Boom and Bust in the Barnett Shale

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Introduction

Industries that capitalize on non-renewable resources, like hydraulic fracturing, typically go through a boom and bust cycle. This cycle is characterized by fluctuating phases of economic growth and reduction. Booming economies experience increases in gross domestic product and production. Economies during bust periods typically suffer from increased unemployment and drops in production. Following this cycle is an important indicator for the long-term sustainability of the fracking industry. This boom and bust cycle in the Barnett Shale is important to the fracking situation because it serves as a case study for the industry to learn from. The Barnett Shale is one of the largest shale formations in the United States, located in Texas, that is cultivated for the use of fracking. The industry can identify problems in the economic structure of fracking by looking at this specific example. The fracking industry can use this data to understand why fracking is profitable in the first place and what factors perpetuate the demise of an area with gas exploration. This topic is important for the fracking controversy because it is hard evidence for both sides of the argument. The Boom and Bust in the Barnett Shale exemplifies positive and negative effects of fracking on residents and the local economy. Citizens should be interested in the boom and bust of the Barnett Shale so that they can make an educated decision on whether or not to support fracking and then subsequently take action on that decision. The personal experiences and economic evidence associated with this specific shale should help form informed opinions. An educated public can take action toward whichever side they choose.
Topic Discussion

The Barnett Shale is a natural gas formation that covers more than 5,000 square miles of North Texas [See figure 1]. Its core production areas are in Denton, Johnsons, Tarrant and Wise counties (“A Decade of Drilling,” 2011). It is one of the most prolific natural gas reservoirs (Wynveen, 2011). The geologic formation lies 6,500 to 8,500 feet beneath the surface of the earth. At its thickest, the shale runs 1,000 feet deep, but can be as shallow as 30-50 feet thick in other areas. Since the advent of conventional gas drilling, drillers have been extracting gas from the Barnett Shale using hydraulic fracturing. However, drilling in the Barnett Shale has started to boom in the past decade. This piece will focus on the effects of gas development in the Fort Worth and Wise County areas. This report analyzes the economics and overall effects of the fracking boom for the area surrounding the Barnett Shale. Since fracking is a relatively new technology, bust towns are difficult to come by this early in the process. Therefore, possible bust symptoms in the Barnett Shale will be compared with those of the actual bust of the auto industry in Detroit, Michigan. By observing the economic shortcomings of the auto industry bust, it is easier to point out which aspects of fracking could be responsible for a possible bust of the Barnett Shale boomtowns.

Energy companies were flooding Fort Worth, Texas, in early 2008 to take advantage of the promising wealth in the Barnett Shale. Oil and gas companies were competing for drilling rights, some even offering bonuses of $27,500 per acre for signing a lease (Urbina, 2011). The media in Fort Worth were being used to push residents to sign leases, promising attractive benefits that many of the lower class citizens could not resist. Billboards lining the highway read, “If you don’t have a gas lease, get one!” (Urbina, 2011, para. 20). One of the most powerful shale gas companies, Chesapeake Energy Corporation, even used a celebrity pitchman to
promote fracking in the area. One television advertisement for Chesapeake Energy had the actor Tommy Lee Jones talk about the benefits that drilling would bring to the residents. Jones said in the ad, “The extremely long-term benefits include new jobs and capital investment and royalties and revenues that pay for public roads, schools and parks” (Urbina, 2011, para. 21). Energy companies were targeting Fort Worth residents with positive fracking advertisements, hoping this would ensure compliance from land owners. Oil and gas companies gave the impression that they had found a method of making shale gas drilling uniform by redefining the “manufacturing model” that allows energy companies to build wells anywhere on the promising parts of the shale (Urbina, 2011). Drilling permits had a sharp increase in 2008 with the number of new wells permitted reaching an all-time high of more than 4,000, compared to 3,600 in 2007 and 2,500 in 2006 (“A Decade of Drilling,” 2011) [See figure 2].

In 2011, the Fort Worth Chamber of Commerce commissioned The Perryman Group, an economic and financial analysis firm, to conduct an assessment of how the Barnett Shale activity has fiscally stimulated businesses throughout the area. For the Barnett Shale the three main sources of economic stimulus are the exploration and drilling activity, pipeline investments, and finally royalties and lease bonuses. Overall, investment in production activity and spending on exploration has generated thousands of jobs and tens of billions of dollars in investment. Local and state governments have also benefited from property taxes, severance tax, boost in retail sales and real estate development, permits and fees – to name a few stimulus sources (“A Decade of Drilling,” 2011). Royalties and bonuses paid by natural gas operators have been given to individual land owners, improving residents overall quality of life.

The Perryman Group found that overall shale production is an important indicator for the collateral economic success of the shale towns. Despite the economic downturn in 2010, the
production from the Barnett Shale remained stable, proving the sheer economic stability of the Barnett Shale production. Production from the shale rose from 1.7 trillion cubic feet in 2009 to 1.8 trillion in 2010 (“A Decade of Drilling,” 2011) [See figure 3]. In 2011, shale activity contributed to 100,000 jobs in the Barnett Shale region and almost 120,000 for Texas as a whole. This was a decline from the 2008 peak of 110,000 but a rise from 90,000 jobs in the 2009 economic recession (“A Decade of Drilling,” 2011) [See figure 4]. In 2010, municipalities received about $31 million in royalties, $30 million in bonuses, and $25 million in tax revenues from natural gas and mineral rights (“A Decade of Drilling,” 2011). This upward trend coincides with the increase in average median family income for Fort Worth, which rose from $60,000 in 2007 to $70,000 in 2012 (“Economic Trends,” 2012) [See figure 5].

Independent school districts, schools separate from any municipality, county, or state, in the Barnett Shale, have received millions of dollars from gas exploration. The school districts received approximately $2.7 million in royalty payments, $2.5 million in bonuses, and $45.8 million in tax revenue from natural gas and mineral rights in 2010. (“A Decade of Drilling,” 2011). Energy companies even donated computers to the East Fort Worth Montessori Academy in 2009. Funds established by various energy corporations, like Chesapeake Energy, will provide scholarships for high school graduates for at least a decade. For example, in 2011, eight Fort Worth high school graduates received $56,000 each toward college education – a combined total of $224,000 (“Fort Worth ISD Graduates,” 2011).

The cumulative economic benefits from Barnett Shale activity has yielded $65.4 billion in output (gross product) and 596,648 person-years of employment in the region, with even larger gains for the state as a whole. The Perryman Group also estimated that as of 2011 the gross product in the shale region was 9.4% higher than it would be without the Barnett Shale (“A
Decade of Drilling,” 2011) [See figure 6]. Personal income was also projected as 8.5% higher and wage and salary employment was 8.7% higher than without shale activity [See figure 7].

A 2011 study was conducted to obtain feedback from residents about their opinions of the Barnett Shale development. The study was titled “A Thematic Analysis of Local Respondents' Perceptions of Barnett Shale Energy Development” and published to the Journal of Rural Social Sciences. Questionnaires were mailed to 1,533 randomly selected households in Wise and Johnson counties. The survey had 42 questions. The first common theme among respondents was a concurrence that there had not been an economic bust stage in the development of the Barnett Shale. Respondents collectively agreed that there had been an overall increase in economic benefits because of the shale development. One respondent even called the collateral benefits from the development as “our lifeblood” (Wynveen, 2011). Respondents who sold leases said that they were happy about leasing their mineral rights, explaining how “proceeds from gas wells are paying my property taxes – residents need it [natural gas development]!” (Wynveen, 2011, p. 17). There were no negative economic consequences discussed. Long-term economic impacts have therefore been sustained in both counties thus far.

However, this economic prosperity came at a cost. Citizens were concerned that gas well producers’ trucks are destroying roads that were not originally intended for such high traffic. Respondents complained that the local towns are not able to keep up with the damage that is being done. Traffic and congestion is an additional problem. Citizens see the increased traffic as dangerous, and it has resulted in more traffic accidents and fatalities. One respondent commented on this problem, stating that “my wife and I have both been run off the road by these drivers. Many of my friends and family members have also had close calls with these trucks” (Wynveen,
Several residents also concluded that corporations were not acting responsibly, claiming that they are greedy, abuse the landowners, and lack concern for landowners who are unsatisfied. One respondent complained about how “one energy company drilled a gas well 250 feet from two water wells. We tried to get them to move further again. No luck. Now we are having trouble with both water wells. Both are pumping sand. We had to replace the pump motor in one. The energy company would not accept responsibility” (Wynveen, 2011, p. 21). Another citizen had similar feelings, saying “I don’t feel like anyone is concerned about me or my property.” An additional respondent added that they have friends who “have signed agreements for drilling…however they cannot get answers as to when drilling will start on their property” (Wynveen, 2011, p. 21).

Since fracking is a relatively new technology, most boom towns have yet to enter a bust phase. However, it is helpful to look at other industries to see how an economic bust has affected the town’s economy, population, infrastructure and other key factors that once made the town booming. Once the symptoms of a bust are identified, it will be easier to see what aspects of the Barnett Shale boom could lead to a possible bust. Detroit, Michigan, is an example of an automotive industry bust. In 1914, Detroit was making half of the cars in the United States (Lepeska, 2012). The economy continued to thrive and 14 years later it was the fourth largest city in the U.S. with a population of 1.6 million along with a new infrastructure that made the area even more attractive. The physical location of the city also gave the area access to the key ingredients for industrial growth. It was near coal, iron, and copper mining industry hubs, which could be accessed by land and water, and it was close to the nation’s best production centers.
The automotive industry was even able to rebound after the great depression in the 1930s by channeling its efforts toward World War II. Industry giants quickly retrofitted plants to build tanks, planes and other parts and vehicles needed for the war. The Chrysler Detroit Tank Plant single-handedly produced 22,000 tanks during the Second World War (Peterson, 2009). After the war the automobile manufacturers took off again, selling a record number of cars and thus stimulating the local economy. In 1950, approximately 200,000 people were employed by the car manufacturing industry in Detroit which had an overall population of 1.85 million people (Maynard, 2011).

Within two years of the 1973 oil embargo, which forced the development of more energy efficient engines, the U.S. auto production fell nearly 30 percent. A key component of the demise of the Detroit boomtown was the decentralization of the industry (Sugrue). New plants were built closer to the people— in small towns and suburbia. Human workers were also being replaced by labor-saving technology which had overwhelming effects on the job market. By the 1970s, international automotive competition had wiped out any glimmer of hope. Detroit has lost a quarter of its population in the last ten years and an overall 60% population loss since 1950. Even when a city and an industry are at their most powerful, their decline is no less plausible. Industries have to be aware of possible threats to the sustainability of their line of work.

The Barnett Shale has shown early signs of future problems for fracking profitability. Deborah Rogers, a member of the advisory committee of the Federal Reserve Bank of Dallas, has been studying shale companies’ data. Rogers said in a 2009 email: “These wells are depleting so quickly that the operators are in an expensive game of ‘catch-up’” (Urbina, 2011, para. 17). She further explained that “this could have profound consequences for our local economy.” Residents in the Fort Worth area would be devastated if the economic flow from
shale use came to a halt. Some Fort Worth citizens have already felt the impact of energy companies’ losses during the 2008 recession.

The economic crisis led energy companies to rescind expensive lease offers, reduce loyalty checks and cut down tax receipts. An example of direct damage in Fort Worth is the dozens of black churches with land leases on which no royalties had been made that will no longer be eligible for tax exemption. “Ruinous, that’s how I’d describe it,” said Rev. Kyev Tatum, of Fort Worth. Some wells in the Barnett Shale have even been falling below expectations. “Our engineers here project these wells out to 20-30 years of production and in my mind that has yet to be proven as viable,” a Chesapeake Energy geologist wrote in an e-mail to a federal energy analyst. The geologist continued saying, “In fact I’m quite skeptical of it myself when you see the percent decline in the first year of production.” A geologist from a large producer of natural gas in the Barnett Shale, ConocoPhillips, went as far as saying in an e-mail to a colleague that shale gas might inevitably be “the world’s largest uneconomic field” (Urbina, 2011, para. 34).

These ‘surprise’ failures can also be partially explained by the uncertainty of gas well productivity. Gas companies have run into trouble because they cannot predict the life of a gas well. Shale gas wells can consistently produce between a range of 25 to 65 years. “These companies have been making such predictions based on limited data and a certain amount of guesswork, since shale drilling is a relatively new practice,” according to New York Times reporter, Ian Urbina (2011, para. 45). If energy companies are unsure about the productivity of wells then it puts the people living in the Barnett Shale region at risk. Since the practice is new it would be wise for companies to play it safe, but competitive pressures have made a precautionary attitude impossible.
Energy companies are taking the risk of developing without fully understanding the long-term sustainability of the wells or the economic damage fracking may eventually cause in these small towns. Not enough time has elapsed to fully see the results. Residents will take the brunt of any shale failures. Just like Detroit, if they lose the big industry they may not have much to fall back on. If other industries in the Barnett Shale area are not profitable enough to save towns from an economic downturn, there is not much hope for the area’s fiscal survival. The decrease in population size was Detroit's most severe loss. If the population size were to diminish, the Barnett Shale area would lose its flow of activity for business, the kiss of death. In Detroit, they were blindsided by the unforeseen technological advances – the pressure for energy efficient engines and machines that replaced factory workers. Detroit factories were not able to act quickly enough to keep up with these advancements. As fracking is a new technology, it too will inevitably be prone to new developments to the process. The Barnett Shale energy companies ought to take this into consideration when planning long-term strategies for gas wells and their maintenance. Should more efficient procedures be developed, they must be quick to act to compete with other advancing shale areas. Detroit also suffered from auto companies spreading plants to other areas, thereby decentralizing production in Detroit. This is an action that was taken without long-term planning.

The Barnett Shale energy companies need to consider all possibilities when taking on any major changes to the economic structure of fracking. The fast-paced business decisions have to be supplemented with consideration of the boomtown’s sustainability needs. However, this type of attention from businesses is unrealistic. Businesses are there to make money and rarely consider the needs of the towns they occupy once the shale is no longer profitable. Oil and gas companies are notorious for pumping resources dry and moving on – not caring much about the
communities left behind. Detroit was brought down by international competition. Businesses left to find areas with more profitable prospects. This type of situation could happen to the Barnett Shale area. One of the biggest companies in the Barnett Shale is Chesapeake Energy Corporation, which has wells in Ohio and Pennsylvania. Chesapeake could easily flee the Barnett Shale the second it becomes uneconomical. Barnett Shale residents also need to be aware of how other shale areas are faring and any advances that have been made. This ties back to keeping up with the technological pace which is the most common root of competitive advantages for corporations. To help prevent bust towns, Barnett Shale corporations need to pay attention to how fracking technology will advance and what actions to should be taken to incorporate such advancements into their current business model.

What is important to take away from this analysis is that the bust phase is difficult to prevent after a prolific boom. The example of Detroit and the auto industry shows that although the boom was significant, it did not protect the area from a bust. What the Barnett Shale leaders and residents should realize is the importance of balance. Fracking is extremely lucrative. However, other industries should be considered before fracking becomes profitless. After all, the shale is a non-renewable resource – there will be a time when fracking will no longer continue. The Barnett Shale area does not have to end up like Detroit did when auto companies moved elsewhere. A sustainable economy can be achieved if other industries are attracted to the area.
Figure 1. Counties Affected by Barnett Shale

Source: Texas Railroad Commission

Figure 2. Barnett Shale – Drilling Permits 1993-2010

Source: Texas Railroad Commission
Figure 3. Barnett Shale Production (BCF) 1993-2010

![Barnett Shale Production Graph](image)

Source: Texas Railroad Commission

Figure 4. The Impact of Exploration, Drilling, and Operations in the Barnett Shale on Employment

![Employment Impact Graph](image)

Source: A Decade of Drilling, 2011. The Perryman Group
Figure 5. Median Family Income, 1997-2012

Median family income for the Fort Worth-Arlington HUD Metro FMR Area increased from $50,400 to $69,200 between 1997 and 2012, an average annual increase of 2.5% over the 15-year period. (Source: U.S. Department of Housing and Urban Development, 2012.)

Source: Economic Trends, 2012. Fort Worth Texas

Figure 6. Historical and Projected Real Gross Product for the Barnett Shale Region

Source: A Decade of Drilling, 2011. The Perryman Group
Profiles of Key Individuals and Groups

1. FWCanDo! (Fort Worth Citizens Against Neighborhood Drilling Ordinance)
   - In September 2005 a small group of concerned citizens came together in response to gas drilling and other related activities that were too close to neighborhoods and schools.
   - This group is completely against fracking and any activities related to it because it threatens people, property and wildlife.
   - There is a wide variety of resources on their website, which encourages citizens to take action against the local government and the industry. The website has photo galleries, facts, media reports, protest events, maps, environmental impacts and a

Source: A Decade of Drilling, 2011. The Perryman Group
wide variety of links that allow people to learn about all the impacts fracking has had on the city of Fort Worth.

- The group also has a blog that writes about the most recent breakthroughs the group has had or any updates on the Barnett Shale and affected people.
- This is important for this topic because it reveals how citizens are affected from all angles in the fracking boom.
- You may contact the group through email at: contact@fwcando.org
- Link: http://www.fwcando.org/home

2. TLMA.org (Texas Land & Mineral Owners Association)

- This group was founded in 1999 with the goal of maintaining and strengthening property rights for all Texas residents and royalty owners. They also want to protect the land and water resources from fracking activity.
- This group has had direct effects on Texas legislation that protects the group’s goals through various forms of lobbying.
- This is important for the boom and bust topic because the group tries to protect citizens who are involved with land leases – a feature of a fracking boom.
- You may contact the group via:
  - Phone: 512-479-5000
  - Email: info@tlma.org
- Link: http://www.tlma.org/

3. North Central Texas Communities Alliance (NCTCA)

- This is a broad-based coalition that works on local, state, and national levels for positive solutions to problems related to natural gas drilling.
The coalition is comprised of individuals, organizations, and communities throughout the Barnett Shale.

Their goal is to communicate, educate and mobilize citizens to action in North Texas to protect health, safety, environment and the overall quality of life.

This is important for this topic because it reveals how citizens are affected from all angles in the fracking boom.

You may contact the group through their mailing address:

- NCTCA
  2320 Oakland Blvd. Suite 5
  Fort Worth, TX. 76103

Link: [http://www.nctca.net/home.html](http://www.nctca.net/home.html)

4. **Texas Vox: The Voice of Public Citizen in Texas**

- This organization has progressive advocates that research and recommend policy that relates to promoting alternative energy resources in order to protect the citizens in Texas.

- This grassroots group is against fracking and has passed legislation that protects citizens from the dangers.

- They do not accept funds from corporations or government agencies so that the organization remains independent. This way they continue to reveal facts about industry and promote legislation that supports their viewpoints.

- This is important for the boom and bust topic because it relates to citizens directly affected by the fracking boom.

- Contact:
Web Resources for Additional Information

1. Barnett Shale Energy Education Council
   a. A great website for basic information about the Barnett Shale and all of the components involved in fracking.
   b. There is in-depth information on safety, leasing, natural gas vehicles, pipelines, legislation, air and water quality and other topics that all have outside links and news articles for further information.
   c. The website is organized, easy to use and provides lots of graphics.
   d. This is an energy website it promotes fracking but it is still useful for basic information about the shale and what is involved.
   e. Link: http://www.bseec.org/

2. Railroad Commission of Texas Barnett Shale Information
   a. This source has balanced information about the effects of drilling in the Barnett Shale. There is a wide variety of topics covered in detail including but not limited to:
      i. Information, maps and pricing of licenses and permits in the shale.
ii. data from drilling, production, wells, natural gas services, open records and many other useful information from the years of drilling.

iii. a detailed FAQ page about who has been affected by fracking in the Barnett Shale.

b. This website has so much information that it may be overwhelming but the information is organized very well. There are not many graphics because the site mainly deals with data and analysis of the data.

c. Visitors also have access to useful links for more information.


3. Oilshalegas.com/barnettshale

a. This website is not as organized but provides valuable economic information about the companies involved in the Barnett Shale.

b. Each energy company is evaluated on their production, success rate, royalties, profit and other important economic statistics.

c. There is no bias; it is based upon facts.

d. There are not that many graphics but the links give more information about each energy company.

e. Link: [http://oilshalegas.com/barnettshale.html](http://oilshalegas.com/barnettshale.html)

4. The Fort Worth Chamber of Commerce

a. This website provides information on the entire economics of the Fort Worth area. The site offers public information about how citizens’ quality of life, education, transportation, workforce, employment, wages have fluctuated over the years.
b. The site is organized but provides other information that is not related to fracking which makes the site not as easy to use. However, there are plenty of graphics.

c. Since facts and statistics are mostly presented there is not much of a bias. But since the chamber of commerce is there to promote business, bias may occur in some of the information.

d. Link: http://www.fortworthchamber.com/

5. Southwest Fort Worth Alliance (SFWA)

a. A grassroots organization that works to protect the rights, quality or life and negotiates mineral rights and royalty offers to ensure it is fair for the citizens in the Barnett Shale area.

b. This group consists of twenty-eight neighborhoods who belong and are protected under the alliance.

c. The SFWA has attorneys that represent and fight for the rights of the citizens in the areas under the alliance. They have had many successful cases.

d. This is biased against fracking but provides great anecdotes and stories about citizens affected by fracking.

e. The website is simple and straightforward. There are many links but not many graphics.

f. Link: http://www.sfwalliance.org/

6. Star-Telegram Blog

a. This blog has the most information out of any of the sources listed. Users can find information about almost any aspect of fracking in the Barnett Shale. The immense amount of information provides a balanced viewpoint.
b. It is sponsored by the Star-Telegram newspaper of Fort-Worth, Texas.

c. Depending on the story there can be many graphics and outside links. The site is easy to use because of the organized index of topics on the side of the page.

d. Link: http://startelegram.typepad.com/barnett_shale/

For More Information


Works Cited


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