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Response

Governing Fracking from the Ground Up

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I. Introduction

David Spence takes a thorough and convincing approach to an issue that pervades most state–local conflicts: how can we regulate an activity in a manner that best balances its costs and benefits and ultimately maximizes net benefits?¹ He explores the difficulty of cost–benefit balancing in one of the most pressing policy areas of our time—the regulation of oil and gas development enabled by recent advances in horizontal drilling and hydraulic fracturing (“fracking,”² or, more broadly, unconventional development).³

Although Spence does not directly invoke the Calabresi–Melamed framework, his arguments fit rather neatly within it.⁴ As is now repeated by rote in the legal literature, Coase observed that regulation and its associated

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1. David B. Spence, *The Political Economy of Local Vetoes*, 93 TEXAS L. REV. 351, 352 (2014).

2. Industrial actors tend to view the term fracking negatively, but it has become common parlance, and I thus use it here. For a discussion of word choice, see, for example, John M. Golden & Hannah J. Wiseman, *The Fracking Revolution: Shale Gas as a Case Study in Innovation Policy*, 64 EMORY L.J. (manuscript at 1 n.1) (forthcoming 2015), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2548080, archived at <http://perma.cc/57WR-Y2ND>.

3. Spence, *supra* note 1.

4. Guido Calabresi & A. Douglas Melamed, *Property Rules, Liability Rules, and Inalienability: One View of the Cathedral*, 85 HARV. L. REV. 1089, 1090, 1092 (1972) (describing three types of protections for entitlements—rules that decide “which of the conflicting parties will be entitled to prevail” when “a state is presented with the conflicting interests of two or more people”). Of course, initial entitlements are important from a distributive perspective.

entitlements, such as the right to prohibit an activity, are unnecessary in a world of costless bargaining.⁵ In the classic example, neighbor A wants to build a polluting factory, and neighbor B wants her property free of pollution. Neighbor A is willing to pay x amount (beyond fixed and operating costs) to build the factory and pollute, and neighbor B is willing to pay y amount to prevent factory construction and thus avoid pollution. The factory will be built if x is greater than y .⁶ But in the real world, of course, there are often significant transaction costs, particularly when a large number of parties are involved,⁷ and, as Calabresi and Melamed note, this makes initial entitlements matter because beneficial transfers of entitlements simply might not occur through bargaining.⁸ This is the case with unconventional oil and gas development. It is not feasible for all the affected individuals to bargain with each other,⁹ and thus government action may be needed. The question with which Spence grapples in Part III of his article thus arises: at which level of government should we regulate? The challenge here, he notes, is that the costs and benefits of fracking are spread widely—they cross local government lines and accrue at the state level—but local governments experience concentrated costs and benefits (particularly costs).¹⁰

Arriving at an efficient level of activity requires accounting for all costs and benefits, and fairness requires that those suffering the negative effects of fracturing be compensated.¹¹ One way to achieve these results, Spence sug-

5. Coase's observation was in fact much more nuanced than this. See R. H. Coase, *The Problem of Social Cost*, 3 J.L. & ECON. 1, 3–8, 18 (1960) (explaining that regardless of whether a system requires payment for damages or provides no liability for damages, an optimal level of activity such as cattle raising will occur, with the cattle raisers either paying a certain amount of damages to neighboring crop raisers to add more crop-damaging steers, or neighboring crop raisers paying the cattle raisers a certain amount to prevent the addition of more steers, but noting that government regulation by agencies may sometimes create the optimal level of activity more efficiently than will private organizations when “the costs of handling the problem through the market or the firm may be high”).

6. *Id.* at 1–2 (describing “a factory the smoke from which has harmful effects on those occupying neighbouring properties”).

7. See *id.* at 18 (noting higher costs of bargaining for an efficient level of activity when “a large number of people are involved”).

8. See Calabresi & Melamed, *supra* note 4, at 1106 (“Often the cost of establishing the value of an initial entitlement by negotiation is so great that even though a transfer of the entitlement would benefit all concerned, such a transfer will not occur.”).

9. Affected individuals include numerous owners of land; owners of minerals; local, state, regional, and federal governments; oil and gas companies and entities that subcontract for them; and industries that use oil and gas produced, among many others.

10. Spence, *supra* note 1, at 378–84.

11. Spence, *supra* note 1, at 376–78, 394–96. This concept of fairness extends beyond fracking issues. Many torts scholars, for example, argue that victims of torts must be compensated so as to be “made whole”—a fairness approach. See Louis Kaplow & Steven Shavell, *Fairness Versus Welfare*, 114 HARV. L. REV. 961, 966, 1041–43 (2001) (summarizing these and other tort-based fairness arguments but arguing that we should use welfare, not fairness, as a criterion for evaluating legal policies). Spence uses a broader concept of welfare maximization than Kaplow and Shavell,

gests, is for states to use some of their fracturing-related surplus to compensate local governments for the concentrated costs they experience in excess of local benefits, thus generating an efficient level of development.¹² This is what Calabresi and Melamed would call a liability rule, requiring those who oppose an activity to accept it and receive collectively determined damages if the activity occurs.¹³ But few states do this, Spence quickly notes, and these measures can be seen as “pecuniary” depending on their form.¹⁴ He therefore focuses on whether giving states or municipalities regulatory authority over fracking will best promote Coasean bargaining, which here involves owners of oil and gas (called “landowners” or “mineral owners”), and oil and gas producers who lease these rights from mineral owners, bargaining with local governments to persuade them to allow oil and gas development.¹⁵ This is a Calabresi–Melamed property rule, which allows those who oppose an activity to fully ban it without paying.¹⁶ The individuals wishing to engage in the banned activity must negotiate with opponents for a payment to conduct the activity, and opponents have veto power because their price demanded to allow the activity might simply be too high.¹⁷ Spence ultimately concludes that giving local governments the power to veto proposals to frack will lead to more bargaining, and thus more efficient outcomes, than state-level decision making.¹⁸ For Spence, then, one good approach to governing fracking is a “ground-up” approach, in which local governments have the initial say over whether development should occur.¹⁹

Interestingly, Spence does not point to transaction costs in suggesting that local governments should have the power to prohibit fracking, as he believes that strong preferences against fracking will overcome the free riding problems that would typically prevent organization and bargaining by local governments (presumably in state processes).²⁰ Rather, he notes that placing initial entitlements elsewhere—away from the local level—might seem unfair and might lead to inefficient bargaining due to status quo bias.²¹

viewing the enterprise of welfare maximization as one that requires decisions about values, including fairness. See Spence, *supra* note 1, at 352 n.6 (agreeing with Dorff’s approach, which Spence describes as an “argument that the choice of how to aggregate utility within a social welfare function implicates values” (citing Michael B. Dorff, *Why Welfare Depends on Fairness: A Reply to Kaplow and Shavell*, 32 S. CALIF. L. REV. 847 (2002))).

12. Spence, *supra* note 1, at 393–94.

13. Calabresi & Melamed, *supra* note 4, at 1106–07.

14. Spence, *supra* note 1, at 393–94.

15. *Id.* at 394–95.

16. Calabresi & Melamed, *supra* note 4, at 1092.

17. *Id.*

18. Spence, *supra* note 1, at 396–97.

19. *Id.*

20. *Id.* at 396.

21. *Id.*

Status quo bias recognizes that individuals strongly prefer original rights allocations, and in this case, original rights rest with local governments, landowners, and neighbors of landowners to choose “no fracking.”²² Therefore, Spence argues, “it will be easier for producers and landowners to compensate neighbors because neighbors (perceiving themselves to be the losers) will be disinclined to want to compensate the producers and landowners.”²³ More bargaining will occur if fracking proponents have to pay those opposed to the practice, and so local governments should be given the initial entitlement, i.e., the right to ban fracking.²⁴ Incidentally, giving local governments this initial decision-making power also seems more just from an “expressive” perspective²⁵—these governments face real and sometimes overwhelming costs, in the form of rapidly changing cultures and local economies, higher demands for services, and, as Spence recognizes, sometimes, substantial pollution.²⁶ Wresting all decision-making authority from local governments, as several states have tried to do, takes away these governments’ ability to meaningfully voice their concerns and frustrations.

Spence also astutely observes that rights allocations are not just about state preemption of local authority over fracking, or the lack thereof. Regulatory takings are also in play. Requiring local governments to pay to ban fracking—an expensive proposition—has the same effect as preempting their authority.²⁷ (Indeed, this happened in another context in Oregon when voters required governments to pay for nearly every land-use action that impacted existing or proposed land development activity. Facing billions of dollars in claims, governments essentially stopped regulating.)²⁸ Spence concludes that, given the concentrated costs faced by local governments and

22. *Id.* Several state governments have changed the status quo by preempting local regulation of oil and gas development. *See, e.g.,* *Energy Mgmt. Corp. v. City of Shreveport*, 467 F.3d 471, 475–76, 483–84 (5th Cir. 2006) (finding that Shreveport could not regulate oil and gas drilling near a lake because Louisiana expressly preempts local regulation of oil and gas development); *State ex rel. Morrison v. Beck Energy Corp.*, 989 N.E.2d 85, 97–98 (Ohio Ct. App. 2013) (finding that Ohio law prevented a town from requiring permits for oil and gas drilling). Preemption of local authority also appears to be expanding in Colorado, where courts have found that the relatively comprehensive state oil and gas statute preempts local regulation due to conflict preemption. *Colo. Oil and Gas Ass’n v. City of Longmont*, No. 2013CV63, 2014 WL 3690665 (Colo. Dist. Ct. July 24, 2014).

23. Spence, *supra* note 1, at 397.

24. *Id.*

25. Although expressive harms are often discussed in terms of the impact of actions on individuals and individual rights, local governments, which are subject to the states’ full preemptive authority, are in a position similar to individuals who are subject to governmental authority. *See* Elizabeth S. Anderson & Richard H. Pildes, *Expressive Theories of Law: A General Restatement*, 148 U. PA. L. REV. 1503 (2000), for a discussion of expressive harms.

26. Spence, *supra* note 1, at 380–81.

27. *Id.* at 397–98.

28. Hannah Jacobs, Note, *Searching for Balance in the Aftermath of the 2006 Takings Initiatives*, 116 YALE L.J. 1518, 1532 (2007).

the relative efficiency of having those who will benefit from unconventional development pay those who face concentrated costs of development, reversing the status quo through takings and making local governments pay might not be the best solution.²⁹ This is particularly so, he notes, because *Penn Central*-type regulatory takings, where governments must pay the full value of the property taken if regulatory burdens are sufficiently high, are “all or nothing”—they do not allow for more balanced allocations of costs and benefits.³⁰

Spence recognizes concerns that placing veto authority in the hands of dispersed governments will create negative races to the bottom in regulation³¹ or, on the flip side, overregulation and underdevelopment.³² Yet he concludes that races to the bottom are unlikely, as local governments are not competing for a limited development activity that will occur in just one or several locations, such as the construction of a factory.³³ And overregulation may not occur in the long term, he observes, because although those experiencing the greatest costs might overestimate the risks in the short term, with better information and longer experience with development, their risk estimates are likely to gradually align with science.³⁴

Spence captures a pressing question in the preemption literature—whether allowing local or state governments to regulate, and allowing strong or weak takings law, will best balance the costs and benefits of fracking—and answers the question in a nuanced, balanced, and persuasive way. I largely agree with Spence’s conclusions about concentrated local costs and the need to allocate entitlements in ways that will allow locals to efficiently bargain. I would slightly reconstruct his account, however, in three modest ways.

First, when focusing on the question of whether states should preempt local governments, we must not forget state, regional, and federal actors. As Spence recognizes, state and national governments experience important costs and benefits of unconventional development.³⁵ Yet one of Spence’s solutions—relying on oil and gas producers to bargain with local governments to allow fracturing—will not capture all of these costs and benefits, something he recognizes with respect to local government participants in the bargaining process³⁶ but does not fully address through his

29. Spence, *supra* note 1, at 410.

30. *See id.*

31. *Id.* at 387–88.

32. *Id.* at 388–89.

33. *Id.* at 387–88.

34. *Id.* at 391–92.

35. *Id.* at 354–68.

36. *See id.* at 388–91 (noting that local governments might “frustrate the will of the broader majority” and ignore “impacts beyond their borders” and overestimate risks, thus leading to too

solutions. Fracking generates benefits not fully internalized by producers, such as tax revenues from the influx of well-paid employees, jobs created in supporting industries outside of the oil and gas sector, and, perhaps, increased national security.³⁷ It additionally produces costs at the state, regional, and national levels also not borne by producers.³⁸ We therefore need a mechanism by which state, regional, and federal governments—not just producers—can participate in the bargaining process over the level of fracking that should occur. And if these governments lack a direct voice in the process, they need a means of controlling risks if local governments, based on their own cost-benefit calculus and bargains with producers, allow fracking to move forward. States already possess a great deal of regulatory authority over fracking, but they have tended to push out regional and federal actors³⁹ who also need a voice in the process. Spence notes that the federal government already has “ample authority” under existing environmental statutes to regulate any impacts of fracking that cross state boundaries or affect a national interest,⁴⁰ but this overlooks the fact that states often successfully resist the government’s wielding this power.⁴¹

Second, and relatedly, we must look more closely at the role of regulation—not just an up or down veto—by local governments. Spence focuses on local vetoes of the right to frack—whether local governments should be able to ban the existence of oil and gas wells within their territory.⁴² But as Spence has explored in other articles, the governance or regulation of oil and gas development is about much more than the location of a well; it is a complex process in which the location and operations of the well are optimized to minimize social and environmental impacts while maximizing benefits. And giving local governments initial entitlements in this decision-making process—not just all-out vetoes—further this complex governance. Indeed, Spence recognizes that a few local governments have

little development, but also noting the importance of recognizing the intensity of local preferences when attempting to maximize utility).

37. *Cf. id.* at 381–83 (describing state and national benefits but not discussing them from the perspective of producer externalities).

38. Spence recognizes some of these costs and their distribution in his discussion of risks. *Id.* at 358–68, 379–81.

39. *See, e.g.,* Hannah J. Wiseman, *Coordinating the Oil and Gas Commons*, 2015 BYU L. REV. (forthcoming 2015) [hereinafter Wiseman, *Commons*] (manuscript at 14–17) (on file with author) (describing states’ efforts to obtain exemptions from federal regulation for oil and gas development, to resist EPA investigation of pollution from oil and gas development, and preempt local governments); Hannah J. Wiseman, *Risk and Response in Fracturing Policy*, 84 U. COLO. L. REV. 729, 739–40 (2013) [hereinafter Wiseman, *Risk and Response*] (describing state regulators’ assertions that their regulations are effective).

40. Spence, *supra* note 1, at 377–78.

41. Wiseman, *Commons*, *supra* note 39, at 17.

42. Spence, *supra* note 1, at 351–53, 389 (describing local vetoes and discussing whether giving local governments a “veto option” will maximize utility).

welcomed fracking rather than vetoing it.⁴³ Of course, establishing regulations can sit neatly within Spence's framework as a form of payment, but it is largely unexplored in the article. He gives somewhat short shrift to governments like Fort Worth⁴⁴ and Arlington, Texas,⁴⁵ that, because they have rather broad decision-making authority over oil and gas development, have allowed fracking while (to some extent) effectively regulating its externalities. Local governments are developing creative solutions to fracking governance and filling in major regulatory gaps left by other governments.⁴⁶ As Uma Outka has recognized, in so doing, they are participating in the governance process as important laboratories of regulation and suggesting how we might best govern this emerging practice.⁴⁷ Local entitlements in fracking are about much more than vetoes; governing from the ground up involves real governance.

Third, to some extent Spence underemphasizes transaction costs.⁴⁸ While I agree that local governments need ground-up authority in light of the disproportionate costs they bear, it is important to more closely consider and address the costs they face in bargaining. Governments involved in bargaining processes with such high stakes (deciding whether to allow fracking or not, or how to regulate fracking) need detailed information to fully identify the costs of development, including long-term costs such as the expensive infrastructure they must build, or require developers to build, to support housing for new workers,⁴⁹ only to find this infrastructure abandoned when the "boom" leaves town. The compensation scheme envisioned by Spence would also have substantial transaction costs that I hope will be

43. *Id.* at 356–58.

44. See Fort Worth, Tex., Ordinance No. 18449-02-2009 (2009), available at http://fortworthtexas.gov/uploadedFiles/Gas_Wells/090120_gas_drilling_final.pdf, archived at <http://perma.cc/V5YW-PLHA> (showing a detailed ordinance that requires oil and gas operators to obtain environmental liability insurance and contains a number of other rules designed to limit the externalities of oil and gas production).

45. See Arlington, Tex., Ordinance No. 11-068 (2011), available at http://www.arlingtontx.gov/planning/pdf/Gas_Wells/Gas_Drilling_and_Production_Ordinance.pdf, archived at <http://perma.cc/NW5Y-G9YR> (showing a similarly detailed ordinance to Fort Worth's).

46. See, e.g., Tushar Kansal & Patrick Field, Approaches to Local Regulation of Shale Gas Development 38–80 (2013) (Lincoln Inst. of Land Policy, Working Paper), available at https://www.lincolninst.edu/pubs/dl/2360_1700_Kansal_WP14TK1.pdf, archived at <http://perma.cc/D84Q-3XRC> (describing local government regulatory approaches, many of which place conditions on development rather than banning it).

47. Uma Outka, *Intrastate Preemption in the Shifting Energy Sector*, 86 U. COLO. L. REV. 3–4 (forthcoming 2015).

48. But see Spence, *supra* note 1, at 396 (briefly recognizing transaction costs but concluding that they will not be high in this context).

49. See, e.g., WILLISTON ECON. DEV., WILLISTON IMPACT STATEMENT 1 (2014), available at http://www.willistondevelopment.com/USRImages/williston_impact_statement.pdf, archived at <http://perma.cc/6MXR-WJ4L> (describing the expense of infrastructure needed to support an influx of workers).

addressed in future work. If local governments were to accept payments from mineral owners, energy companies, and the state, all of whom want fracking to move forward, would they demand payments from every energy company that had already leased mineral rights or anticipated owning these rights? And would the state legislature have to vote to pay each town for fracking? Further, if the bargaining process resulted in towns paying mineral owners, energy companies, and others, how would this compensation mechanism work?

This response briefly outlines these three suggested modifications and additions to Spence's persuasive framework for state and local fracking governance. Part II explores the importance of more fully considering national and regional (and state) actors within the bargaining analysis, and Part III describes the role of local governments in regulating, not just vetoing, oil and gas development. Part IV, in turn, briefly addresses the transaction costs that are likely to impede local bargaining and suggests how we might limit these costs through improved information flow and model compensation schemes. I conclude by arguing that as academics and courts continue to wrangle over the proper allocation of entitlements, it is important to remember that many local governments currently have very little voice in the bargaining process, and federal, regional, and state regulation does not address many of the impacts they are experiencing. In states like Louisiana⁵⁰ and, so far, Ohio,⁵¹ where local governments are largely preempted from regulating, alternatives will be essential. States must provide funds for local governments to remediate environmental damage, plan for affordable housing for those displaced by well-paid workers, and repair bridges and roads, among other activities,⁵² or find alternative mechanisms for addressing the real and concentrated impacts shouldered by local governments. In other words, we must turn to the Coasean scheme that Spence only briefly addresses—the scheme that very few states have followed, where states compensate local governments for their losses—while waiting for an improved governance solution.

II. Entitling Federal and Regional Governments

In two well-crafted articles, Spence has covered a wide range of fracking preemption issues. In *Federalism, Regulatory Lags, and the Political*

50. See, e.g., *Energy Mgmt. Corp. v. City of Shreveport*, 467 F.3d 471, 475–76, 483–84 (5th Cir. 2006) (describing Louisiana's preemption and affirming the preemption of Shreveport's regulation of oil and gas development).

51. See, e.g., *State ex rel. Morrison v. Beck Energy Corp.*, 989 N.E.2d 85 (Ohio Ct. App. 2013) (describing Ohio's express preemption of local regulations of oil and gas development and striking down most of a town's permitting requirements for oil and gas wells).

52. See, e.g., 58 PA. CONS. STAT. ANN. § 2302 (West 2014) (providing funds for these purposes through an "impact fee" imposed on unconventional well development).

Economy of Energy Production, Spence focuses on federal–state governance of fracking, arguing that states should largely have control.⁵³ He believes that there are few interstate impacts of fracking, that the “national interest” in fracking (its benefits for air quality, for example) has already been covered by the expansion of shale gas development, and that states will not and have not raced to the bottom, among other factors.⁵⁴ And in his more recent *Local Vetoes* piece, Spence makes a compelling argument that, as between states and local governments, we might want to allocate initial entitlements to local governments.⁵⁵

Much of Spence’s approach relies on the assumption—which seems largely but not always true—that most of the impacts of fracking fall at the state and local levels,⁵⁶ and that these governments should therefore be the primary focus. He also notes that where interstate externalities occur, the federal government, through statutes like the Clean Air Act and Clean Water Act, already has adequate authority to address these impacts.⁵⁷ But in the bargaining process proposed by Spence, it appears that producers and landowners would sit at the bargaining table with local governments, not state, regional, or federal officials.⁵⁸ In order for the interests of these officials to be fully represented, a broader, albeit less realistic, bargaining solution would be needed—one that centrally involved local governments but was more complex than local vetoes.

Imagine a world in which a set of government actors from around the country has convened in Washington, D.C., to decide how we might best regulate fracking. There are representatives from federal and state environmental agencies—fish and wildlife staff interested in impacts on endangered species; health specialists concerned about respiratory and other health effects associated with air pollution, particularly close to well sites; and hydrologists worried about contamination of groundwater from surface waste pits, among a number of other agency experts. There are sociologists who specialize in boom and bust economic cycles, in which workers from an industry rapidly move into town, demanding infrastructure and services and sometimes displacing locals, particularly low-income individuals. As these sociologists have documented, the town invests in millions of dollars of infrastructure and services, sometimes accruing large deficits, and the workers sometimes rapidly leave town as natural gas prices drop, leaving

53. David B. Spence, *Federalism, Regulatory Lags, and the Political Economy of Energy Production*, 161 U. PA. L. REV. 431, 507–08 (2013).

54. *Id.* at 478–506.

55. Spence, *supra* note 1, at 396–97.

56. Spence, *supra* note 53, at 492; Spence, *supra* note 1, at 377–78.

57. Spence, *supra* note 1, at 377–78.

58. *See id.* at 396–97 (describing only producers and landowners as participating in bargaining to change the status quo).

challenges in their wake.⁵⁹ There are local government officials who are concerned about maintaining the farming and tourist aspects of their economies, and whose citizens are worried about the noise, odors, and visual impacts associated with wells. These officials also have a number of constituents who want the royalties and bonus payments associated with oil and gas development, and the officials themselves are excited about potential revenues in the form of property and hotel taxes, as well as more jobs for their constituents. State officials, in turn, are similarly enthusiastic about tax revenues and job growth, although they are also concerned about having to remediate polluted water or soil.

The table around which these individuals sit has a large map of the United States and the extensive shale gas and oil formations that underlie many regions of the United States. Overlaid on this map are data on human populations that overlap with shale gas and oil, as well as important wildlife species, sensitive wildlife habitats, valuable freshwater resources, irreplaceable agricultural soils, and information about areas with high joblessness rates or bankrupt local governments. The officials begin identifying the areas where concentrated shale development might best occur—for example, away from particularly sensitive human and wildlife populations, or areas where air pollutants are likely to be trapped. They also identify the oil and gas development controls needed to lower the negative externalities associated with development and bargain over who has the most resources and expertise to implement these controls. At the end of the session, the officials determine where oil and gas development will occur and who will have primary authority over which impacts. They also enter into memoranda of understanding for shared authority—federal, state, and local hydrologists agree, for example, to collaborate on shared testing and monitoring of water quality as well as on implementing regulations to prevent spills that would impact water. Local and state officials agree to share the zoning authority that will place wells in the areas where there is a consensus that development should occur, and state authorities agree to require technology to be placed on wells that will keep air pollution below a limit that federal and state authorities have decided upon.

59. See, e.g., Thomas Gunton, *Natural Resources and Regional Development: An Assessment of Dependency and Comparative Advantage Paradigms*, 79 *ECON. GEOGRAPHY* 67 (2003); Michael L. Ross, *The Political Economy of the Resource Curse*, 51 *WORLD POL.* 297 (1999); Jeremy G. Weber, *The Effects of a Natural Gas Boom on Employment and Income in Colorado, Texas, and Wyoming*, 34 *ENERGY ECON.* 1580 (2012) (describing the extent to which boom–bust cycles occurred in these areas); Susan Christopherson & Ned Rightor, *How Should We Think About the Economic Consequences of Shale Gas Drilling?* 12–15 (May 2011) (Cornell Univ. City & Reg'l Planning Working Paper Series: A Comprehensive Econ. Impact Analysis of Natural Gas Extraction in the Marcellus Shale), available at http://www.greenchoices.cornell.edu/downloads/development/shale/marcellus/Thinking_about_Economic_Consequences.pdf, archived at <http://perma.cc/YV4Z-3J4M>.

Although this scenario is unrealistic, it has, to a certain extent, begun. The federal Environmental Protection Agency (EPA) is studying the impacts of unconventional development on water quantity and quality,⁶⁰ and regional U.S. Geological Survey offices are conducting limited analyses of baseline water quality and quantity.⁶¹ The federal EPA has also limited certain air emissions from hydraulically fractured gas wells under the Clean Air Act, enacting regulations that the states will implement.⁶² The Susquehanna River Basin Commission—a state compact commission—regulates water withdrawals for fracturing within the watershed of the Susquehanna River.⁶³ States have enacted a wide range of new environmental regulations of unconventional development, and some, like New York and Maryland, have conducted extensive environmental risk studies and, to a lesser degree, health studies.⁶⁴ And some local governments, like Arlington⁶⁵ and Fort Worth, Texas,⁶⁶ and Santa Fe County, New Mexico,⁶⁷ among many others, have enacted extensive ordinances governing fracking, requiring everything from environmental liability insurance for operators to limits on the timing of fracking operations in order to reduce annoyance from noise.

60. EPA's *Study of Hydraulic Fracturing for Oil and Gas and Its Potential Impact on Drinking Water Resources*, U.S. ENVTL. PROTECTION AGENCY, <http://www2.epa.gov/hfstudy>, archived at <http://perma.cc/7KGM-8V6G> (last updated Sept. 15, 2014).

61. Hannah J. Wiseman, *Hydraulic Fracturing and Information Forcing*, 74 OHIO ST. L.J. FURTHERMORE 86, 90–91 (2013) (describing several USGS studies); see *Produced Waters, News & Recent Publications*, U.S. GEOLOGICAL SURVEY, <http://energy.usgs.gov/EnvironmentalAspects/EnvironmentalAspectsOfEnergyProductionandUse/ProducedWaters.aspx>, archived at <http://perma.cc/TE8N-N4XD> (last updated Apr. 10, 2014) (describing the Survey's involvement in investigating potential contamination of water in association with shale gas development).

62. Oil and Natural Gas Sector: Reconsideration of Certain Provisions of New Source Performance Standards, 78 Fed. Reg. 58,416, 58,417 (Sept. 23, 2013) (to be codified at 40 C.F.R. pt. 60).

63. See SUSQUEHANNA RIVER BASIN COMM'N, INFORMATION SHEET: NATURAL GAS WELL DEVELOPMENT IN THE SUSQUEHANNA RIVER BASIN 1 (2013), available at <http://www.srbcc.net/programs/docs/naturalgasinfosheetjan2013.pdf>, archived at <http://perma.cc/GH2M-HPNR> (describing water regulations, such as the protection of passby flow to ensure that minimum quantities of water remain in streams).

64. See generally Revised Draft SGEIS on the Oil, Gas, and Solution Mining Regulatory Program, N.Y. DEPT. OF ENVTL. CONSERVATION (Sept. 2011), <http://www.dec.ny.gov/energy/75370.html>, archived at <http://perma.cc/95RN-U7SR>; see also MD. DEPT. OF ENV'T & MD. DEPT. OF NAT. RES., ASSESSMENT OF RISKS FROM UNCONVENTIONAL GAS WELL DEVELOPMENT IN THE MARCELLUS SHALE OF WESTERN MARYLAND (2014), available at <http://bit.ly/1ujFFp7>, archived at <http://perma.cc/G9Y9-WD2C>; MD. INST. FOR APPLIED ENVTL. HEALTH, POTENTIAL PUBLIC HEALTH IMPACTS OF NATURAL GAS DEVELOPMENT AND PRODUCTION IN THE MARCELLUS SHALE IN WESTERN MARYLAND (2014), available at http://www.marcellushealth.org/uploads/2/4/0/8/24086586/final_report_08.15.2014.pdf, archived at <http://perma.cc/Z3X9-Z4RN>.

65. Arlington, Tex., *supra* note 45.

66. Fort Worth, Tex., *supra* note 44.

67. Santa Fe County, N.M., Ordinance 2008-19 (Dec. 9, 2008).

A range of governments are acting in the area, in other words, but often not in a coordinated way and typically leaving gaps. At the same time, many states are attempting to push other actors out of the zone of governance for unconventional development—grabbing most regulatory power for themselves. A number of states have attempted to preempt local regulation, and even more have strongly resisted federal regulation, arguing that states are the best actors to address varied geologies and climates and have superior regulatory experience in unconventional development.⁶⁸ In other cases, states have resisted regional governmental authority because they believe it is too lax from an environmental perspective.⁶⁹

The limitations of state-centric and even local regulation are not adequately emphasized in Spence's work. While it is true that the great majority of fracking impacts, both positive and negative, fall at the local level, as Spence recognizes, some of the costs of fracking are strongly concentrated at the state level.⁷⁰ Yet other impacts are regional and national⁷¹ in scope and are perhaps more important than Spence recognizes. For example, oil and gas development fragments habitats⁷² and kills

68. See, e.g., David J. Porter, *Examining the Science of EPA Overreach: A Case Study in Texas Before the H. Comm. on Sci., Space and Tech.*, RAILROAD COMM'N OF TEX. (Feb. 5, 2014), <http://www.rrc.state.tx.us/media/1012/epaoverreach.pdf>, archived at <http://perma.cc/DB4X-5XNC> (arguing against federal authority in oil and gas); Wiseman, *Risk and Response*, *supra* note 39, at 739 n.42 (describing state officials' testimony arguing that their regulation is adequate and describing their opposition to federal regulation); Press Release, States First Initiative, Governors Lead Effort Supporting State Oil & Gas Regulatory Programs (Dec. 13, 2013), available at <http://www.statesfirstinitiative.org/#!/Press-Release-Governors-Lead-Effort-Supporting-State-Oil-Gas-Regulatory-Programs/c8t8/CC19F3D4-9ADC-4920-9C11-AD541A36C0A2>, archived at <http://perma.cc/LB44-L47S> (showing that twelve states support "an effort aimed at supporting and enhancing the role of the states as the primary and appropriate regulators of oil and gas development"); *Requesting Legislative Clarification of the Definition of "Underground Injection" in the Safe Drinking Water Act*, GROUND WATER PROTECTION COUNCIL (Sept. 17, 2003), <http://www.gwpc.org/sites/default/files/Res-03-5.pdf>, archived at <http://perma.cc/9MLF-G5WB> (requesting legislative clarification in a resolution signed by state regulators that the federal Safe Drinking Water Act does not apply to fracturing, contrary to a conclusion reached by a federal appeals court).

69. See *New York v. Army Corps of Engineers*, 896 F. Supp. 2d 180 (E.D.N.Y. 2012) (rejecting on the grounds of standing New York's argument that the Delaware River Basin Commission had to complete an environmental impact statement under the National Environmental Policy Act when writing proposed natural gas development regulations).

70. Spence, *supra* note 1, at 376–78.

71. See, e.g., Press Release, Md. Attorney Gen., AG Gansler Secures Funding to Safeguard Susquehanna Water Quality (June 14, 2012), available at <http://www.oag.state.md.us/Press/2012/061412.html>, archived at <http://perma.cc/MY8V-T3U5> (describing a fracturing accident in Pennsylvania that polluted a waterbody flowing through Maryland).

72. See, e.g., E.T. SLONECKER ET AL., *LANDSCAPE CONSEQUENCES OF NATURAL GAS EXTRACTION IN BRADFORD AND WASHINGTON COUNTIES, PENNSYLVANIA, 2004–2010* 26 (2012), available at <http://pubs.usgs.gov/of/2012/1154/of2012-1154.pdf>, archived at <http://perma.cc/7B5X-RG7K> (concluding that "[f]orests became more fragmented due to natural gas resource development").

wildlife⁷³—a regulatory target that federal courts have long recognized as a Commerce Clause interest.⁷⁴ Migratory birds are attracted to open oil and gas waste pits and often die after landing in these pits.⁷⁵ Withdrawals of water for fracturing can kill endangered and threatened species, particularly if numerous operators withdraw water from the same source on one day, an effect that is amplified during a drought.⁷⁶ While existing federal environmental authority allows the federal government to address these and other impacts,⁷⁷ the federal government has not always taken up this task, leaving state and local governments to fill in the gaps.⁷⁸ In many cases, state and local government actors likely have the best first-hand knowledge of problems with national impacts, including wildlife deaths. But these impacts would be best addressed with some federal involvement and expertise, and certain states have consistently, vocally resisted federal involvement.⁷⁹

Regional actors could also play a much more productive role in the governance process. For example, in certain areas large amounts of oil and gas wastes are transported across state lines for disposal,⁸⁰ and regional compacts addressing ideal locations for disposal and safe waste handling and

73. See, e.g., *U.S. v. Brigham Oil & Gas, L.P.*, 840 F. Supp. 2d 1202, 1204–07 (D.N.D. 2012) (describing bird deaths in and near surface pits over the Bakken Shale).

74. See, e.g., *San Luis & Delta-Mendota Water Auth. v. Salazar*, 638 F.3d 1163, 1175 (9th Cir. 2011) (concluding that the ESA “bears a substantial relationship to interstate commerce” and noting that “[f]our other circuits have addressed post-*Lopez* Commerce Clause challenges to sections 4 or 9 of the ESA, and each has rejected those challenges”), *cert. denied sub nom Stewart & Jasper Orchards v. Salazar*, 132 S. Ct. 498 (2011).

75. See *Brigham Oil*, 840 F. Supp. 2d at 1204–07.

76. See Kalyani Robbins, *Awakening the Slumbering Giant: How Horizontal Drilling Technology Brought the Endangered Species Act to Bear on Hydraulic Fracturing*, 63 CASE W. RES. L. REV. 1143, 1163–65 (2013) (describing the Fish and Wildlife Service’s listing as endangered several aquatic species and its observation that water withdrawals and other oil and gas activities can harm these species).

77. See, e.g., 16 U.S.C. § 1538 (2012) (prohibiting individuals from “taking” environmental species).

78. See Michael Burger, Response, *Fracking and Federalism Choice*, 161 U. PA. L. REV. ONLINE 150, 157 (2013) (concluding that “due to a toxic blend of agency capture, flawed research, and shortsighted administrative decisions, the federal government’s leadership in fracking regulation has been paralyzed”). See generally Wiseman, *Risk and Response*, *supra* note 39 (describing the federal government’s limited response to a variety of risks). Where the federal government tried to issue criminal penalties due to the deaths of migratory birds in waste pits at oil and gas sites, it was stymied by a federal judicial decision narrowly interpreting strict liability under the Migratory Bird Treaty Act (MBTA). See *U.S. v. Brigham Oil & Gas, L.P.*, 840 F. Supp. 2d 1202, 1208 (D.N.D. 2012) (requiring intent for criminal prosecution under the MBTA).

79. See *supra* note 68.

80. See, e.g., Rick McCurdy, *Underground Injection Wells for Produced Water Disposal*, ENVTL. PROTECTION AGENCY, http://www2.epa.gov/sites/production/files/documents/21_McCurdy_-_UIC_Disposal_508.pdf, archived at <http://perma.cc/3WF-8E9B> (last updated Feb. 17, 2014) (noting that prior to the enhancement of wastewater reuse in Pennsylvania, “[l]ack of Suitable Disposal Infrastructure/Capacity in PA Originally Resulted in Produced Water Being Trucked (or railed) to Ohio and West Virginia”).

disposal practices could be beneficial. Yet no regional compacts have emerged for this purpose, and we will need better coordination of state and regional actors if such compacts are to be developed.

Focusing on the importance of local governments in the shale gas governance process threatens to draw focus away from other governments—including regional and federal ones—that could effectively participate in limiting impacts from the local to the national and even international level. Local governments must participate in the governance of unconventional development because of the concentrated impacts that they bear, but the process of bargaining toward an efficient level of fracking requires input from a range of other actors, not just to address local impacts like health problems near well sites, but also the problems and benefits that cross local and state boundaries.

III. Focusing More on Governance and Less on Vetoes

Just as we need to include a range of government actors in the fracking governance process, including local actors, we also need to think more carefully about the productive role that local actors can play in controlling the externalities of development and identifying its ideal location. Spence focuses on local government vetoes and whether they are likely to produce an efficient level of activity, but giving local governments power within the fracking governance process involves much more than vetoes. Although a number of local governments, whose power has not been divested through strong takings doctrine or state preemption, have chosen to ban fracking,⁸¹ others have implemented detailed fracking regulations⁸²—a point not discussed in detail in Spence's piece.

As Spence recognizes, some of these regulations, like those in Dallas, Texas, appear to be *de facto* bans.⁸³ Santa Fe County has implemented a similarly complex set of regulations that might be cost prohibitive for most oil and gas operators, requiring everything from a water use, infrastructure, and environmental impacts analyses to the acquisition of expensive liability insurance.⁸⁴ But even these very detailed ordinances could allow a particularly ambitious operator to attempt to drill and frack for oil and gas, and they might provide interesting examples of potential oil and gas “best practices,” pieces of which could be incorporated into other regulations. Dallas, for example, requires fracking companies to use tracers that would

81. See Spence, *supra* note 1, at 351.

82. See, e.g., Santa Fe County, N.M., Ordinance 2008-19 (Dec. 9, 2008); FARMINGTON, N.M., CODE OF ORDINANCES ch.19, art. 2, § 19-2-101 (2014); *supra* notes 44–45.

83. Spence, *supra* note 1, at 357.

84. Santa Fe County, N.M., Ordinance 2008-19 (Dec. 9, 2008).

indicate the ultimate fate of water and chemicals injected for fracking.⁸⁵ Further, a number of local governments have implemented detailed yet slightly less restrictive ordinances that allow unconventional development while controlling some of its externalities.⁸⁶ Still others, like Garfield County, Colorado, have not implemented many regulations but have formed a local committee that hears citizens' complaints and works with industry to address them.⁸⁷ Garfield County has also conducted extensive air pollution monitoring around well sites.⁸⁸ These local actions could serve as useful models for other local regulation or state, regional, and federal governance approaches. As Outka has recognized, the great variety of local regulations of unconventional development helps to highlight local impacts and inform energy policy.⁸⁹

Further, recognizing that empowering local governments not only leads to vetoes but also proactive regulation might help to override the objections, noted by Spence, that local governments will overregulate fracking.⁹⁰ While Spence argues that local, powerful preferences against fracking might eventually moderate as these preferences align with actual, proven risks,⁹¹ it would be helpful to emphasize that some local governments are already making an effort to more accurately identify and regulate the risks in lieu of implementing all-out bans. This makes local governments important actors within a collaborative governance process in which national, state, regional, and local actors all have some authority over unconventional development. These and other governments need the backstop of veto authority because unconventional development in certain areas, such as highly valuable pristine wildernesses or densely populated areas with people who are particularly sensitive to pollution, is simply too costly to be worthwhile. But giving governments an entitlement within the bargaining process entails a range of potential outcomes, from the all-out veto to large amounts of regulated development.

85. DALLAS, TEX., DEVELOPMENT CODE: ORDINANCE NO. 10962 ch. 15, §§ 51-4.213(19), 51-4.213(28).

86. See, e.g., *Applications and Permits*, FORT WORTH, TEX., <http://fortworthtexas.gov/gaswells/default.aspx?id=50608>, archived at <http://perma.cc/4AJQ-NREN> (showing 1,895 producing gas wells in Fort Worth as of September 26, 2014); *supra* notes 44–45 (Arlington and Fort Worth, Tex., codes).

87. *Energy Advisory Bd.*, GARFIELD CTY., <http://www.garfield-county.com/oil-gas/energy-advisory-board.aspx>, archived at <http://perma.cc/P8XQ-AFAS>.

88. *Air Quality Management*, GARFIELD CT., <http://www.garfield-county.com/air-quality/>, archived at <http://perma.cc/RT7Z-8YCV>.

89. Outka, *supra* note 47.

90. Spence, *supra* note 1, at 391–92.

91. *Id.*

IV. Addressing Transaction Costs

Beyond the need for including more governments in the bargaining process over the costs and benefits of fracking, the bargaining solution proposed by Spence demands further discussion of transaction costs. If mineral owners and energy companies are to pay towns, there are important questions about who will pay and how much. This might be solved, of course, by incentives—those who care the most will come to the table. But there will be free-riding and collective-action problems even among the individuals most incentivized to drill and fracture wells. Smaller energy companies might hope that the “majors” will do most of the bargaining, for example, as will those who own smaller amounts of minerals. Further, if state (and regional and federal governments) will also come to the table to pay local governments to allow fracking, who from these governments will have the authority to determine the amount of payment? Will legislative solutions be required? The same goes for local governments offering compensation in the other direction, where a local government will benefit from fracking at the expense of a region whose river could be polluted, for example. Will these decisions, too, require a vote? These concerns could all be worked out, of course. Although state constitutions typically limit how and when tax schemes may be changed, perhaps states that pay local governments for fracking could simply skim less off of local sales or tourism taxes than they typically do, or take more out of state oil and gas legacy funds⁹² for the purposes of fracking compensation. But all of this will require more consideration.

To reduce these transaction costs, more and better information will need to be available to all levels of government so that they can accurately estimate costs and benefits. Spence believes that this will happen as governments produce more cost-benefit information.⁹³ But the literature on risks and benefits is still nascent although fast growing, and the risks at the local level, in particular, are so varied that many governments remain in the dark—especially with respect to longer term “boom-bust” costs that cannot be easily predicted.⁹⁴ Initiatives that study local impacts and communicate them to state officials will be essential. Further, if we are to rely on thousands of local governments bargaining with mineral owners, energy companies, and states over the appropriate level of fracking, this area may be

92. See, e.g., *Government Funds*, STATE N.D. OFF. TREASURER, <http://www.nd.gov/ndtreas/governmentfunds.htm>, archived at <http://perma.cc/89XU-M649> (describing North Dakota’s Legacy Fund, funded by oil and gas taxes and explaining that “[t]he principal and earnings of the Legacy Fund may not be expended until after June 30, 2017, and an expenditure of principal after that date requires a vote of at least two-thirds of the members elected to each house of the Legislative Assembly”).

93. Spence, *supra* note 1, at 392–93.

94. There are, however, a growing number of boom-bust studies. See *supra* note 59.

ripe for model legislation to suggest how compensation to and from local governments should occur. Although operationalizing Spence's theory will be complex, it is not an unmanageable task and is a very worthwhile one.

V. Conclusion

David Spence has identified, analyzed, and sorted out core areas in oil and gas preemption and takings analysis, including the importance of recognizing strong, local preferences, based on the concentrated costs (and less concentrated benefits) borne at the local level, within a policy framework aimed at maximizing utility. He concludes that efficiently addressing these preferences would require either the states to compensate locals through some form of redistribution or locating veto authority over fracking at the local level, and he focuses on the latter approach. With the limited exceptions and additions I have voiced above, I agree that giving local governments authority is likely more fair and efficient than not. Yet many local governments and individuals lack this needed authority, and while we wait for preemption battles to be sorted out, interim, liability-rule solutions involving taxing or redistribution are essential. Moreover, as noted above, producers do not capture all the benefits of fracking, so relying on them to bargain with local governments with veto power will not always lead to efficient outcomes. Here, too, redistribution of some of the state surplus back to localities as compensation for their losses could be useful.

As governments like Louisiana and Ohio preempt most local authority over oil and gas wells,⁹⁵ local governments experience concentrated costs of oil and gas development, such as road damage and localized pollution, while not proportionately sharing in many of the benefits experienced at the state level. When states preempt local governments or allow aggressive takings claims, or both, while failing to compensate local governments for their losses, inefficient levels of development may occur, and local governments have no means of limiting development or receiving compensation for their losses. Mechanisms that Spence briefly mentions, such as impact fees paid from states to local governments, will therefore be doubly important in a world where local authority over unconventional development remains highly uncertain. Only Pennsylvania, it appears, has implemented a true impact fee, in which oil and gas operators pay a tax based on the amount of gas they produce, and the state reallocates portions of the proceeds to local governments for activities such as road and bridge repair, environmental remediation, and affordable housing.⁹⁶ Other states have more limited funds

95. Spence, *supra* note 1, at 371–72; *see supra* notes 50–51.

96. 58 PA. CONS. STAT. ANN. § 2302 (West 2014).

allocated for narrower purposes,⁹⁷ which will need to rapidly change if local governments are denied a say in the process. While enabling meaningful local voice in fracking governance is a first-best solution, where this is politically impossible, second-best measures are still hugely useful. Without these measures, the values of national security, job growth, and revenue trumpeted by the oil and gas industry and many states will overshadow the significant costs of localized pollution, social change, and boom–bust cycles within the fracking policy debate.

David Spence's framework for analyzing local–state allocations of authority over unconventional development has a great deal to recommend it. Yet a fuller exploration of the areas discussed in prior sections—recognizing the importance of including many levels of government in the bargaining process and emphasizing the benefits of local governance, not just vetoes, as well as the usefulness of redistribution and the mechanisms of achieving it—could further buttress his account. Of course, no single article could fully address such a complex issue, and I look forward to Spence's further work in this area, which will no doubt continue to persuasively and expertly inform preemption debates in oil and gas.

97. *See, e.g.*, LA. CONST. art. 7, § 4 (oil and gas severance tax); COLO. REV. STAT. ANN. § 39-29-109 (West 2013) (same).