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Energy Security, International Investment, and Democracy: The Case of the United States Shale Oil and Gas Industry

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ABSTRACT
Proponents of the US shale oil and gas industry argued that American citizens' economic prosperity and national security were at stake if the industry was not rapidly expanded. Following copious amounts of a certain type of "patriotic" rhetoric, the industry grew rapidly. Simultaneously, foreign ownership of US shale industry infrastructure occurred in tandem with calls for new policies and laws to limit US citizens' democratic rights with regard to the industry's activities. As a result, we argue that the development of the US shale industry has weakened national security by creating negative security externalities and eroding democratic values. We offer implications for other democratic societies rich in natural resources.

KEYWORDS
Energy; environment; foreign investment; national security; natural gas

Introduction

In the United States, a certain type of "patriotic" rhetoric urges increased energy security and enhanced national security by expanding the shale oil and gas industry ("shale industry" for short). In recent years, however, billions of dollars of actual and promised foreign investment has been directed toward the nation's rural areas. Aside from the fiscal returns to rural areas from such investments, this paper highlights some of the ways in which such investments lead to negative security externalities and weakened democratic values. Here we use Norris' description of a security externality as a situation where economic transactions by one or more foreign actors, which could be state or commercial actors, has positive or negative effects on a target state. Some such security externalities include "sensitive technology transfer, loss of strategic industries, [and] concentrated supply and demand dependence (in areas of trade, investment, and monetary relations)".[1] Further, the intention of the actor does not matter, only that the consequences are important to the target state.

In the case of the US shale industry, we argue that economic transactions, either actual or expectations of such transactions, by foreign states and/or

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companies from Asia, Saudi Arabia, Russia, and Europe have weakened democratic values in the United States and created negative security externalities. Specifically, the security externalities are: 1) the erosion of democratic values throughout the Central Appalachian region of the United States, including Ohio, Pennsylvania (PA), and West Virginia (WV), 2) reduced control over a strategic industry (energy), 3) increased economic dependence on foreign actors in those same areas, and 4) decreased credibility as a defender and practitioner of democracy. Given that liberalism was the intellectual basis upon which the US was founded, and that democracy is the very "core of US national identity,"[2] a weakening of democratic values within the US is indeed a threat to its security, which was (ironically) a basis for developing the US shale industry in the first place.

In this paper, we explore the consequences of billions of dollars of foreign economic transactions in the form of foreign direct and indirect investment, and the promises thereof, flowing to the US shale industry. Many of these impacts amount to weakening of local citizens' self-determination, property rights, and freedom of assembly and speech. At the same time, citizens and the natural environment have endured increased levels of pollution and associated risks, but with few permanent jobs being created due to the high levels of automation in, and jobs migrating out of the shale industry. Companies within the industry even take great pride in increasing "operating effectiveness" and "efficiency" through automation, which can mean laying off more than 20% of their workforce.[3]

Methodologically, our approach is based on triangulating mixed social science methods within a case study of the Central Appalachian region of the US. We conducted site visits in Ohio and WV, and even interviewed residents in Northern Wisconsin and Illinois, who have also been affected by the shale industry. One of the authors focused their field research especially in Eastern Ohio, a part of the region often referred to as the "Saudi Arabia" of the shale oil and gas industry. We recorded and transcribed 15 interviews and have had dozens of off-the-record conversations with local residents. We also analyzed datasets that involved the extent of shale oil and gas production and pipeline information in Ohio, given that it is the epicenter of the shale industry in Central Appalachia, and obtained data pertaining to specific investments of foreign firms through publicly available information such as press releases and news reports. In addition, our research involved tracking various laws proposed and passed in U.S. state legislatures pertaining to freedom of expression and state preemption over natural resources decisions.

This research fits into broader discussions of connections between democracy and security; and the tension between economic development and social and environmental justice. Our case illustrates effects to democracy that create a negative feedback loop or "vicious cycle." This

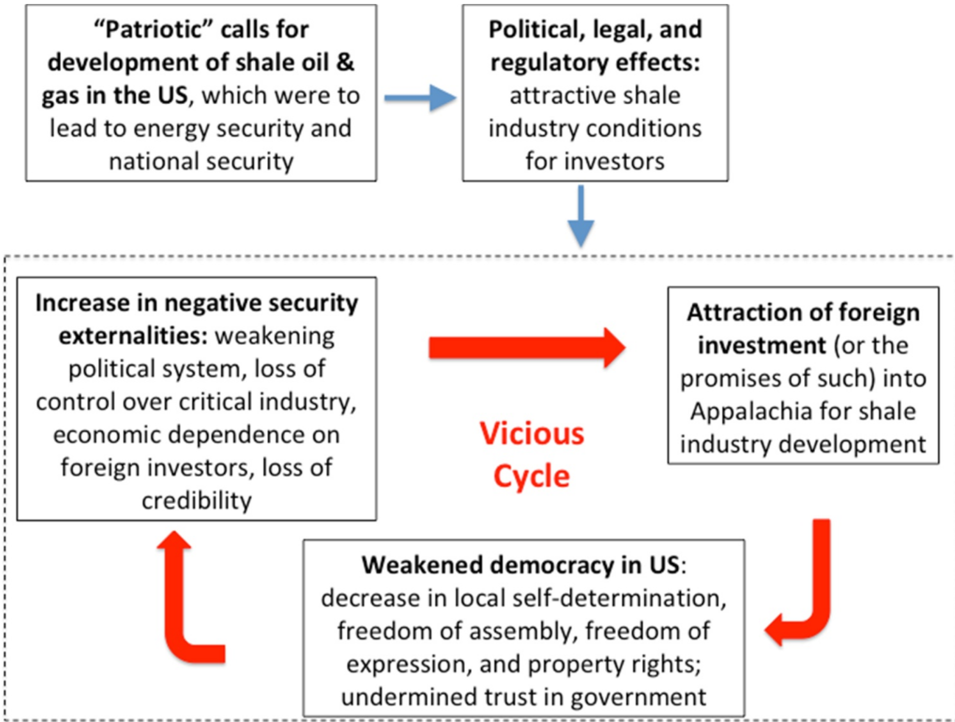

Figure 1. Vicious cycle within the US shale industry.

vicious cycle is that the expansion of the U.S. shale industry necessitated the attraction of foreign investment, which further weakened democracy within parts of the U.S. and created negative security externalities. These negative security externalities include the loss of control over a critical industry (energy), economic dependence on foreign actors, weakened democratic governance, and eroded perceptions of the U.S. as a legitimate defender of democracy. These issues generate further attraction of foreign investment and the cycle continues. Figure 1 provides a visual summary of our argument.

In the next section we describe the geologic and technical development of the US shale industry in Central Appalachia and a certain type of "patriotic" and economic appeal to justify its rapid development. Then we highlight some of the political, regulatory, and legal effects that increased the industry's attractiveness to investors but weakened democracy. Next, we provide data illustrating the magnitude of actual and promised foreign investment into the shale industry and discuss additional consequences to democracy in the region. The final section summarizes how these issues have created negative security externalities for the U.S., and how they will aggravate the vicious cycle.

"Patriotic" calls for the development of the US shale industry

Geologic and technological discoveries

In this paper, our focus concerns the dramatic expansion of the U.S. shale industry from about 2003 to early 2020 and its effects on the democratic rights enjoyed by U.S. citizens primarily in Central Appalachia despite shale formations existing throughout the U.S. There are several geologic and technological aspects of shale that should be briefly mentioned in order to better understand the industry, its effects on democracy in the U.S., and resultant security externalities.

First, "shale" is a type of "fine-grained, sedimentary rock" that "acts as both the source and the reservoir" for different kinds of fossil fuel deposits.[4] Second, the two primary kinds of fossil fuels extracted from shale rock are natural gas and shale oil. Third, analysts often shift from referring to shale rock as "formations" to "plays" once the formations become prospects for drilling and the "technically recoverable" portion of any basin has been determined by the industry and the U.S. Geological Survey (USGS). Interestingly, in October of 2019, the USGS doubled their already enormous estimate of the amount of technically recoverable natural gas in the Appalachian basin from their 2011–2012 assessment.[5] Fourth, the application of hydraulic fracturing ("fracking") and horizontal drilling are two technological developments that have made possible the dramatic production of both natural gas and shale oil in the US over the past 16 years.[6]

Lastly, there are many shale plays throughout the US and some of them are geologically stacked on top of each other. The three most productive (in descending order) are the Appalachia, Permian, and Haynesville plays.[7] The Appalachia play, which is not only the largest but also the fastest growing in terms of production, consists of three shale formations (Marcellus, Utica, and Point Pleasant formations). These formations lie under areas of New York, PA, Ohio, WV, Maryland, Virginia, Kentucky, and Tennessee. Thousands of feet underneath the productive Marcellus shale formation lie two more productive shale formations – the Utica and Point Pleasant formations.[8] In 2008, the state of New York placed a moratorium on fracking and in 2014 it announced it would ban it permanently.[9] Therefore, Ohio, PA, and WV have produced the vast majority of eastern US shale gas since 2008 from the most productive natural gas play (Appalachia) in the U.S,[7] and hence this is the area where we direct most of our attention on the shale industry's impacts on democracy and security.

"Patriotic" political and economic justifications

The particular type of "patriotic" rhetoric we observed by proponents of fracking is similar to the first of two types of patriotism Alexis de

Tocqueville observed in *Democracy in America*, where he referred to "instinctive" and "reflective" patriotism. The former refers to the feeling "that ties a man's heart to the place where he was born . . . Like all unpondered passions, this patriotism impels men to great ephemeral efforts, but not to continuous endeavor." On the other hand, "reflective" patriotism "is engendered by enlightenment, grows by the aid of laws, and the exercise of rights."[10]

Fabian Hilfrich applied Tocqueville's two types of patriotism to the debate raging in America during the Philippines' 1899–1902 war for independence from the U.S.[11] Hilfrich argues that Americans who supported imperialism in the Philippines justified the U.S.' actions as instinctive patriotism, which required all Americans to support the war, not voice dissent, and to question dissenters' loyalty to the nation. However, the "anti-imperialist" Americans argued that it was their patriotic duty to voice dissent because upon reflection one could see that the war violated the principles enshrined in the Constitution. Thus, "instinctive" patriotism required loyalty to the nation, or more accurately to the administration at the time, while "reflexive" patriotism required loyalty to democratic ideals that should be unchanged, regardless of the administration in power. Hilfrich's observation is similar to ours in that we observed the use of "instinctive" patriotic rhetoric among proponents of the shale oil and gas industry by making appeals to national and economic security, suppressing dissent, and questioning dissenters' loyalty to their nation.

With regard to shale oil and gas operations in the U.S., the State of New York reflected upon the industry's impacts, prioritized citizens' existing laws and rights, considered the long-term health and environmental effects, and banned fracking within the entire state despite possible economic gains. Some of the negative consequences the State of New York to avoid were the environmental risks and hazards associated with pumping millions of gallons of water from fresh water sources necessary in fracking operations, the injection of chemicals associated with fracking, the resultant expansion of the industry and its footprint on the natural environment in the form of pipelines and compressor stations, negative water quality impacts from storm runoff from all manner of fracking related infrastructure, spills, contamination of groundwater, waste disposal, loss of habitat and wildlife, poor air quality and increased greenhouse gas emissions, increased noise and negative visual impacts, increased truck traffic and associated diesel truck idling, increased impact on social services, adverse effects to public health, and negative impacts on "community character."[12]

In order to overcome the many concerns of expanding the shale industry, which of course were not limited to residents of New York, the industry's proponents framed the advantages using "instinctive" patriotic rhetoric that focused on political, economic, and national security language. A good place to start is with former Texas Governor, 2016 presidential candidate, and former Trump Administration Department of Energy (DOE) Secretary Rick Perry. As reported by The Marcellus Shale Coalition, which is the Appalachian region's largest trade association with over 200 corporate members, as Secretary of the DOE Perry testified before Congress in March of 2018 stating:

> As the [former] governor of Texas, in August and September [of each year], I worried greatly about a Category 5 hurricane coming up the Houston ship line and devastating the petrochemical footprint that is a substantial amount of that industry for the United States. That is a national security issue.

His logic was that to protect America's national security, the country's petrochemical footprint, which includes shale, should not be limited to just the Gulf area. Rather it should be distributed across America. Secretary Perry continued:

> The region we're looking at ... is in the Appalachian region to help transition it to be an area where petrochemical refining would be the basis [for expansion].

He articulated the rationale for expanding the shale industry to Appalachia as follows:

> To develop [the Gulf's petrochemical industry] in another region of this country, the Appalachian, makes sense because you're sitting on top of Marcellus and Utica, which are prolific gas fields, and helping transition the workers who are either out of work or not working in jobs that are satisfactory from their perspective into higher-paying refining and petrochemical type jobs. That is something we're working on actively today at DOE.[13]

Four years prior, in September of 2014 and nine months before Perry officially declared his candidacy for president of the US, he gave a speech at an event hosted by the Texas Public Policy Foundation. During that speech, Perry called for the US to:

> build an energy shield to protect our strategic allies ... With the natural gas we now produce, we can help liberate our European allies from Russian energy aggression ... Energy is a weapon in the hands of aggressors. So I say, if energy is going to be used as a weapon, America should always have the largest arsenal.[14]

This rhetoric positioned shale oil and gas not just as defensive resources to protect America's national security, but also as an offensive weapon.

As recently as October 2019 USGS reports of increased technically recoverable natural gas across the Marcellus and Utica basins were being greeted with statements such as the following from Marcellus Shale Coalition (MSC) President David J. Spigelmyer:

> Thanks to shale and production from Appalachia, the US has rapidly transformed from a nation increasingly reliant on energy imports to the global leader in natural gas production. This positive shift in America's energy outlook continues to drive meaningful economic and environmental progress while boosting national security.[15]

Of course, energy security was framed as a national security issue long before Secretary Perry's and MSC President Spigelmyer's speeches. What is most relevant here is the national security rhetoric that justifies the development of the shale industry, and specifically the Marcellus Shale play, which is notable given citizens' concurrent concerns with greenhouse gas emissions and other environmental and health concerns from fracking. In 2011, Jack Gerard, president of the American Petroleum Institute, wrote a letter to President Barack Obama arguing for expansion of the oil industry, to include drilling in new areas, building more pipelines, and expanding shale development. In this letter Gerard wrote:

> We provide more than energy; we offer real-world solutions that will create jobs, strengthen our energy security and generate significant government revenue without raising taxes.[16]

Republicans and their supporters were not the only ones to use such language. In 2011, researchers from the Center for American Progress, a think tank that adopts liberal and centrist positions, wrote, "Our country's dangerous overdependence on foreign oil poses a triple threat to our energy security by endangering our energy supply, economic security, and national security." The researchers went on to quote The Center for Naval Analysis's Military Advisory Board, who wrote:

> Our dependence on foreign oil reduces our international leverage, places our troops in dangerous global regions, funds nations and individuals who wish us harm, and weakens our economy; our dependency and inefficient use of oil also puts our troops at risk … Domestic natural gas can play a vital role in reducing reliance on foreign oil and enhancing national security.[17]

Therefore, if a "triple threat" isn't enough to motivate citizens and politicians to expand development of shale plays, then they only need to realize that the US' very troops' lives are in danger, so they better get on it. Issues of social and environmental justice, and of citizens' right to dissent were most certainly not among the most important issues to consider by this Board.

More recently (and less dramatically), in 2015, PA's Democratic Governor, Tom Wolf, created a Pipeline Infrastructure Task Force to work with industry to develop the Marcellus Shale play. Wolf stated:

> We need to work with the industry to make sure that the positive economic benefits of Pennsylvania's rich natural resources can more quickly be realized in a responsible way. This task force is part of our commitment to seeing the natural gas industry succeed.

The task force is chaired by Wolf's Department of Environmental Protection Secretary, John Quigley, who added, "Through smart planning, Pennsylvania can experience economic prosperity, achieve energy security, and protect the environment and communities."[18] Although social and environmental issues were acknowledged, they still were superseded by the hopedfor economic benefits, and still there was little mention of protecting dissenters' democratic rights. This national-level dialogue did not pass over the heads of people living in Appalachia. One gentleman (Interviewee "A") who described himself as someone who voted for candidate Donald Trump in the 2016 presidential election because Trump was "the lesser of two evils," lives in Belmont County, Ohio, which is at the heart of the shale boom in eastern Ohio. Eastern Ohio was described by another interviewee (Interviewee "B") as the "Saudi Arabia of the gas and oil industry." Interviewee A said, "I do seem to have that impression that all this money is going somewhere else, you know … " and at the same time described the "overwhelming" influx of money coming into the community through the fracking boom in terms that portrayed some economic benefits, while at the same time "the farms are empty, and it's definitely changed our way of life." The interviewee described life in eastern Ohio as follows:

> people here were, you know, desperate. They were grasping for jobs for money for a way to eat, then, you know, here they come swooping in with all this money. And I know people in supervisory positions for … ancillary companies, people that rent equipment, to the frackers that are, you know, are people I would never thought could even get a job. And now they're running these companies that do rentals and all kinds of things … " (interview with [author], August 22, 2019)

The influx of shale companies and investment was not an abstraction to the people of eastern Ohio and other regions of Appalachia. They heard the national dialogue, participated in local discussions, and are living through the expansion of the industry and its effects.

Political, legal, and regulatory effects

Despite the articulated benefits, real or imagined, the effect of such instinctive patriotic rhetoric was the passage of several laws, regulations and presidential policy directives (PPD) that dramatically helped the shale industry expand throughout the US, particularly in Central Appalachia. One such presidential policy directive (PPD-21) was issued in 2013 by President Barack Obama titled, "Critical Infrastructure Security and Resilience." This PPD was to "[advance] a national unity of effort to strengthen and maintain secure, functioning, and resilient critical infrastructure."[19] It identified sixteen sectors of the economy as being essential to national security, and among them are the chemical sector (of which oil and gas are crucial inputs) and the energy sector, which the PPD specifically notes electricity, oil, natural gas, and pipelines are a crucial part.[20]

In October of 2018, several officials from the Trump administration, which included then-Secretary of Homeland Security Kirsten Neilson, met with the Oil and Natural Gas Sector Coordinating Council. This council is a group of owners and operators from twenty-three oil and natural gas trade associations across all industry operations who advise the administration on issues affecting them.[21] After the October 2018 meeting, an Under Secretary of Homeland Security, Christopher Krebs, stated:

> This meeting was a key milestone in the partnership between the federal government and the oil and natural gas industry, as we launched the pipeline cybersecurity initiative that partners [Department of Homeland Security] cybersecurity resources, [Department of Energy's] energy sector expertise, with [Transportation Security Administration]'s regular and ongoing assessments of pipeline security to get a broader understanding of the risks the sector faces.[22]

Therefore, both the Obama and Trump administrations affirmed the importance of the chemical and energy sectors, which include oil and gas, to national security. However, they were almost exclusively concerned with physical and cyber-attacks disrupting the sectors' proper functioning and showed no discernable appreciation that they were sowing the seeds of negative security externalities.

Industry's effects on weakening democracy

Proponents of the shale industry recognized that US shale oil and gas reserves are far greater than domestic consumption, and so the shale industry sought to stimulate both domestic and foreign demand. In order to do this, the industry helped create better legal, regulatory, and international trade conditions for itself through several think-tanks and lobbying groups.[23] In 2018, one such group, IHS Markit, framed the expansion of natural gas as a way to increase trade and ease global tensions and helped President Trump become "the world's number one LNG salesman" despite him simultaneously speaking of his desire for the US to achieve "energy dominance."[24]

One of the most politically and regulatory effective groups working to create even better conditions for the shale industry is the American Legislative Exchange Council (ALEC). ALEC is the source of what many industry proponents call the Critical Infrastructure Protection Act, which would make it a felony to impede or inhibit critical infrastructure operation and/or construction. In other words, dissent would not be tolerated, in fact it could be criminal. Close approximations, if not exact replicas, of this act have been passed in several oil and gas rich and/or pathway states, and have been debated in Ohio with Senate Bill 33, and in South Dakota with Senate Bill 189.[25] The latter bill was also known as the Riot Boosting Act; its clear intent was to limit freedom of expression and assembly. Because it so limited these fundamental forms of democratic engagement, the bill was recently blocked by US District Judge Lawrence L. Piersol, who wrote:

> Imagine that if these riot boosting statutes were applied to the protests that took place in Birmingham, Alabama, what might be the result? … Dr. King and the Southern Christian Leadership Conference could have been liable under an identical riot boosting law[.][26]

The proposal for the now blocked Riot Boosting Act came a few short years after the 2016 Dakota Access Pipeline (DAPL) conflict. The act is an example of the shale industry's proponents coordinating state-level legislation efforts in anticipation of further protest across the U.S. As illustrated by the State of New York's ban on fracking and protests in South Dakota, there are many different types of upstream, midstream, and downstream projects in Appalachia and other regions of the U.S. that could affect the health and safety of communities and the natural environment. Such projects include new construction of gas transmission pipelines and oil and gas injection wells required to dispose of waste generated by fracking. It is only natural that industry proponents would seek to coordinate political, legal, and regulatory efforts to maintain the attractiveness of the industry for further development and investment.

Meanwhile, concerned citizens often framed their opposition to such legislation in terms of preserving local control, exercising their first amendment rights, and as means of staving off the worst effects from climate change. Tocqueville would describe many of these actions as examples of "reflective" patriotism. On the other hand, proponents of the industry, including some prosecutors, framed some citizens' efforts not simply as unpatriotic or disloyal to the nation, but as terroristic acts, which is why sentencing under these actual and proposed acts come with felony convictions and more than 10 years in prison. As the American Fuel & Petrochemical Manufacturers (AFPM) put it in a December 7, 2017 letter declaring their support for ALEC's legislative efforts:

> Energy infrastructure is often targeted by environmental activists to raise awareness of climate change and other perceived environmental challenges. These activities, however, expose individuals, communities, and the environment to unacceptable levels of risk and can cause millions of dollars in damage … As the private sector continues to expand and maintain the infrastructure necessary to safely and reliably deliver energy and other services to hundreds of millions of Americans, policymakers should continue to consider how they can help discourage acts of sabotage … Finally, it will also hold organizations both criminally and vicariously liable for conspiring with individuals who willfully trespass or damage critical infrastructure sites.[9]

Thus, it would be an act of "instinctive" patriotism to suppress the peaceful expression of dissent, and those organizations deemed "criminally and vicariously liable" could face, in some states, 100,000 USD to 1 USD million, which of course could put them out of operation. The AFPM's senior vice president for federal and regulatory affairs, Derrick Morgan, referred to these vicarious organizations as "inspiring … organizations who have ill intent, want to encourage folks to damage property and endanger lives ... "[27] The intent of some of the industry's proponents is to criminalize protest, peaceful and otherwise. When peaceful protests are intentionally lumped in with not-peaceful protests, the effect is a weakening of democracy.

At the epicenter of our analysis, ALEC is believed to have encouraged the Ohio state legislature to pass two House Bills, 362 and 625, since the bills' intent and language is similar to other laws in other states that ALEC has publicly backed.[28] HB 362 would "create the crime of masked intimidation"[29] and it would outlaw wearing a mask, such as a cartoonish head of President Trump, at a protest of the construction of a gas pipeline. (During the covid-19 pandemic it is not clear how or if the government would enforce the ban on masks.) From an instinctively patriotic perspective, how could someone mocking the president be loyal to the nation and patriotic? A second piece of legislation, HB 625, was offered by one of the same State Representatives co-sponsoring HB 362, which states that no counties in Ohio "may impose a fee, tax, assessment, or other charge on auxiliary containers."[28] One Ohio newspaper described the passage of HB 625 as "dumb," continuing:

> In defiance not only of environmental sustainability but of home rule, (the constitutional idea that municipalities should be allowed to govern themselves), the state's House of Representatives saw fit to pass HB 625 yesterday, a vindictive piece of legislation that prohibits municipalities from regulating or taxing auxiliary containers like plastic bags.[29]

The effects of HB 362 and 625 weaken democratic values in Ohio by suppressing local decision-making and peaceful protest in favor of the industry.

ALEC's website provides the language of the Critical Infrastructure Protection Act, which helps state legislatures around the US craft their own legislation. State legislatures throughout the US, including those in Central Appalachia and even Wisconsin, which is where much of the sand needed in fracking operations come, have debated their own versions of the act. According to the International Center for Not-for-Profit Law, 19 states and the federal government have considered over two dozen pieces legislation related to suppressing protest near critical infrastructure. Twelve of the twenty seven pieces of legislation have been defeated or expired, six are pending, and nine have been enacted.[30]

Due to the numerous types of infrastructure covered by these acts, their vague language, the large number of states involved, and the importance of oil and gas infrastructure to the federal government, many citizens have had, and will continue to have, their democratic rights suppressed. As more of these bills pass in state legislatures, it is fair to assume that the industry's strengthened position will draw more foreign investors to Central Appalachia and other regions, along with further erosions of local self-determination, freedom of expression, and freedom to peacefully assemble.

Attraction of foreign investment

Overview of foreign direct investment in the U.S

Foreign entities directly investing billions of dollars in the United States are neither new nor unusual, nor do we attempt to empirically demonstrate that the shale boom singularly caused the recent increase in the total amount of foreign investment in the U.S. However, we do argue that the amount of foreign investment in a short period of time and in a particularly economically distressed area, Central Appalachia, has had enormous effects on its citizens' self-determination.

The U.S.' Bureau of Economic Analysis (BEA) tracks foreign direct investment (FDI), of which there are three kinds: acquisitions of U.S. businesses, expansions of current businesses, and establishments of existing businesses. The scale of total FDI in the U.S. helps put investments in the shale industry in perspective. In 1996, there was less than 100 USD billion of total FDI, in 2000 it grew to over 300 USD billion, and after September 11, 2001 (9–11) it plummeted. We suggest it is not coincidence that 2003 marks the introduction of horizontal drilling and fracking in the Marcellus play *and* the rapid growth of total FDI in the U.S. since 9–11. FDI grew in the U.S. until the financial crisis of 2008, but between 2009 and 2013 the BEA stopped collecting FDI data. From 2014 to 2015, total FDI in the U.S. increased by 70% from about 250 USD billion to about 425 USD billion. After the inauguration of President Trump, FDI dropped back to between 250 USD billion and 300 USD billion, which is where it has remained[31] most likely due to his America First trade policies.

In 2018, about two-thirds of FDI was in the manufacturing sector ($199.7 billion of 292.6 USD billion), and the BEA places the chemical sector within the manufacturing sector, in which of course oil and gas are a significant part. The chemical sector alone accounted for 142.3 USD billion of FDI in 2018, which is almost half of all FDI.[31] In other words, billions of dollars of foreign money have recently flowed into the United States' oil and gas industry, and the subset of that industry that includes shale plays in Appalachia has seen rapid and significant investments. According to a recent USGS report, current natural gas projections are nearly 50 times higher than USGS's estimates twenty years ago.[5] The geologic, political, and economic effects have been that the US traded in its dependence on foreign oil for dependence on foreign money; and we argue this came at the expense of local citizens' ability to exercise their democratic rights. In this paper, we do not measure whether the country from where the FDI originates has a greater effect on weakening democracy and aggravating negative security externalities in the U.S. than the magnitude of the FDI. While the source of the FDI may be relevant in some situations, the magnitude of the FDI seems to matter more.

Notably, FDI does not include foreign entities purchasing U.S. companies' securities (stocks or bonds). Below, we provide some trading data that offers a wider view of foreign investment in the US shale industry.

Specific foreign investments in the shale industry (upstream, midstream, and downstream)

The oil and gas industry, of which the shale industry is a subset, is divided into three "streams," upstream operations (which includes drilling), midstream operations (which includes transportation and storage such as pipeline and compressor construction and operation), and downstream operations (which includes refining, marketing, and distribution). Not surprisingly, foreign investment can be found in every stream.

Examples of foreign investment in upstream firms

As of 2017, the twenty-five largest shale oil and gas producers (which are considered "upstream" firms) were all headquartered in the U.S. Further, the four largest produced about two thirds of the shale oil and gas in Ohio, and they were Gulfport Energy Corporation, Ascent Resources Utica LLC, Chesapeake Exploration LLC, and Rice Drilling D LLC.[32] Of just the top four upstream firms in Ohio, which produce about 60% of the shale oil in Ohio, there was at least 2.1 USD billion of actual invested capital from foreign-controlled entities into the shale industry.

The largest producer in Ohio, Gulfport Energy Corporation, is headquartered in Oklahoma (OK) and had revenues of about 1.5 USD billion at the end of 2018. As of mid-2019 Gulfport's top ten largest investors owned about 60% of its stock. Of these ten investors, one is a hedge fund headquartered in the Cayman Islands and three are financial firms headquartered in Western Europe. Collectively, these four investors owned about 14% of Gulfport's stock, which was valued at about 110 USD million as of mid-2019.[33] This is not an abnormal percentage of foreign ownership of an American firm, but according to Gulfport's website they are engaged only in the production of gas and oil in Ohio and OK, and its operations in Ohio are three times larger than its operations in OK. Stated differently, most of the 110 USD million in foreign cash generated by Gulfport was used to produce shale oil and gas in Ohio.

The second largest shale oil and gas producer in Ohio was Ascent Resources, which was also headquartered in OK. As of mid-2019 we did not find any foreign investment into this particular firm; however, Ascent Resources is a private firm, so they are not required to disclose any information about their owners, investors, or any other financial and operational information. This means local citizens cannot determine if foreign investment also flowed to that firm, which, like other oil and gas firms, had significant impacts on their communities.

Chesapeake Exploration LLC, the third largest producer in Ohio, has about 360 employees but is a subsidiary of Chesapeake Energy Corporation, which has over 2,300 employees. In 2018, Chesapeake Energy generated just over 10 USD billion in revenues, and was number 309 on the Fortune 500 list.[34] By the end of June 2020, however, Chesapeake Energy filed for bankruptcy, with over 9.5 billion in long-term debts.[35] Often it is difficult to gain financial information about a subsidiary, but if Chesapeake Exploration's employees are as efficient as the parent company's employees in generating revenue, then Chesapeake Exploration would generate about 1.6 USD million in revenue, or about as much as Gulfport Energy.

In 2011, Chesapeake Exploration formed a joint venture with Total E&P USA, which is a wholly owned subsidiary of a French multinational company,[36] and with EnerVest, which is a private equity firm with headquarters in Texas and West Virginia. The terms of the joint venture required Total E&P USA to pay Chesapeake Exploration and EnerVest 700 USD million in cash and "Total [also] agreed to pay up to 1.63 USD billion during 7 years in the form of a 60% carry of Chesapeake and EnerVest's future drilling and completion expenditures".[37] In return, Total E&P USA would acquire a 25% stake in Chesapeake Exploration's Utica Shale operations. Essentially, this joint venture allowed nearly 2 USD billion from a French subsidiary to flow into Appalachia's shale industry.

Rice Drilling D LLC, the fourth largest shale oil and gas producer in Ohio in 2017, was a subsidiary of Rice Energy, which itself was acquired by EQT Corporation in late 2017.[38] Both firms were headquartered in western PA. In 2014, Rice Energy was one of the largest producers of natural gas from the Marcellus and Utica shale plays, and they raised about a billion dollars in an initial public offering that year,[38] but it appears that most of their early investors were American firms.[39]

The information above does not include the enormous amount of FDI China was *intending* to invest in a different part of Appalachia. In November of 2017, both the Trump administration and the Chinese government announced a plan for China Energy Investment Corporation Limited, which is a Chinese state-owned energy and mining company, to invest "$83.7 billion in shale gas development and chemical manufacturing projects in West Virginia."[40] The proposal involved upstream, midstream, and downstream projects, representing only a portion of 250 USD billion China was considering investing throughout the U.S. over the next 20 years. However, as of mid-2019, China has not invested any of the 83.7 USD billion,[41] which is most likely due to the trade war between the U.S. and China.

The fact that China has not yet made this investment does not mean the *hope* of such investment had no impact on the state's activities and local governance. In fact, West Virginia's Commerce Secretary, Woody Thrasher, said of China's proposed investment:

> West Virginia has actively sought direct foreign investment to strengthen and diversify our economy … Toyota Motor Manufacturing, Hino Motors, Gestamp, Sogefi and other solid corporate citizens with international parent companies create jobs, generate incomes and support communities in West Virginia. In that same spirit, we welcome China Energy and the mutual benefits our energy collaboration will bring.[40]

Seven months after Thrasher made this statement he was fired by the Governor of West Virginia. It is not clear if his failure to turn China's promised FDI into a reality, the controversy surrounding his handling of federal relief funding for flooding,[42] or something else sealed his fate. Either way, he returned to the private sector to run his West Virginia-based engineering company that, among other services, conducts surveys for oil and gas pipeline construction companies.[43]

Examples of foreign investment in midstream firms

As stated earlier, in the shale industry "midstream" firms are those that collect and transport natural gas and oil, and this is done primarily through pipelines. Based on the total mileage of pipelines operated, the seven largest midstream companies in 2017 in Ohio were Cardinal Gas Services, MarkWest Energy Partners, Blue Racer Midstream LLC, Eureka Midstream LLC, Strike Force Midstream, Summit Midstream Partners LLC, and Utica East Ohio Midstream.

Both Cardinal Gas Services (#1) and Utica East Ohio Midstream (#7) are subsidiaries of The Williams Companies, which is headquartered in OK, engaged in midstream operations all over the U.S., and had 8.7 USD billion in revenues in 2018.[44] Although foreign institutional investors as a group own a small percentage of the company, in the first quarter of 2019, four of the six largest transactions were made by French, Swedish, Italian, and Australian institutional investors that increased their ownership in Williams by buying 36 USD million in stock. This represents a very small investment in relative terms, but it also illustrates foreign investors' attraction to the growing American gas gathering pipeline business.

In the year following EQT Corporation's acquisition of Rice Energy (two predominantly upstream companies), EQT spun off its midstream subsidiary as a separate firm in 2018, and that firm named itself EQM Midstream Partners[45] EQM is headquartered in Pittsburgh and has revenues of about 1.5 USD billion. It has a 60% ownership of Eureka Midstream, the 4th largest midstream firm in Ohio, and also owns Strike Force Midstream, the 5th largest midstream firm in Ohio. As of mid-2019, EQM's 7th largest institutional investor was a Canadian investment firm that held about 1.25% of its stock, which was valued over 111 USD million.[46]

The third largest midstream firm in Ohio, MarkWest Energy Partners is a wholly-owned subsidiary of MPLX LP. However, MPLX is actually owned by

Marathon Petroleum Corporation. As of October 2019, the Norwegian central bank owned about 476 USD million of Marathon's stock, or 1.19%.[47]

The 6th largest midstream firm in Ohio, Summit Midstream Partners, is owned by a private equity firm, Energy Capital Partners, which has several offices throughout the U.S. and one in Seoul, South Korea. Of the four largest institutional investors in Summit Midstream Partners, one is a Canadian bank and the other is a South Korean investment firm and collectively they own 4.6% of Summit Midstream Partners, or 28 USD million.

Like the upstream firms, foreign investments in midstream firms get more interesting when one sees the direct, as opposed to the indirect investments (through stock transactions of publicly traded firms). Blue Racer Midstream LLC, the 3rd largest midstream company in Ohio, is a 50/50 joint venture between an independent midstream firm headquartered in Texas and a private equity firm headquartered in Connecticut. In June, Blue Racer's owners were considering an initial public offering, which they estimated would bring in 2.5 USD billion.[48] Three months earlier, in March of 2019, Blue Racer's private equity partner, First Reserve, and SK Holdings, one of South Korea's largest conglomerates, announced SK's intention to invest 300 USD million in Blue Racer. The CEO of SK Holdings, Mr. Dong Hyun Jang, proudly stated their intention to expand their operations:

> SK has built a substantial platform of energy investments throughout North America, providing what we believe is a robust investment foothold in an energy epicenter. This investment in Blue Racer and the partnership with First Reserve, a leading global private energy investment firm, are a continuation of that investment thesis – and the opportunity to combine our strategic expertise with experienced energy players. We believe Blue Racer is a premier midstream operator, and we look forward to helping build value through our energy business capabilities and synergy with shale-related assets in the U.S.[49]

Blue Racer provides a colorful map on their website (Blueracermidstream.com) illustrating their operations in the Utica and Marcellus shales, which is precisely where the borders meet of Ohio, Pennsylvania, and West Virginia. At the same time, industry leaders, governors of all three states, and the Trump administration championed the establishment and/or expansion of what is being billed as the Appalachian Storage and Trading Hub (ASTH), which is a venture spearheaded by the Appalachian Development Group. Mr. Jang's comments suggest their operations will expand further throughout Appalachia.

Examples of foreign investment in downstream operations

It takes only three specific examples of foreign direct investment, actual or promised, in downstream operations of the shale industry in Appalachia to reach sums of tens of billions of dollars of investment – in Ohio alone. In Belmont County, Ohio, the home of Interviewee A, Governor Kaisich found a partner to invest 7.5 USD billion to build a new "cracker" plant, which is a plant that "takes a byproduct from natural-gas production and turns it into ethylene [or "ethane" as it's more commonly known], an essential ingredient for making plastics and chemicals."[50] The partner is PTT Global, which is a chemical company based in Thailand. This investment would be spread over 20 years, but PTT Global is already spending 150 USD million just to complete the feasibility study.

Eighty-four miles northeast of Belmont, OH, and 25 miles northwest of Pittsburgh, PA Royal Dutch Shell, headquartered in The Netherlands, is already constructing a 6 USD billion cracker plant on the banks of the Ohio River. The local chairwoman of the Board of Supervisors, Rebecca Matsco, expressed mixed feelings about the new cracker plant. On the one hand, she is hopeful that it will reinvigorate her town's economy that suffered after the steel industry left, but on the other hand she hopes to spark more recreation and tourism in the area, because "people will want to come here for more than a peek at a big petro-chemical plant."[51] Matsco stated the locally elected representatives had no authority to refuse the cracker plant; they only had the authority to create local rules that affected traffic or noise and light pollution.[52] She stated, "I know the folks at the state level who were actually responsible for making the cracker happen are still benefiting from having been involved, so I'm not worried about how former Governor Tom Corbett feels about the President [Trump] taking credit [for the cracker being built in her town]".[51]

Finally, an announcement at the 2019 World Economic Forum by Saudi Arabia's state-owned oil and gas company, ARAMCO, declared they too want to invest "billions of dollars" in the U.S. natural gas industry. By some reports, AMARCO is the most profitable company in the world.[53] Amin Nasar, the CEO of ARAMCO, followed former Secretary Perry's advice and is looking beyond Texas for investing in the U.S. oil and gas sector. The Saudis already own the Motiva refinery in Texas, which is the largest refinery in North America, and Nasar stated:

> We have agreed to bring an additional 10 USD billion in the Motiva refining complex ... We do have appetite for additional investments in the United States. Aramco's international gas team has been given an open platform to look at gas acquisitions along the whole supply chain. They have been given significant financial firepower – in the billions of dollars."

Four months later, in May of 2019, reports surfaced that ARAMCO was indeed trying to invest in the U.S. shale oil and gas industry in Appalachia by way of investing in a Norwegian firm that owns 344,000 acres in eastern Ohio[54] beneath which it fracs for shale oil and gas, and operates pipelines and compressor stations in the region.[55] If this investment goes forward, then the Saudis would secure enormous investments in upstream and midstream operations in the shale industry in Appalachia. To fulfil their stated strategy at the World Economic Forum, they would only need to find downstream operations in Appalachia in which to invest, and it's not clear why they wouldn't be able to achieve this.

Although it is outside the geographic scope of this paper, one final report is worth illustrating how foreign investors' interest in the U.S.' natural gas sector can create negative security externalities for the U.S. This involves the largest ethane producer in the U.S., American Ethane, which is headquartered in Texas and offices in New Orleans, LA. There are two interesting aspects to American Ethane relevant to our argument. The first is that in November of 2018, the firm, "sign[ed] a landmark 26 USD billion trade deal with a Chinese firm at a ceremony in Beijing, with U.S. President Donald Trump and Chinese President Xi Jinping watching and applauding" and the 26 USD billion in planned exports has now grown to 72 USD billion.[56] This means that American Ethane plans to export tens of billions of dollars of ethane to China despite Trump's Energy Secretary, Rick Perry saying that the U.S. should "build an energy shield to protect our strategic allies … [because] Energy is a weapon in the hands of aggressors. So I say, if energy is going to be used as a weapon, America should always have the largest arsenal." Thus, President Trump was celebrating the export of billions of dollars of the U.S.' "weapons" and "shields" from a critical industry, which ostensibly needs to be protected from protestors exercising their civil rights, to a country that has an assertive economic policy toward its strategic rivals, of which the U.S. is one.[1]

The second interesting point involves the actual ownership of American Ethane. The public face of American Ethane is its CEO, John W. Houghtaling II, who has important political connections, having served as a special counsel to the Attorney General of the state of Louisiana (LA). Further, American Ethane's chief lobbyist was a staffer to former Senator David Vitter of LA, as well. Additionally, 88% of American Ethane is owned by three Russian oligarchs who once had close connections to Russian President Vladimir Putin. This revelation came in July of 2018 because American Ethane's "lobbyist revised its filings with Congress [in July of 2018] as it was being linked to an unfolding spy scandal that has drawn in the Kremlin and the National Rifle Association." However, back in 2014 its filings stated "no substantial foreign control."[57] Regardless of whether the three Russian oligarchs only recently became interested in the U.S. natural gas industry or whether their involvement could no longer be concealed, the point is that foreign investors have acquired enormous investments, and hence control, over important segments of the U.S. shale gas and oil industry, while American politicians consistently deploy "instinctive" patriotic rhetoric about how this sector is crucial to energy security, self-determination, and national security.

Cycling back to weakening democracy

"Instinctive" patriotic rhetoric created attractive industry conditions, which weakened democracy while attracting foreign investors, and cycles back to result in even more extreme examples of the erosion of democracy. Once such example is illustrated by recent arrests near construction of the second Mariner East Pipeline. This pipeline will supplement the first Mariner East Pipeline by transporting natural gas extracted from the Marcellus and Utica shale plays to an industrial complex on the banks of the Delaware River in eastern, PA. The construction of the second pipeline is estimated to cost 2.5 USD billion,[58] and is owned by Energy Transfer, which is a midstream firm with revenues of 54 USD billion in 2018. Three of Energy Transfer's ten largest institutional investors are banks headquartered in Japan, Switzerland, and the UK. Collectively, they only own about 6% of Energy Transfer, but that translates into over 2 USD billion of foreign money invested into a firm operating in rural areas of Appalachia.[59]

In December of 2019, police arrested two residents who live in counties affected by the construction of the 2nd Mariner East Pipeline. One of the residents was arrested while giving a tour of the pipeline construction to concerned citizens and stated that the company "just continues to intimidate residents . . . They waste our police resources on things like this. They take our pictures, they take pictures of our cars, they follow us. They are not good neighbors."[60] However, the infringements on democracy in this episode are actually worse than it seems. A few weeks before this incident, a district attorney (DA) in eastern Pennsylvania (PA) charged the pipeline company "with bribery in illegally hiring state constables to guard construction sites while carrying badges and guns." The DA said, "There's a very clear line that has to be drawn between law enforcement who is acting for the public good, and the public good alone, and the corporate employee who is acting for the good of the organization."[60] This incident suggests that a vicious cycle continues, with the pipeline company dominating small, poor, rural economies in Appalachia with 2 USD billion of foreign capital, and leverages its financial influence to co-opt local police forces to suppress possible dissent.

Our main argument that enormous amounts of money, much of it from foreign investors, flowing into poor, rural areas of the United States weakens democracy rests on similar logic as the four U.S. Supreme Court Justices who dissented in Citizens United v. Federal Election Commission. In their 2010 dissent, the four justices expressed grave concern about the influence of foreign and domestic money in U.S. elections. They recognized that, "Unlike voters in U.S. elections, corporations may be foreign controlled." The dissenting justices also wrote, "One fundamental concern of the First Amendment is to 'protec[t] the individual's interest in self-expression.'"[61] Our research also shows the governors of WV, PA, and Ohio, multiple state legislatures, two presidential administrations, and even local law enforcement agencies have prioritized corporations' interests, many with hundreds of millions and even billions of dollars of foreign investment, over protecting citizens' individuals self-expression and self-determination. Instead of viewing what Hermwille and Sanderink noted as the oil and gas industry's "conspicuous silence" after President Trump withdrew the U.S. from participation in the Paris Climate Agreement,[62] we see active lobbying and investment with the intention of exerting control and influence over conditions that affect the industry – and democracy is one such "condition" that affects the industry.

Conclusion

Our contribution offers a framework for understanding a vicious cycle that produces negative security externalities for the United States and possibly for other democratic societies also rich in natural resources. The "instinctive" type of "patriotic" rhetoric that frames the extraction of shale oil and gas in Central Appalachia as necessary for "energy security" and "national security" has led industry representatives to push for and secure favorable industry conditions despite known important environmental and health risks while the industry increases automation and reduces the need for stable jobs. We do not view this as a tradeoff of democracy for security as Pavone suggests[63] with regard to the misplaced logic for expansion of surveillance technologies. Rather, we argue that the way the U.S. shale industry expanded resulted in a weakening of democracy *and* security. The implication of this finding is significant because it reveals the predominance of presumed economic benefits over other social justice and environmental priorities that also factor into contemporary American politics. in order to prioritize possible economic benefits over social and environmental justice.

Next, we contribute a window to view the flood of foreign investment into this industry and additional proposed legislation to weaken public dissent and local control. Under this view, our argument is that the foreign money flooding into Central Appalachia contributes to negative security externalities in that democratic values, trust in leaders, and hence the political system itself is weakened. Such weakening increases American dependence on foreign investment, thus reducing domestic control over one of its critical industries. This situation encourages additional foreign investment as the U.S. becomes increasingly perceived as having weak governance structures that protect citizens' democratic rights, and undermines trust in the government to protect those rights, while elevating corporate and foreign financial interests, which then encourages further investment, and the vicious cycle continues. In contrast to other scholarship that argues that in the context of U.S. foreign policy, democracy "is relatively resistant to conflicts with national security and economic interests,"[2] we contend that in the context of the U.S. shale industry there has been a weakening of democracy *and* the creation of negative security externalities. Because of proponents' relentless expansion of the U.S. shale industry, the U.S. ultimately risks being viewed as a weak protector of democratic rights, but rich in natural resources, and a land not of the free but ripe for profiteering by foreign investors, some of whom have sophisticated economic policies that negatively affect the United States' security interests.

In our view, the logical solution to breaking this vicious cycle would be a U.S. Supreme Court that overturned Citizens United v. Federal Exchange Commission and related cases that return primacy to democratic values over the financial interests of corporations. Since this recommendation is not politically foreseeable at present, it is reasonable to expect that such economic interests and negative security externalities will expand across more critical industries within the U.S., resulting in further erosions to both democracy and security.

The implications for other countries with strong democratic traditions but also rich in natural resources is clear – only the reflective crafting and enforcing of laws and regulations that protect citizens' democratic rights and that give at least equal weight to their social and environmental issues can withstand the pressures of outside investment. For example, after decades of fracking in the United Kingdom, in March of 2019, its High Court ruled that several parts of the UK government's fracking policy were unlawful due to the lack of consideration for the impacts of climate change.[64] Several months later, the government changed its policy and essentially ended fracking in the UK.[65]. Interestingly, there was only one firm licensed to frack in the UK, Cuadrilla Resources, and its ownership dynamics are similar to what we observed in the U.S. Prior to the ban on fracking, about half of Cuadrilla was owned by an American private equity firm. However, in early 2020 that firm sold its stake in Cuadrilla to a privately held Australian firm that now owns 93% of Cuadrilla.[66]

In short, societies with strong democratic traditions and rich in natural resources are not immune from outside investment that could result in negative security externalities. It is ultimately up to diligent citizens and their societies' institutions to reflectively decide how they will prioritize social, environmental and economic issues, and protect their democracy while maintaining security.

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