

Crude Oil Exports and Shipping Constraints in the Global Market. Empirical Evidence Explaining Global Crude Price Differentials.

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Overview

In 1975, President Ford signed the Energy Policy and Conservation Act (EPCA) that prohibited the export of domestically produced crude oil in the United States. As part of an omnibus spending bill that passed through Congress and was signed by President Obama in December of 2015, the export ban was lifted. While the export ban received relatively sparse attention over much of the 40 year period that the ban was in place, the debate over lifting the ban resurfaced due to the “shale boom” that has caused historic increases in oil and gas production in the U.S. Many predictions were made about what would occur if the export ban were to be lifted. Some majorly publicized studies claimed that the lifting of the ban would lead to increases in domestic oil production, creating hundreds of thousands of jobs and billions of dollars of economic activity and lowering gasoline prices for consumers (Yergin et al., 2014; Ebinger and Greenley, 2014). These claims of large economic benefits are associated with increases in domestic oil and gas production spurred by a convergence of domestic and foreign crude prices.

But other studies have associated large price differentials between domestic and foreign crudes with transportation constraints within the U.S. (Kaminski, 2014; Borenstein & Kellogg, 2014), not the export ban. Therefore, part of the price differential between domestic and foreign crude prices during the historic shale boom was likely due to shipping constraints within the U.S., while another share might have been due to the export ban. This is an important empirical question that is addressed in this research.

I start with a basic economic model that describes the domestic and global markets for crude oil. Then, using this economic model as a guide, I test empirically a plausible counterfactual domestic crude price during the shale boom in the absence of the export ban. If a large share of the price differential between domestic and foreign crude prices was due to the export ban, then had the ban not have been in place during the shale boom, then even larger increases in drilling might have been observed over this period. On the other hand, if a large share of the price differential was due to internal shipping constraints within the U.S., then the export ban likely had little impact on domestic drilling, even during the historical shale boom.

Methods

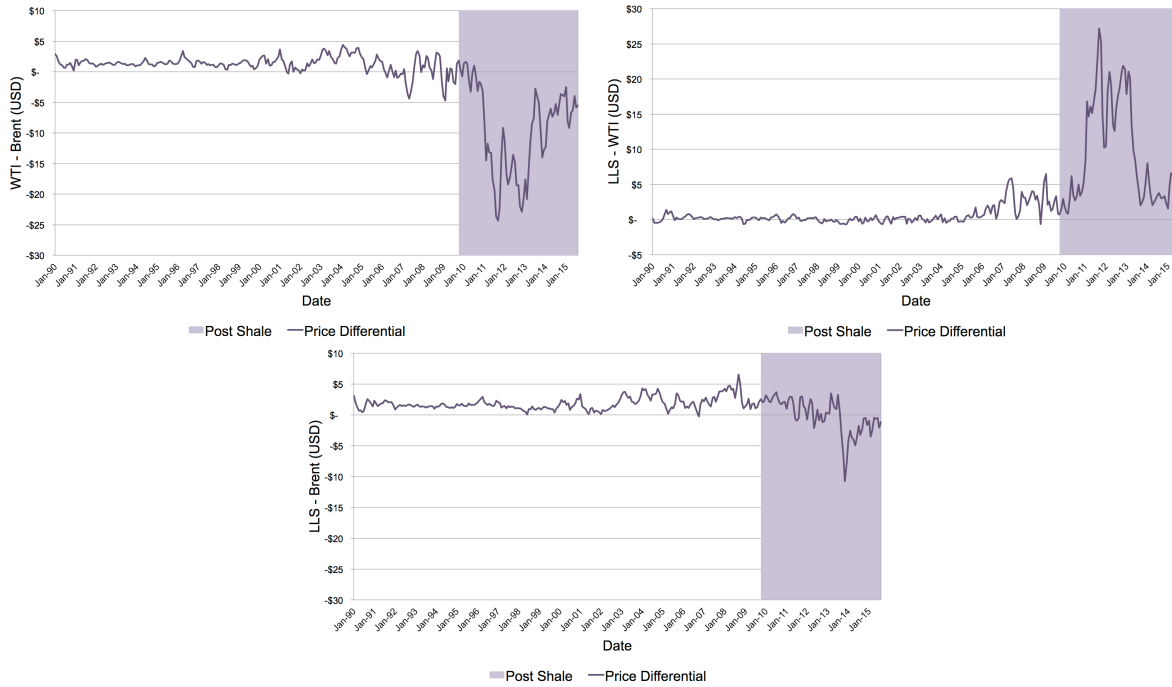
Incorporating the unique market for crude oil into a basic economic model is the first step to understanding the likely implications of lifting the ban on the domestic market for crude. This model should (1) take into account the fundamentals of this unique market, (2) be able to accurately describe past events and (3) be used to reasonably predict a counterfactual with and without an export ban. The results of this model alongside a review of the economic literature sets up an empirical question that will be tested.

Using a hedonic pricing model that compares different crudes of different qualities (following Medlock, 2015), I estimate a counterfactual price differential between Brent and WTI during the shale boom in a scenario where no export ban is present. The key to this analysis is to compare crude prices in different regions within the U.S. to assess what share of these internal price differentials are due to quality differences compared to shipping constraints. Differences in the change in wellhead prices of similar crudes in different regions with different shipping constraints is the source of identification.

Results

Preliminary results suggest that the lion's share of the price differential between domestic and foreign crude prices during the shale boom was due to shipping constraints within the U.S., not due to the export ban. While empirical hedonic pricing model results are still preliminary, the main results are best illustrated in the following figures. After the shale boom, WTI that historically sold at a slight premium to Brent was discounted considerably. If this price differential was due to the export ban, not shipping constraints within the U.S., then Gulf Coast crudes, such as

Louisiana Light Sweet (LLS) should also experience a similar devaluation. But, as shown below, LLS did not suffer the same devaluation as WTI. In fact, LLS traded at a large *premium* to WTI during the peak of the boom. While both of these crudes were constrained by the export ban, LLS was already at the Gulf Coasts near the majority of the country's refining capacity. Comparing LLS to Brent, we see that LLS was discounted relative to Brent after the boom, but this discount was significantly smaller in magnitude and much shorter lived than the WTI discount. Thus, results suggest that much of the price differential between Brent and WTI during the shale boom was due to capacity constraints—not the export ban. Therefore, estimated large economic benefits associated with increased drilling due the removal of the ban, even during the boom's peak, have likely been overstated.



Conclusions

Policy implications of these results are vast. The debate over lifting the export ban, like many current political debates, can be summed up into right versus left, economic development versus the environment. Right-wing conservatives, who are pro-business, argued that the lifting of the ban will increase the price of domestic crude, therefore incentivizing new production and creating thousands of jobs. Left-wing liberals, who are concerned about CO₂ emissions, argued that lifting the ban will increase domestic crude production and therefore exacerbate global climate change. In short, both groups seem to agree that lifting the ban will increase domestic production. The disagreement is on whether more crude production is *good* (i.e. economic development) or *bad* (i.e. global climate change). This research suggests that both these benefits and concerns have likely been overstated.

References

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