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Opportunities and Challenges of the U.S. Crude Oil Export Ban

The rapid growth of oil and natural gas production from unconventional shale resources in the United States has reopened debate on the question of U.S. oil and natural gas export policy. Foreign policy considerations should be central to the discussion of this issue. To date, the debate in the United States has focused mainly on domestic economic aspects and the possible benefits of actively promoting artificially low domestic prices through barriers to trade. Today, I will discuss the risks inherent the continued promotion of logistical bottlenecks, even in the face of rising domestic production. I will also elaborate on the national security and foreign policy benefits that the United States can reap by promoting an open energy trade policy that permits exports of natural gas, condensate, refined petroleum products and crude oil.

The United States has for many decades been the leading nation in championing open markets and free trade in energy. *Open trade and investment in energy is important to U.S. vital interests* for many reasons. First and foremost, artificial restrictions on energy flows can be a source of international conflict and, in fact, has been a factor contributing to armed conflict in modern history. Moreover, the United States, by virtue of both its superpower role and its position as the largest oil consuming country, has a direct interest in preventing energy supply from being used

as a strategic weapon. Finally, barriers to foreign investment in energy resources in key countries generally contribute to supply constraints, leading to rises global prices and potentially harming economic growth in major oil consuming countries such as the United States and its key industrialized trading partners. For these three reasons, the United States should continue to actively support open markets and free trade in energy and to do so, it cannot restrict its own energy exports. By leading the charge on new energy technologies and exports, the United States now has the ability to fashion a global energy world more to its liking where petro-powers can no longer hold American drivers hostage or turn off the heat and lights to millions of consumers in the United States or allied countries to further geopolitical ends.

Beyond these core American values and interests, it is important for the United States to conduct a thoughtful debate and re-evaluation of current export policy to avoid creating market distortions that, while temporarily benefiting some consumers in particular U.S. regions, may create more questionable medium to longer-term trends that could turn out to be more damaging than helpful. Our history of energy policy is replete with such negative examples, such as President Nixon's inflation-targeted price controls on natural gas which ultimately caused a long lasting shortage of natural gas supply in the United States and a two-tiered system of oil pricing that ultimately, in practice, incentivized imports of foreign oil.

An evaluation of export policy needs to consider the following key variables:

1) Long term geopolitical considerations are likely more important to our nation than the expediency of any short term commercial gain to a particular set of vested industry interests.
2) Transportation and supply bottlenecks can create distortions that can become very costly in economic terms over time even if they bring some short term benefits to consumers.
3) The United States participates in international trade and thus, blocking exports of one or more particular commodities or manufactured products cannot "protect" U.S. consumers from international prices. Ultimately, the discussion of banning some exports and not others is a question of who in the United States economy gets the profits from tapping the arbitrage of higher international prices. So for example, if gasoline prices are higher in the international market than in the United States, refiners will have a financial incentive to export gasoline until that arbitrage window closes. These U.S. gasoline exports will eventually produce the same boost in retail prices to U.S. consumers as crude oil exports.[1] That is because rising exports of U.S. gasoline to international markets will eventually erode profit margins for European, Asian and Latin American refiners, causing them to reduce their own refinery throughputs, lowering demand for crude oil and thereby weakening international crude oil price levels. In this way, rising U.S. crude oil production impacts global crude oil markets through displacement via U.S. refined product exports. Thus, it is not correct to say that the United States, by continuing to ban U.S. crude oil exports, can isolate American consumers from global prices. The often cited figures in Barclay's assessment of the financial savings resulting from the export ban oversimplifies the mechanisms and correlations of the interactions of U.S. and global

[1] In the case of gasoline exports, refining companies like Valero get a larger share of the profits. In the case of direct crude oil exports, oil exploration and production companies get the bigger piece of the pie.

gasoline pricing. Differences in elasticity of gasoline demand in the United States and Europe over different time periods (ie consumer responsiveness to price changes), differing refinery configurations and costs, weather trends, and local inventory levels all influence the differences between gasoline prices in the U.S. and Europe in 2008-2010 vs today, not just changes in the price of U.S. midcontinent crude oil relative to UK benchmark Brent crude.

4) The "tyranny of distance" for oil, refined products and natural gas trade flows will in most circumstances guarantee U.S. users a continuing energy cost advantage over foreign competitors even if export bans are lifted due to the generally lower cost of transportation within the United States compared to long distance, waterborne exports. This transportation cost advantage is, in many cases, of significant size and will ensure that U.S. energy prices are lower than those of countries that would buy U.S. oil and gas ex-ship. U.S. oil and gas short haul exports to Mexico and Canada are already protected by the NAFTA free trade agreement.
5) The best way to protect U.S. consumers from sudden price movements in gasoline, heating oil or natural gas from unexpected supply disruptions or weather related events is to ensure that adequate inventories are on hand in regional markets. To protect U.S. consumers against volatility in fuel pricing due to shifting levels of global demand for refined petroleum product and/or natural gas exports, the United States should require U.S. producers and refiners to hold reasonable minimum inventories to guard against temporary domestic shortfalls of supply or seasonal volatility. Such minimum product inventory standards are already used successfully in Europe and Japan to enhance energy security and protect domestic markets in the event of an unusual event such as the Fukushima nuclear accident. In fact, the United States was able to weather Hurricane Rita and Katrina partly by borrowing gasoline from these mandated European minimum inventory stockpiles. As the United States shifts to a lower percentage of crude oil imports, it may want to consider holding a higher proportion of strategic stocks in the form of mandated commercially held stocks of refined products, rather than publicly held crude oil stores.
6) Crude oils and condensates from different geologic basins have different properties and are not fully fungible when it comes to refining them into usable fuels by various refineries. In particular, the light field condensate being produced in the United States from tight formations and shales require different forms of refinery distillation and other secondary processing than heavy oil production from offshore U.S. Gulf of Mexico, Canada, and Mexico. Top specialized analysts such as Alan Troner of Asia Pacific Consulting are forecasting that a large overhang of unusable condensate will emerge in the U.S. market by 2016 due to limitations on U.S. refiners' ability to process this particular quality of liquids. Relaxation of export rules for this class of associated liquids production would be desirable to maintain growth in production of natural gas and crude oil wells that also produce high levels of associated condensate. Asia Pacific Consulting estimates that as much as 500,000 b/d of the 3.5 million b/d to 4 million b/d of U.S. condensate production in the United States would not be easily absorbed into the U.S. refining and processing system by 2016 and might have to be simply shut-in until refiners can make investments to expand new units to handle such supplies, depriving the U.S. of export revenues and related trade and fiscal benefits (see appendix for more details).

Geopolitical Benefits

Energy trade can be used to *strengthen our ties to important allies and trading partners* and thereby enhance American power and influence. For example, U.S. LNG exports from the Gulf coast could be an important strategic back-up role to shaky Russian or Middle East gas supplies, for example, much the way the US served as an oil swing producer back in the 1960s, rendering an Arab oil boycott during the 1967 Arab-Israeli war infeasible. US Asian allies Japan and South Korea are seeking flexible US Gulf coast LNG contracts for reasons of economic and geopolitical leverage. Our ability to serve as a source for critical swing energy supplies enhances our importance to our energy trading partners in other geopolitical and economic spheres and *allows us to help our allies in times of market instability*.[2] It would, for example, constrain Russia's ability to use its energy supplier role as a wedge between the United States and its European allies.

As American shale production expands from natural gas to oil, the geopolitical benefits will mushroom both by *improving U.S. financial strength and by eliminating U.S. vulnerability to economic blackmail*. The upshot of shale oil will be to reverse the course of history and roll back the clock to pre-1973. Oil producing states will no longer be able to use the lever of a possible energy supply cut-off to America to pressure Washington to adjust its foreign policy. If domestic shale oil abundance someday more closely matches shale gas abundance and the US has no imports to replace, then we will have more discretion on when and how to use the Strategic Petroleum Reserve. In such circumstances, a President could consider using the SPR to either loan oil to other countries for geopolitical aims (for example, to *counter the economic blackmail of the "oil weapon"* against an allied country) or to provide extra oil into the market to head off attempts by coalitions of other energy producers to create artificial rises in global prices, should such oil price spikes start to cause financial or economic harm to the global economy.

In this regard, U.S. energy exports will *weaken some of our adversaries such as Iran and Russia*. US shale gas has already played a key role in weakening Russia's ability to wield an energy weapon over its European customers by displacement. By significantly reducing US requirements for imported liquefied natural gas (LNG), rising US shale gas production has increased alternative LNG supplies to Europe in the form of LNG displaced from the US market, *limiting some of Russia's power*. It has also already *curbed Iran's ability to tap energy diplomacy* as a means to strengthen its regional power or to buttress its nuclear aspirations by eliminating the need for Iranian natural gas to potential importing customers by creating surpluses of alternative supplies. This remarkable development, by allowing the U.S. to impose tighter sanctions, has brought Iran to the negotiating table on limiting its nuclear program.

Energy exports also *improve our balance of trade*. The health of the US economy and fate of the US dollar come under pressure when rising oil prices raised our massive oil import bill, worsening the US trade deficit.[3] Such economic pressures are multiplied when we are forced by oil dependence to deepen our military commitments in the Middle East, thereby similarly adding

[2] It is easy to imagine the expansion of American power if its natural gas companies could gear up to supply LNG to a European country cut off by Russia, such as happened in the winter of 2006. If the US can become an energy supplier of last resort, its geopolitical importance will rise significantly along with its diplomatic freedom of movement.

[3] For a detailed discussion of the link between the US dollar and oil prices, see Amy Myers Jaffe and Mahmoud El-Gamal, Oil, Dollars, Debt and Crises: The Global Curse of Black Gold, Cambridge, UK: Cambridge University Press, 2010

to the US deficit. All this weakens the United States relative to China, which holds a large chunk of US indebtedness and free rides off expensive US naval activities to guarantee the free flow of oil from the Persian Gulf. Over time, shale development will reverse this strategic and economic disadvantage. As the years pass, it will be the Chinese economy that is more exposed than the United States to Middle East developments. Citibank estimates that rising domestic shale oil and gas production, by reducing oil imports and keeping "petro-dollars" inside the U.S. economy, will reduce the U.S. current account deficit by 1.2 to 2.4 percent of gross domestic product (GDP) from the current value of 3 percent of GDP. Energy exports would enhance this trend by adding gains to the balance of trade. As energy exports improve our global financial footing, it will not only *give us an upper hand with China*, which will still be highly dependent on foreign oil imports, but it could even allow the United States the luxury to regain its strong influence as a donor to global institutions such as the World Bank and United Nations, again enhancing our national power and influence.

Finally, energy exports are already an important *part of our free trade obligations* to important neighbors such as Mexico and Canada as well as more distant long-standing allies such as South Korea. U.S. law requires the U.S. Department of Energy (DOE) to review and approve any natural gas exports to countries with which the United States does not have a free trade agreement. Current rule making requires that exports to our free trade partner countries be approved expeditiously. For nations not covered by applicable free trade agreements, the review is supposed to lead to approval unless the project is determined to "not be consistent with the public interest." As a practical matter, the United States is already an exporter of domestic natural gas. The U.S. exported a total of 436.3 bcf of natural gas in the first quarter of 2013, mainly to Canada and Mexico. Canada has also been a major buyer of U.S. condensate. U.S. pipeline gas exports to Mexico are important to Mexico's economic health and to border relations and therefore it is unlikely the United States would ever consider cutting off Mexico's gas trade with us. South Korea now holds a Free Trade Agreement (FTA) with the United States. South Korea has indicated its desire to import U.S. Gulf coast LNG. Under normal economic conditions, it would not be in the U.S. economic and foreign policy interest to fail to honor our free trade obligations to South Korea while continuing to honor our obligations to Mexico. By extension, the United States, as an established exporter of natural gas, should not be turning away close allies like Japan and Europe. Since U.S. trade with Asia is important to our economic health, on balance it would not be in the U.S. interest to turn down Asian trading partners wanting to expand already massive trade to include natural gas, especially given that a preponderance of analysts have concluded that U.S. shale resources are large enough to minimize the pricing impact of LNG exports from the United States. This logic could also apply to refined petroleum products and condensates, which are already an important part of our current foreign trade.

Thus, I would argue that these many foreign policy considerations must be taken into account in any review on the question of the advisability of U.S. crude oil and condensate exports. We must consider all aspects of the implications of the energy export question on our national security and foreign policy interests. To focus only on the uncertain impact that exports might have on the U.S. industrial sector or gasoline prices in a specific region of the United States is foolhardy, given the complexity of interactive forces that will influence prices in the long run. Rather than second guessing price impacts which remain highly uncertain, we should widen the export debate to consider U.S. global priorities as well as domestic economic concerns.

In theory, the United States could behave like Russia and members of the Organization of Petroleum Exporting Countries (OPEC) and restrict hydrocarbon exports in general or to particular countries for political or nationalistic reasons. But we need to resist this temptation. Flows of U.S. oil and gas should follow profit incentives and market signals. The participation of American suppliers to the global market and foreign oil companies in the U.S. market extends the reach of U.S. anti-trust restrictions beyond our borders. It is true in general that foreign demand for American oil and gas can, all things being equal, put upward pressure on prices. But removing bottlenecks can smooth the functioning of markets, allowing arbitrage to promote flows to and from the most efficient geographic supply sources, eliminating localized volatility and easing sharp localized price movements during times of disruptions or unexpected events.

Efforts to engineer particular market responses on a local level can have unintended consequences. Greater U.S. cooperation on the global climate change agenda is of critical importance. Climate protection advocates worry that increased natural gas exports will lead to even greater use of natural gas instead of renewable sources. But bottlenecks preventing the free export of U.S. natural gas have, for example, led to the unintended consequences of increased exports of cheap displaced U.S. coal to Europe, unwittingly raising Europe's carbon emissions despite strong EU clean energy directives. Efforts to stop the construction of the Keystone XL Pipeline to ship Canadian oil sands has led to an increase in rail traffic of crude oil around the U.S., again with unintended environmental and safety consequences.

The more oil supplies there are and the more liquid those supplies are, the more the global market will mirror the competitive U.S. market. Supply bottlenecks are what aggravate price volatility to begin with, as any Bostonian can attest this time of year. New England's historical lack of local storage and limited pipeline deliverability has over the years produced sudden price climbs in cold winters. Had new pipelines like the Rex Express, which connects Colorado and Ohio, not been in place this year, recent winter price swings would be even higher and more prolonged. It is the same with the disruptions of light crude from Libya and elsewhere around the world this past year; but for U.S. products exports and the lower requirement for light crude imports to the United States, global crude price levels would be far higher.

As U.S. domestic production levels rise, the United States will have to think carefully about the kind of exporter it wants to be and how to promote the ideal level of free trade and energy investment wherever possible. The United States needs to consider the usefulness of past experiences when we counted on our European allies to provide us with badly needed gasoline from Europe's strategic stocks during our difficulties with the U.S. fuel manufacturing and distribution systems during Hurricane Rita and Katrina. And we need to think carefully about what our global economic and security obligations might be, should an oil supply crisis of major proportions emanate sooner rather than later out of the Middle East --both before, and even after, the U.S. gets closer to being energy self-sufficient. The mindset of husbanding resources out of fear of shortages has never served major producing countries like the United States well. In the crisis years of the 1970s, such hoarding behavior worsened the dislocations, not eased them. By contrast, in more recent years, we have fashioned an international emergency oil supply response system that protected the global economy in the aftermath of Saddam Hussein's invasion of Kuwait, and would be important should a similar or even worse kind of conflict were to arise again in an important oil producing area of the Middle East or West Africa. I am not saying that President Obama should turn open the spigot on willy-nilly, given the current instability in the

Middle East. But clearly the circumstances of our energy situation is changing and we should not cling to historical policies because they are familiar and thereby politically comfortable. What is required is a thoughtful policy that is grounded in the realities of how energy markets operate and taking into account what is best for the economy as a whole, and not specific consumers or industries.

Appendix: Further Thoughts on Mid-Continent Gasoline Prices

The chart below, compiled with data from the U.S. Energy Information Administration (EIA) highlights that Midwest gasoline consumers are not, as has been reported in the media, reaping huge benefits from the crude oil discounts enjoyed by Midwest (PADD II) refiners compared to Gulf Coast (PADD III) refiners. The crude oil feedstock discounts enjoyed by refiners with access to mid-continent landlocked U.S. production (as illustrated by the blue line which shows the value difference in the crack spread between Midwest and Gulf coast refiners) did not lower the wholesale price of Midwest petroleum products compared to prices linked more closely to international markets, nor did they lower the retail prices of gasoline or diesel fuel prices in the Midwest markets served by PADD II refiners relative to the markets served by coastal refiners that do not enjoy these discounts. Since petroleum products are freely traded in a global market, U.S. petroleum product prices reflect international crude prices, not lower-priced domestic crude.

The Special Circumstances of U.S. Condensate Production

Liquid hydrocarbons suspended as particles in natural gas (under subterranean pressure and temperature) are called natural gas liquids or NGLs. Many tight oil and shale gas fields also produce NGLs, most commonly LPGs such as propane, butane, and iso-butane and condensate. Condensate typically remains liquid without special containment. It can be used as a petrochemical feedstock, a blending component, boiler feed, or as a diluent for the transport of heavy crude oil. It can also be processed directly in a splitter (special distillation tower design only for manufacture of light products) to produce lighter end refined products. Condensate is similar to ultra light, low sulfur crude oil and therefore is currently is being blended in with the rising tight oil production stream. For some previously marginal Midwest refineries that lacked sophisticated secondary refining equipment, the increase of light tight oil and condensate blend has been a godsend, raising profits by substituting away from scarce foreign imported feedstocks. But for the more sophisticated refineries on the U.S. Gulf coast, rising supplies of condensate produce greater challenges. These refineries need a sufficient volume of heavier fuel oil or heavy gasoil (VGO) as their feedstock to yield the optimum levels of gasoline, jet fuel and diesel production given the range of equipment in their facilities. Thus, there is a physical limit to how much condensate spiked crude oil they can use and still benefit from expensive coking units and to optimize the full scale of their distillation towers and facilities to produce the most valued combination of refined products. To some extent, refiners can blend some tight oil/condensate into heavier crude to add marginal volume use and tap the opportunity of the domestic production surge, but eventually to absorb all the condensate that is being produced, refineries will have to make large capital investment in new distillation tower capacity. Condensate's high naphtha yield reduces the working capacity of the tower. Valero is

reconfiguring its existing tower at its Houston plant to be able to accommodate more condensate as is Marathon in Ohio and Kentucky facilities. Kinder Morgan is also commissioning a new splitting facility in Houston. But a lot of the rising U.S. condensate production is currently being sold to Canada for use as a diluent. By 2016-2017, the increase in condensate production is projected to exceed U.S. refiners and Canada's ability to absorb flows easily. As a result, the United States may need to relax restrictions for the export of field condensate or much of the incremental oil output from shale development will become increasingly physically unusable except outside the United States. In this case, lack of a clear export policy would lead to a reduction in further production increases of natural gas and tight oil.