Has Unconventional Oil & Gas Development in the Texas Permian Basin Created a Subnational Resource Curse?

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Key Words: Permian Basin, Permian Strategic Partnership, Subnational resource curse, Texas, UOGD

Abstract

The Permian Basin’s combination of massive capital investments, world-scale oil and gas production, and strong, adaptable local institutions with historical experience managing boom-bust cycles creates a unique subnational resource curse case study. This is the first analysis focused specifically on whether subnational resource curse dynamics seen in other oil-rich locales (1) apply to the Permian Basin, (2) if they apply, to what extent, and (3) compensatory policy steps, including emergence of public-private infrastructure partnerships and community engagement at a scale generally not seen in other hydrocarbon provinces.

Introduction

The Permian Basin underlies West Texas and Southeastern New Mexico, covering an area larger than the state of South Dakota. Massive deployment of hydraulic fracturing has broken the Permian’s decades-long output decline, and the region now produces more than 4 million barrels of oil per day, more than every OPEC member country aside from Saudi Arabia and Iraq). It also produces an approximately equivalent amount of natural gas (Figure 1). Permian Basin unconventional oil and gas production is geographically bifurcated between the Midland Basin—centered on Midland County—and the Delaware Basin, whose Texas components centers on Reeves, Loving, and Ward counties—some of the most remote and least-populated parts of Texas (Figure 2).

Figure 1. Permian Oil and Natural Gas Output (million barrels of oil equivalent per day)

Source: EIA Drilling Productivity Report, Author’s Analysis
The Permian’s rapid production growth over the past decade was the product of massive capital investment. Since 2010-2011, when U.S. oil and gas firms began to emphasize liquids (crude oil and
condensate) production due to depressed natural gas prices, an estimated $140-to-150 billion has been invested in the upstream drilling and completions business in the Permian Basin. During the 2016-2019 period alone, producers invested nearly $80 billion of capital in upstream development and Permian Basin output basically doubled. For perspective, Saudi Aramco, the world’s single largest oil producer, invested approximately $89 billion in its upstream operations over the same timeframe.

Among large oil and gas investment zones, the Permian Basin is unprecedented in several ways. First is the sheer mass of capital invested, as described in the preceding paragraph. Second is the velocity of capital deployment. Shale wells in many parts of the Permian can be drilled, completed, and brought onto production in 60 days or less if supporting infrastructure already exists in the area.

Third, unconventional developments have a long supporting “tail” and value chain that injects financial resources across a much greater range of capital equipment and employment touch points than would be the case in traditional oil and mining projects where a small hive of workers—often in a remote area—develops a huge, long-lived asset. In Kazakhstan’s Kashagan project, for instance, the developer consortium spent approximately $50 billion in CAPEX over more than a decade. Yet after the upfront burst of activity to get the project established, Kashagan now employs just 3,200 full time workers and seven thousand contract workers to support approximately 400 thousand bpd of oil production at peak output. And materials inputs diminish significantly after the initial construction phase.

In contrast, sustaining the Permian Basin’s 2019 average oil production level of 4.3 million barrels per day (a proxy for prospective activity profiles with oil prices at or above $55/barrel) requires drilling and completing an average of 400-to-500 horizontal wells per month. The Texas Independent Producers & Royalty Owners Association (TIPRO) estimates that the oil and gas industry in the Permian Basin employed more than 87,000 people in 2019. On the physical input side, the Permian Basin during 2019 consumed approximately as much water per day as the City of San Antonio, more than 600 rail cars’ per day worth of frac sand, and at least 2.4 million tonnes per year of steel oilfield tubular goods.

Against this backdrop, the paper attempts to assess to what extent key subnational resource curse dynamics have affected the Permian Basin during the ongoing unconventional oil & gas investment and production boom that began in 2010-2011. Its core goal in doing so is to inform local and state level policymaking in hydrocarbon-rich parts of the United States, as well as emerging unconventional oil and gas provinces globally, for instance Neuquen in Argentina’s Vaca Muerta play. The paper also describes the unique large-scale engagement unfolding in the Permian between private corporate resource developers and local governments, a compensatory policy response that may have broader global relevance.

Data Sources and Future Research Vectors

The paper utilizes a broad range of supporting datasets, including oil and gas production data from the EIA, New Mexico Oil Conservation Division, and Texas Railroad Commission, completions data from FracFocus, housing data from Zillow and the City of Midland, water and sewerage data from the cities of Midland, Odessa, and Pecos, U.S. Census Bureau workforce and child welfare data, corporate CSR reports, road safety data from the Texas Department of Transportation, and data obtained from multiple local and national newspapers. It also draws upon the author’s personal knowledge and contacts in the Permian Basin, where he was born and raised and where he currently owns a membership interest in an oilfield water development firm.
The Permian Basin’s unconventional hydrocarbon extraction activity is distributed unevenly. In geographical terms, this study thus focuses on the Texas portion of the Permian Basin. The economic catchment area of oil and gas development typically sees the bulk of job creation occur within a 100-mile radius of the producing county (Feyrer et al., 2017), and in more recent work, an even smaller radius of 60-to-80 miles (James and Smith, 2020). Accordingly, this study focuses on Midland (and to some extent, Odessa) as well as the Town of Pecos City, the regional hub community for the Texas Delaware Basin. Midland/Odessa have a population larger than the next 10 largest Permian Basin communities combined. They also are economic aggregators that serve a broad catchment area and host a disproportionate chunk of the region’s white and blue-collar energy sector workforces, as evidenced by the multiple corporate headquarters and regional offices, large equipment yards, and so forth. Activity in those communities reflects a large proportion of the total economic and demographic activity in the Permian Basin.

The Texas Permian Basin—particularly the cities of Midland and Odessa—is different than many other zones elsewhere in the world that have thus far been assessed by subnational resource curse scholarship because they have a nearly century-long history with intensive oil & gas development, which confers, among other things, a robust pre-existing infrastructure base and deep institutional memory among local officials and residents of managing commodity price-driven boom bust cycles.

The Town of Pecos City and surrounding Reeves County offer a test case more akin to other communities where intensive unconventional oil and gas development is truly a new phenomenon, and thus, potentially more disruptive. Long a low-income agricultural area, Pecos has been transformed by unprecedented levels of oil and gas activity in the past decade and when oil prices are above $50, is now one of the most active unconventional drilling areas in the U.S. (and thus, globally).

While Eddy and Lea Counties in New Mexico are among the top oil and gas producing areas in the Permian Basin, much of the value chain, technical staff, and associated industrial activity are based outside of New Mexico. For instance, even firms with significant New Mexico-based production generally run their operations from Midland—or even Houston, Denver, Oklahoma City, or other distant hubs.

New Mexico also has a different level of direct fiscal dependence on oil and gas than Texas does, with more than 20% of budget revenues coming from oil and gas taxation and leasing activities—a proportion more than twice as high as the direct oil and gas share of Texas’s state budget. Finally, most of the oil and gas revenues that New Mexico depends so heavily on originate from only two counties—Eddy and Lea—that are home to less than 10% of the state’s total population and who in cultural and political terms are highly distinct from the state’s major population centers.

As an October 2019 New York Times report puts it, “A frenetic oil boom is revealing a sharp divide between the region producing the oil and those deciding how to spend the wealth.” Texas to date does not have the same broad degree of alienation between resource-production regions and major population centers. Due to these multiple differentiating factors, the subnational resource curse assessment in New Mexico would be a logical follow-on to this present analysis.

**The “Resource Curse” and “Subnational Resource Curse”: Global Dynamics**

The “resource curse” concept centers on the idea that “economic development, political institutions, and community wellbeing may be worse off for regions with large natural resource endowments.” (Sachs...
Resource curse scholarship to date has parsed out at least three core vectors: (1) “Dutch Disease” situations where massive resource revenue inflows distort exchange rates and make manufacturing and other industries less competitive (IMF, 2020); (2) energy commodity price volatility that disrupts growth by causing boom-bust cycles in resource-dependent economies; and (3) resource revenue flows’ potential corrosive effects on institutional quality (Solarin, 2020). Resource curse situations may also include political instability (or even armed conflict), strains on physical infrastructure, and adverse impacts on health, safety, and wellbeing from environmental factors and criminal activity (see, for instance Collier and Hoefller, 2004).

The “subnational resource curse” follows similar conceptual lines, with at least one set of scholars defining it as “the overall negative effects of natural resource wealth in the economy, politics, polity or environment of a subnational area” (Manzano and Gutierrez, 2019). In other words, the primary characteristic distinguishing the “subnational resource curse” from the more traditional “resource curse” is a more granular geographical focus. Subnational analysis offers the most appropriate lens for assessing the effects of imported investment capital (akin to FDI) and resource revenue flows generated in specific U.S. hydrocarbon basins like the Permian.

The positive and negative subnational effects of intensive natural resource development involve two fundamental vectors: (1) infrastructure capacity and (2) institutional capacity. In a dynamic and fast-moving boomtown environment, the two often interact closely with one another. As a pessimistic example, the infrastructure challenges involved in repairing and expanding roads to safely handle oilfield or mining traffic typically cannot be handled by local governmental institutions that lack the capacity, competence, or probity to appropriately deploy money inflows for the good of the community.

Certain of the subnational resource curse indicia delineated in Figure 3 do not presently exist in the Permian Basin. These include armed conflict and repression, lack of local political accountability (multiple locations), fiscal mismanagement, and pervasive, largely unchecked local corruption. But other challenges, including physical infrastructure strains such as housing shortages and road safety are very real issues in communities across the Permian Basin.

The author uses the Transparency International Corruption Perceptions Index score for each country as a proxy for institutional capacity, both in terms of being able to (1) competently handle capital investment and revenue influxes associated with resource booms and (2) effectively address social and community infrastructure challenges from high-intensity resource development operations.

One of the trends that emerges from the initial cross-country comparison is that resource-rich countries with low Corruption Perceptions’ Index score are often beset with more severe subnational resource-related challenges and have less effective capacity to address those challenges. Countries with stronger institutions—for instance Australia, Canada, and the U.S.—still grapple with serious subnational resource curse issues such as housing shortages, crime, and health issues stemming from environmental degradation. But they generally appear to do a better job of confronting these issues.

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1 Measured as an average of the score in each year from 2012 to 2019. Such scores generally do not move dramatically from year-to-year, or even over a 7-year timeframe. Moreover, the scores are a heuristic. For instance, the corruption present (or lacking) in a country with a score of “80” is not likely to palpably differ from the situation of a country boasting a score of “82.” By the same token, the countries scoring near 80 (Australia, Canada, U.S.) present dramatically different environments than Brazil (39) or Russia (28).
resource ownership is also profoundly important, an issue addressed below. On both institutional capacity and resource ownership structure, the Texas Permian Basin is among the most functional major global oil and gas production zone.

**Figure 3. Subnational Resource Case Examples**

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</thead>
<tbody>
<tr>
<td>2013</td>
<td>Australia</td>
<td>79</td>
<td>Queensland, Western Australia</td>
<td>multiple</td>
<td>primarily national</td>
<td>housing unaffordability</td>
</tr>
<tr>
<td>2017</td>
<td>U.S.</td>
<td>73</td>
<td>multiple</td>
<td>unconventional oil &amp; gas</td>
<td>private, state, federal</td>
<td>crowding out of self-employment</td>
</tr>
<tr>
<td>2018</td>
<td>U.S.</td>
<td>79</td>
<td>Pennsylvania</td>
<td>unconventional natural gas</td>
<td>private</td>
<td>elevated incidence of pediatric asthma hospitalizations</td>
</tr>
<tr>
<td>2019</td>
<td>Chile</td>
<td>69</td>
<td>multiple</td>
<td>hard rock mining</td>
<td>national</td>
<td>lack of local institutional capacity, resource windfall crowds out residential property taxes</td>
</tr>
<tr>
<td>2017</td>
<td>Ghana</td>
<td>44</td>
<td>Krobo</td>
<td>limestone</td>
<td>national, royalties paid to custodialchieftancy</td>
<td>resource revenues reinforce the political power of unaccountable hereditary chieftancy structures</td>
</tr>
<tr>
<td>2009</td>
<td>Brazil</td>
<td>89</td>
<td>multiple</td>
<td>crude oil</td>
<td>national</td>
<td>significant increases in local government revenues from oil royalties not matched by commensurate increases in household income or socio-economic outcomes</td>
</tr>
<tr>
<td>2019</td>
<td>Colombia</td>
<td>37</td>
<td>San Vicente de Chucurí</td>
<td>crude oil</td>
<td>national</td>
<td>land conflict, fuel theft, extortion, organized non-state actor violence, political destabilization</td>
</tr>
<tr>
<td>2018</td>
<td>Peru</td>
<td>37</td>
<td>Esplinar, Huari</td>
<td>hard rock mining</td>
<td>national</td>
<td>lack of local institutional capacity, corruption</td>
</tr>
<tr>
<td>2020</td>
<td>Colombia</td>
<td>37</td>
<td>Arequipa</td>
<td>crude oil</td>
<td>national</td>
<td>corruption, distortion of municipal budget and financial decisions, lack of local institutional capacity</td>
</tr>
<tr>
<td>2019</td>
<td>Tanzania</td>
<td>54</td>
<td>Buluahului, North Mara, Mtwa, Lindi</td>
<td>gold, natural gas</td>
<td>national</td>
<td>local-central gov't conflict, gov't. use of force against local population</td>
</tr>
<tr>
<td>2020</td>
<td>Russia</td>
<td>28</td>
<td>multiple</td>
<td>crude oil</td>
<td>national</td>
<td>positive oil price shocks increase corruption, reduce democracy and quality of governance</td>
</tr>
</tbody>
</table>

Source: Multiple Studies

**Source:** Multiple Studies

**Negative Effects**

**Positive Effects**

**Publication Year** | **Country** | **Avg. Country Corruption Perceptions Index, 2012-2019** | **Subregion** | **Resources** | **Resource Ownership** | **Subnational Resource Curse Symptoms?** |
<table>
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</thead>
<tbody>
<tr>
<td>2010</td>
<td>Canada</td>
<td>81</td>
<td>Alberta</td>
<td>crude oil, natural gas</td>
<td>national and private</td>
<td>substantial increases in employment and income in energy extraction and non-energy sectors in producing areas</td>
</tr>
</tbody>
</table>
So how do these factors potentially apply in the Texas portion of the Permian Basin? The region is subsumed into the United States’ massive $20 trillion/year economy, which suppresses national-level Dutch Disease effects. Some parts of the Permian Basin may suffer localized displacement impacts as a result of a large resource-driven revenue influx. Displacement and other key dimensions—including fiscal management, infrastructure strains, price volatility, and institutional quality—will be investigated in the analysis section of this paper.

After the shale boom kicked off in 2007-2008, many scholars examined impacts of intensified oil and gas extraction activity in various parts of the U.S. Employment impacts have been a focal point, with Pennsylvania forming a geographical area of particular emphasis in the sample of 28 studies reviewed by Krupnik and Echarte (2017). These indicated a considerable degree of variation between various regions. The studies also generally indicated that unconventional oil & gas extraction activity, while posing challenges, drove net economic gains in various parts of the U.S.

But they focused most heavily on basins other than the Permian, none of which had close to its scale. Enormous deployment of capital investment and correspondingly large labor inflows and demands on community infrastructure have challenged local Texas Permian communities at a scale that previous booms have not. North Dakota was the earliest U.S. shale super boom, with the New York Times Magazine noting that the state “has had oil booms before but never one so big, never one that rivaled the land rush precipitated more than a century ago by the transcontinental railroads...” But the Permian takes heft to an entirely different level: FracFocus data show that since 2009 approximately 13,000 wells were drilled in the Bakken, vice nearly 50,000 in the Permian Basin. Likewise, the Permian’s peak oil production to date was 50% higher than the combined peak to date oil & gas production from the Bakken and Eagle Ford.

Moreover, most prior studies examined the pre-2015 period of U.S. unconventional oil & gas development, thus pre-dating the point at which Permian Basin unconventional development accelerated significantly and came to comprise the approximately 1/3 of total U.S. oil output it now accounts for. Finally, the existing scholarship does not emphasize resource curse dynamics in the Permian Basin (for instance, Wang 2020).

Work such as Wang’s analysis of economic impacts from oil and gas development in the region naturally sets the stage for an inquiry into the subnational resource curse in the Permian Basin. The author has not yet located any pieces examining the effects of massive flows of external-origin investment capital and resource revenues on the Permian Basin of Texas and New Mexico, and thus believes that this analysis is an original contribution to the literature.

The analysis will now explore how certain subnational resource curse indicia are—or are not—showing up in the Permian Basin and how communities and corporations operating in the region have responded to infrastructural and institutional challenges.

The Subnational Resource Curse: What Does Texas Permian Basin Evidence Show?

Globally, the range of subnational resource curse effects is broad. There is not a specified number or intensity of these that automatically yields a diagnosis of “subnational resource curse.” Yet the determination process is also not indefinite or potentially arbitrary, as for instance U.S. Supreme Court Justice Potter Stewart’s famous 1964 concurring opinion where he declined to define “hard-core pornography” but said “I know it when I see it.” Testing the existence of a subnational resource curse is
fundamentally a balancing exercise aimed at assessing how the benefits conferred by development and exploitation of the resources do—or perhaps, do not—exceed the negative externalities created thereby. We now undertake this inquiry for the Permian Basin in four key categories listed in Figure 4 (below).

Figure 4. Subnational Resource Curse Impacts

<table>
<thead>
<tr>
<th>Type of Impact</th>
<th>Infrastructural</th>
<th>Health/Safety/Environment</th>
<th>Fiscal</th>
<th>Political</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strains on community</td>
<td>Strains on community infrastructure, including housing, roads, municipal water</td>
<td>Crime, road safety, air pollution, noise pollution, light</td>
<td>Excessive municipal debt, crowding out of economic diversification,</td>
<td>Institutional erosion, reinforcement of political incumbency, corruption,</td>
</tr>
<tr>
<td>infrastructure,</td>
<td>and sanitation systems, schools, hospitals</td>
<td>pollution, water pollution/resource depletion</td>
<td>boom-bust cycles</td>
<td>severe political conflict between local communities and state/provincial/</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>federal-level authorities, organized violence, state repression</td>
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</tr>
</tbody>
</table>

Degree of Impact in Texas Permian Basin

| High                        | Moderate | Moderate-to-low | Low                        |

In many jurisdictions such as Brazil, Colombia, and Russia, local governments receive direct royalty payments from oil, gas, and mineral production (Rodriguez 2020, Caselli and Michaels 2009, Zakharov 2020). In some instances, these payments come to constitute the lion’s share of municipal revenue, which can overwhelm local institutions, catalyze corruption, and generally reduce the quality of governance. For instance, Rodriguez profiles corruption and poor public management of public procurement processes in Arauca municipality in Colombia, where on average between 1986 and 2015, oil royalties accounted for 61% of municipal revenues.

This is not the case in the Texas Permian Basin, where a significant portion of total rents instead flow directly to local private land and mineral owners. Oil and gas are privately owned in Texas, more than 90% of surface lands are in private hands, and private mineral leases typically charge royalty rates that can be as high as 25 percent of gross revenues generated by the sale of hydrocarbons from a well. Furthermore, private parties can monetize multiple other species of property, including caliche (full dirt and rock for building roads and well pads), water, surface damages, pipeline easement rentals, and fees for injection disposal of produced water. Land and mineral owners thus benefit from multiple sets of activities along the unconventional oil and gas value chain.

To quantify what this means in practice, consider 2019 financial data from University Lands (UL), which manages the surface and mineral interests of 2.1 million acres of land across nineteen counties in West Texas (mostly in the Permian Basin region) for the benefit of the Permanent University Fund, which
supports multiple educational and healthcare entities in the University of Texas and Texas A&M systems. In Fiscal 2019, UL reported approximately $1.1 billion in net revenue, or $522 per acre managed.

Many private landowners charge more for various royalties and fees than UL does and have more intensive activities on their lands and in prime areas, can likely generate a multiple of the UL per acre revenue levels. While difficult to precisely quantify total economic benefits to private property owners due to many of the agreements between energy companies and landowners being confidential, private land and mineral owners in the Permian Basin collectively receive billions annually in various payments related to unconventional energy development activity. Finally, the ownership of surface land and mineral rights is relatively concentrated, particularly in the Delaware Basin, where multiple landowners have holdings exceeding 20,000 surface acres and in many instances, commensurately large mineral ownership positions. This gives them a degree of size and leverage for bargaining with resource developers that denizens of most other oil and gas-producing areas around the word simply do not have.

Municipal budgets in Permian Basin cities in Texas depend heavily on secondary and tertiary revenue sources—in particular, taxes generated through ad valorem assessments on residential and commercial property and taxation of various local economic activities such as the sale of goods and lodging. In both Midland and Odessa, Texas (which combined house approximately ½ of the Permian Basin’s population and most of the major corporate offices and largest equipment yards), municipal revenues basically doubled between 2010-11 when the boom started and 2018-2019, the furthest point we have data for (Figures 5 and 6).

Figure 5. Municipal Revenue Sources in Midland, Texas, Fiscal 2001-2019

Source: Midland, Texas Comprehensive Annual Financial Reports, Author’s Analysis
The revenue increase was driven primarily by (1) a doubling in the taxable value of residential and commercial property stock in each city, (2) substantial increases in taxable sales, (3) hotel stays (where both volume and higher nightly rates contributed), and (4) gross receipts and miscellaneous other taxes. Tax revenues’ share of total municipal revenues remained high thought the entirety of each period measured, ranging from 77% to 87% of the City of Midland’s gross revenues [FY2001-FY2019] and 72% to 83% for the City of Odessa [FY2009-FY2018].

Sales taxes can be volatile and are the most direct and fast-acting pathway by which global oil and gas price volatility transmits itself into local fiscal (and political) situations. Smaller communities face an especially pronounced level of fiscal buffeting, but even stalwart communities such as Midland and Odessa that are larger and have more institutional experience handling such swings are still challenged. To illustrate the volatility unconventional oil and gas development activity have brought in the Texas Permian Basin, consider the sales tax trajectories of Reeves County (County Assessment District 1 and the Reeves County Hospital District), Ector County (primarily the Ector County Hospital District), Midland County, and Lubbock County (much less oil and gas activity). Using January 2013 net sales tax payments reported to the Texas Comptroller’s Office as the baseline, Midland and Ector counties experienced greater sales tax revenue volatility than Lubbock, but even at their monthly peak, revenues basically doubled from the baseline level. In Reeves County, however, the monthly apogee in 2019 was nearly 15 times the January 2013 level.

The biggest fiscal challenge from the perspective of communities in the Texas Permian Basin is not necessarily how to manage volatile sales tax revenues or shifts in property tax revenues (the other key financial base), but rather, how and when to pull the trigger on big-ticket infrastructure such as water
systems and schools where local taxpayers may then have to bear costs for 20-to-30 years into the future. Early in the unconventional oil and gas revolution, many parts of the Permian Basin enjoyed a grace period due to pre-existing infrastructure accumulated during the region’s previous 50 years as a world-scale hydrocarbon producer. However, as the next section will detail, system demand now exceeds in many cases what existed before and if oil prices sustainably recover above $50/bbl, such strains could be exacerbated.

**Pre-Existing Infrastructure Capacity Helped the Texas Permian Handle The Unconventional Boom’s First Phase**

Permian Basin communities are in a somewhat unique position relative to other comparable resource boom communities in North America and globally. Several factors confer adaptability.

First, the population and political leaderships in multiple Texas Permian Basin communities have an institutional memory not only of commodity price cycles, but how to cope with oil and gas price swings with production at world-class scale. North Dakota’s Bakken area had prior oil and gas activity and Pennsylvania has produced oil since the time of the Civil War (Colonel Drake). Alberta also has a long oil production history. But none operated with the Permian’s heft or depth of local experience in managing volatility. Indeed, the area supplied much of the oil that helped the Allies prevail in World War II and then had several booms and busts—including one in the mid-1980s that came on the heels of a boom so intense that Rolls Royce even had a dealership in Midland at one point to save customers from having to make the 330-mile drive to Dallas.²⁹

Second, the regional hub of Midland plus Odessa already had a substantial pre-existing infrastructure “cushion” in place that helped absorb the first waves of unconventional oil and gas activity. Infrastructure breaks down into two basic categories—housing, whose costs are generally borne by private parties and entails a large number of discrete investment decisions whose individual value is typically in the low hundreds of thousands of dollars—and “community” infrastructure projects such as schools, water systems, hospitals, and roads. Community infrastructure projects are fewer in number than other adaptations such as housing construction, but are typically publicly financed and involve investments of hundreds of millions of dollars per project. Their size relative to underlying municipal finance bases that in many cases have been unsustainably inflated by commodity-generated revenue and investment inflows make such centimillion dollar projects a major potential danger point for resource boomtowns.

In certain instances, frenetic development ensues, arguments are then made that major infrastructure investments are essential to sustain the boom, communities undertake projects that sometimes cost hundreds of millions of dollars [or a substantial proportion of total annual municipal revenue], and then commodity prices crash, development activity stalls, but local residents and ratepayers are left holding the tab for debts that may need to be serviced for 20 or more years.

North Dakota’s Western Area Water Supply Project, where public entities underwrote a massive water supply network whose primary beneficiaries were private energy companies that lobbied for the project offers a cautionary tale (Smith and Haggerty, 2020).³⁰ In this case, private energy producers lobbied for—but did not make binding financial commitments to—an unprecedented water infrastructure buildout that ultimately created a 1,700 mile pipe network throughout the Bakken play at an estimated cost of $460 million. Thereafter, drilling activity dropped sharply after oil prices crashed in late 2014 and the
premium-priced water sales to frackers that the project had depended on to make its finances work fell to a fraction of their prior levels.

Key Permian cities have thus far managed to avoid saddling themselves with “infrastructure albatrosses” on the scale of the North Dakota example project. One reason for this is the Permian Strategic Partnership—a public private forum through which multiple energy producers are coordinating substantial financial contributions to support community infrastructure projects. This structure, described in greater detail toward the paper’s end, may help better align public and corporate interests in key community systems, in part by forcing companies to put financial “skin in the game” in a way that they did not in North Dakota, for instance.

**But Broader Infrastructure Strains Have Emerged**

The headroom has been occupied in many areas, however. Consider the sister cities of Midland and Odessa—the Permian Basin’s economic nerve center. Demands upon certain “big ticket” infrastructure—particularly potable water supply, and by extension, sewage flows—have been managed to a substantial extent by using price changes to reduce system demand in response to drought.31 But others, ranging from school to sewer network expansions, airport usage, emergency services demands, and municipal refuse collection have seen substantial demand increases over the past 20 years in Midland and Odessa (Figure 7). In multiple instances, annual infrastructure demands in recent years of intense oil & gas activity have grown at rates far exceeding the underlying population increase.
Figure 7. Demands on Selected Community Infrastructure Systems in Midland, Texas Between Fiscal Year 1999 and Fiscal Year 2019
*Fiscal Year = September to September

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<td>20-year Trend</td>
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<td></td>
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<td></td>
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<tr>
<td>FY1999</td>
<td>39.5</td>
<td>11.4</td>
<td>65.0</td>
<td>25,601</td>
<td>499</td>
<td>485,086</td>
<td>1,380</td>
<td>105,376</td>
</tr>
<tr>
<td>FY2000</td>
<td>43.4</td>
<td>9.8</td>
<td>62.0</td>
<td>25,208</td>
<td>502</td>
<td>478,941</td>
<td>-</td>
<td>107,360</td>
</tr>
<tr>
<td>FY2001</td>
<td>47.5</td>
<td>11.4</td>
<td>62.0</td>
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*Estimated using U.S. Census Data for Percentage of Children Ages 5-17 Living in Poverty and Absolute Number of Such Children Estimated to Live in the County.

The City of Midland’s annual financial disclosures reflect the same system demands highlighted above. Notably, “construction in progress”—a proxy for major investments in public infrastructure—have climbed to record levels during the past two fiscal years (2020 data have not been reported yet). Plotting these expenses for every fiscal year since 2007 (the inception of the unconventional oil and gas boom) shows an initial round of investments in fiscal 2009 and 2010 as various infrastructure was modernized and upgraded, with expenditures tapering down in fiscal 2011 and 2012.

The next several years saw a “breather” period as the city restrained new construction project expenses (in part due to an oil price downturn) and allowed the existing base to absorb demands imposed by ongoing activity. Once the more recent, high-intensity phase of Permian unconventional resource
development commenced, Midland had to re-embark on a much larger construction program to repair wear and tear from prior years and also accommodate the massive flows of people and materials unleashed in calendar years 2017 through 2019, as well as expected future activity (Figure 8).

Figure 8. “Construction in Progress” in City of Midland’s Budget vs. Permian Basin Oil Production

[Image of a graph showing construction in progress vs. Permian Basin oil production with labels for “First round of infrastructure investment,” “Major construction to accommodate intensive present development and future expectations,” and “Headroom absorbed as activity increases.”]

Source: City of Midland Comprehensive Annual Financial Reports, EIA, Author’s Analysis

Addressing specific points of strain in an oil boomtown’s public infrastructure invokes very different economic and political implications. Adding staff and equipment for increasing a municipality’s public safety or sanitation services capacity entails investments that are significant, but generally small relative to the total budget and rapid to execute. For example, trucks can be purchased with one-time payments and delivered within months, while people can also be hired quickly—and with manageable risk since hires can be terminated if they fail to perform.

Large, fixed infrastructure items are very different. They often have costs equivalent to a substantial portion of annual municipal budgets—even for medium-sized cities like Midland (Figure 9). Moreover, they are typically debt financed, with repayment occurring over decades regardless of whether demand for that item materializes. With examples such as the Western Area Water System described above looming, Permian Basin residents who must vote on bond issues necessary to finance expansions of water supplies, schools, and other items are thus wary of tying into multi-decade commitments against the backdrop of commodity prices that can turn dramatically in weeks or even days. This may be one reason a 2019 bond issue seeking nearly $570 million for school construction in Midland was narrowly defeated in a tumultuous election.32
As key Texas Permian Basin cities move to address infrastructure constraints amid volatile global oil prices, fiscal management does not appear to be a significant issue. Midland and Odessa’s respective municipal debt profiles over the past 20 fiscal years reflect competent and generally, conservative, fiscal management in the face of booming oil & gas production, volatile commodity prices, and unprecedented strains on community infrastructure. Comparing the Permian sister cities’ to the communities of College Station and Waco, two cities of similar size that have experienced substantial population growth but are not tightly tied to the fortunes of the oil and gas industry, illustrate West Texas financial conservatism. Indeed, the City of Midland notes in its most recent comprehensive annual financial report that the City Council adheres to a “safe debt limit” equal to no more than 8% of assessed property value in the city. Actual debts are only about half the self-imposed “safe” level.

Even with a major issuance of general obligation bonds in fiscal 2019 to pay for infrastructure maintenance and expansion, Odessa’s primary government debt per capita was still less than half of Waco’s level. For its part, Midland is closer to the debt levels of Waco and College Station (as of fiscal 2018 due to the 2019 Comprehensive Annual Financial Report being inaccessible). Midland’s debt level—which substantially exceeds Odessa’s—is heavily driven by the development of the T-Bar and ClearWater Ranch water supply project and associated minimum guaranteed offtake contract with the Midland County Fresh Water Supply District #1 (Figure 10).

As the author reviewed Midland and Odessa’s municipal financial reports covering the past 20 fiscal years, the common thread was (1) self-imposed fiscal discipline and (2) high-cost projects typically focusing on water and sewerage. Potable water supplies are a special point of focus, given their existential importance
in a climate zone where annual precipitation rarely exceeds 15 inches per year and extended droughts are common. In Midland’s case, while the T-Bar/ClearWater Ranch supply project accounts for more than half of the city’s reported primary governmental debt (classified as a capital lease obligation), it can provide a daily water supply capacity approximately equivalent to the city’s entire present usage and locks this down through calendar year 2040.

Figure 10. Primary Governmental Debt, $ per Capita by Selected Mid-Size Texas City

Source: Comprehensive Annual Financial Reports

Key Texas Permian Basin communities’ ability to competently manage local finances in a disciplined way despite boomtown pressures strongly suggests that the checks and balances built into local political institutions are generally functioning as designed.

Human Influx Creates Health, Safety, Environment, and Housing Challenges

The services-intensive nature of unconventional oil & gas production coupled with the Permian Basin’s scale and speed of activity created large demands for labor at an intensity and scale substantially beyond that of prior energy activity expansions in the region (Figure 11).

16
Figure 11. Permian Basin Labor Force Shifts Toward Longer and Stronger Increases in Workforce Demand

Source: Census Bureau (via Federal Reserve Bank of St. Louis), Author’s Analysis

Health, Safety, and Environment Challenges

Road traffic is one of the first infrastructure demands to spike when an unconventional oil and gas boom occurs. Vehicle movement is especially concentrated in and around the best rock—the “sweet spots” that drive an outsized portion of drilling and completions activity. Traffic volumes in Reeves and Midland Counties, in particular, have risen enormously in both absolute and relative terms since the boom began.34 For example, Texas Department of Transportation meters on US Highway 285 north and south of the city of Pecos, indicate that average annual daily traffic counts on certain stretches of the road have risen almost 10-fold since 2009 (Figure 12).
**Figure 12.** Changes in Annual Daily Traffic on Selected Roads Near Midland and Pecos, Texas, Vehicles Per Day

(US Highway 285, Interstate 20 West, and Texas State Highways 158 & 349)

Increased traffic volumes have lethal consequences. Crash fatality rates per 100,000 population run much higher in the Permian Basin than they do statewide in Texas (Figure 13). Fatality rates in both the Midland and Delaware Basins also respond to activity levels in the oilfield: 2016, a down year also saw fatality rates decrease sharply in both Permian sectors. Likewise, 2018, the high water mark to date in terms of sheer activity intensity, saw fatalities spike in the Delaware Basin and rise significantly in the Midland Basin. Even in the relative “down year” of 2016, the road fatality rate per 100,000 population for the core Texas Permian Basin counties was still twice the US national average and roughly on par with that of Russia, one of the world’s most dangerous industrialized countries to drive in.\(^{35}\)
State authorities are responding decisively to road damage and danger created by heavy weight, high-intensity oilfield traffic. The Texas Department of Transportation has already expanded US HWY 285 and State Highway 349 using a so-called “Super 2” arrangement whereby a passing lane is added in alternating directions every few miles to help drivers get around slow equipment convoys and thus reduce the incentives for high-risk passes that have caused head-on collisions. As of January 2021, data from the Texas Department of Transportation’s Project Tracker indicate a beehive of road repair and upgrade activity in the Odessa District that encompasses the Texas Permian Basin’s highest oil and gas activity counties, with $5.2 billion’ worth of recently completed, ongoing, and pending projects.

Intense unconventional oil and gas activity can also affect local health and wellbeing. One of—and perhaps the—first studies of subjective stresses energy development places on nearby populations comes from (Elser et.al, 2020). This study found in a sample of 566 respondents from across Texas, 292 of whom lived in the Permian Basin, that environmental distress score (EDS) responses were noticeably elevated, particularly in the categories of “felt impact” and “solastalgia” or “emotional anxiety that derives from climatic impact on the environment.”

For objective health impacts, the author was unable to locate studies directly pertaining to the Permian Basin. There is however a rich literature from Pennsylvania in particular that shows substantive geospatial relationships between intense unconventional gas development and production activity and a range of adverse health impacts, including heart failure hospitalizations (McAlexander et.al, 2020). With a finite set of hydrocarbon molecule types being emitted from fracked wells around the U.S. and common basic
human physiology regardless of geography, it appears reasonable to expect that deeper health science investigations are likely to find some degree of negative health impacts on populations in the Permian Basin who live near intense unconventional oil and gas activity zones.

Unconventional oil and gas activity can also have public health impacts through the spread of infectious diseases, particularly sexually transmitted infections (Beleche 2018 and Cunningham 2020). The author does not find any published studies assessing this issue in the Texas Permian Basin specifically, suggesting it would be a worthwhile subject for future epidemiological inquiry. Likewise, intensified unconventional oil and gas activity has been associated with higher levels of criminal activity in jurisdictions including North Dakota (James 2017). Yet like infectious disease, there are apparently no published studies yet that conduct a deep analysis of the crime impacts that unconventional oil and gas development has had in the Permian Basin of Texas. This would be a logical and useful area for future scholarly assessment.

For health and safety issues, local reactions will remain the key variable in determining the ultimate impacts. In some instances—for instance, water contamination—responses will likely be more robust. The strong local reaction to the potential risks posed to the San Solomon Springs near Balmorhea is one example of an issue capable of stimulating responses despite locals’ generally strong support for the industry. Flaring is also sparking a level of political response not seen during previous oil and gas booms, became a statewide issue in the 2020 race for a Texas Railroad Commission seat, and has triggered at least two pieces of draft legislation in the Texas House.

Seismicity related to oilfield activities has also attracted increasing public, political and regulatory attention in the Permian Basin. At this point in time, seismic epicenters generally fall in remote areas and thus far have not been shown to damage structures in the manner seen in Central Oklahoma, for instance. Accordingly, while parties seeking to operate saltwater disposal wells in certain areas will face higher regulatory scrutiny moving forward, seismicity does not appear to be a major risk factor for unconventional oil and gas operations’ social license to operate in the Texas Permian Basin.

But in other instances, local economic interests are likely strong enough to ensure a far greater degree of tolerance for the side effects of unconventional oil and gas development in Midland, Odessa, and Pecos than would be the case in a place like Denton (near Dallas) where negative externalities are juxtaposed against a much more diversified local economy. Recent scholarship from Oklahoma supports this hypothesis, finding that communities with a high economic reliance on oil and gas production tended to have a strong sense of attachment to the industry, with many residents willing to accept a substantial degree of negative externalities in exchange for the economic benefits generated by oil and gas activity in their area—and often, for them personally or family and friends (Campbell 2020).

**Housing Challenges Amidst Strong Activity and Oil Price Volatility**

During the boom’s earliest innings, rapid labor force influxes could be accommodated more easily because Midland and Odessa (as well as some smaller regional towns) had spare housing, apartment, and hotel capacity because up until 2007-2008, the Permian was widely perceived to be a basin in a slow, but terminal decline. But once the headroom was occupied, it became tougher and more expensive to house new arrivals, a trend that has continued to the March 2020 price crash and which will likely be revived if oil prices exceed $50 per barrel and Permian Basin drilling and completions activity steps back up to the 350 wells per month level or higher.
Oil price volatility over the past 5 years, especially the massive price swings in early to mid-2020 resulting from the coronavirus pandemic, challenges the ability of private investors and government officials to plan for local and regional infrastructure needs moving forward. There is a rich body of economic literature dating back to at least the early 1980s which examines the effects of oil price volatility on firms’ investment decisions.46

Research in the field has focused on oil’s importance as an input cost for businesses and how uncertainty about the direction of oil prices can affect capital investment decisions. But for an investor contemplating a hotel, apartment, or other such capital project in the Permian Basin, oil price volatility impacts the decision much more profoundly because the investment does not simply treat oil as an input cost; rather, the asset will cater to demand driven by oil & gas activity, making it fundamentally a directional bet on oil prices. A 2019 study in Energy Economics found that firms in oil producing countries—who are presumably more directly leveraged to oil rents—reduced their corporate investment by greater amounts during times of oil price uncertainty than did firms in oil consuming countries.47 While the author has not yet located a study specifically focused on oil price volatility’s impact on investor decisions in the Permian Basin, the same dynamics cited in global studies appear to apply.

In an uncertain oil price environment coming on the heels of a multi-year price downturn, investors’ default position will likely be “build to the minimum expected oil price” or in many instances, stay on the sidelines until prices improve. Put simply, if a real estate project can generate cashflow with WTI at $35-to-40/bbl, then it delivers outsize returns with WTI at $65. Or perhaps it does not get built at all if an investor is more risk-averse or in the case of larger investors, if oil price exposure in the Permian makes projects elsewhere in Texas or the US more attractive on a relative basis as they compete for capital in the investor’s portfolio.

As an example of how commodity price risk can alter investors’ willingness to respond to market demands, consider the dramatic slowdown in the apartment and hotel units permitted by the city of Midland, Texas following the 2014 oil price crash (Figure 14). Despite strong growth in oil production volumes and associated services activity and meaningful increases in local labor force numbers, developers slammed on the brakes in 2015 after frenetic permit issuance in 2013 and 2014.

Part of the slowdown could be attributed to the fact that in 2013 and 2014, the city granted developers permits for a combined total of 1,075 hotel rooms and 2,168 apartment units. But the fact that the labor force in Midland County alone rose by more than 5,000 persons between January 2015 and January 2019 and by more than 14,000 persons in the contiguous counties casts doubt on a backlog alone being the key factor behind slow apartment and hotel permitting between 2015 and late 2018.
The magnitude of labor force population increases during the oil price downturn, combined with that fact that home prices, apartment rents, and hotel room rates stayed strong through nearly the entire duration of the low oil price period suggest that demand in fact would have been sufficient to stimulate new construction beyond actual levels, had private investors been less spooked by oil price swings. Take for example the fact that Zillow data show that Midland County’s median home price remained steady through the worst of the downturn despite the time needed to sell a house spiking above 100 days during the oil price nadir in January 2016 and during a second period of uncertainty in late 2016/early 2017.

Insufficient permanent housing capacity can weaken municipal finances. The RVs, man-camps, and other temporary shelters that house workers who are commuters or who cannot find housing locally do not expand the local real estate tax base. This is a particularly critical vulnerability in Texas, where property taxes are an important contributor to municipal tax revenue since there is no state or local income tax.

**Compensatory Responses—Unique Public-Private Partnership**

Unlike overseas oil and gas plays where somewhere between one and perhaps five companies dominate production operations in an infrastructure-poor area—such as Shell in the Niger Delta or ExxonMobil and OilSearch in Papua New Guinea—the Permian hosts hundreds of operators. Of these operators, 25 account for about half of Permian Basin output. The Basin’s diverse slate of producers and service companies creates a potential collective action problem as multiple producers’ activity ties up local infrastructure bandwidth.
In response, industry and the community have formed the Permian Strategic Partnership (“PSP”), a private coalition of energy producers whose mission is “...to improve the quality of place for Permian Basin families by partnering with local leaders to develop and implement strategic plans to foster superior education, accessible housing, a supportive healthcare system, safer roads, and workforce development.” As of November 2018, the PSP had committed to provide “more than $100 million over the next several years as seed money to spur additional private sector investment.” Five areas comprise the PSP’s core priorities: (1) safer roads, (2) improved schools, (3) quality health care, (4) affordable housing, and (5) workforce development.

Each of these focus zones offers opportunities for joint public-private investments, where companies can facilitate community infrastructure development but leave the prime mover and project execution roles to local and state government. Initial evidence also suggests the PSP will play a role as a de facto lobbying group for situations where oil industry infrastructure needs coincide with those of Basin communities. West Texas is economically vital but has relatively few people compared to the Triangle and Rio Grande Valley, which demographically dominate the Texas legislature. Accordingly, an industry consortium like the PSP can help ensure a stronger voice in Austin and secure needed resources for maintaining and upgrading key community infrastructure such as roads.

The PSP has also shown that it can serve as a “seed investor” to help anchor and de-risk large-scale infrastructure projects. As an example, consider the 2019 collaboration to fund the construction of 14 IDEA schools in Midland and Odessa by 2025, with $16.5 million of initial funding coming from the Permian Strategic Partnership alongside $28.5 million pledged by local foundations.

Public-private partnerships—whether systematic like the PS or ad hoc and centered on a specific issue or geographical area—have significant upside as a tool for addressing community infrastructure strains in the Permian Basin. As an issue-specific example, Pioneer Natural Resources struck two deals with the Cities of Midland and Odessa to upgrade municipal wastewater treatment facilities (Midland) and purchase treated effluent (Odessa), collectively saving ratepayers at least $100 million and perhaps more over time. Pioneer’s investments depart somewhat from the community infrastructure framework used throughout this paper because they use a directed corporate investment or long-term purchase commitment that underwrites improvements to a city’s infrastructure and bolsters municipal financial health, but in this case renders the water produced a captive asset exclusively accessible to Pioneer. In contrast, firms that invest in roads, schools, parks, and other such items are creating infrastructure capacity that is more broadly usable both by the public and by other commercial interests.

Companies have followed several broad models of community infrastructure investment to date in the Permian, including:

- large, high-dollar public/private partnership projects such as Pioneer Natural Resources’ agreement to upgrade Midland’s wastewater treatment plant in exchange for guaranteed offtake of treated effluent for oilfield use;

- smaller, ad hoc investments in services providers needed by employees such as the Primrose School constructed in Midland with support from Anadarko, Chevron, EOG, and Oxy;

- smaller, ad hoc investments in community amenities that don’t specifically benefit the company, such as XTO’s funding of part of the Dennis the Menace Park project in Midland.
• investments through, or in collaboration with local philanthropic groups and an industry consortium such as the Permian Strategic Partnership.

Corporate investments by oil and gas producers in community institutions and infrastructure historically stem from several motivations. The first set are those taken to improve local (and in many cases, global) perception and reputation of the company. The second category is acts of corporate philanthropy and community investments aimed at placating various local interests who may feel “left out of” money flows from local resource development. The third category of motivation for corporate investments in community infrastructure is the reality that left unchecked, community infrastructure limitations can become a bottleneck on development and strand resources. In some cases, impairments can become sufficiently large that they negatively impact the overall valuations of firms working to develop a resource, a phenomena that has already happened with certain Permian-focused oil & gas producers. The fourth category of corporate investments in community infrastructure are those actions taken to compensate for local governments’ lack of capacity or will to execute essential support infrastructure projects.

In practice, these motivations are often intertwined and actions may simultaneously serve multiple end goals. For remote sites that are in less-developed countries that often lack reliable basic infrastructure such as all-weather roads, drinking water and sanitary sewer service, electrical power, medical clinics/hospitals, and schools corporate investments can help convince communities to support a resource development project whose rents will predominantly flow to far-away government and corporate entities. They also facilitate resource development, since better roads mean faster movement of materials, access to cleaner water and medical services mean healthier and more productive workers, and education can over a span of years help mold a more productive pool of local workers.

Investments aimed at placating local interests who feel bypassed by the economic benefits of a resource development boom become especially important in areas where rents flow primarily to the government (particularly central governments) and the developer corporations. Perception-based investments may not yield direct bottom line benefits for a corporate actor in the near-term, but they help maintain social license to operate over the longer term. This paper adopts the following definition of social license:

*The demands on and expectations for a business enterprise that emerge from neighborhoods, environmental groups, community members, and other elements of the surrounding civil society.*

Maintaining a well-stocked social capital account can help pre-empt local opposition to operations that in a worst case can delay or entirely foreclose development of a resource. Even in Texas and even in cases where the oil & gas sector is an important employer, companies cannot assume that social license to operate is perpetual. Those who do can find themselves the target of community opposition that in more extreme cases could broadly and significantly curtail industry operations.

Deep engagement with the community can provide energy companies an early warning of potential challenges to their social license, allowing them to respond with maximum effectiveness. Many of the firms developing unconventional oil and gas resources in the Permian Basin are either “pure play” firms with all of their resource holdings in the Permian Basin or derive an increasingly material portion of their production from the Permian. Such a Basin-specific asset concentration strengthens the case for investing in community infrastructure to forestall opposition to operations that could become an existential challenge to the firm’s value. Furthermore, activities and investments that improve the local operational environment will, all else held equal, likely benefit corporate valuations.
Conclusion

The Permian Basin displays certain subnational resource curse indicia, but robust local institutions and growing corporate engagement will likely allow challenges to be successfully managed. Capital investors in the Permian Basin have strong incentives to ensure that local infrastructure—and the institutions involved in building them—are up to the task of maximizing the region’s comparative advantage in a global oil and gas market.

From an investor perspective, strong local institutions in the Permian Basin also mean that corporate investments in the community infrastructure are acts that not only bolster social license, but which also in some cases can contribute to the corporate bottom line. Monetary contributions to entities such as the Permian Strategic Partnership can thus become force multipliers as opposed to simple compensatory payments, as is so often the case in resource-rich regions and localities with weak governance and institutional structures.

There will also be a distinct political dimension that plays a significant role in whether Permian Basin residents on the whole see themselves as victims of a “subnational resource curse,” as opposed to the “oilfield heroes that keep lights on and gas tanks full in a less-than grateful liberal America.” The region is one of the most politically conservative in the State of Texas and unlike the major metropolitan areas, shows no signs of becoming blue—or even a bit purple.

Juxtaposed against this underlying political reality is the rising crescendo of calls for an “energy transition” that in many iterations minimizes the future role of carbon fuels. Given the United States’ present severe political polarization, a push for sharp, “Green New Deal”-style transition policies would likely be seen by many Permian Basin residents as an existential economic threat driven by an alien political agenda. At least one empirical analysis examined the political dimensions of energy transition in two fossil-fuel dominant counties in Utah, broadly finding that many respondents viewed renewable energy as an economic threat and also “an affront to local culture and identity” imposed by a “leftist movement” with no ties to the affected communities (Olson-Hazboun, 2018).

Depending on the direction federal policy takes under the Biden presidential administration, such forces could be animated to a much greater extent in the Permian Basin than has been the case to date. Greater local community alienation from state and federal political decisions could potentially create political conflicts that are a common subnational resource curse phenomenon abroad, but have to date not been major factors in the Permian Basin.

Managing growth and volatility is a boomtown challenge and the ongoing semi-bust and retrenchment will challenge local political leaders and the corporate entities they are engaging with in ways not seen in prior boom periods. Volatility will be a constant as will the need to plan for the future within the fog created by that same volatility—witness the famous bumper stickers from the last Texas oil boom that read “Please, God, Send Me One More Oil Boom. This Time, I Promise Not to Piss It Away.” If Permian Basin government entities can maintain their institutional robustness, they will likely be able to resist the worst of the subnational resource curse and maximize their comparative advantage in oil and gas production.
Endnotes


Mary D. Willis, Todd A. Jusko, Jill S. Halterman, Elaine L. Hill, “Unconventional natural gas development and pediatric asthma hospitalizations in Pennsylvania,” Environmental Research, Volume 166, 2018, Pages 402-408, ISSN 0013-9351, https://doi.org/10.1016/j.envres.2018.06.022


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Jacobellis v. Ohio, 378 U.S. 184 (1964)


29 https://www.texasmonthly.com/articles/thats-oil-folks/


51 PSP Newsletter 1, https://www.permianpartnership.org/category/news/  


56 For an intellectual underpinning of this third view, see Henisz W, Dorobantu S, Narvey N (2014) Spinning gold: The financial returns of stakeholder engagement. Strateg Manage J, 10.1002/smj. (corporate investments to build stakeholder support can help natural resource developments progress on schedule and on budget, thereby allowing investors to more highly value an asset).


