock market, so too is it fair to compare the performance of abated properties to the overall performance of the housing market.

The following chart compares the median prices of all previously abated properties to the median prices of non-abated dwellings (houses+condos) in Philadelphia in two different periods: 2000-2008 (when the abatements were in effect), and 2009-2017 (after the abatements had expired). To ensure a clean apples-to-apples comparison, only houses and condos that met the same general criteria as post-abated properties were included this analysis[3].

Median Dwelling Prices: Pre- and Post-Abatement
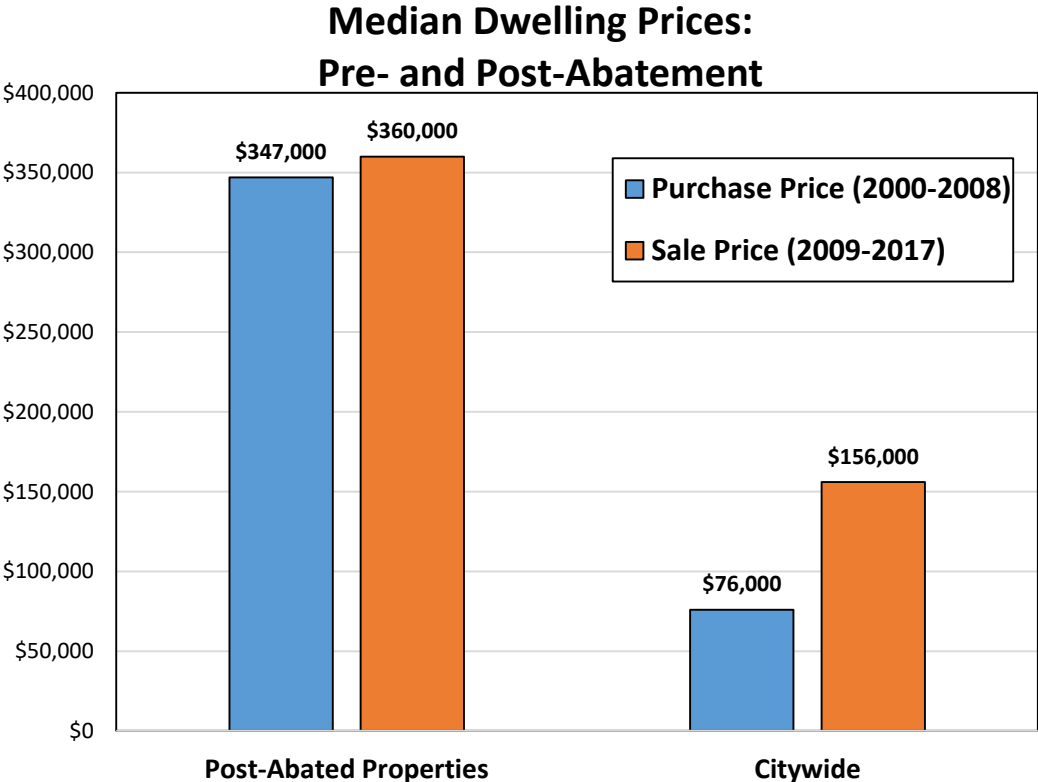
In general, the price of abated properties increased by less than housing prices citywide during this period:

- Abated properties were purchased for a median price of $347,000. After their abatements expired, they sold for a median price of $360,000; a 3.7% increase.

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[3] Only houses and condos that sold twice in the 2000-2018 period and under arms-length conditions were included in the data sample for this analysis.

- During 2000-2008, the median purchase price of all non-abated dwellings in Philadelphia was $76,000. After 2008, the median sales price of these same properties was $156,000; a 105% increase.
- Although previously abated properties are generally much higher-priced than non-abated properties, the value of abated properties appreciated by much less than the value of non-abated properties following their original purchase in both dollar terms ($13,000 v. $80,000) and in percent terms (3.7% v. 105%).

While these numbers may indicate an aggregate relative loss in value, they do not provide any insight into the number of individual gainers and losers. To do this, it is necessary to "mark to market" each previously abated property by comparing the percent change in its original purchase price and subsequent post-abatement sale price to the overall percent change in house prices during the same period. However, since house prices were exceptionally volatile during this period, and the price data is contaminated with non-economic "noise" such as seasonality and heterogeneous differences in the types of dwellings that sold, using simple median or average house prices would be both incorrect and inconclusive.

Instead, a regression-based methodology was deployed to compute a house price index for Philadelphia. This produces a much smoother house price index whose fluctuations over time reflect secular market movements that are free of statistical noise and non-market idiosyncracies[4]. The following chart plots the house price indices for both previously abated properties and all non-abated properties from 2000 through 2017:

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[4] The technical term for this type of house price index is a "weighted repeat sales price index." It was computed using the exact same methodology as Case-Shiller, which produces house prices indices, updated monthly, for most major U.S. cities. See the appendix for details.

Philadelphia House Price Indices 2000-2017
2000=100
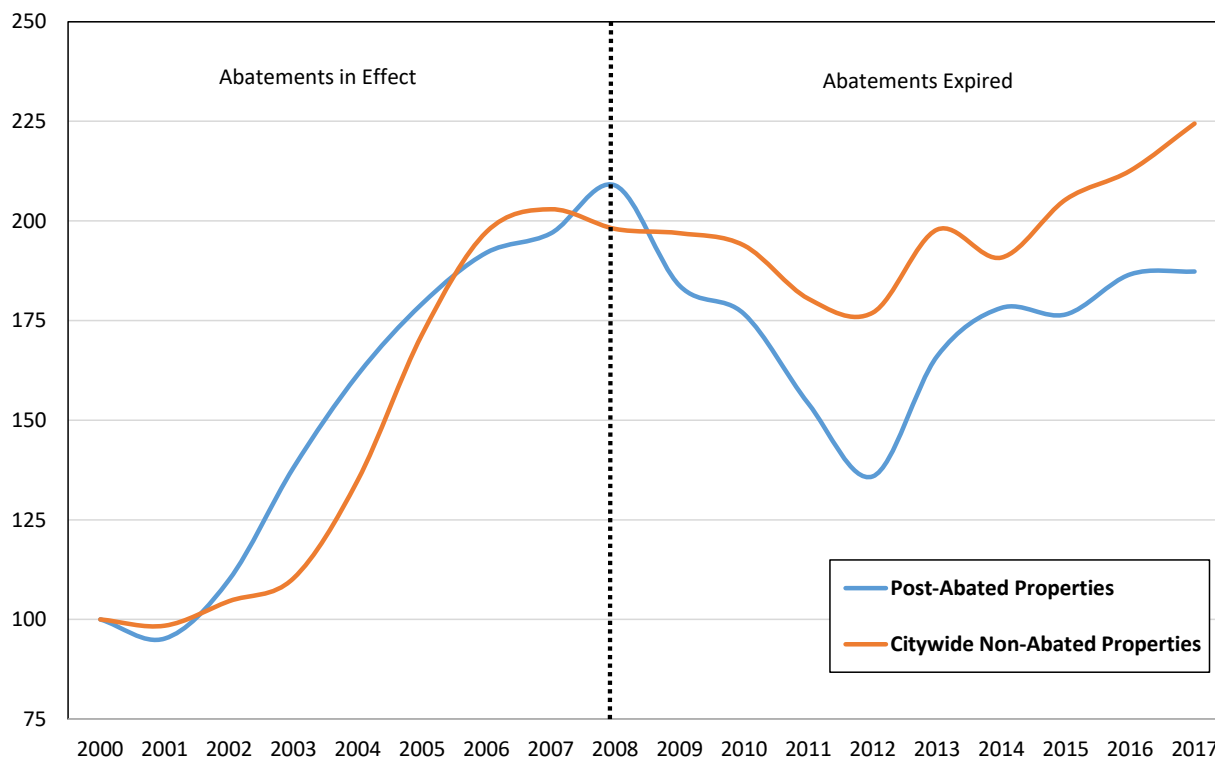
The blue line in the index for previously abated dwellings, while the orange line represents the index for non-abated dwellings. The percent change in either index between any two years reflect the general price appreciation (or depreciation) rate of properties in each index. The vertical dashed line in the middle of the chart represents when abatements that were previously granted began to expire after 2008. Hence, the movements in the blue line prior to 2008 represent how abated properties changed in value when their abatement was in effect, while movements in the same line after 2008 represent how these same abated properties changed in value after their abatements expired.

- **Price appreciation for both abated and non-abated properties was both strong and very similar while abatements were in effect during the 2000-2008 period.**

  - The index for abated dwellings increased from 100 to 209, reflecting a 109% increase in the general price level of abated dwelling during this period.
  - The index for non-abated dwellings increased from 100 to 203, indicating a 103% increase in the general price level of non-abated dwellings during the same period.
  - Hence, both abated and non-abated dwellings roughly doubled in value during the 2000-2008 housing boom years.

- **The post-boom recessionary years of 2008-2012 saw the value of previously abated properties fall by significantly more than non-abated properties.**

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- o From peak to trough, the price index for abated dwellings fell from 209 to 136; a 35% decline.
- o From peak to trough, the price index for non-abated dwellings fell from 203 to 176; a 13% decline.
- o Hence, the relative value of previously abated properties fell by almost three times the value of non-abated properties during the post-boom recession.
- o The greater magnitude of the decline in post-abated properties is likely due to their abatements expiring at the same time the overall housing market and economy underwent a significant contractionary phase.

- **While the decline in value for previously abated properties may be large, it should be noted that it was largely a "paper" decline.**

  - o Of the total 1,175 properties that sold after their abatements expired in the post-2008 period, only 59 of them (barely 5% of the total sample) sold between 2009 and 2012 when prices were generally falling.
  - o Hence, although the fall in prices was significant, most of these losses went unrealized by their owners as the vast majority of them (95%) waited until prices began to recover after 2012 to sell their previously abated unit.

- **During the post-2012 recovery period, previously abated properties increased in value by more than non-abated properties.**

  - o From trough to their current peak, the index for abated properties increased from 136 to 187; a 38% increase.
  - o From trough to their current peak, the index for non-abated properties increased from 176 to 224; a 27% increase.

- **Despite differential appreciation rates, previously abated properties still have significantly higher values than non-abated properties.**

  - o Because the current value of the index for previously abated properties is less than that of the index for non-abated properties (187 v. 224, respectively), it would be tempting to interpret this as meaning that the general price level of post-abated properties is below that of non-abated properties.
  - o This is emphatically _not true_. The fact that the former index is less than the latter implies that the general price appreciation of post-abated properties has been less than that of never-abated properties from 2000 through 2017. Of course, this statement does not apply to some sub-periods within those 18 years, when abated dwelling did outpace non-abated dwellings.
  - o As mentioned earlier in this paper, the median price of previously abated dwellings in the post-2008 period is $360,000, which is substantially higher than the median price of $156,000 for all non-abated dwellings in Philadelphia during the same period.

Using these results, a counterfactual sales price was computed for each property by applying the citywide house price index to the dwelling's original purchase price. Essentially, the original purchase price was "grown" by the percent change in the index to the dwelling's actual time of sale[5]. This price represents what each post-abated dwelling would have sold for if it had appreciated at the same rate as non-abated properties. The following table compares summary statistics on actual v. counterfactual sales prices:

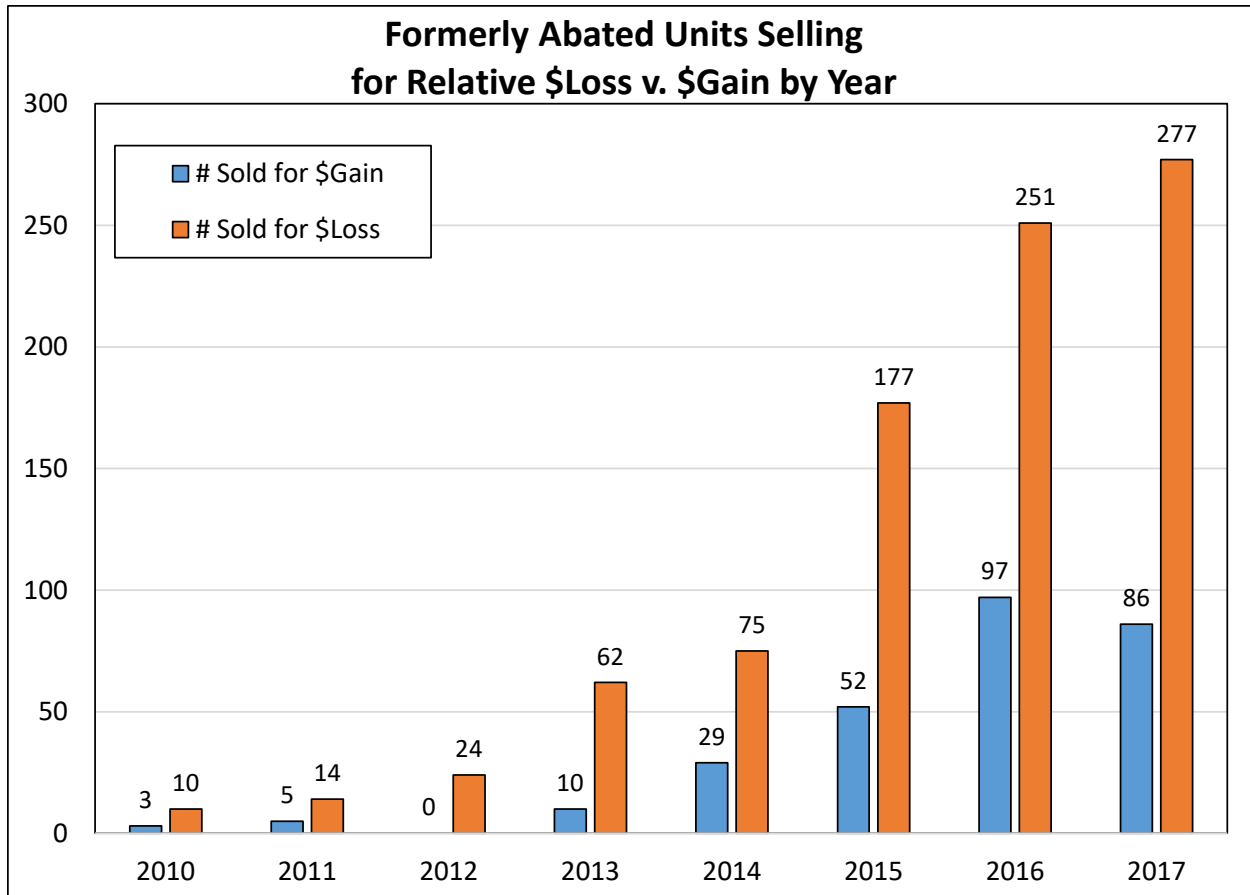**Actual Sales Prices v. Counterfactual Sales Prices for Properties with Expired Abatements**

	Actual Sale Price	Counterfactual Sale Price	%Difference
#Sales	1,175	1,175	N/A
25% Quartile Price	$255,000	$323,000	-21%
50% Median Price	$360,000	$440,000	-18%
Mean Price	$425,000	$506,000	-16%
75% Quartile Price	$505,000	$592,000	-15%

The results indicate that abated properties generally appreciated at a slower overall rate than that of the general housing market:

- The 25% lowest-priced sales of post-abated properties had sales prices of $255,000 or less. Had they appreciated at the citywide rate, they would have had a counterfactual price of $323,000 or less; a -21% difference.
- The median sales price of a previously abated property was $360,000. Their counterfactual median price is $440,000; a -18% difference.
- The top 25% highest-priced sales of post-abated properties had sales prices of $505,000 or more. Had these dwellings appreciated at the citywide rate, they would have had sales prices of $592,000 or more; a -15% difference.

Using these results, all formerly abated properties were then re-classified as "Relative Gainers" or "Relative Losers" based upon whether or not their percentage change in price pre- and post-abatement either exceeded or lagged the overall percentage change in the housing market's price index during that same period. The following chart compares the number of relative gainers and losers in each year as abatements expired:

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[5] Example: a new condo unit in Center City is completed in 2005 and immediately sells for $430,000. Ten years later, it sells for $475,000; a 10% gain. But, during this same period, the citywide price index increased by 18%. Had this condo appreciated at the citywide (non-abated) rate, it would have sold for $514,798, which is its counterfactual price.

Formerly Abated Units Selling
for Relative $Loss v. $Gain by Year

Legend:
- # Sold for $Gain
- # Sold for $Loss

Year	# Sold for $Gain	# Sold for $Loss
2010	3	10
2011	5	14
2012	0	24
2013	10	62
2014	29	75
2015	52	177
2016	97	251
2017	86	277

These results indicate that the number of relative losers exceeded the number of relative gainers in each year following the expiration of these dwelling's abatement:

- Of the 1,175 properties which sold after their abatements expired, 282 sold for relative gains, while the remaining 893 sold for relative losses.

- Also, the dollar amount of relative gains was generally smaller than the dollar amount of relative losses:
    - Of those that sold for a relative gain, the median gain was $56,000.
    - Of those that sold for a relative loss, the median loss was -$108,000.

- Lastly, this difference in gains v. losses is not distributed uniformly across properties. Lower-priced dwellings typically experienced small gains and large losses, while high-priced dwellings generally experienced large gains but only small losses:

    - Of the 25% lowest-priced properties (originally purchased for $255,000 or less), those that sold for a gain experienced an average gain of $22,000 while those that sold for a loss experienced an average loss of $169,000.
    - Of the 25% highest-priced properties (originally purchased for $505,000 or more), those that sold for a gain experienced an average gain of $124,000 while those that sold for a loss sold for an average loss of only $64,000.

o Note that this result is also true for changes in absolute prices: dwellings that were higher-priced to begin with generally experienced larger gains in both dollar and percentage terms than lower-priced dwellings.

In summary: Most abated properties generally sold for prices that were higher than their original purchase price once their abatements expired. However, their general appreciation rate has lagged that of non-abated properties.

The results would seem to suggest a number of broader implications about the Philadelphia's abatement program:

- **First, any assertions or concerns that the expiration of the abatement would lead to a massive liquidation of previously abated properties at steep discounts is strongly refuted and rejected by the data.** As mentioned in the first paper in this series, approximately two-thirds of previously abated dwellings still remain in the hands of their original owner-occupants. Of the remaining third that have sold, most have sold for prices higher than their original purchase price.

- **Second, the data indicate that the value that buyers/investors place on the abatement is both very large and very real: adding approximately 15-20% to a property's purchase price.** After adjusting for general price fluctuations in the market, most previously abated properties sold for a relative discount of 15-20% compared to non-abated properties[6]. Since abated properties are either new construction or had recently undergone significant improvements, it is unlikely that this decline can be explained by deterioration in their physical quality. It is also unlikely that this could be explained by declines in the location value of these dwellings (e.g. deteriorating neighborhood quality-of-life) since the majority of them are either in the prime neighborhood of Center City or in the revitalizing neighborhoods surrounding Center City. That only leaves the only other thing that can affect the property's value: its tax treatment; i.e. the expiring abatement.

- **Third, interpreting the financial benefit that the abatement's tax treatment confers to a dwelling is likely to depend upon one's personal opinion about the abatement.** To critics and skeptics of the program, the 15-20% premium that the abatement adds to a property's initial value but then dissipates afterwards will likely be viewed as an unnecessary and wasteful tax giveaway that simply pads the bottom line of developers who build these properties. To proponents of the program, the 15-20% premium is proof that the program is giving a needed boost to house prices in order to help cover Philadelphia's very high cost of construction[7], thus making new development happen that wouldn't otherwise[8].

- **Finally, preserving and increasing the location value of abated dwellings is the best way to mitigate against any future (post-abatement) losses in value, whether absolute or relative.**

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[6] Astute readers may point out that the true value of an abatement is the present discounted value of the foregone tax payments over ten years. This will be computed and examined in the final installment of this series, which will examine the fiscal impact of past-abated properties.

[7] Philadelphia's cost of construction is 4th-highest in the U.S., after New York, San Francisco and Boston. Source: enr.com.

[8] Full disclosure: this author has previously published research supporting this latter view of the abatement.

Once an abatement is granted to a property, the property's future (post-abatement) value is determined by a metaphorical "horse race" between its location value and its structure value. The location value is reflected in the land value of the property, which is not covered by the abatement and also generally increases over time due to both general inflation and the continued revitalization of those neighborhoods that attract abated dwellings (which both reflect and improve the desirability of those neighborhoods). Conversely, the structure value of an abated property, which is covered by the abatement, generally declines over time due to both physical depreciation of the property and the downward amortizing of the abatement. The more that city officials and community groups can do to increase the desirability of these neighborhoods, the greater the increase in the land value of abated properties will be, which will ultimately soften and potentially counteract declines in the structure value of these properties once their abatement expires.

The next and final installment in this series will examine the fiscal impact that post-abated properties have had in Philadelphia.

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Appendix

For an intuitive tutorial on how repeat-sale house price indices are computed, here is an excellent video:
https://www.youtube.com/watch?v=jnbEsM7SajA

Price Index Regression Output for Abated Properties

The SAS System

The REG Procedure
Model: MODEL1
Dependent Variable: ln_ret

Number of Observations Read	1175
Number of Observations Used	1175

Note: No intercept in model. R-Square is redefined.
Weight: wght5

Analysis of Variance					
Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	17	7072.60531	416.03561	57.74	<.0001
Error	1158	8344.26073	7.20575		
Uncorrected Total	1175	15417			

Root MSE	2.68435	R-Square	0.4588
Dependent Mean	0.15051	Adj R-Sq	0.4508
Coeff Var	1783.50723		

Parameter Estimates					
Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
year_2001	1	-0.04926	0.10769	-0.46	0.6474
year_2002	1	0.09479	0.09858	0.96	0.3365
year_2003	1	0.32258	0.08226	3.92	<.0001
year_2004	1	0.47891	0.07435	6.44	<.0001
year_2005	1	0.58348	0.07339	7.95	<.0001
year_2006	1	0.65253	0.07329	8.90	<.0001
year_2007	1	0.67749	0.07494	9.04	<.0001
year_2008	1	0.73668	0.12326	5.98	<.0001
year_2009	1	0.60840	0.02216	27.45	<.0001
year_2010	1	0.56916	0.08873	6.41	<.0001
year_2011	1	0.43288	0.10548	4.10	<.0001
year_2012	1	0.30668	0.09359	3.28	0.0011
year_2013	1	0.50707	0.07557	6.71	<.0001
year_2014	1	0.57764	0.07634	7.57	<.0001
year_2015	1	0.56836	0.07295	7.79	<.0001
year_2016	1	0.62372	0.07279	8.57	<.0001
year_2017	1	0.62756	0.07326	8.57	<.0001

Price Index Regression Output for Citywide Non-Abated Properties

The SAS System

The REG Procedure
Model: MODEL1
Dependent Variable: ln_ret

Number of Observations Read	69117
Number of Observations Used	69117

Note: No intercept in model. R-Square is redefined.
Weight: wght5

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	18	565757	31431	4906.84	<.0001
Error	69099	442616	6.40553		
Uncorrected Total	69117	1008373			

Root MSE	2.53092	R-Square	0.5611
Dependent Mean	0.65104	Adj R-Sq	0.5609
Coeff Var	388.74741		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
year_2000	1	-0.13645	0.00816	-16.72	<.0001
year_2001	1	-0.01589	0.00825	-1.93	0.0541
year_2002	1	0.04474	0.00874	5.12	<.0001
year_2003	1	0.09808	0.00930	10.55	<.0001
year_2004	1	0.29972	0.00981	30.55	<.0001
year_2005	1	0.53976	0.01118	48.28	<.0001
year_2006	1	0.67939	0.01211	56.11	<.0001
year_2007	1	0.70771	0.01242	57.00	<.0001
year_2008	1	0.68306	0.01310	52.12	<.0001
year_2009	1	0.67763	0.01266	53.54	<.0001
year_2010	1	0.66196	0.01179	56.16	<.0001
year_2011	1	0.59045	0.01267	46.60	<.0001
year_2012	1	0.57085	0.01125	50.74	<.0001
year_2013	1	0.68217	0.01006	67.81	<.0001
year_2014	1	0.64609	0.00962	67.17	<.0001
year_2015	1	0.71975	0.00870	82.76	<.0001
year_2016	1	0.75425	0.00809	93.22	<.0001
year_2017	1	0.80840	0.00796	101.62	<.0001