On the subject of international energy, shale gas is a big deal. Its production is a function of advanced technology applied to a century-old business. In 2013, Ernest Moniz—now celebrated for his role in the Iran nuclear deal but then director of the MIT Energy Initiative—spoke about shale gas as a “game-changer” and a “bridge to a low carbon future.” Shale gas has indeed had a heavy impact on the market for gas in America—driving down its price to the lowest level in decades, tilting the competitive electricity generating mix away from coal, and leading to a sharp interest in American exports of liquefied natural gas (LNG). Because of shale, the United States will be the largest gas producer in the world until at least 2040 (and probably far beyond).

But as yet shale gas production is only an American phenomenon despite a world that seems to have abundant shale gas resources (Exhibit 1). The paradox of shale gas development is that it has happened in a regional market with the world’s lowest natural gas prices: one-third of that in Europe, for example. Furthermore, when the world considers shale gas, it seems not to look underground locally, but only to the United States.

Why does US shale gas flow while the rest of the world’s shale regions remain untapped? Why does gas displace more costly coal in the United States (as Moniz foresaw) but yield to cheaper coal—much of it from America—in Europe? Others have wrestled with this question.

I think that there are three distinct reasons why shale gas is strictly a US development so far—having little to do with technology or the cost of locating or extracting shale gas. Rather, to paraphrase my December 2015 column, what matters are the regional institutional and political endowments that shape international energy markets. In short, three distinct factors distinguish the shale gas boom in the United States:

1. The farmer owns the gas.
2. The highly competitive oil/gas field service sector is everywhere.
3. Connecting to the nearest interstate pipeline completes the journey to market.

With these elements, billions of dollars of invested capital flow into competitive shale gas development. Without them, particularly the third, interest dries up and investors go home (as in Poland, which has some of Europe’s most promising shale resources).
THE FARMER OWNS THE GAS

In the United States, the states themselves have jurisdiction over minerals ownership.

Those mining laws have comparatively ancient legal roots, with the differences between countries reflecting the long-standing split between the common law and Roman law as reinterpreted by Napoleon’s and Bismarck’s French or Prussian civil codes. In the individual US states, fee-simple title gives the landowner rights to everything below the surface—down to the center of the earth. On private lands (which account for some 60 percent of US lands), the owner of rights to the surface in most instances owns the subsurface mineral rights and terms for exploration and development.

Not so, in most of the rest of the world’s democracies—where the state owns the gas. In Europe, the French mining law of 1810 and the Prussian mining law of 1865 essentially appropriated minerals rights for the state. Even in the United Kingdom, from which the United States inherited its legal tradition, the value and control of subsurface mineral rights passed to the UK government in 1946. Thus, owing to Napoleon, Bismarck, and Clement Atlee, farmers in Europe and the United Kingdom (and in all other countries that look to those places for their mineral law traditions, such as Canada and Australia) no longer own the gas underneath their fields.

Thus, if Anadarko Petroleum wants to drill for shale gas in the Marcellus field in Pennsylvania, it has only to deal with the farmer. But when the major oil companies worked to develop, for example, Poland’s apparently ample shale, they dealt with the Polish government—which at the same time wrestled with one of the most costly long-term take-or-pay LNG import contracts in the world (with Qatar). Earlier this year, Chevron Corp gave up looking for shale gas in Poland, following the withdrawal of Exxon Mobil, Total, and Marathon Oil over the past three years, leaving business to Polish state-run firms.

It is no surprise that the Polish government “owner” of that LNG import contract would have second thoughts about bypassing it with locally produced shale gas. But it would be unfair to single out Poland. Many local governments, from New York to France, have banned shale gas development outright. Others, such as the United Kingdom, have placed other development barriers in the way of companies that would develop shale gas.
In these respects, given the length of time needed to have the capital resources devoted to producing shale gas, it is no surprise that investors head to those regions without such restrictions.

**THE SERVICE SECTOR IS EVERYWHERE**

I have heard—clearly somewhat apocryphally—that given the number of gas field service firms in Pennsylvania, scheduling a time to have a horizontal well hydraulically fractured is only a bit more complicated than trying to schedule the cable TV guy.

Scheduling a time to have a horizontal well hydraulically fractured is only a bit more complicated than trying to schedule the cable TV guy.

The story points to a highly vigorous and competitive oil and gas field services industry. Using the Department of Labor’s Standard Industrial Classification (SIC) codes, the nature of the industry is evident: SIC 1311 (Crude Petroleum and Natural Gas) contains 146 firms; SIC 1382 (Oil and Gas Field Exploration Services) contains 16 firms. Most of these firms are privately held. For publicly traded firms, the Value Line Investment Survey lists 91 publicly traded firms in its “Oilfield Services/Equipment Industry” listing—many of which have been in business for decades. Both through the firms’ own actions and through their collective action organizations (such as the American Petroleum Institute—founded in 1919), these industries have political weight and a unique freedom to operate in the United States.

**HITTING THE INTERSTATE SYSTEM COMPLETES THE JOURNEY TO MARKET**

Obtaining unobstructed access to the shale gas fields without political complications is important, as is being able to rely upon a vigorously competitive service industry to develop, gather, and treat unconventional gas. But all of those things, including well development, royalties, gathering fees, and such, are expensive. Where does the money come from to repay those investments and associated operating costs?

Unlike oil, which can be loaded on trucks, railroad cars, or barges at comparatively small cost, gas requires pipelines to ship to even the smallest of the many millions of consumers who use it. And there’s the problem. Petroleum exploration companies can deal with the first two problems (resource ownership and the service sector) in many parts of the world—and have—in oil production. But shale gas requires pipelines, which have to cross the countryside and continents—on both private and public lands—to connect to the consuming markets in the major cities.

What distinguishes the United States (and Canada) from every other country is its competitive and largely deregulated interstate pipeline system.

What distinguishes the United States (and Canada) from every other country is its competitive and largely deregulated interstate pipeline system. By creating a competitive market in transport capacity rights, federal pipeline regulatory reforms in the 1990s essentially took pipeline interests out of a participatory role in the gas market. It is a system of rival pipeline ownership operating under federal licenses—overseen by a type of regulatory control that has led to the creation of a deregulated market in transport capacity rights.

Availability of such a competitive continental market for gas invites the financial industry to participate in bearing the risk of shale development.

A ready spot market for gas awaits shale gas developers who reach the interstate system. There is no regulatory or bureaucratic agency—and no further regulatory requirements—between the gas producer and the market once at the interstate pipeline. The availability of such a competitive continental market for gas invites the financial industry to participate in bearing the risk of shale development—as such firms participate in the production and sale of other commodities.

Outside of North America, pipeline firms generally control the gas trade either through overar-
Thus, the production of shale gas is likely to remain an American phenomenon, driving down regional prices for a long time to come.

The production of shale gas is likely to remain an American phenomenon, driving down regional prices for a long time.

## Notes

6. See note 4, p. 122.
9. Of course, I use “farmer” to reflect any landowner.