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REAL PROPERTY TAX BASE, MARKET VALUES, AND MARCELLUS SHALE: 2007 TO 2009

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Local Real Property Tax Base and Marcellus Shale: 2007 to 2009

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Introduction

Over the past few years, Marcellus shale has been generating a great amount of interest throughout Pennsylvania. Marcellus shale development is still in the initial stages of growth, and many questions about its economic implications have surfaced. There has been much discussion about the impact of gas development on local tax collections, and local officials so far generally are not reporting large increases in revenue due to the activity (Jacobson and Kelsey, 2011; and Kelsey and Ward, 2011). Directly examining the impact of Marcellus activity on the local real property tax base and on aggregate market values at the local level can provide another perspective on the local fiscal impacts of gas development. If the local tax base is increasing due to gas development, local real property tax collections will increase with no change in tax rates, giving local governments and school districts more dollars to manage impacts of Marcellus shale development.

Data available from the Pennsylvania State Tax Equalization Board (STEB)[2] allows looking at how assessed and market values are changing in relation to Marcellus drilling activity at the county and municipal level. This analysis is important because it helps understand overall what is occurring at these jurisdictional levels, with implications for local tax collections and the overall real estate market. The STEB data provides a 'Big Picture' view of what is occurring at the county and municipal level, but cannot help understand what is occurring on individual parcels. Changes at the jurisdiction level reflect the sum value all the properties within the jurisdiction (or in the case of assessed values, the sum of all the taxable properties). These sums hide major changes that could be occurring at the individual property level. If one part of the jurisdiction has been growing dramatically, with high market demand and thus rising real estate prices, for example, and another part of the jurisdiction has been declining, with falling real estate prices, the sum value of all properties within the jurisdiction may not change much. But for individual property owners, these local changes are of critical importance because they affect how the value of their individual property is changing. For many homeowners, their house is their largest asset, so changes in market value have direct implications for their economic well-being.

Method of Analysis

Changes in market and assessed values were calculated for all Pennsylvania counties and municipalities between 2007 and 2009, using information from the Pennsylvania State Tax Equalization Board (STEB), which annually analyzes real property sales data gathered from county assessment offices. STEB's data is used by the Commonwealth as part of its school subsidy formula, and it thus serves as the official data used by the state about how market and assessed values are changing across Pennsylvania. Their data does not yet include information from 2010 or 2011, which is when Marcellus activity really expanded, so the analysis can only consider the earliest years of Marcellus development. There was sufficient activity through 2009 that local impacts should be apparent in some municipalities.

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[2] This study used the corrected data, revised by STEB as requested by the Pennsylvania Auditor General in February, 2011.

We omitted the counties that reassessed in 2008 or 2009 from our assessed value calculations, because reassessment changes the base year used for calculating assessed values, making the 2007 and 2009 data incomparable. These included Butler, Clarion, Clinton, and Luzerne counties. Even though Columbia County did not reassess, the reassessment in Luzerne County changed assessed values in four Luzerne County municipalities located within the Berwick Area School District (Columbia County), making data between 2007 and 2009 not directly comparable in the county. We categorized counties by the total number of Marcellus Shale wells drilled in 2007, 2008 and 2009, using data from the Pennsylvania Department of Environmental Protection (DEP), and calculated the average changes in each group. Of the 67 Pennsylvania counties, 5 counties had more than 90 Marcellus wells, 11 had between 11 and 89 wells, and 11 had 10 or fewer Marcellus wells drilled during these years. Forty had no Marcellus wells (see Appendix).

Municipalities similarly were categorized by the number of Marcellus Shale wells drilled during the study years, also using DEP data. Twelve Pennsylvania municipalities had 20 or more Marcellus Shale wells drilled within their jurisdiction between 2007 and 2009. An additional 16 had between 10 and 19 wells drilled during that time period, and 94 municipalities had between 1 and 9 Marcellus wells.

Results

A. Market Values at the Jurisdiction Level

The *market value* of a property is the price at which it would sell in a competitive market. In other words, it is an estimate of what landowners will receive if they sell the property on the open market, and the fair price that buyers will pay to purchase the property. Market values can change due to new construction, property improvements or damage, changing market demand, or changes in the neighborhood that affect the desirability of the property. Changes in market value are important to landowners because they directly affect how much the property is worth if resold. At a county or municipal level, changes in market value reflect overall how demand for property is changing within the jurisdiction.

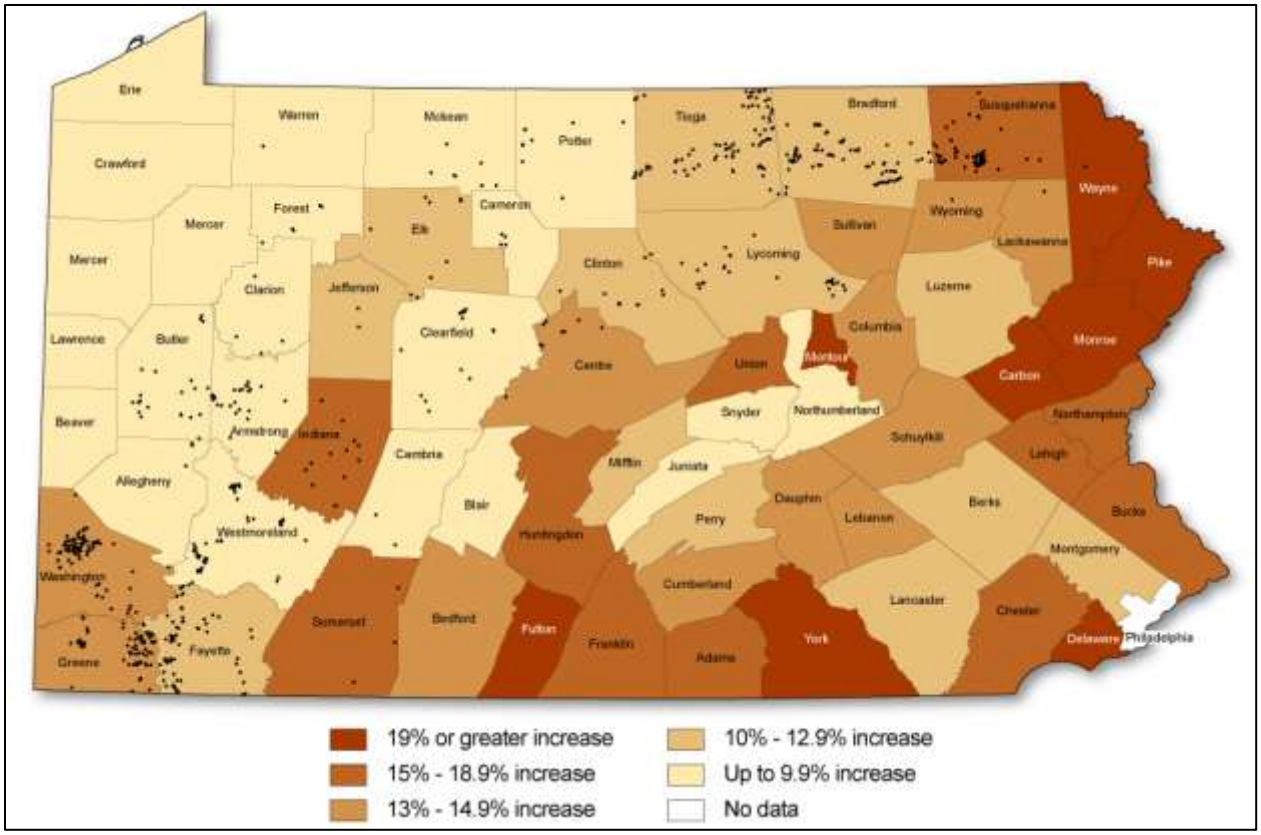

Figure 1. Market Value Change & Marcellus Wells, 2007 to 2009

Analysis of changes in market value at the county level show no real pattern associated with Marcellus shale drilling activity (see Map 1 and Table 1). Counties with more than 90 wells averaged a total property market value increase of 13.8 percent between 2007 and 2009, which was slightly higher than the 13.7 percent average increase experienced in counties with no Marcellus shale wells during this time period. Both sets of counties did better than the statewide average increase of 12.5 percent. Counties with a low or medium level of some Marcellus well activity, in contrast, on average experienced total market value increases smaller than the state average.

Table 1. County Level Average Change in Market Value, By Marcellus Wells, 2007 to 2009

Marcellus Activity in County	Average Change in Market Value
More than 90 wells	13.8%
11 to 89 wells	10.0%
10 or fewer wells	11.0%
No wells	13.7%
State Average Change by County	12.5%

In contrast, market value changes at the municipal level seem associated with Marcellus shale drilling activity. Townships and boroughs with more Marcellus wells on average experienced larger average increases in market value than did those without Marcellus wells (see Table 2). Municipalities with 20 or more Marcellus wells between 2007 and 2009 on average experienced a 15.8 percent increase in total market value within their jurisdiction, compared to only a 12.2 percent increase in townships and boroughs without any Marcellus wells. As discussed previously, these municipal-wide totals do not address questions about how property values are changing immediately adjacent to natural gas activity, but they mean that if there are decreases in property value at some locations due to drilling activity within the municipality, these tend to be offset by increases elsewhere in the township (such as would occur due to increased demand for housing, or industrial space). Such offsets are not a consolation to the owners of property which may be decreasing in value, so the equity of whose property values may be increasing and whose may be decreasing is important to consider.

Table 2. Municipal Level Average Change in Market Value, by Marcellus Wells, 2007 to 2009

Marcellus Activity in Municipality	Average Change in Market Value
20 or more wells	15.8%
10 to 19 wells	13.5%
1 to 9 wells	12.4%
No Marcellus wells	12.2%
State Average Change by Municipality	12.2%

B. Assessed Values at the Jurisdiction Level (e.g. Tax Base)

The *assessed value* is the taxable value of the property, used for determining how much the property owner should pay in real property taxes. Assessed values for all properties in a county are set during a formal county-wide reassessment process, which in the Commonwealth typically is done every twenty years or so. The assessed value is determined by the county Assessment office, based upon the market value during the year of reassessment. Other than during a reassessment year, assessed values do not change unless the property is changed in some way, such as from new construction or damage on the parcel, or if the owner successfully appeals that the assessment is not accurate. They are unaffected by market price changes, which means a property's market value can rise or fall, even significantly, but its assessed value will not change

The total value of assessed properties in a jurisdiction is known as the Real Property Tax Base, and it is important because these affect how much tax revenue a given millage rate will generate for counties, school districts, and municipalities; a larger tax base means tax rates can be lower to raise the same amount of tax revenue for a local government or school district. The size of the tax base thus affects the size of the millage rate, and thus how much individual property owners owe in local real property tax. This is why living in a wealthier tax base can be beneficial to a homeowner; the tax burden can be spread wider, making individual property owners' tax bills smaller.

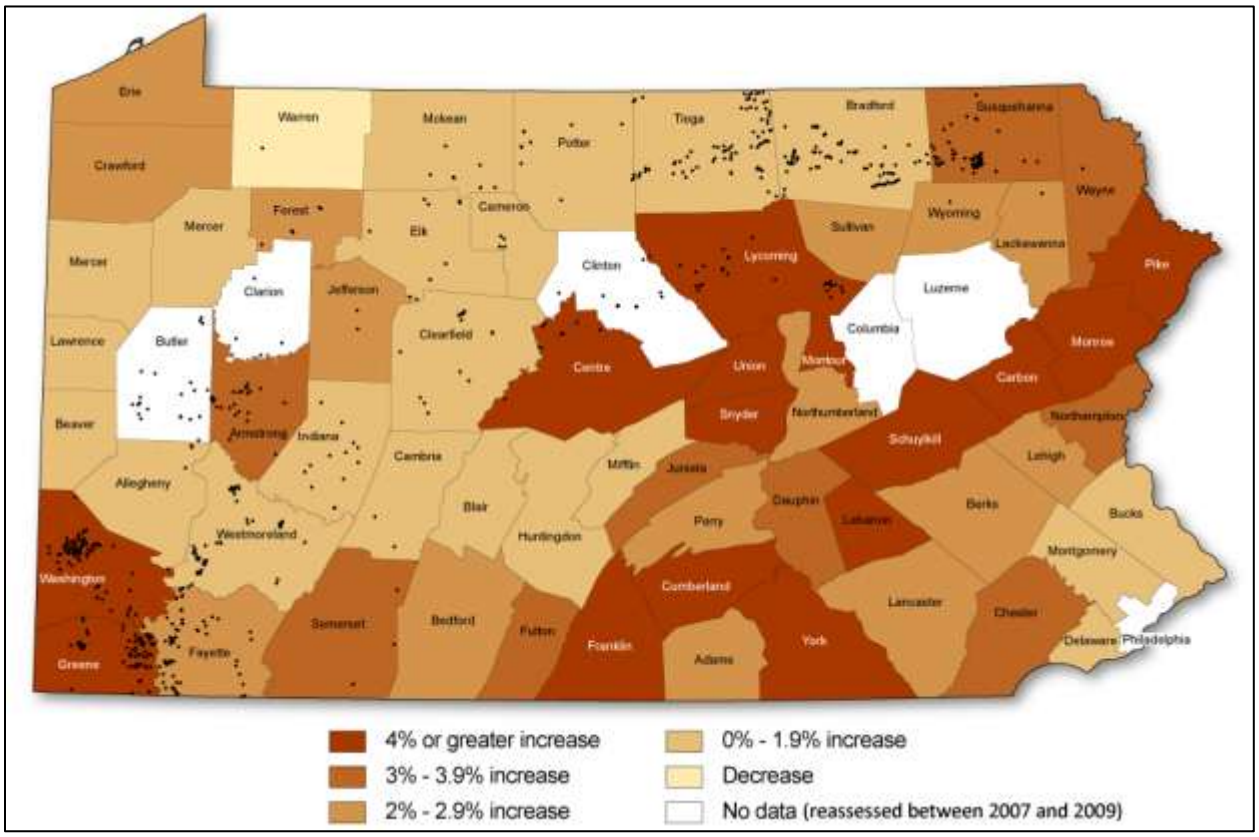

Figure 2. Assessed Value Change & Marcellus Wells, 2007 to 2009

Like with market values, there is no clear pattern between changes in total assessed values at the county level and the level of drilling activity (see Map 2 and Table 3). Counties which had more than 90 Marcellus wells drilled between 2007 and 2009 on average experienced a real property tax base increase of 3.2 percent, compared to an average increase of 3.0 percent in counties without Marcellus wells. Counties which had between 11 and 89 wells, and 10 or fewer wells, on average experienced below average increases in assessed value.

Table 3. Average Change in Total Assessed Value (Tax Base), by Marcellus Wells, 2007 to 2009

Marcellus Activity in County	Average Change in Assessed Value
More than 90 wells	3.2%
11 to 89 wells	2.5%
10 or fewer wells	2.1%
No wells	3.0%
State Average Change by County	2.8%

Municipalities with Marcellus wells on average experienced somewhat higher real property tax base increases than did municipalities with no wells (see Table 4), but this pattern did not seem related to the scale of the drilling activity. Townships and boroughs with between 10 and 19 wells, for example, averaged an increase of 4.1 percent in total assessed value, compared to an average 3.5 percent increase in townships and boroughs with 20 or more wells.

Table 4. Municipal Level Average Change in Assessed Values (Tax Base), by Marcellus Wells, 2007 to 2009

Marcellus Activity in Municipality	Average Change in Assessed Value
20 or more wells	3.5%
10 to 19 wells	4.1%
1 to 9 wells	2.4%
No Marcellus wells	2.2%
State Average Change in Municipalities	2.3%

If the scale of drilling activity is ignored, the average tax base increase among municipalities with drilling was 2.8 percent, which is about 0.6 percent higher than the average increase municipalities with no drilling. In 2009, this meant municipalities with drilling received an average of $973.08 more in real property tax revenues than they would have had without any drilling activity (the median increase was $447.42) (calculated using DCED Local Government Financial Statistics data).

Implications

The STEB data indicates that Marcellus Shale development so far is having minor impact on total property values and the real property tax base in Pennsylvania counties. There is no clear pattern to average changes in market value or assessed value, relative to the level of drilling activity. Because the real property tax base helps determine how many dollars are collected for a given tax rate, this means that Marcellus Shale development has not had a noticeable impact on county real property tax collections.

At the municipal level, the STEB data indicates that Marcellus Shale development in general is associated with higher than average increases in total market values within those townships or boroughs with drilling activity. These market value increases seem to be only partially translated into changes in the tax base (total assessed values), which suggest that the overall market price increases are a combination of improvements to property (which increase assessed values), and overall increases in demand for existing parcels.

Municipalities with Marcellus shale drilling activity on average had somewhat higher increases in assessed value than did municipalities without such drilling, but these increases were not related to the scale of drilling activity. In 2009, these tax base increases translated into an average increase of $973.08 in total real property tax revenue such municipalities (median increase of $447.42), which is small relative to the amount of activity occurring within those jurisdictions with drilling activity. These results

are consistent with prior research that found negligible or mixed revenue impacts of Marcellus shale development on local governments (Jacobson and Kelsey, 2011; Kelsey and Ward, 2011).

The recently passed local impact fee (HB 1950) provides the opportunity for county and municipal governments to receive some additional dollars to help cover local public expenses resulting from drilling activity. It is too early to tell how well the fee collections will relate to the actual costs borne within these communities.

It is important to keep in mind that the STEB data reflects the total value of properties in the jurisdiction, so these results are not relevant for understanding what is occurring with market values on individual parcels. Much of the public uncertainty about property values is understanding what is happening to parcels on or near where drilling is occurring. Since the data and analysis is at the county- and municipal level, it misses potential critical differences within the jurisdiction that may be of concern to individual landowners, and of the equity of who is benefitting and who is bearing costs as a result of the drilling activity. For example, anecdotes from communities with significant Marcellus development activity suggest that real estate is being affected by a variety of competing factors which affect demand, and thus market value. There are common reports of rising demand for commercial and industrial properties, which gas companies and others require for office space, storage, maintenance facilities, and other related use. The need for worker housing has increased rents and demand for homes in many communities. In addition, new hotels and other buildings are being constructed in some of the communities due to gas development activity, increasing the market and assessed value of the parcels being built upon. In places where the surface owner also owns the mineral rights, sale prices reflect the value of both the land itself and the potential lease or royalty values (though these are not reflected in assessed values because natural gas currently is exempt from the real property tax). At the same time, there are reports that the value of some properties near well sites, compressor stations, or other gas activity are declining due to their proximity to the gas activity, property damage, changing water quality, or other effects. The impact of Marcellus development on individual property owners depends critically upon where their land is located relative to these changes, not simply on the overall changes within the jurisdiction.

In addition, the STEB data reflects the market transactions which have actually occurred. It is possible that uncertainty about drilling has affected landowners' willingness to sell properties, and potential buyers' willingness to purchase properties in areas with Marcellus activity. There are anecdotal stories suggesting some landowners are hesitant to sell because they are unsure about the value of their mineral rights and potential future royalties, and that some buyers similarly are hesitant to buy properties because of uncertainty about water quality or other possible impacts of drilling. If these actions are widespread across the Marcellus region, real estate market activity would be affected and the STEB data may not be accurately reflecting these underlying trends.

Since Marcellus shale development is a fairly new and constantly evolving activity in Pennsylvania, it is important to continually monitor and analyze the relationship between drilling activity and local property values, tax base, and local government revenues. The current results reflect where drilling activity has been occurring in those municipalities, and may change over time as the local pattern of drilling activity changes within these communities, and as the total number of wells increases. Anecdotes suggest that much of the drilling activity so far has been focused on the agricultural, forest, and otherwise more rural parts of the municipalities, which generally have relatively low per-acre market and assessed values. If drilling negatively affects property values, since the value of these agricultural and forest lands tend to be relatively low, the overall impact on total property values within the jurisdiction will not be great (though it still is bad for the owners of those parcels). In contrast, if

drilling shifts into residential and other areas of concentrated relatively high value properties, the drop of total assessed and market values could be much greater, affecting the overall tax base (as well as those neighbors). In addition, when drilling activity wanes and workers move elsewhere, it is likely that demand for housing and other properties will fall, potentially dropping market values. It is unclear how permanent or transitory market and assess value increases will be, and thus whether in the long run the local tax base in jurisdictions with drilling will be higher or lower relative to those jurisdictions without drilling activity.

References:

Governor's Center for Local Government Services. 2011. "Local Government Financial Statistics, 2009." Harrisburg, PA.: Pennsylvania Department of Community and Economic Development.

Jacobson, Michael, and Timothy W. Kelsey. "Impacts of Marcellus Shale Development on Municipal Governments in Susquehanna and Washington Counties, 2010." Penn State Cooperative Extension, The Pennsylvania State University. Marcellus Education Fact Sheet. 2011.

Kelsey, Timothy W. "Reassessment: What Property Owners Need to Know." Penn State Cooperative Extension, The Pennsylvania State University. 2007.

Kelsey, Timothy W., and Melissa M. Ward. "Natural Gas Drilling Effects on Municipal Governments Throughout Pennsylvania's Marcellus Shale Region, 2010." Penn State Cooperative Extension, The Pennsylvania State University. Marcellus Education Fact Sheet. 2011.

Pennsylvania State Tax Equalization Board. (2011). " STEB Market Values." Harrisburg, PA: Pennsylvania State Tax Equalization Board.

Pennsylvania State Tax Equalization Board. (2011). "County's Assessed Values." Harrisburg, PA: Pennsylvania State Tax Equalization Board.

Pennsylvania Department of Environmental Protection. (2011). "Wells Drilled By County." Harrisburg, PA.: Pennsylvania Department of Environmental Protection.

Pennsylvania Department of Environmental Protection. (2011). "Wells Drilled By Municipality." Harrisburg, PA.: Pennsylvania Department of Environmental Protection.

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Appendix: Changes in Total Market and Assessed Values, and Number of Marcellus Wells by County, 2007-2009.			
County	**Market Value**	**Assessed Value**	**Number of Wells**
Adams	16.3%	2.38%	0
Allegheny	6.9%	1.22%	3
Armstrong	9.2%	3.49%	19
Beaver	9.6%	1.82%	0
Bedford	14.2%	2.70%	0
Berks	12.2%	2.59%	0
Blair	8.4%	1.69%	0
Bradford	10.6%	1.37%	127
Bucks	15.3%	1.43%	0
Butler	8.7%	*	18
Cambria	8.2%	1.80%	2
Cameron	2.4%	1.41%	1
Carbon	19.1%	6.40%	0
Centre	14.5%	4.34%	12
Chester	16.3%	3.53%	0
Clarion	8.3%	*	4
Clearfield	7.0%	1.58%	31
Clinton	10.8%	*	15
Columbia	13.2%	+	0
Crawford	8.9%	2.49%	0
Cumberland	14.6%	4.69%	0
Dauphin	14.6%	3.01%	0
Delaware	19.5%	1.76%	0
Elk	11.0%	0.82%	10
Erie	7.9%	2.03%	0
Fayette	10.9%	2.98%	73
Forest	7.4%	2.36%	5
Franklin	17.7%	5.20%	0
Fulton	22.8%	3.39%	0
Greene	13.2%	4.88%	109
Huntingdon	17.5%	1.83%	0
Indiana	15.1%	1.53%	11
Jefferson	12.0%	2.26%	3
Juniata	8.8%	3.08%	0
Lackawanna	15.0%	2.73%	1
Lancaster	12.3%	2.74%	0

Lawrence	8.5%	1.61%	0
Lebanon	14.5%	4.02%	0
Lehigh	16.2%	2.85%	0
Luzerne	12.4%	*	0
Lycoming	11.6%	5.10%	37
McKean	5.5%	0.43%	13
Mercer	6.9%	1.89%	0
Mifflin	10.2%	1.72%	0
Monroe	20.1%	5.18%	0
Montgomery	12.5%	1.60%	0
Montour	19.5%	5.05%	0
Northampton	16.8%	3.51%	0
Northumberland	9.4%	2.40%	0
Perry	13.0%	2.59%	0
Philadelphia [2]	7.7%	5.21%	0
Pike	19.6%	4.51%	0
Potter	7.8%	0.82%	11
Schuylkill	13.2%	4.02%	0
Snyder	8.9%	4.15%	0
Somerset	15.9%	3.50%	3
Sullivan	13.9%	2.52%	0
Susquehanna	17.2%	3.13%	92
Tioga	12.7%	1.65%	122
Union	18.6%	4.70%	0
Venango	9.8%	1.13%	0
Warren	5.6%	-0.13%	0
Washington	14.9%	4.73%	170
Wayne	20.1%	3.29%	1
Westmoreland	8.7%	1.98%	65
Wyoming	13.8%	2.07%	1
York	20.4%	4.41%	0

***Reassessed between 2007 and 2009, so assessed values are not comparable**
+Total assessed value in STEB data is affected by reassessment in Luzerne County, so 2007 and 2009 are not comparable

Source: Pennsylvania State Tax Equalization Board, and the Pennsylvania Department of Environmental Protection.

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