Moving Crude Oil, Volatile Prices, and Sticky Policies

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For the last six years, the U.S. system for getting crude oil to its refiners has been scrambling to adjust to the breakneck growth of North American upstream oil production.¹ The changes have sparked a number of fierce policy conflicts. The battle over the Keystone XL pipeline is the most prominent of those clashes. It is, though, far from the only one, and the policy issues at stake are much larger than any one project. Now, the sharp drop in world oil prices is adding new urgency to the discord over policy.

The U.S. oil and gas renaissance has placed heavy new demands on the U.S. logistics system. Between 2009 and 2013, annual U.S. crude production on private land grew by 61 percent (Humphries 2014). The burgeoning output of light tight oil (LTO) was the engine that powered this rise in output. Most of the LTO growth centers on a long roughly oval cluster of tight oil basins scattered from south and west Texas north all the way to Alberta. The oil sands of Alberta, which produce bitumen, have been a second major source of added North American oil output.

As supplies from these new areas have surged, those from older sources have ebbed. Drilling restrictions in California and Alaska have caused both of those states¹ oil output to fall. The Macondo oil spill led to the long Gulf of Mexico drilling moratorium and much more restrictive federal regulations on offshore drilling. In response, from 2009 to 2013, annual U.S. offshore oil output actually fell by 9 percent (Humphries 2014).

Yet the mid-continent surge was big enough to make up for these declines and to still decrease total imports. Ten years ago the United States imported about 60 percent of its oil; today, it imports only around 30 percent—of which, moreover, around 40 percent comes from Canada.

This changed pattern in the geography of oil production has, within a mere five years, largely reshaped the entire oil logistics system. As LTO and Canadian oil undercut the prices of overseas imports, some refineries on the east and west coasts could stay in business only by forging new transport links to the emerging mid-continent oil supplies. As refineries switch sources of crude, ocean tankers and oil pipelines have lost market share—although pipelines still deliver about 60 percent of U.S. crude oil tonnage. Crude-by-rail racked up very large percentage gains in market share—albeit from an extremely low base. Both truck and barge modes also scored significant gains in tonnage delivered (US Department of Energy 2014).

These changes in the transport system result from the use of novel techniques that enable drillers to wrest oil (and natural gas) from low-porosity rock formations. One such technique, high volume hydraulic fracturing (fracing), involves injecting water, sand, and chemicals into the well. Of course, the water, sand, and chemicals must first reach the wells before they can be injected. Hence, LTO production has not

¹ This paper extends a presentation at the panel discussion “Will the Changing U.S. Energy Mix Transform Multimodal Freight Systems?” made at the 2015 annual Washington Meeting of the Transportation Research Board.
just changed the freight flows outbound from U.S. oilfields; it has redefined the inbound flows as well. As part of this trend, much high quality fracking sand travels considerable distances, often by rail, from quarries to the oil fields.

Beyond these direct links to and from the oilfields, the upstream boom has also had indirect impacts on the transport system. The surge in oil and gas has brought growth to both suppliers and customers. Industries like steel, nonferrous metals, sand and gravel, chemicals, metal fabrication, and the manufacture of construction and transportation equipment have all expanded (Bonakdarpour, et al. 2014). Among customer industries, oil refineries, airlines, motor carriage, and chemical manufacture have reaped notable gains. This expansion has, in turn, fueled still more demand in the transport sector.

**The world market and North America’s high-cost oil**

A source of growth has been all the more welcome after the Great Recession, but the world oil market has always been prone to both bubbles and panics, and market overshoots can end as they often start—with a sudden jolt (Yergin 2009). At present, something of the kind is threatening the North American oil renaissance. Recent trends have sent world crude oil prices plunging. By early January 2015, crude oil prices were 60 percent below their June 2014 highs (International Energy Agency 2015).

The biggest single trigger of the oil price plunge is the sluggish global economy. The EU’s chronic problems have caused its GDP growth to flag and curbed demand for oil. China and India are growing more slowly than they have in the past, and that the slowdown may presage a longer-term secular trend toward lower growth rates (Pritchett and Summers 2013).

As oil demand has languished, supply has surged. Iraqi output is rising in spite of ISIS, and Russia’s output has remained high in the face of sanctions. Much of Libya’s exports have survived the conflict there. The Iran sanctions have lowered its oil sales and output, but some exports continue, and, over time, all sanctions tend to erode. North America’s new supplies are themselves an important source of oversupply.

That OPEC has not been able to defend the world price should surprise no one. As a body, OPEC has not wielded real market power since the 1970s (Colgan 2013). Cartels without a central government to enforce their rules often fall prey to cheating. Among OPEC’s members, preferences over price and output levels differ sharply, and some members are mortal enemies. This is hardly a formula for a successful cartel.

The Saudis, to be sure, have some market power, but they have had little success in persuading others to cooperate with them in exercising it. Were the Kingdom to act on its own, it would have to bear the full cost of the cutback in output while reaping only part of the gains in higher prices. At present, Saudi leaders have rejected this option. The choice has led to angry charges that they are waging an oil price war on U.S. producers. Then again, had they chosen to reduce their output, U.S. politicos and pundits would now be reviling them as monopolistic price fixers.

No doubt the Saudis do applaud the coming fall of U.S. and Canadian output, and they are probably quite gleeful over the pain being inflicted on their Iranian, Russian, and ISIL foes. But the Saudi refusal to cut
their output is also in line with the lesson of the mid-1980s. In those years, amidst much cheating by other OPEC members, the Kingdom gave up a great deal of market share in a futile effort to defend high prices (Yergin 2009). Seemingly, they have learned that lesson well.

Whatever the Saudis’ intent, lower world prices will retard the growth in North American oil output, and if prices stay low enough for long enough, they will reverse it. The North American production techniques are advanced, but they are costly. Moreover, the output of LTO wells declines much more steeply than that from either oil sands mining or from conventional wells. LTO producers, therefore, must drill many new wells just to offset the effects of the legacy wells’ steep production decline curves.

U.S. oil output is also highly capital intensive. For instance, in 2013, more than 60 percent of all the world’s drilling rigs were located in the United States (Maugere 2013). In fact, one analyst estimated that in 2013, LTO producers used 20 percent of the global oil industry’s total capital to produce just 4 percent of its oil (Chilcoat 2014).

By inference, any factor that chills investors’ ardor for drilling new LTO wells will depress output much faster than it would were the production decline curves less steep. However, many of the costs of new LTO wells that are planned for existing fields are sunk. The land has been leased, permits acquired, delineation wells drilled, and field infrastructure built. Much of this drilling will go forward despite low prices.

In contrast, where costs are still avoidable, LTO drillers are retrenching sharply (Gold and Ailworth 2014). Between September of 2014 and early January of 2015, the U.S. rotary rig count fell by 120, from 1931 to 1811 (Baker Hughes 2015). The decline is continuing. When prices are low, producers cut back on the number of new wells that they drill. Of those wells that they do drill, they also decrease the share of exploratory wells in favor of drilling more development wells. Since development wells have a much higher success rate than exploratory wells, in the short-run, this shift in drilling practice will partly offset the loss in output caused by the falling rig count. As a result, U.S. LTO output might not begin to slow until the second half of 2015, and prices are likely to stay low while supply remains high (International Energy Agency 2015).

While governments often assume that each new swing in the world crude oil market heralds a long-term secular trend, in reality, normal economic feedbacks dampen the amplitude of the market’s swings. Political events can reinforce the economic feedbacks. For instance, many oil exporters must use most of their oil rents to maintain domestic order, and when low prices shrink the volume of rents, domestic violence can ensue. Violence, in turn, can lead to negative supply shock. Venezuela, Libya, and Nigeria seem like current candidates for playing a role in such a scenario.

Were would oil prices to rebound and stay high, U.S. producers would surely begin again to ramp up output, and history shows that they can do so very swiftly. It also shows that the U.S. freight transport system can keep pace with the rapid growth. How these industries will perform with an extended stretch of low and perhaps volatile oil prices is another question. Unfortunately, current public policies seem more likely to impede the needed adjustment than to foster it.
Oil transport regulation and oil price uncertainty

The uncertain and unstable world oil price regime greatly amplifies the need to reduce wasteful regulatory burdens on the oil logistics system. When crude oil prices were high, U.S. drillers could live with some wasteful laws and mandates, including some that constrained how and where they shipped their inputs and outputs. Such waste harmed them but would not put them out of business. That is changing.

President Obama has claimed that, with today’s low oil prices, the Keystone XL pipeline decision has declined in importance. He has things exactly backwards. With crude oil at $90 per barrel, the Alberta oil sands would be developed no matter what the United States decided about Keystone. Much of the Alberta oil would find its way to the U.S. Gulf Coast refineries by rail, or by more circuitous pipelines and inland waterways. At lower oil prices, the transport savings from the Keystone XL pipeline could be crucial to unlocking some of the value of the oil sands bitumen (U.S. Department of State 2014).

To be sure, if building the Keystone XL expands the mining of the oil sands, and at low world oil prices, it does, it follows that building the pipeline will add something to global climate change. It will, but by a trivial amount. Even if one assumes that the oil sands will be mined only if the Keystone XL pipeline is built, the pipeline’s effect on climate would still amount to less than one tenth of one percent of current global carbon dioxide emissions.

Mr. Obama has pledged that, if the Keystone pipeline extension contributes to climate change, he will veto it. But all fossil fuels emit greenhouse gases, and for a long time they will continue to be essential to everything from farming to computing. Mr. Obama, himself, in his 2016 State of the Union speech, boasted of making “America number one in oil and gas.”

America is not, in fact, the number one producer of crude oil; it is the third largest, but the President’s logical fallacies are worse than his sloppiness with facts. Mr. Obama boasts about America increased oil production, which he knows increases greenhouse gas output; at the same time, he threatens to veto Keystone XL solely because it, too, would increase emissions, albeit very slightly. He has also claimed that U.S. consumers would not benefit from Keystone because some of the oil it will carry will be re-exported. Since the market for oil is global, adding oil to any part of it lowers prices for all consumers. Mr. Obama is either being guileful and dishonest, or he is very confused.

Unfortunately, Keystone is not alone as a source of waste in U.S. crude oil logistics. The strict curbs on U.S. crude oil exports are at least as bad. Since the end of oil price controls in 1981, this restriction has lacked even a pretense of a valid rationale; meanwhile, the onshore oil boom has greatly hiked the costs of the export ban. Restricting LTO exports prevents U.S. LTO producers from shipping their output to the refineries able to get the most value from it. Because the resulting mismatch between oil produced and the refineries best able to process it, refined product prices are higher than they need be (Brown, et al. 2014).

In effect, ending the export ban would mean higher prices for U.S. LTO producers but lower prices for imported crude. Some U.S. refineries would end up paying more for U.S. crude oil; others would pay less. The net effect on the U.S. economy would be positive (Baron, et al. 2014). Such a step would also be consistent with long-standing U.S. goal of global trade liberalization, and of Mr. Obama’s stated goal of
raising U.S. exports. The case is so strong that think tanks across the political spectrum, from the Brookings Institution to the Heritage Foundation, have urged the President to relax the limits on exports.

The present is a golden moment for ending the export ban. With today’s low crude oil prices, allowing exports would have little short-run impact on those Midwest refiners that are now taking advantage of highly discounted LTO prices. In any case, with low prices at the pump, refiners’ attempts to stoke the public’s fears about exports and price hikes are likely to fall largely on deaf ears. This is a problem that the President could indeed solve with a stroke of his much-vaunted pen, and on this issue, Republicans in Congress would strongly support his use of it. Thus, although the short-term benefits of liberalization will grow as world crude oil prices recover, so will the political costs of delaying reform.

It is, then, all the more disappointing that the moment appears likely to slip away. The recently revised Department of Commerce regulations represent some very tentative and incremental progress. However, they leave the rules opaque and are still highly restrictive. Remarks by John Podesta suggest that the White House is uninterested in reform. The President, who has been so avid to waste no crisis, seems poised to waste the absence of one.

In contrast to the inaction on export reform, the U.S. Department of Transportation (DOT) is embarked on a sweeping revision of the safety rules of crude-by-rail movements. A series of accidents, including a truly horrific one in Lac Mégantic Quebec, made this move inevitable.

Nonetheless, devising cost-beneficial safety rules for crude-by-rail poses a knotty problem. Canada’s Transportation Safety Board identified 18 factors that contributed to the Lac Mégantic accident (Transportation Safety Board of Canada 2014). Yet most of the U.S. DOT regulatory response centers on only one of those factors, replacing and refitting rail tank cars. Other approaches include classifying light tight crudes as more hazardous. Or DOT could reroute trains, or it could require changes in rail operating practices. To be sure, DOT has taken some steps in these other areas; yet, the new tank car standards will account for by far the biggest share of the resource costs of its new rules.

Tank car specifications may, indeed, need to change, but the narrow focus seems open to doubt. Would some of the resources required to replace and to refit tank cars be better spent on avoiding derailments in the first place. In other works, to paraphrase the U.S. military’s study of limiting harm from improvised explosive devises, should some of the effort be directed to the causal links ‘farther to the left of boom?’ Or is there an institutional remedy, perhaps in the form of tougher liability rules for railroads?

DOT’s analysis does not reassure one that they have weighed all the alternatives. The issue is more troubling in that some of the proposed steps could make things worse instead of better. For instance, the Pipelines and Hazardous Materials Safety Administration (PHMSA) draft regulations propose a number of options for replacing and retrofitting the tank cars that would increase the cars’ tare weights. A heavier tank car, though, can carry a smaller payload. More cars will be needed to haul the same amount of oil. Accident exposure, therefore, will go up (Fritteli, et al. 2014). At least one critique of the PHMSA proposed rules contends that not a single option that it has proposed can pass a benefit cost test; the report also goes on to challenge the validity of the PHMSA analysis itself (Neels and Berkman 2014).
Given the uncertainties about oil price, it is hard to know how any assessment of benefits and costs of replacing long-lived assets like tank cars can be valid. The plain fact is that the scale of crude-by-rail’s future potential is itself open to some doubt. At least for now, E&P companies are focusing their capital expenditures away from exploratory drilling; yet it is mainly in serving new fields where rail’s shorter entry time outweighs its linehaul cost penalty.

From the start, crude-by-rail was solely the product of high oil prices and the LTO boom that they ushered in. The growth of output from the Bakken Three Forks formation has been an especially strong driver of crude-by-rail growth. Today, of the roughly 1 million b/d of crude that is moving by rail in the US and Canada, 780,000 b/d is from the Bakken (Curtis, et al. 2014). The prospects for crude-by-rail are, then, to a degree, linked to the prospects for Bakken Three Forks. Production costs vary widely in this formation, and, even in the face of lower prices, production there will continue.

Still, as low crude prices drive producers to concentrate on the lowest cost sources, Bakken Three Forks seems likely to experience at least relative decline. Production costs are lower in Eagle Ford, and so are transportation costs (Smith 2014). Eagle Ford, moreover, also has water borne alternatives to rail (Fritteli, et al. 2014). Moreover, as new or expanded or reversed pipelines bring more LTO to the Gulf Coast, barring export reform, the more distant Bakken Three Forks oil will increasingly be pushed to the east and west Coast refineries (Curtis, et al. 2014). In this sense the logistical challenges of Bakken crude-by-rail movements are likely to grow.

Regulation, it should be noted well, is slowing entry into all crude oil transport markets. Green groups have become highly adept at perverting laws that were meant to promote better-informed public discourse into vehicles for obstructing the build-out of needed infrastructure. The U.S. green movement has launched a campaign that uses every possible legal tool to delay the needed links in the crude oil logistics system and to raise the costs of building those links that it cannot altogether block.

The delays of the Keystone XL pipeline are the most egregious case in point. The same use of strategic litigation is also playing out at the state and local levels. The greens are trying to frustrate rail movements of fracxing sand and local crude-by-rail and rail-to-water transfer hubs, as well as trying to block other pipelines. Yet the U.S. regulatory process seems to be unable to distinguish legitimate efforts to inform the public from strategic litigation aimed at delaying and suppressing needed infrastructure.

Finally, the Jones Act proves that not all regulatory waste is new or is caused by the greens. In intercoastal and coastwise transport, the Act requires the use of U.S. flagged ships that are built in U.S. shipyards and crewed mostly by Americans. These mandates generate monopoly rents for U.S. water carriers, shipyards, and labor unions. But they raise water transport costs and thereby restrict the output. Therefore the act wastes resources. The LTO boom, by creating a greater potential demand for waterborne crude oil movements, has significantly increased the social costs of the Jones Act.

One economically logical safety valve for the growing LTO glut on the Gulf would be waterborne movement to the east and west coast refineries. The Jones Act blocks that response just as the export ban prevents the oil from flowing abroad. Needless to say, the Obama administration shows no appetite for granting an oil exemption.
Prospects for reform

The prospects for near term reform are dim. U.S. election rules and its demographics often combine to produce divided governments. As the worldviews of the two main parties have grown more polarized, these conditions conduce to gridlock. Statutes other than those devoted to empty symbolism, rent seeking, or both arelargely winnowed out. Therefore, the executive branch will remain the main engine of policy change—for better or worse. Current trends suggest that, for supporters of expanded oil output, the rest of Mr. Obama’s tenure in office will primarily involve damage limitation. Indeed, major reforms are likely torequire a switch in party control of the White House.

In the past, President Obama had seemed to be ambivalent to North America’s upstream oil sector. Even now, his rhetoric remains positive. He touts the growth in oil output as “energy independence.” The term is undefined and largely meaningless, but it remains a fetish of U.S. energy policy (Grossman 2013). While Mr. Obama has peppered oil producers with a fusillade of new mandates that purported to limit harmful effects from drilling, at least when oil prices were high, the costs of these measures did not threaten to halt the growth in oil output. Moreover, to the extent that the social costs of drilling are real, which in part they clearly are, internalizing them enhances economic welfare.

Offshore, the Draft Proposed Program for OCS leasing also presents a mixed picture. On the positive side, it offers potential gains in the South Atlantic, but it would also impose new limits on drilling off Alaska, and it continues the drilling ban in the eastern Gulf of Mexico.

On oil transport issues, the administration has acted only when events have forced its hand. When it has acted, though, it has paid little heed to the continuing need for oil supplies. In the case of the Keystone XL pipeline, it has blocked a much needed piece of transport infrastructure. In the case of crude-by-rail safety, despite having only the cloudiest view of future market conditions, as noted above, it appears to be flouting with new rigid and costly mandates. Elsewhere, as in the case of oil exports, even where political costs are low and economic benefits are high, it has remained passive or it has been, at best, hesitant.

Lately, Mr. Obama seems to be drifting toward a more negative stance toward oil. He has embraced stringent unilateral curbs on U.S. greenhouse gases. His administration has launched costly new abatement plans for ozone and methane. It is most doubtful that, in the end, the ozone plan will pass an unbiased benefit cost test (Sunstein 2014). He is now also seeking to permanently lock-up a large swath of reserves in order to ‘preserve’ ANWR as a frozen wasteland. Other drilling on federal lands also lags far behind the development on private land (Humphries 2014).

The most troubling aspect of the seeming drift is that, for a Democratic president, this anti-oil stance obeys a political logic. As the ideological chasm between the two main parties has widened, interest groups have aligned with one or the other (Fiorina 2009). The green movement is, in all but name, an adjunct of the Democratic Party. Republicans receive roughly parallel support from the oil and gas industry.

Therefore, Mr. Obama knows that, in imposing costly limits on drilling, he is likely to elicit more campaign dollars from his super-rich green donors. He is, at the same time, narrowing the geographic base of his (and his Party’s) political foes and sapping their financial base. For a while, events held this
incentive in check. President’s political power depends on the public’s perception of the state of the economy. While employment was in the doldrums, and oil and gas drilling was one of the few bright spots, Mr. Obama could not afford to act too openly on his animus toward oil. As GDP has rebounded, he is freer to do so. (Mr. Obama may not be running again, but he wants to remain relevant, and his power as a fund raiser will be his major means of doing so.)

Currently, Mr. Obama not only claims bragging rights over increased U.S. oil output; he also boasts that oil is now so plentiful and cheap that his anti-oil policies will not matter. He might even get away with this astounding mix of deceit and braggadocio. He has only two years left in office, and the backlog of wells where many costs are sunk suggests that output will continue rising for a while.

In the longer term, if oil prices stay low, the fiction that anti-oil policies will not harm U.S. producers will collapse, but that probably does not much matter. As long as prices at the pump stay low, most voters will not much care about what happens to U.S. oil output. Then too, with few exceptions, most of the states harmed by anti-oil policies are red. True, supplier and customer firms are much more widely dispersed, but while that fact extends their geographic reach, it also dilutes their political impact. Most national Democratic candidates pay no political price for being anti-oil.

In oil producing states, some Democratic politicians are obliged to defy the national party’s extreme anti-oil policies. Thus, in their respective states, Governors Brown and Hickenlooper have refused to support highly draconian anti-drilling policies. The national Party, though, is undaunted by the state level effects of its anti-oil policies. Indeed, its transparent unconcern contributed to its 2014 Senate electoral route.

Instead, the constant in the national political constellation is the need for all Democratic candidates for the White House to win the support of green super-rich donors and, of less moment, that of other green activists. Throughout the early Obama years, the convergence of high oil prices and feeble GDP growth forced the President to mute his animus to U.S. oil producers. Barring a reprise of that odd confluence of forces, Democratic White Houses will rarely pursue pro-growth reforms for oil.

The political incentives of a Republican White House are largely the reverse of those of a Democratic one. Less restrictive rules on drilling are likely to offer the Party a political gain. But the risks, and they are not trivial, are that the green groups and the news media might successfully use at least some pro-growth reforms to turn anti-industry public sentiments against the Republican Party.
Bibliography


