



# Economic Impacts from a State's Perspective

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## Introduction

The process of hydraulic fracturing has been a controversial topic of discussion for a few years. Scientists, activists, politicians, and citizens alike talk in circles over the issue. One major component of these discussions is the economic impacts of fracking. Economic impacts affect the entire country, not just individuals or groups directly involved in the fracking process. With the United States and the global community as a whole in a state of economic turmoil, the economic benefits fracking has to offer appeal to many.

The United States is the world's leader in shale gas reserves, a wealth that could exponentially help the nation achieve increased energy independence. A study released by an economic forecasting company, IHS Global Insight Inc., predicts that in the United States, the fracking industry will support more than 1.4 million jobs by 2015 and more than 2.4 million jobs by 2035 ("IHS Unconventional Gas Report"). However, external costs associated with fracking such as health issues and property damages take away from some of the charm and add to the controversy. Additionally, fluctuations in shale gas prices over time have created hesitations among drilling companies. Wellhead prices for natural gas in the US have dropped to a 30-year low. In March 2012, prices averaged \$2.50 per 1,000 cubic feet, after having been as high as \$13.00 per 1,000 cubic feet in 2008 when the industry boom was occurring (Fay, 2012). Also contributing to the controversy over fracking economics is the unknown amount of shale gas under US territory. "The U.S. Department of Energy estimates for the Marcellus shale alone have ranged from 410 trillion cubic feet to 141 trillion cubic feet of gas. In contrast, the U.S. Geological Survey estimates that the Marcellus shale formation contains 84 trillion cubic feet of undiscovered natural gas" (Fay, 2012). Uncertainty in supply also helps explain the variations in gas pricing.

Fracking economics is important to the general public. Fracking has the potential to be hugely beneficial to the economic condition of the United States as a whole. It also has the potential to be hugely detrimental to the economy, environment, and well being of the country. The remainder of this paper will go into further detail about economic aspects of fracking and provide explanations on how fracking could be both advantageous and disadvantageous to the states.

## **Topic Discussion**

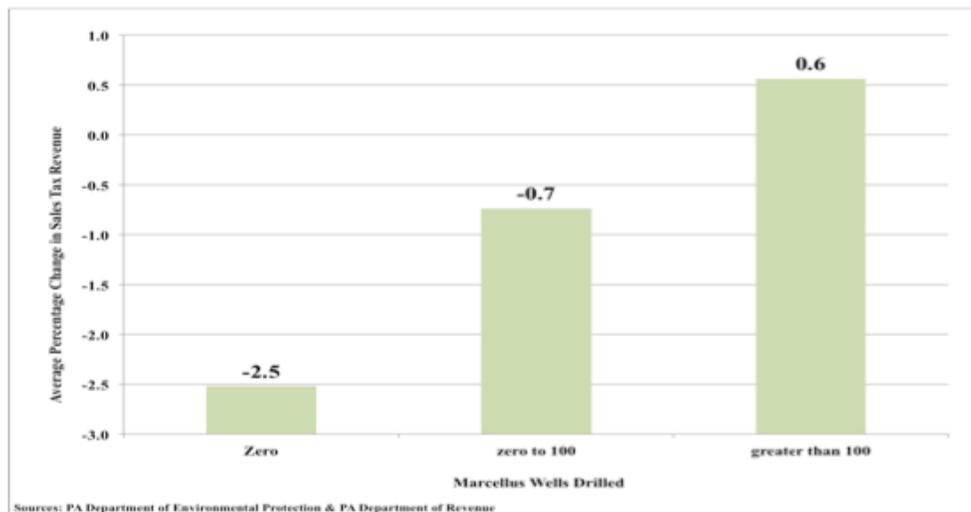
This section provides a discussion of many key factors that contribute to fracking economics. Such factors include: state taxes, bonds, damages, impact fees and future implications resulting from the hydraulic fracturing process. Much of fracking's appeal comes from the money that can be made throughout the processes. First, a brief history of fracking economics will be discussed. While hydraulic fracturing itself is still a relatively new phenomenon, researchers have been tracking the economic impacts for several years. Table ES1 in "The Pennsylvania Marcellus Natural Gas Industry: Status, Economic Impacts and Future Potential" shows the development of economic impacts of the Marcellus Shale regions in Pennsylvania since 2009. The "Added Value" column represents the amount of the regional equivalent of gross domestic product. Added value has increased each year since 2009, as have tax collections and employment opportunities (Considine et. al, 2011).

There is no denying that fracking has contributed increased revenue for the Commonwealth of Pennsylvania over the past few years, but other implications exist that will be explained later in this section which may reduce the value of these numbers.

## **Taxes**

One major component of economic impacts is the collection of state taxes. One type of tax is the state sales tax, which marks the level of retail activity occurring within a county. Higher retail sales result in higher sales tax collection. According to a report released in March 2012, “state collections in counties with 150 or more Marcellus wells drilled between July 1, 2007 and June 30, 2011...experienced an average increase of 23.8% between these years...compared to an average decrease of 5.1 percent in counties with no Marcellus activity” (Costanzo & Kelsey, 2012: 3). The following graph compares average statewide sales tax collections from 2008 to 2010 with counties grouped by number of wells drilled in the Marcellus.

**Figure 1.** Average Change in Sales Tax Compared to Marcellus Wells Drilled



*Source:* Pa. Department of Environmental Protection and Pa. Department of Revenue

As illustrated in the graph above, counties with more fracking activity experienced smaller declines in sales tax revenue than counties with no wells. Additionally, counties with more than 100 wells saw an increase in sales tax revenue. These results suggest fracking may have indirect economic implications such as increases in retail sales. Through the increased

amount of activity and personnel necessary for fracking, more people contribute to the retail industry, leading to increased sales tax collections.

A second type of state tax is the realty transfer tax. In Pennsylvania, this is a 1 percent tax on the sale of real estate. As a result of the collapse of the housing bubble in 2008, realty transfer tax collections suffered throughout Pennsylvania. However, 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” (Costanzo & Kelsey, 2012). In the midst of the worst economic downturn since the Great Depression, counties with Marcellus drilling activity fared better with real estate action occurring during those years than counties without drilling.

A third type of tax affected by fracking is the state personal income tax. Included in personal income are wages and salaries, interest, investment income, and leasing and royalty income. In counties with the most Marcellus drilling, total taxable income surpassed the state average. These counties experienced a 6.3 percent increase on average, while the state average was a 5.5 percent decrease in taxable income at the county level (Costanzo & Kelsey, 2012). The difference in taxable income partially results from leasing agreements and royalties received by landowners in counties with high Marcellus activity. Leasing agreements are arrangements made between landowners and drilling companies that grant the companies the right to drill on that specific plot of land. The companies pay the landowners an amount agreed upon by both parties. Additionally, drilling companies pay the landowners royalties, which is a percentage of the amount of total gas production resulting from the drilling. Due to the lease agreements and royalties paid in counties with Marcellus activity, personal incomes for residents of those counties increased, resulting in increased personal income tax collections. “In counties with 90

or more Marcellus wells, the number of returns reporting royalty income increased 55.5 percent, and tax collections increase 441.5 percent” (Costanzo & Kelsey 2012, 5). Increase in personal incomes is another way to measure economic impacts of hydraulic fracturing in Marcellus Shale regions.

One very important type of state tax is the severance tax, a tax that Pennsylvania does not employ. A severance tax is a levy on nonrenewable natural resources, such as oil and gas. It is important to note that all other fracking states have a severance tax; Pennsylvania is the only state with fracking that does not. If Pennsylvania did have a severance tax, drillers would be taxed for the extraction of shale gas. These severance tax collections would add to the state revenue in addition to the types of taxes previously mentioned. Much controversy exists over whether Pennsylvania should start implementing a severance tax. Many argue that a severance tax would destroy the fracking industry because companies would refuse to pay. Others argue the tax would help protect those people who suffer consequences such as property damage and health issues as a result of fracking.

Sales, realty transfer, and personal income tax collection data are all vital parts necessary to evaluate the economic impacts of hydraulic fracturing. This section has shown that tax collections have increased in counties with high Marcellus drilling activity, indicating that those counties are experiencing an economic boom as a result of the presence of the fracking industry. The next section of this chapter will investigate bonds placed on wells.

## **Bonding Requirements**

States apply bonding requirements, which are meant to protect the public by ensuring that financial resources exist to cover the cost of well plugging and reclamation. Unfortunately, “the amounts of those bonds are generally too low to pay for proper well closure, and state laws

generally do not require drillers to obtain bonds to cover the cost of off-site environmental remediation or compensation to victims” (Dutzik & Ridlington, 2012: 32). In Pennsylvania, drilling companies are required to pay \$10,000 for each well deeper than 6,000 feet, and \$4,000 for wells less than 6,000 feet deep (Dutzik & Ridlington, 2012). Pennsylvania also has a “blanket bond” requirement that covers all wells a company drills in the state. The blanket bond cost was recently increased from \$25,000 to \$625,000 (Hopey, 2012).

In comparison, New York state’s bond requirements are much more specific. For wells less than 2,500 feet in depth, companies must pay \$2,500 per well for the first 25 wells, \$25,000 plus \$2,500 per well if drilling between 26 and 50 wells, and \$70,000 plus \$2,500 per well for over 100 wells. Wells being drilled between 2,500 and 6,000 feet have higher rates per well. In New York, wells being drilled more than 6,000 feet deep have varying bond requirements depending on the anticipated costs of plugging and abandoning that well (NY Dept. of Environmental Conservation). The bonds are meant to ensure that if something goes wrong, there will be financial means to fix the problem. The bonds usually do not pay for complete repair, leaving citizens to pay the remainder. As a result of insufficient bonds, the areas where fracking occurs and residents of those areas often suffer damages. The next portion of this chapter will further discuss damages caused by hydraulic fracturing and their economic impacts.

## **Damages**

The economic impacts of fracking expand far beyond taxes and bonds. The process creates stresses that many communities cannot prepare for or handle. As a result, counties with high fracking activity experience severe damage. One type of common damage due to fracking and its large industrial needs is road damage. Transportation of millions of gallons of water, sand, and fracking chemicals is necessary for fracking. Many of the roads that lead to drilling

sites are in rural areas that were not built to support large, heavy trucks on a regular basis. Consequently, repairs need to be made more frequently. “A 2010 Pennsylvania Department of Transportation document estimated that \$265 million would be required for repair of roads affected by Marcellus Shale drilling” (Dutzik & Ridlington, 2012: 25). Another type of damage seen in areas with drilling activity is property damage. Several private drinking wells have exploded due to methane build up and other contaminants that made their way to private wells from fracking sites. Methane can produce gas flares, which can be detrimental to residents’ water supplies, a damage whose economic impacts are unpredictable and difficult to calculate.

## **Impact Fees**

While Pennsylvania does not employ a severance tax, the state does require drilling companies to pay impact fees. Impact fees are bonding requirements in place for drilling companies to cover the costs of road repairs and other damages. The current fee is \$50,000 per well, one of the lowest prices in the nation (PA Budget and Policy Center). Act 13 is the piece of legislation that allowed the state to adopt impact fees. Act 13 is the first rewrite of the Oil & Gas Act since 1984. Under Act 13, a county has 60 days to pass an ordinance authorizing the fee. If it fails to pass, “50 percent or more of the county population or 50 percent of the municipalities in the county may override the county decision, and the fee will then be imposed” (Buchanan Ingersoll & Rooney PC). As of September 10, 2012, the Commonwealth of Pennsylvania had collected \$197.6 million in Marcellus Shale impact fees (PA Budget and Policy Center). Failure to address and repair damages causes future issues. The next section will discuss future implications from hydraulic fracturing.

## Future Implications and Recommendations

Fracking is an exhaustive process, a process that leaves a long-lasting effect on the communities in which it occurs. Some economic impacts of fracking do not cease to exist once the drilling companies abandon a well pad; implications exist far into the future. One negative implication is the decline in property values. The value of areas surrounding drilling sites decreases due to pollution and the stigma that might result from proximity to industrial operations. Odor, traffic, noise, and visual impacts can negatively affect residents' enjoyment and use of their homes (Dutzik & Ridlington, 2012). Property damage, which was discussed earlier, is another contributor to decreases in value of areas close to drilling sites.

Additionally, properties near fracking locations can be more difficult to finance and insure, potentially affecting their value. Lenders and insurers are hesitant to issue new mortgages to homes and have started requiring large buffer zones around houses on land with gas leases (Dutzik & Ridlington 2012). Standard homeowners' insurance does not cover damage related to fracking. Another indirect economic effect of the fracking process is health-related issues and costs, which are discussed in detail in a separate chapter of this guide. Health care costs may rise due to health issues from water and air contamination from fracking. Such consequences can have profound economic impacts on both individual and state levels. In order to minimize and potentially avoid some of these unfortunate outcomes, recommendations must be made. The first recommendation is that governments on the federal, state, and local levels should hold the oil and gas industry accountable for all costs of fracking. Bonding requirements should be increased so they are sufficient to cover the costs of plugging wells, paying for road repairs and other physical damage; correct environmental contamination; and fully compensate

anyone harmed by fracking activities (Dutzik & Ridlington, 2012). Stronger regulation enforcement will also be necessary to reduce fracking effects.

This section has discussed long-term economic impacts resulting from fracking and recommendations on how to minimize those implications. The presence of fracking has provided monetary benefits to counties with high fracking activity. The data discussed are proof that the fracking industry can be extremely prosperous for states. However, consequences and indirect economic impacts from fracking have the potential to diminish this prosperity. Adequate bond requirements and strict regulatory enforcement is crucial if states want to experience economic gains from fracking. If hydraulic fracturing is ever to be truly economically beneficial, drilling companies must be held responsible for all impacts that fracking activity may have on a community. Citizens should never suffer financially, physically, or emotionally due to fracking. The next section will contain a question and answer interview with an expert about the topic of fracking economics.

## **Stakeholder Interview**

I interviewed Professor Timothy Kelsey, Ph. D. from Pennsylvania State University. He is a professor of Agricultural Economics and is the State Program Leader for Economic and Community Development. He earned his Ph. D in Agricultural Economics from Michigan State University in 1989. He conducts research on a variety of economic development issues in Pennsylvania, including economic impacts of Marcellus Shale development, and local government. The interview will be presented in question and answer form. Professor Kelsey's responses are paraphrased.

**Q:** *Do you think Pennsylvania should adopt a severance tax?*

**A:** I cannot provide an answer to this question because it would require me to take a policy position.

**Q:** *What tactics are other states using to hold drilling companies accountable for indirect costs of fracking that would be helpful for Pennsylvania?*

**A:** Other states have severance taxes and use those dollars to ensure there is money to restore drilling sites if there are future issues. Dollars from severance tax collections are also used to help focus infrastructure development and help with public costs of development.

**Q:** *What should people living near fracking sites do to minimize damages and other potential costs?*

**A:** There is a range of things that can be done. For people who are leasing their land, it is important to specify in the lease agreement they want environmental protection. Environmental protection is not guaranteed unless the leaser requests it in the lease agreement. Leasers can also limit surface access to drillers; the leasers can allow horizontal drilling to occur, but they can deny companies surface access, which has a bigger impact on day-to-day use of the land. I highly recommend that leasers have their water tested before drilling starts. State law says if degradation is found, the drilling company is responsible for paying the cost of damage. This law only applies if there is a pretest to show what the condition of the water was before drilling started. The pretest can then be compared to a test of the water after drilling occurred, which would provide evidence to prove the contamination came from fracking activity.

**Q:** *Are current bonding requirements sufficient and if not, what needs to be done to hold drilling companies responsible?*

**A:** Many local officials would say bond rates, specifically for roads, are way too low. These bonds are at least 10 to 15 years old and have not kept up with inflation or the increased cost of

repairing roads. There is a need for increasing bond limits. But, I have heard from local officials that many municipalities are not bothering to bond roads anymore because it creates challenges for other users, such as dairy farms and lumber trucks, even if they are only running one truck. Instead of bonding requirements, local governments have started creating formal or informal road use agreements with the drilling companies. The agreement states that if a company creates damage, the company will have to repair and maintain the roads at its own expense. Government officials said this technique has been working very well. In many cases officials say roads are in better shape now than they were before drilling activity started because the companies are building higher quality roads before they start using them. Municipalities with drilling have found a successful way to minimize road damage, so they are currently not as concerned with bonds.

**Q:** *Overall, is fracking economically beneficial for states?*

**A:** It depends on who is being considered. There are a lot of dollars to be made with Marcellus development. Royalty revenues could be millions, so in the case of people receiving royalty payments, fracking would be hugely beneficial. A lot of small businesses have experienced increased activity from fracking. On the other hand, there are real concerns with property values close to support sites. There are also questions about the tourism industry and how the presence of the fracking activity may deter tourists. One negative impact from development activity is that rent prices are tripling or quadrupling, a factor that may repel drilling companies. I have heard that drilling has created problems with low-income residents. In general, fracking is good for some, but creates challenges for others.

## Profiles of Key Individuals and Groups

There are many groups or organizations of people that play key roles in fracking economics. This section of the chapter will provide information about four of the most important groups of people impacted by the economics involved with fracking. The groups are: Department of Revenue, Department of Environmental Protection, Gas drilling companies, and residents living in drilling areas.

The first group discussed is the Department of Revenue. Each state has this department. In Pennsylvania, the department's "mission is to fairly, efficiently, and accurately administer the tax laws and other revenue programs of the commonwealth to fund necessary government services" (PA Department of Revenue). This Department is relevant to fracking because it collects all the revenue from the taxes previously discussed in this chapter. It is the Department of Revenue's responsibility to make sure the different players in the fracking industry are paying all appropriate taxes to the state and that taxes are collected efficiently. The Department of Revenue can then calculate increases or decreases in tax collections over time, which serves as great indicators of economic activity. For more information on Pennsylvania's Department of Revenue, visit the [Department of Revenue website](#), which provides phone numbers and mailing addresses for the various offices within the department.

Another important group involved in fracking economics is the state Department of Environmental Protection. The Office of Oil and Gas within the DEP is "responsible for the statewide oil and gas conservation and environmental programs to facilitate the safe exploration, development, recovery of Pennsylvania's oil and gas reservoirs in a manner that will promote the commonwealth's natural resources and the environment" (PA Department of Environmental Protection). This department has a Marcellus Shale Advisory Commission that released a report

in 2011 calling for stronger drilling regulations that increased bond requirements to \$10,000 for deeper wells and tripled the setback distance from streams, ponds, and other bodies of water from 100 to 300 feet. The Department of Environmental Protection protects the community from consequences from fracking by regulating economic factors in addition to environmental ones. For more information on Pennsylvania's Department of Environmental Protection visit the [Oil and Gas Section of the Department of Environmental Protection's website](#), or e-mail [RA-epcontactus@pa.gov](mailto:RA-epcontactus@pa.gov).

While the Department of Revenue and Department of Environmental Protection are both government organizations, there are many groups involved in fracking economics that are not government agencies. Gas drilling companies are clearly essential to the entire fracking industry. Economically, they are responsible for paying landowners leasing fees and royalty payments. They must also pay bonding requirements and impact fees to the state when necessary. Cabot Oil and Gas Corporation is one company that has been highly involved in the fracking community. It has undergone a lot of controversy due to improper well closures that caused property damage to residents in Dimock, Pennsylvania. Cabot reported spending \$109,000 on methane removal for 14 local households in Dimock, PA. Additionally, Cabot reports to have spent \$730,000 per well to cap three shale wells in Pennsylvania (Dutzik and Ridlington 2012). Cabot, along with the many other gas companies across the nation, contribute to economics associated with fracking through the many payments they make at the state, county, and personal level. To contact Cabot Oil and Gas Corporation, call (281) 589-4600.

A fourth important group of people involved in fracking economics is residents living in areas affected by the drilling. Residents are involved in economics because they are the ones who receive payments from lease agreements and royalties, which increases their taxable

income. Additionally, the residents suffer the indirect economic consequences, such as road and property damage, from fracking. To find out more information about the involvement of and impact on residents in drilling areas, contact government officials from those counties. The Chairperson of the Board of Commissioners in Susquehanna County is Alan M. Hall. Call (570) 278-4600, the Susquehanna County Court House for more information.

This section has provided profiles on four of the most important groups in fracking economics, but there are many more parties involved.

## **Web Resources for Additional Information**

1. [Economonitor](#) is a website where economists, financial professionals, political thinkers, and more can contribute pieces for the site. Economonitor has regular bloggers, and guest contributors who write about all aspects of economics. The site contains many articles and blog posts about fracking. One of the site bloggers, Ed Dolan, wrote a post about fracking economics and the environment. The post contains links to other articles, reports, and companies discussed.
2. [Energy Tomorrow](#) is a website run by the American Petroleum Institute. The site has five main categories: types of energy sources, security concerns, economic issues, job creation, and environment and safety issues, and a blog. Within each category, there are links to different resources including blog posts, published papers, videos, podcasts, and twitter feeds. The economy category gives information about pensions, taxes, earnings, and gas prices. The website also provides a list of events. This site is a good starting point for gathering information because further research can be gathered through the many resources it offers.

3. [Catskill Mountainkeeper](#) is a grassroots advocacy organization that works to protect and preserve the Catskill Region of New York State. The website contains an entire program dedicated to fracking. It includes articles on a variety of issues associated with fracking such as air pollution, water contamination, and economic implications. The articles contain links to external reports mentioned as well as links to other related articles within the website.
4. [Oil & Gas Monitor](#) is an online forum that monitors developments that affect the world of oil and gas exploration, finance and investing, compliance and regulation, and equipment and technology. The website contains expert articles, biographies on the expert writers, and links to resources for more information, products and services to the oil and gas industry. The homepage contains links to headlining articles, recent posts, as well as a “monitor cloud”: a word cloud containing the most commonly used words in oil and gas discussions.
5. [Stop Drilling Go Clean](#) is website maintained by the Sierra Club Niagara Group of Western New York. The website contains information about various topics associated with fracking such as flaws of Department of Environmental Conservation Environmental Impact Statement, facts on hydrofracking, and economic problems with fracking. The website also provides an opportunity for visitors to take action against fracking in New York. The content of the website provides links to other websites, newspaper articles, and published reports associated with the various topics.
6. [Fracking Insider](#) provides insight and analysis of regulatory, legislative, legal, and economic developments associated with fracking. The economics section of the site has many articles written by experts in the field. The articles contain links to government

acts and reports discussed as well as links to the websites of other companies or organizations mentioned. The website is a good resource for gathering information about a variety of issues related to hydraulic fracturing.

## For More Information

1. <http://politicsandpolicy.org/article/fracking-economic-boom-or-environmental-danger>
2. <http://www.energyindepth.org/PDF/Hydraulic-Fracturing-3-E's.pdf>
3. <http://www.heritage.org/research/reports/2012/08/hydraulic-fracturing-critical-for-energy-production-jobs-and-economic-growth>
4. [http://www.nytimes.com/2010/11/07/business/energy-environment/07frack.html?pagewanted=all&\\_r=0](http://www.nytimes.com/2010/11/07/business/energy-environment/07frack.html?pagewanted=all&_r=0)
5. <http://stateimpact.npr.org/pennsylvania/tag/fracking/>
6. <http://www.foodandwaterwatch.org/factsheet/false-promises-and-hidden-costs-the-illusion-of-economic-benefits-from-fracking/>
7. <http://www.newpa.com/strengthen-your-community/redeveloping-your-community/marcellus-shale/>

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