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U.S. Oil Imports, Exports, and Energy Security

In December 2015, P.L. 114-113 lifted restrictions on U.S. exports of crude oil, allowing U.S. exporters full access to world oil markets. The restrictions had been in effect for 40 years. Lifting the export restrictions addressed the changing nature of U.S. oil supply which is characterized by growing output of light oil. Due to the rapidity with which these oil supplies have entered the market, producers initially encountered infrastructure bottlenecks in transporting the new oil supplies to buyers, as well as noting a fundamental mismatch between the characteristics of the new oil supplies and the desired crude oil inputs of U.S. refineries. Many producers of the new oil supplies found that they could only sell their oil at a discount to both West Texas Intermediate (WTI) and other world reference prices of crude oil (e.g., Brent and Dubai). As a result, low realized prices threatened the potential growth of the U.S. oil industry. Producers saw entry into the world oil market as a way to increase demand for their oil and to close the price spread.

While opponents of the oil export restrictions pointed to enhanced domestic oil supply and job growth, proponents of the ban claimed that its repeal could lead to higher domestic gasoline prices as well as lower capacity utilization rates and fewer jobs in the refining industry. Also of concern were issues of energy security. Some define energy (oil) security in terms of oil independence. From this point of view, domestic oil supplies replacing imports signified reduced dependence on the world oil market, and hence, greater oil security. Exporting U.S. oil would in their argument leave the United States dependent on imports and the world oil market. Regardless, the United States would remain connected to the world oil market through crude oil imports and petroleum product imports/exports.

Evaluating Crude Oil Imports and Exports

Three years have passed since the lifting of the crude oil restrictions, and an evaluation of the effects, both in terms of trade and energy security, can be undertaken.

Crude oil exports have risen. From 2008 to 2012 the United States exported on average about 45 thousand barrels of crude oil per day (mb/d). In the next three years, 2013 to 2015, a time characterized by growing U.S. shale oil production, but with the export restrictions still in effect, exports averaged about 316 mb/d (mostly to Canada which was not subject to the restrictions), a six-fold increase. In the three years since the lifting of the restrictions, crude oil exports have averaged over 1.2 million barrels per day (mmb/d), a four-fold increase. Exports have increased each year since the restrictions were lifted, rising from 591 mb/d in 2016 to 1.1 mmb/d in 2017 and 1.9 mmb/d in 2018.

Why is domestic oil exported instead of being used domestically? Exports are likely taking place for three reasons. First, the type of oil that has come into the U.S. supply picture in the past five years is light, sweet (low sulfur) oil. Many U.S. refineries are not optimized to use this type of oil. As a result, U.S. oil is shipped overseas while oil of a type appropriate to U.S. refinery demand is imported. This type of trade transaction increases U.S. integration with the world oil market, and it maximizes the value of the output of the oil refining industry. Second, logistical cost issues may determine the sourcing of crude oil. Given the location of a refinery, it may be cheaper to procure oil overseas than to purchase and ship domestic oil given transportation constraints. Third, some large U.S. refineries are owned by foreign national oil companies and they may choose to use their own nation's oil, imported into the United States in their operations. For example, Venezuela owns Citgo Petroleum Corporation and Saudi Arabia owns Motiva Enterprises Company, both with refineries in the Gulf Coast region.

Crude oil imports have fallen. From 2008 to 2012 the United States imported on average about 9 mmb/d. In the next three years, 2013 to 2015, imports averaged about 7.4 mmb/d, a decrease of about 18%. In the three years since the lifting of the restrictions, crude oil imports have averaged about 7.9 mmb/d, an increase over the previous three years, but still less than the 2008 to 2012 period. The data suggest that while imports of crude oil declined with the lifting of the export restrictions, they then began to increase, providing some evidence to suggest U.S. dependence on world markets might be increasing.

Over the same period, product supplied to the U.S. market (the Energy Information Administration measure of consumption) increased from 19.6 mmb/d in 2016 to 19.9 mmb/d in 2017 and, based on available 10-month data for 2018, is set to total about 20.3 mmb/d. A possible interpretation of these data might conclude that the approximately 700 mb/d increase in U.S. product supplied from 2016 to 2018 resulted largely from the 500 mb/d increase in imported crude oil, again raising the question as to whether growth in the U.S. market is tied to import growth.

This picture is altered when net imports are considered. Net imports are defined as gross imports minus exports. This measure brings into sharper focus a nation's dependence on the global market for commodities it both imports and exports.

Crude oil net imports have fallen. From 2008 to 2012, U.S. imports of crude oil averaged about 9 mmb/d. In the next three years, 2013 to 2015, net imports averaged 7.1 mmb/d,

a decline of 21%. In the three years since the lifting of the export restrictions crude oil net imports have averaged 6.7 mmb/d, a decline of about 6%. In addition, quantity of net imports of crude oil per year has shown a downward trend; that is, it has declined every year since 2015 on a year-on-year basis.

As a result of rising U.S. crude oil production, coupled with rising exports of crude oil, the nation's net dependence on foreign oil supplies has declined, and given the trend in net imports, is likely to continue to fall. This implies that a portion, about 1.2 mmb/d of U.S. import dependence, might be considered an adjustment of U.S. crude oil production to reflect differences in quality desired in oil supply, or locational and cost differentials.

Petroleum Product Imports/Exports

To fully evaluate the effects of the full integration of the United States into the world oil market, petroleum products also must be considered. Crude oil has no major direct consumption use in itself. Oil must be processed at a refinery to yield a wide range of petroleum products including transportation fuels such as gasoline, diesel fuel, and aviation fuel. In addition, home heating oil, propane, and a wide variety of other products used by various industries are included in the output of the refining industry.

Petroleum product exports have risen. From 2008 to 2012, the United States exported on average about 2.2 mmb/d of petroleum products. In the next three years, 2013 to 2015, as shale oil production was increasing, but without the lifting of export restrictions on crude oil, the United States exported about 3.8 mmb/d of petroleum products, an increase of about 72%. For the period 2016 through the first 10 months of 2018 the United States exported about 5.1 mmb/d of petroleum products, a 34% increase.

U.S. petroleum product exports to various countries/regions have increased. In Latin America, Peru, Brazil, and Guatemala have seen imports from the United States increase over the period 2015 to 2017 by 37%, 106%, and 80%, respectively. These and other nations now depend on U.S. supply, supporting the strength of the U.S. refining industry. Among close U.S. allies, Japan and South Korea have rapidly increased imports of U.S. petroleum products by 95% and 93% over the 2015 to 2017 period. Trade in petroleum products creates important trading relationships between nations where both partners to trade might be expected to gain.

The net liquids import/export position of the United States, considering crude oil and petroleum products, has improved. From 2008 to 2012, U.S. net imports averaged about 9.2 mmb/d. In the next three years, 2013 to 2015, the U.S. net imports were 5.3 mmb/d, a reduction of about 42%. For the period 2016 through the first ten months of 2018 U.S. net imports were about 2.7 mmb/d, a further decrease of 49%. In addition, U.S. crude oil production is widely expected to increase, while petroleum product consumption growth in the United States is expected to be modest. A combination of growing production and modestly increasing domestic consumption could lead to

further improvements in the net import position, as U.S. petroleum product exports expand.

Oil Security

While the lifting of crude oil export restrictions and favorable U.S. oil production trends have not yielded total oil independence and security, important progress has been made.

U.S. crude oil imports have most recently averaged 7.9 mmb/d. Petroleum product exports have averaged 5.1 mmb/d, yielding a net draw on world oil markets by the United States of about 2.8 mmb/d. In a sense, about 5 mmb/d of U.S. crude oil imports exist specifically to supply nations around the world with petroleum products, rather than the domestic market. Petroleum products generally have a higher value per barrel than crude oil, value captured by U.S. refiners and exporters, enhancing the financial health of exporting firms. Overseas markets have allowed refiners to operate closer to peak capacity and maintain high levels of output and employment.

As the United States expands oil exports, this provides nations around the world an alternative to importing from the Organization of the Petroleum Exporting Countries (OPEC) or Russia among others. Reduced direct dependence and increased diversification reduces OPEC's and other nations' ability to control prices and use oil as a tool to achieve their political objectives. Oil prices can become more market determined and less tied to specific interests. Some analysts have seen the United States becoming a "swing producer" for the world market, and itself exerting influence on world oil prices.

Crude oil and petroleum product imports from the United States are highly successful among U.S. allies, especially in the important Asian markets. This success creates an important economic bond along with political and military ties. U.S. crude exports, which offer a combination of attractive crude grades, private market financing and low-risk contract fulfillment are well positioned to expand in Asia and displace OPEC supplies. In addition, the ability of private oil firms to adapt to changing conditions more effectively than state oil companies and generally remain immune to political pressure has also proven to be attractive to international buyers.

It is unlikely that the United States can gain full independence, or isolation from, the world oil market. The price of oil is an international price reflecting the demand and supply conditions in a large world market. Changes in demand and/or production in any nation creates a new set of incentives for all oil consumers and producers. A set of mutual dependencies—where many nations are linked by trade, and no set of oil suppliers can easily enforce its own will, or dictate trade—is likely to approximate energy security for nations in the market.

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