Marcellus Shale and Local Collection of State Taxes: What the 2011 Pennsylvania Tax Data Say

Charles Costanzo and Timothy W. Kelsey

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Development of Marcellus shale natural gas in Pennsylvania has brought many changes to parts of the Commonwealth. Because of the rather recent nature of the drilling activity, the extent of its effects on local economies and state tax collections has not been clearly understood. Marcellus-related activity can affect these through several means. Leasing and royalty income paid to mineral right owners increases household income, and since it is taxable under the state’s personal income tax, will affect state income tax collections. Increases in local employment or earnings due to Marcellus-related work can likewise affect state income tax collections. If mineral right owners and those employed due to Marcellus development spend more money locally, state sales tax collections can increase. If development of the Marcellus Shale affects local real estate markets, it may similarly affect realty transfer tax collections.

It still is early in the development of Marcellus Shale, so much cannot be known about its full long run economic implications. Yet state tax collection information gathered by the Pennsylvania Department of Revenue can provide some insight into the short run economic and state tax implications of gas development in the Commonwealth. This Fact Sheet provides basic analysis of state tax information between the years of 2007-2011 as reported in the Department of Revenue’s ‘Pennsylvania Tax Compendium.’ The Fact Sheet updates similar analysis we conducted last year using 2010 data (Costanzo and Kelsey, 2011), and provides a more current perspective on Marcellus shale activity and state taxes. The data continue to show distinct differences between counties with Marcellus Shale gas drilling and those without.

Method of Analysis

Counties were categorized by the number of Marcellus shale wells drilled during the study years, using Pennsylvania Department of Environmental Protection data. Changes in state tax collections within each county were calculated using the Department of Revenue data, and then the average change was calculated within each category. The analysis had to be conducted somewhat differently, depending upon the specific tax. The currently available state sales and realty transfer tax data is from the 2010/2011 fiscal year (June 1 through July 30), while the currently available Personal Income Tax data is from calendar year 2009. For analysis of the sales tax and realty transfer tax, we grouped counties by those with 150 or more Marcellus wells, 10 to 149 Marcellus wells, 1 to 9 Marcellus wells, and no Marcellus wells between July 1, 2007, and June 30, 2011. For the personal income tax analysis, we grouped counties by those with more than 90 Marcellus wells between 2007 and 2009; 10 to 89 Marcellus wells; 1 to 9 Marcellus wells; and no Marcellus wells. These categories were selected based upon how the counties clustered by well counts. To see how these are changing over time, we compared these results to last year’s analysis.

It is important to note that the data reflect tax collections by the state government within each county; county governments cannot levy these taxes, so the changes should not be viewed as affecting local tax collections. Previous studies on Marcellus shale development and local government and school district finances have found very mixed or slight tax impacts, in large part because much of the new income occurring from Marcellus development is not subject to available local taxes (see, for example, Kelsey and Ward, 2011; Jacobson and Kelsey, 2011; Kelsey, Adams, and Milchak, 2012; and Kelsey, Hartman, Schafft, Borlu, and Costanzo, 2012).

State Sales Tax Collections

Sales tax collections are a marker of the level of retail activity occurring within a county. Higher local retail sales means more state sales tax collections, while declining local retail sales means lower collections (though changes in sales tax collections don’t perfectly track retail sales because food and clothing are excluded from the tax). The
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data indicate sales tax collections in counties with much Marcellus activity continued to outperform collections in counties with less or no Marcellus activity. State collections in counties with 150 or more Marcellus wells drilled between July 1, 2007, and June 30, 2011, for example, experienced an average increase of 23.8% between these years (see Table 1), compared to an average decrease of 5.1 percent in counties with no Marcellus activity. These average increases in Marcellus counties are higher than experienced between 2007 and 2010, suggesting that retail activity continued to increase in those counties. The increases between 2007 and 2011 were particularly dramatic in several counties; sales tax collections in Bradford County increased 50.8 percent, collections in Greene County increased 31.4 percent, and collections in Susquehanna County increased 27.4 percent during this time period. Sales tax collections dropped in only three of the 23 counties with more than 10 Marcellus wells during this time period, compared to decreases in 22 of the 32 counties with no Marcellus shale drilling. The data fits anecdotes about Marcellus activity increasing local retail activity.

<table>
<thead>
<tr>
<th>Level of Marcellus Activity</th>
<th>Average Percent Change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>July 1, 2007 to June 30, 2010</td>
</tr>
<tr>
<td>150 or more Marcellus wells drilled</td>
<td>11.4% (5)</td>
</tr>
<tr>
<td>10 to 149 Marcellus wells drilled</td>
<td>-0.9% (13)</td>
</tr>
<tr>
<td>1 to 9 Marcellus wells drilled</td>
<td>-1.2% (13)</td>
</tr>
<tr>
<td>No Marcellus wells drilled</td>
<td>-7.8% (36)</td>
</tr>
<tr>
<td><strong>State Average at the county level</strong></td>
<td><strong>-3.8% (67)</strong></td>
</tr>
</tbody>
</table>

Realty Transfer Tax Collections

Pennsylvania’s Realty Transfer Tax is a 1 percent tax on the sales of real estate (many municipal governments and school districts also levy a local realty transfer tax). Changes in Realty Transfer Tax collections result from changes in the average value of sold properties, changes in the number of sales, or a combination of both.

Between 2007 and 2011, realty transfer tax collections across the Commonwealth suffered from the collapse of the housing bubble. Counties with much Marcellus shale drilling appeared to avoid some of these declines, and generally did better than the statewide average. State realty transfer tax collections in counties with 150 or more wells on average increased 4.3 percent between 2007 and 2011, compared to an average 33.4 percent decline in counties with no Marcellus drilling (see Table 2). This 4.3 percent increase is a substantial improvement over collections from 2007 to 2010, when they had an average 14.5 percent decline in collections, but yet even then performed better than did counties without any Marcellus wells. The large change in 2011 means the counties with much drilling activity on average saw large increases in either sales activity, real estate prices paid, or a combination of both during that year. Those counties with less drilling activity on average did better between 2007 and 2011 than did those without any wells, though the pattern varied a bit from the 2007 to 2010 experience. Counties with no Marcellus shale wells on average experienced larger decreases in state realty transfer tax collections, with the average loss increasing from 28.2 percent from 2007 to 2010, to an average loss of 34.4 percent from 2007 to 2011. The data suggest that collections in the counties without Marcellus shale drilling on average continued to decline over these years, while the collections in high drilling activity Marcellus counties were trending in the opposite direction.
Table 2. Average Change in State Realty Transfer Tax Collections, by County

<table>
<thead>
<tr>
<th>Level of Marcellus Activity</th>
<th>Average Percent Change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>July 1, 2007 to June 30, 2010</td>
</tr>
<tr>
<td></td>
<td>(number of counties)</td>
</tr>
<tr>
<td>150 or more Marcellus wells drilled</td>
<td>-14.5% (5)</td>
</tr>
<tr>
<td>10 to 149 Marcellus wells drilled</td>
<td>-10.8% (13)</td>
</tr>
<tr>
<td>1 to 9 Marcellus wells drilled</td>
<td>-19.5% (13)</td>
</tr>
<tr>
<td>No Marcellus wells drilled</td>
<td>-28.2% (36)</td>
</tr>
<tr>
<td>State Average at the county level</td>
<td>-22.1% (67)</td>
</tr>
</tbody>
</table>

State Personal Income Tax Collections

The Commonwealth’s Personal Income Tax is a levy on personal income, including wages and salaries, interest, investment income, and leasing and royalty income. Data on the tax is released by the Department of Revenue separately from sales, realty, and other state tax information, and typically lags a year behind information on these other taxes. The most up-to-date Personal Income Tax data is for the 2009 tax year, which is a year older than the other taxes. Because the Department of Revenue reports this data by the residence of the taxpayer, filings reflect the earnings of county residents (not of workers who commute into the county, or whose legal residence is outside of Pennsylvania).

The number of Personal Income Tax returns filed by residents statewide declined between 2007 and 2009, but in counties with much Marcellus shale activity, the average decrease was less (see Table 3). Filings in counties with 90 or more wells on average experienced a 1.3 percent decrease in tax filing, compared to the statewide average decline of 2.6 percent, and a 1.9 percent average decrease in counties with no Marcellus wells. Total taxable income in the counties with the most Marcellus activity similarly outperformed the state, with a 6.3 percent average increase, compared to the state average 5.5 percent decrease in taxable income at the county level.

Table 3. Average Change in Taxable Income Subject to the Personal Income Tax, by County, 2007 to 2009

<table>
<thead>
<tr>
<th>Level of Marcellus Activity</th>
<th>Average Percent Change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number of Returns Filed</td>
</tr>
<tr>
<td></td>
<td>(number of counties)</td>
</tr>
<tr>
<td>More than 90 Marcellus wells</td>
<td>-1.3% (5)</td>
</tr>
<tr>
<td>10 to 89 Marcellus wells</td>
<td>-3.3% (12)</td>
</tr>
<tr>
<td>1 to 9 Marcellus wells</td>
<td>-5.6% (10)</td>
</tr>
<tr>
<td>No Marcellus wells</td>
<td>-1.9% (40)</td>
</tr>
<tr>
<td>State Average at the County Level</td>
<td>-2.6% (67)</td>
</tr>
</tbody>
</table>
These percentages hide important changes in how specific types of income are changing in relation to Marcellus shale activity. Between the years of 2007 and 2009, total gross compensation (e.g., wages and salaries) to residents in counties with Marcellus wells on average increased more than in those without wells (see Table 4). For example, gross compensation to residents increased an average of 3.3 percent in counties with more than 90 Marcellus wells, compared to an average 0.3 percent decline of compensation to residents in counties without any Marcellus wells. The number of tax returns reporting such income declined slightly in the counties with the most drilling (down 1.0 percent), while returns in counties without Marcellus shale wells averaged a decline of 1.7 percent. This means the percentage of county residents earning wages or salaries declined a little less in high drilling counties than in other Pennsylvania counties.

<table>
<thead>
<tr>
<th>Level of Marcellus Activity</th>
<th>Avg. Percent Change Gross Compensation (change in number of returns)</th>
<th>Avg. Percent Change in Rights, Royalties, &amp; Patents (change in number of returns)</th>
<th>Avg. Percent Change in Net Profits (change in number of returns)</th>
</tr>
</thead>
<tbody>
<tr>
<td>More than 90 Marcellus wells</td>
<td>3.3% (-1.0%)</td>
<td>441.5% (55.5%)</td>
<td>1.4% (-5.1%)</td>
</tr>
<tr>
<td>10 to 89 Marcellus wells</td>
<td>-0.6% (-3.2%)</td>
<td>13.0% (5.2%)</td>
<td>-13.4% (-4.8%)</td>
</tr>
<tr>
<td>1 to 9 Marcellus wells</td>
<td>-3.7% (-5.5%)</td>
<td>140.7% (12.7%)</td>
<td>-10.5% (-8.6%)</td>
</tr>
<tr>
<td>No Marcellus wells</td>
<td>-0.3% (-1.7%)</td>
<td>23.9% (6.2%)</td>
<td>-6.9% (-3.6%)</td>
</tr>
<tr>
<td>State Average at the County Level</td>
<td>-0.6% (-2.5%)</td>
<td>72.3% (10.8%)</td>
<td>-8.1% (-4.7%)</td>
</tr>
</tbody>
</table>

Changes in the number of tax returns reporting rights, royalties, and patent income varied substantially between the counties (Table 4). Leasing and royalty payments received by mineral right owners is reported as this type of income on state tax return, so it would be expected that Marcellus activity would increase this tax source. In counties with 90 or more Marcellus wells, the number of returns reporting royalty income increased 55.5 percent, and tax collections increased 441.5 percent. Counties without any Marcellus wells also experienced growth in both returns and collections, but less on average than in the other counties (6.2 percent increase in returns, and 23.9 percent increase in collections). Some of the royalty income increase in non-Marcellus counties likely is related to Marcellus activity, because land being developed for Marcellus includes second home and recreational land owned by Pennsylvanians living outside of the Marcellus counties. This is one reason there is wide variation in the lease and royalty income changes between counties with similar levels of drilling; the percentages of mineral rights in the county owned by county residents, owned by the Commonwealth, and owned by non-residents varies quite a bit across the counties. Lease and royalty dollars on mineral rights owned by the Commonwealth and non-residents immediately leaves the county, so is not reported as income within the county where the drilling is occurring.

Residents’ tax returns similarly indicated that net profit income on average increased more in high drilling counties during 2007 to 2009 than in counties with no Marcellus drilling activity. Net profits are what business owners pay on their business earnings (Table 4). Collections in counties with 90 or more Marcellus wells increased an average of 1.4 percent between 2007-2009, compared to a decrease of 6.9 percent in counties with no wells. The higher average total collections in the high drilling counties occurred across fewer local businesses, however; the data indicates that these high drilling counties averaged a loss of 5.1 percent of taxpayers reporting net profit income, compared to only a 3.6 percent decline in counties with no Marcellus wells. This suggests that the survival rate of locally owned businesses in Marcellus counties was slightly poorer than of locally owned businesses outside the...
Marcellus region. Some anecdotes from drilling counties suggest this could be due increased competition from non-local firms moving into the Marcellus counties, from businesses moving between counties, or from local businesses being purchased by outside companies, but the data does not allow confirming this.

The impact of Marcellus activity on the total amount of personal income tax dollars collected by the Commonwealth appears relatively small. The counties with 90 or more wells through 2009, for example, accounted for only 2.8 percent of total Personal Income Tax collections in 2009. The total increase in state Personal Income Tax collections from these counties with the most wells was $533,000 in 2009, which is a positive contribution to the Commonwealth’s budget, particularly during tight economic times. But the size of these county level changes are relatively small compared to the $9.1 billion collected statewide in Personal Income taxes for 2009. Counties with between 10 and 89 Marcellus wells during this time period similarly accounted for only 8.8 percent of total Personal Income Tax collections, and had a net decrease of $39.4 million in collections from 2007 to 2009.

Implications

The Pennsylvania Department of Revenue data shows major tax collection patterns associated with Marcellus Shale development. State tax collections in counties with significant activity related to Marcellus Shale drilling witnessed, on average, larger percentage increases in sales, personal income, and smaller declines in realty transfer tax collections than did other Pennsylvania counties. The increases in sales tax collections are particularly important, because they indicate that Marcellus development positively affects the local retail sector. These increases in several counties, particularly Bradford (50.8 percent), Greene (31.4 percent), and Susquehanna (27.4 percent) are especially remarkable.

There was wide variation between counties within the same levels of drilling activity, so the experience of any individual county may be different from the averages. Economic activity in these counties is affected by a wide variety of factors, in addition to Marcellus shale, so drilling by itself cannot fully explain all the changes and differences between counties. Yet the cross-tab analysis does convey general trends and influences associated with Marcellus development.

This analysis still only reflects the relatively early stages of natural gas drilling and does not include impacts on other state revenues, such as permit fees and the Liquid Fuels tax, or the cost impacts of Marcellus development, such as those on state agencies, public services or the environment. It also does not indicate the impact of Marcellus development on local government and school district tax collections, since royalty and leasing income is exempt from the local earned income tax and local jurisdictions cannot levy sales taxes.

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1 This number may be smaller than some would expect, given the county average changes. Only one of the five counties with more than 90 wells (Washington County) experienced a decrease in in state Personal Income Tax collections during this time period, but due to its large population size compared to the other high activity counties, its decrease largely cancelled out the increases in tax collections in the other high drilling counties.
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Written by Charles Costanzo and Timothy W. Kelsey, Ph.D. The authors are an undergraduate student in Penn State’s Community, Environment and Development program, and Professor of Agricultural Economics, Penn State University.

Cover photo courtesy of Rich Wykoff.

References and Data Sources:


## Appendix A: County Level Changes in Sales Tax and Realty Transfer Tax Collections, 2007 to 2011

<table>
<thead>
<tr>
<th>County</th>
<th>Marcellus Wells Drilled</th>
<th>Change in Sales Tax Collections</th>
<th>Change in Realty Transfer Tax Collections</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>July 1, 2010 to</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bradford</td>
<td>779</td>
<td>410</td>
<td>21.3%</td>
</tr>
<tr>
<td>Tioga</td>
<td>520</td>
<td>250</td>
<td>3.3%</td>
</tr>
<tr>
<td>Washington</td>
<td>435</td>
<td>147</td>
<td>-2.4%</td>
</tr>
<tr>
<td>Susquehanna</td>
<td>328</td>
<td>151</td>
<td>10.1%</td>
</tr>
<tr>
<td>Greene</td>
<td>309</td>
<td>90</td>
<td>24.5%</td>
</tr>
<tr>
<td>Lycoming</td>
<td>279</td>
<td>188</td>
<td>-2.6%</td>
</tr>
<tr>
<td>Westmoreland</td>
<td>149</td>
<td>57</td>
<td>-1.8%</td>
</tr>
<tr>
<td>Fayette</td>
<td>148</td>
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<td>100</td>
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Data sources: PA DEP; PA Department of Revenue ‘Tax Compendium’
### Appendix B: County Level Changes in State Personal Income Tax Collections, 2007 to 2009

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<th>County</th>
<th>Marcellus Wells Drilled, 2007 to 2009</th>
<th>Change in Taxable Income</th>
<th>Change in Gross Compensation</th>
<th>Change in Rights, Royalties, &amp; Patent Income</th>
<th>Change in Net Profits</th>
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Data sources: PA DEP; PA Department of Revenue ‘Personal Income Tax Statistics’
This publication is available in alternative media on request.

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