

Crude Oil Exports: Economic and Geopolitical Impacts

The expanding production of crude oil and natural gas has been a bright spot in the U.S. economy, but has also sparked debate in the public policy arena about the export of these products. Earlier this year, the American Council for Capital Formation's Center for Policy Research convened an esteemed panel of experts to further the understanding of issues relevant to crude oil exports and trade policy.* This is the second in a series of roundtables that ACCF has convened with scholars to discuss U.S. exports policy. ACCF previously held a panel on the topic of natural gas exports.**

THE ROUNDTABLE PANELISTS



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* The American Council for Capital Formation Center for Policy Research discussion panel on February 12, 2015.

** <http://accf.org/should-free-trade-principles-apply-to-u-s-exports-of-liquefied-natural-gas/>

Our panel of three highly distinguished experts spent more than an hour discussing various aspects of crude oil exports and trade policy. This ACCF Center for Policy Research panel discussion is very timely given pending legislation on the Hill and decisions before the Administration. (Speakers are indicated by their initials.)

PC: Over the last couple years, public understanding of the shale revolution, and the dramatic increase in oil and natural gas production in the U.S., has expanded.

However, as the discussion has turned to crude oil exports, what has surprised you the most about these public discussions? More generally, why do some policymakers and the public think that exporting crude oil should be treated differently than the export of other goods and services?

MS: Two things I found surprising: One is the fact that so many voices have said crude oil exports aren't a great idea and that we need to proceed very slowly and deliberately. A lot of our policy conversations in the United States presume, rightly so, that more exports benefit the United States. So I think that's one thing that has been surprising

I think the second surprise is the extent of confusion about what energy independence does or doesn't entail. Many people view oil as a strategic industry, and we can talk about what definition might and might not make sense. There is a widespread belief that the more oil we produce and keep in the United States, the more insulated from the world oil market the United States will be. In many ways, though, that protection simply won't exist.

JB: I agree with Matt. A couple of things with regard to the public response: One; is there clearly is a public misunderstanding on a few dimensions.

First, the U.S. is not going to be a net exporter of oil anytime soon. So, unlike with natural gas in the United States, we don't have a surplus of more oil than we know what to do with. I think that clouds the debate a little bit as well. This debate is about quality differentials and letting markets work efficiently.

Second is a clear perception issue – we've spent 40 years telling the American people that we're running out of oil and that it's a scarce commodity, since the Arab Oil Embargo, and that creates the perception that it needs to be kept within the U.S.

The idea that if we were to send that overseas it would cause U.S. gasoline prices to go up is still an idea that is quite prevalent and creates a political challenge to getting change on this policy, even though by this point, there are a vast number of analyses and studies by economists and others showing that it is not likely to be the case.

So as Matt said, we spent decades fighting for free and open markets, yet it's notable how quickly some people

can revert to protectionism when the U.S. suddenly finds itself on the plus side of the energy balance.

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FV: So let me pick up on a point that both Matt and Jason have raised. The Energy Policy And Conservation Act 1975 (EPCA) was adopted in reaction to the Arab Oil Embargo and U.S. Geological Survey and other assessments that asserted that the United States production had peaked and we were actually running out of oil and gas, which are depletable resources.

As a consequence of technology and higher prices for the past several years, today's assessments of the resource base are dramatically different from what we thought in the 1970s. I expect we will get into crude oil quality issues later as well as the prospects for continued domestic production increases, but I would contend that the strongest argument in favor of oil exports is that we as a nation have been and are advocates of free trade – and that position has served us very well over the years. We export what is surplus to domestic needs and import what we need in a variety of commodities.

That said, there is no question that after 40 years of being told that our lack of domestic energy resources should be viewed as a vulnerability, the prospect of now having significant energy resources has been met with some skepticism and that, clearly, the pricing of energy remains a politically sensitive issue, especially when it comes to gasoline.

But in the case of crude oil exports, it's important to note that we actually have legislation that dictates how we “manage” scarce resources in the United States, so we are not starting with a clean slate with respect to policy on that issue.

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And to the argument (also vintage 1970s) against the “Drain America First” concept, why should we produce/export if we have limited resources, and I think there's still a little bit of carryover from that. If we were starting from

scratch with the new unconventional oil and gas revolution, I think exports would have been an easier sell to the American public and policymakers, but the fact that we have to overturn or revise existing policy, such as EPCA, complicates that decision.

Maybe the biggest “surprise” for me is that in the space of five or six years, the conversation on resource abundance and exports has actually matured as much as it has. This revolution was a surprise to a lot of people including folks in the industry.

And we have moved fairly quickly through a variety of contentious and difficult issues in the process – from disagreements over the size of the resource base, and early issues surrounding well integrity and the composition of fracking fluids, to water quality and quantity, methane emissions and seismic events caused by reinjection of waste water. “Above ground” issues like traffic congestion, road repair, well spacing and scale of development have not been easy even for communities that have a history with oil and gas production activity. So the conversation has evolved, and not to belabor the point because we’ll come back to it, but I think the oil story and the gas story are two quite different stories.

PC: Comparing the discussions of LNG exports to the discussion of crude exports, what are the most important differences for you? Is the importance of differences in the quality of oil produced in the U.S. and abroad being overlooked in the debate over export of U.S. crude?

FV: If you begin with the technology advances and the higher prices we experienced between 2006 and 2008, you can put some context around the unconventional revolution in the US. We can drill wells that are six miles deep and drill laterals (extended reach horizontal wells) that can hit a resource target the size of a chair. In the case of natural gas (shale gas), we’re actually able to access what we call the source rock, which is generating hydrocarbons, so there’s zero geologic risk.

The oil side, the discussion is a bit more nuanced. Some of the US unconventional development is in what we call the “oil window” where under certain pressure and temperature conditions, the formation is generating long-chain hydrocarbons (oil). In other areas, we are simply using fracking and long laterals to increase productivity of known formations.

And while results to date have been promising, there is still a concern about how long this lasts. On the gas side, I don’t think anyone has that concern because with the ability to drill so deep, we’re actually finding gas horizons that are literally “stacked” on top of one another and in some cases making it practicable to produce from multiple zones simultaneously from a single well pad.

The oil side, we’ve got a number of different plays that are geologically attractive, but they’re not homogeneous, so the productivity results can vary widely. And the quality issue that you raised is, I believe, extremely

important and under appreciated as people frequently just discuss the volumes.

As a consequence we are rapidly approaching the time when we will likely have a surplus of “light” oil, which is incompatible with optimizing our current refinery requirements – and this mismatch is the basis for advancing the current export debate.

JB: So let me just mention three points that are important I think in the difference in the oil export debate and the gas export debate.

The first, which should suggest that the debate about oil exports is actually a little bit easier, is that when we debated whether to allow the export of natural gas, it was sort of pitted as domestic petrochemical industry like Dow Chemical versus increasing production in open markets, and several analyses showed that it is likely the case that exporting natural gas puts upward pressure on natural gas prices.

So there was a legitimate issue to discuss about whether the benefits of free trade in gas offset the fact that domestic gas prices for consumers and industry would in fact be higher as a result of exports.

That is not the case with oil. If we export oil, we’re not pushing up the prices for consumers at the pump. You may be adversely impacting refiners. But the fact that you are not impacting gasoline prices should suggest the politics issue is a little bit easier, although that has not been evident in the way the public views the economic impacts of this. So that’s the first thing.

The second thing is that we will be a net exporter of natural gas. We will not be a net exporter of oil. We’re still going to be importing oil, though as Frank said we may have a surplus of the certain quality of oil. I think that is also important when we think about all sorts of aspects about the debate that are different for gas and for oil.

And then the final point is that just as the process plays out and we think about what kind of current outlets exist for oil exports and how much policy needs to change, it is important to note that the LNG export process is completely transparent. We know who supplied what and we know who’s received a license and we know why they got license because it’s a public decision.

By statute, the oil export license application request process of the Commerce Department is not public at all. So there are certain ways in which you could export either crude or lightly processed oil today, but it is hard for the public to know exactly where those lines are and exactly how much is allowed to be exported today. It is important to know that in order to have a sense of what additional policy actions may need to be taken to prevent future market dislocations.

MS: I’ll add two additional thoughts to the insights that Frank and Jason already have.

One is the underlying economics of gas versus oil is very different when you look at the world economy. The natural barriers to trade in gas are really high, in large part because it's a gas.

A lot of natural gas has the potential to travel around the world to make it more of a global market. But in most cases, as Jason just alluded to, you have to liquefy it first. That's very expensive and complicated.

If the technological barriers to transporting natural gas long distances can be overcome, then the arbitrage opportunities will be much bigger than they are in oil. Look, for example, at today's abundance of natural gas in the United States compared to, say, Japan or Europe. U.S. prices in the past two to three years have been approximately one third or even one quarter what they are in other countries.

My second point comes back to the political economy and the national security arguments that one hears about trading gas versus oil. Justly or not, many people worry more deeply about the national-security value of oil than they do natural gas.

Gas is used to heat certain homes in the United States. It does power some of our transportation. It does fuel some of our electricity generation. But because of how heavily we rely on oil and its derivatives to power cars, trucks, trains, and planes people worry more about economic harm from exporting oil than they do exporting natural gas.

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FV: And it's not only about the United States but our allies (Japan, Europe, S. Korea, etc.) whose economies are dependent on having secure supplies of oil (and gas) as well. Since the Carter Doctrine (and even before) it's been the policy of the United States to ensure global access to oil supplies and keep sea-lanes open to promote global trade and navigation. And then I want to add a kind of a “yeah, but” to Jason's first statement. I think in a high price environment and this is primarily a political hurdle, when you talk about exports and gasoline prices, you can assert that, all things being equal, extra supply means more liquidity in the market and that should directionally lead to lower (rather than higher) prices at the pump.

But, we're already in a low(er) price environment where consumers are enjoying \$2/gallon gasoline. Any change to the status quo that impacts – i.e. increases prices – could be viewed as a political liability, regardless of the cause.

Finally, in certain parts of the country that have been benefiting from distressed or discounted crude (be-

cause of either infrastructure constraints or export bans) – once such “distortions” are removed, both crude and product prices could likely go higher in some markets. The lower price environment has changed the conversation a bit.

JB: Yes, you're right, that the politics of the issue are challenging, they are very challenging whether gasoline prices are high or low, but you're right that people might worry that the inevitable price rise for gasoline gets ascribed to exports even if it's totally unrelated.

FV: Yes.

PC: We're going to get back to the price question again. Looking at trade restrictions in general, what lessons can we draw from the recent announcement of China ending its decade-old quotas on rare earths? One interesting statistic that was quoted in press was the loss of China's share of global rare-earths output. Are benefits of free trade to the U.S. economy being overlooked in the debate about crude exports?

FV: With respect to rare earth minerals, part of the problem is they are inaptly named in that they are not really rare. They are, however, geographically not well distributed and the extraction/processing economics are difficult. China removed the export ban, but they have since applied export license fees. So I think the jury is still out about where this goes and other nations have moved really slowly to add to the global supply. The demand uses are growing for these materials – for electronics, for nuclear, for solar and batteries but they're not easy to get to if you don't have the mining and industrial resources or economic incentives.

On the broader trade issue, the rise in U.S. oil (and natural gas) production has reduced our need for imports and positively affected our balance of trade. Energy prices have been reduced to the benefit of industrial and residential users and domestic jobs have been created – all good things.

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JB: I would say that the recent experience with China and restrictions on rare-earth exports are important because the conversation about oil exports has tended to be about how much of a price discount might emerge in the U.S. market if we don't allow it, and then what impact

that discount has on U.S. production. There are going to be a lot of different views about that. People get hung up on whether it is a couple hundred thousand barrels or millions of barrels, and you go back and forth on that.

Whatever the answer is – there’s broad agreement about directionally what the impact probably is – there’s probably not enough conversation about what I think are broader geopolitical impacts of having in place trade restrictions like this.

We saw over the last several years the international community pushing back hard against the trade restrictions China had put in place. The U.S. led that effort and was very vocal about the fact that these were inconsistent with international trade commitments and obligations.

And so I think when we leave in place our own trade restrictions on energy, it just undermines that position and, should the U.S. ever have to defend these restrictions at the WTO for example, we would likely have to make the same sort of exception arguments that we have successfully defeated trade restrictions in other countries. It might just weaken our ability to fight against trade restrictions like those China put in place on rare earths in the future.

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MS: Let me share a few thoughts, starting with one building on what Frank just said. In China, I think part of why export restrictions are falling is the slow-down in overall Chinese economic growth. After GDP growth of nearly 10 percent a year for over 30 years, today Chinese GDP growth has slowed to only about 7 percent.

If you turn back to the United States, the energy revolution of recent years underscores how productivity booms tend to create jobs and boost incomes. Many people associate productivity booms with information technology in general—and, in particular, with the IT boom of the late 1990s and early 2000s. But qualitatively, the energy boom is very similar to the IT boom. Both have been driven by the serendipitous discovery of new production techniques, as Frank said at the outset.

The similar economic gains of these two booms you can see by looking at today’s cities and states at the heart of the energy revolution. Take North Dakota. The unemployment rate in North Dakota today of about 3 percent is well below the national average. It’s basically frictional unemployment of people moving from job to job.

Next, consider wages and incomes. If you look at the U.S. BEA statistics on states’ growth in real incomes per person, North Dakota far away has had the fastest growth in income per person of any of the 50 U.S. states over the past decade.

In the wake of the financial crisis, with the United States still struggling to create good jobs, it is important to remember how important innovation is to creating jobs and boosting incomes.

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And in general, the benchmark economics almost always says that a country gains from being able to export some of the increased output it enjoys from a productivity boom. Yes, domestic consumers of that booming product might prefer it not fetch a higher price on world markets—but that is not a sound reason to restrict exports.

The next point I’ll briefly make is to consider any externality—that is, any non-market consideration for why you might want to restrict the flow of trade. For example, does exporting a product threaten a country’s national security?

But on this topic the opposite seems to be true: especially for natural gas, many governments—such as Eastern European countries worried about the ongoing strife with the invasion of the Crimea by Russia—have been imploring the United States to export more, not less. Towards the end of last year, the ambassadors of several former Warsaw Pact countries such as Hungary, Poland, and the Czech Republic, sent a letter to U.S. congressional leaders asking the United States to do everything we can to export more natural gas to the world market to reduce their reliance on Russian natural gas.

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FV: With respect to Matt's last point, let me just add that in many cases the political rhetoric has gotten way out in front of the infrastructure realities to be able to deliver US oil and gas abroad in meaningful volumes. When the Ukraine crisis erupted many European and US political leaders alike argued for sending US' LNG exports to Ukraine despite the fact that we had no LNG to send (first shipments will begin 4Q 2015 or more likely 2016 – and they are largely contracted for) and Ukraine had no way of receiving LNG imports. For the last eight years, people have been telling the Ukrainians that they needed pipeline interconnects, additional storage, don't negotiate natural gas contracts in January (when it's cold) and to build LNG receiving terminals, promote efficiency and look at alternative energy - and nothing was done.

When you look at the economics of U.S. exports especially in the current price environment, literally, after you've added in the transportation cost that Matt was talking about earlier in addition to the cost to liquefy and then re-gasify at the other end, the U.S. price of gas at \$3 or \$3.50 when landed in Europe is the equivalent of what's there already. There's no margin for error.

Most of the U.S. LNG that would likely be exported, would probably be destined for Asia rather than Europe, because of pricing, and even then a lot would depend on what Chinese demand looks like, what happens with Australia's gas supplies, whether or not Japan reopens its nuclear facilities to relieve the pressure on oil and gas, etc.

There's a lot of LNG export projects that may get approved. I'm not sure how many will actually be built. With the oil and gas price relationship now changing, some of these projects may be at risk. We are in a new place now.

The economics of oil and gas production are more challenging. A \$100/barrel oil price masked a lot of inefficiencies.

Final thought here is that reduced investment in depletable resources invariably leads to lower production and lags in responding to demand resurgence. Those conditions have historically led to price spikes down the road.

JB: I thought lower prices were good for the macro economy but I guess that's a different conversation that we can have.

FV: It is.

JB: But to Frank's point on gas exports, it's just important to remember that even if people come to Washington and ask for supplies to be sent to Europe, the U.S. government doesn't decide where the gas gets sent. The market determines that. Contract negotiations determine that. I would argue that while there's still a licensing requirement per statute that Congress put in place a

long time ago, for all intents and purposes, there is not a meaningful restriction on the export of natural gas at this point because people who want licenses to build export facilities in non-free traded countries are getting them. They could maybe get them a little bit faster but they're getting them.

PC: Many people argue that the current ban on U.S. crude exports introduced by the Energy Policy and Conservation Act of 1975 is out of date and should be repealed. Do you agree and if so, what it is about today's market conditions compared to the '70s that makes this policy out of date?

FV: The supply resurgence has totally changed things. The conditions have changed and the policy hasn't caught up. For 40 years, we thought we had a scarcity of oil and gas resources and then prices got high enough to incentivize companies to experiment with fracking and laterals. It was \$12/mcf gas and \$80-100/barrel oil that actually made people work harder on the technology and put more experimentation in the field to better understand the formations and geology.

The combination of higher prices and technical advancements allowed producers to economically access a substantially larger resource base. We all agree there are enormous resources of natural gas. I think there are huge amounts of oil as well. A note of caution here, however, seems prudent when talking about the longevity and size of the unconventional revolution. Conventional oil resources usually have a decline/depletion rate of 4-5% and a recovery factor of 60%. So far, unconventional oil – and we are still in the very early stages here, so technology is likely to improve – has exhibited much steeper declines and single digit recovery rates.

We've moved beyond chapter one, of what looks to be a very good story but still in the early stages.

JB: I agree that one market change is obviously the dramatic increase in U.S. production in the last several years. I'll mention two others.

The export restrictions that were put in place through several pieces of legislation in the 1970s that gave us the basic law we have today were partly in response to concerns about oil scarcity and partly also a response to domestic oil price controls that were put in place in the early 1970s. Because once the world price of oil rises above the U.S. price of oil, in order for price controls to be effective, you need to prevent U.S. producers from being able to export the oil to fetch the high world price.

Whatever your thoughts on the wisdom of price controls in the first place, those were eliminated in 1981. So that original rationale, or part of the rationale, for the export restrictions no longer exists.

The second point is the changing nature of the oil market generally. Today's world market is very different from the

one that existed in the 1970s, when most oil was sold under long-term contracts. People were worried about how a disruption in the contracted shipments could result in a potential physical shortage for the buyer.

Today, oil is the most traded liquid global commodity and moves on a dime to different parts of the world as arbitrage windows open. So the concerns we have about the potential sources of our oil being disrupted are manifested in price changes for the world as a whole, because it's a single global oil market for the most part, with some quality differentials.

MS: I agree with Jason and Frank that the world supply of and demand for oil has changed so dramatically in the past few years, there is no compelling national security or environmental externality argument that I see for why we should restrict U.S. oil exports. I do worry about global warming and climate change, but that should be addressed through the price of oil, not the flow of oil.

The second point I'll add is that many voices today argue that if we keep in the United States the oil we are producing, then drivers will see lower gas prices at the pump.

But the economics here is more subtle. A lot of the new oil we are producing in the United States is classified as light oil, but a lot of refining capacity in the United States was set up to import and refine heavier grades of oil. This scarce light refining capacity means that lower U.S. oil prices have been at least partly enjoyed by refiners seeing lower input costs and thus higher profits—profits which have not been directly passed to consumers at the pump through price reductions.

FV: And just staying on that point. The prevailing notion for a while was that the mismatch between the quality of light tight oil and domestic refiner configurations was the limiting factor to US production and that eliminating the export ban would provide for the unfettered flow of large volumes of US LTO oil into international markets. A lot of the early studies that examined the impact of the export ban adopted this model. But when you look at international refining capability, the facts tell a more nuanced story – some 15 percent of global refining capacity is geared to use light oil, while almost 30 percent of global supply is now light.

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So there's likely going to be limits in the international market as well, to the extent that policymakers feared the domestic price impacts of making large volumes of domestic oil (some studies forecast some 3 million

barrels per day of exports) available to global markets, using more realistic assessments could actually facilitate the export debate.

Final point here is that there is broad agreement that a rationalization of global refining capacity is coming. To the extent that this "shakeout" forces the closure of less sophisticated refineries, like many of those in Europe, which are designed to run lighter crudes, the opportunity for greater LTO exports may be further restricted.

PC: Continuing on with this point, when the Energy Policy and Conservation Act was introduced, both export of petroleum products and crude oil were banned. However, since that time, some of the restrictions were relaxed. Current policy allows export of petroleum products but not crude oil. What impact does this differentiation have or will have on market do you think?

FV: As Jason already pointed out, the US Department of Commerce has promulgated what we refer to as "short supply" controls that govern the export of crude and condensates. Refined petroleum products are treated as the equivalent of manufactured goods and they're allowed to be exported.

To date, Commerce has approved a handful of applications for the export of lightly processed condensate. Some people had projected that we will be exporting a million and a half barrels of condensate this year. That is, I believe, unlikely to happen in part due to the quality/ characteristics of the condensate and how it matches up to demand usage around the world.

To get a more complete picture of the prospective demand and export opportunities, you have to really take a step back and look at the processing capability and what the demand looks like. In a high demand scenario, I think there would have been a lot more opportunity. In a low demand scenario, there are fewer opportunities to sell. There is also the issue of netbacks to producers when faced with discounted competition from other would be exporters, and then, of course, adding in transport costs from the US.

JB: Yes. I would say two things. One, and this goes back to the point that both Frank and Matt made earlier, is the fact that we can export refined petroleum but not crude, plus the fact that we're still importing crude. So as the marginal barrel we refine is the higher priced imported barrel, this means the price of the pump is being set based on the global market for gasoline and this explains why the benefit of discounted U.S. oil was not being passed through to the consumer.

So that's one impact. We have also shifted from being the world's largest importer of refined product to the largest exporter on a gross basis, I think, and on a net basis maybe the second largest exporter.

We've been exporting a lot of diesel that has kept refinery runs high, and that has boosted gasoline supply within the United States. For a couple of brief periods, we've actually been a net exporter of gasoline too, which is pretty remarkable. It actually helps refineries keep operating, which is good for U.S. supply and for the U.S. economy.

We also just saw labor strikes at many refineries. This was sort of a reminder of the fact that in response to extreme conditions like hurricanes or a labor dispute or something else, we benefit from having access to the global gasoline and diesel market when we need to import supplies.

And I think to not undermine our credibility; it makes sense to participate in that market in both directions if we want to have access to imports when they benefit us.

FV: I think there's a further point too. By allowing just condensate and not crude oil, we may be (intentionally or not) encouraging investment in infrastructure that's going to be stranded investment down the road if/when we move to lift the crude export ban.

So if we start seeing a lot of simple distillation units in the field or separators/stabilizers that are constructed solely for the purpose of getting an export license, when you get to the point of allowing the export of crude, you're not going to need that distinction.

Some people view the decision to allow condensate exports but not crude oil as sort of a political compromise, but "I think we've put people in a box by giving them half a loaf. We should allow crude exports on the basis of free trade/market policy. Economics will ensure that we export only what is surplus to domestic demand.

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MS: Jason and Frank just made a really important point. Markets don't get everything right, but the magic of the market is if you allow producers and consumers in the U.S. to interact with the rest of the world, they will tend to figure out the most efficient flows.

And as Jason pointed out, what is most efficient is sometimes surprising: for example, the U.S. exporting diesel fuel to other countries. If governments tilt the market's incentives, then they risk stimulating investment in unproductive lines of business.

Real business decisions get made and real jobs get created based on what governments do in these situations. American companies and their workers would greatly benefit from getting some clarity about how and when to sunset EPCA. I think that would be the best policy outcome.

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– Matthew J. Slaughter

PC: What does keeping the ban in place mean for domestic production? What does it mean for energy security and for energy independence?

JB: I would say as much clear consensus as there is from the folks on this call that restrictions in trade and energy probably don't make sense for many reasons, economic and geopolitical, I think it is important to be a little realistic and modest about the impact that this may have on U.S. production in the near, and maybe even medium, term.

If recent U.S. production growth rates of a million barrels a day were to continue, then there would clearly be a shortage of U.S. light crude refining capacity and that would likely reduce domestic crude prices relative to international levels. This could in turn slow the pace of upstream investment and future crude output.

Modifying or removing the crude export restrictions would help boost U.S. supply and there's a range of estimates for what that might look like. Given the recent collapse in oil prices and the potential for U.S. production growth to slow dramatically, it is not clear how much of a binding constraint the export ban is. In addition, there are outlets to export today, and as Frank noted, the Commerce Department potentially has an outlet to use, that it has the ability to dial up or down if it wants to. We are already exporting half a million of barrels a day of crude. We now have the opportunity to export lightly processed condensate, maybe lightly processed light oil as well.

Also, the impacts are likely to be seen seasonally for a while, so the impact of an oil export ban on depressing US crude prices may be seen in temporary spreads blow out when refineries go into turnaround, for example, as I think you may see at the end of 2015.

Still, we shouldn't overstate how much of an impact this actually has on U.S. production overall, even though there's no doubt directionally it would be positive. I think the arguments around energy security and – I don't like the phrase energy independence – geopolitics are probably even stronger for allowing exports. I think it would make the U.S. more resilient, not less, to supply disruptions elsewhere in the world.

I think greater integration into global markets can help make the U.S. supply more responsive to international market developments, and as I mentioned before, lifting crude export restrictions is consistent with long-standing U.S. trade policy priorities. I think it enhances the credibility of the U.S. in current and future trade negotiations and avoids setting a precedent that could harm our trade policy objectives in the future.

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– Jason Bordoff

FV: So I would generally agree. Significantly lower oil prices have altered the circumstances. If we had this discussion last summer, it probably would have been a different conversation.

With respect to calls for Energy Independence – and a succession of presidents going back to Nixon have articulated this as a desirable objective and one that resonates politically – I think the term is misunderstood and counterproductive. We live in an interdependent world. Energy security is enhanced by having more reliable supplies, global trade and back up systems like the strategic reserve and alternative energy options.

That said, striving to ramp up US oil production in a low price environment doesn't seem to make a lot of sense. It's like buying high and selling low. We are not going to “lose” the resource and prudent development makes sense economically, environmentally and with respect to local community impacts.

Because of the short cycle times, the shales have the ability to quickly respond to market conditions and we've got a lot of offshore production (big fields) that will be coming on in the next couple of years. Depending on what we do with Iranian sanctions or how fast Iraq's production comes back, what happens in Venezuela, Nigeria, Libya, etc., there's a lot more production potential worldwide. And as Matt said earlier, we kind of scoff at China's 7 percent growth because it's down from 10, but 7 percent is still pretty healthy. It's just the rest of the world is not doing all that well on the demand side.

Prices will come back into balance as we work off the current supply overhang, but they are unlikely (absent some geopolitical disaster) to revert to the levels we saw from 2010-2014 anytime soon. Having prices that are persistently too low and discourage drilling likely portends a spike coming in the future. It would be great if we

could smooth out the price curve, but I'm not sure we can because the oil and gas industry has historically operated with investment to production leads and lags. But in terms of security, a well-supplied market is the best thing you can ask for.

MS: Jason and Frank said a lot of wise things there. Energy security is exactly what I think Frank just described it as. Energy independence is so unhelpful of a phrase that it would be terrific if invoking it triggered a misdemeanor like jaywalking.

There are definitely distributional concerns to exporting America's new energy abundance. I don't mean to belittle those hurt by rising energy prices from greater exports, such as chemical manufacturers that use natural gas as a key input. I understand that. But there's just no sense in which independence is plausible or desirable, given how connected we are to the world.

Let me add one other point here: I think sometime this conversation about energy exports is conducted with blinders on. The United States has a broad trade policy agenda right now with a lot of countries. With our overall trade policy we are trying to create good jobs in the United States and good wages. It tends to be globally connected jobs that pay higher wages.

Ambassador Mike Froman continues to do yeoman's work for the United States trying to negotiate the TPP, the Trans-Pacific Partnership, with about dozen nations. He then shuttles off to the Europe for the TTIP negotiations with the EU. The point here is there are a wide range of trade and investment issues critical to the United States today—and, frankly, energy is just one of them. America unduly focused on energy runs the risk of being short sighted about the country's broader agenda to better connect with the world economy. Restrictions on energy exports erode our credibility in important other policy forums where we are trying to get other countries to open up and be more integrated with the United States.

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– Matthew J. Slaughter

PC: Our next question, I know we have discussed this, but it's such a hot topic. I just want to elaborate again. What about the potential impact of crude oil exports on domestic prices especially gasoline prices?

The recent studies by Department of Energy, Brookings Institute, Columbia University argue that lifting the ban could lower gasoline prices. What are the implications under lower or decreasing world crude prices?

FV: I would be a bit more cautious here. All things being equal, extra crude supply should not increase gasoline prices. Directionally, it should have just the opposite effect.

My concern is when advocates “guarantee” that if you allow exports that gasoline prices will be lower. I don’t think you can say that given the multitude of variables – refinery outages, geopolitical events, storms, etc. – that impact the market.

But there’s no question that there is greater supply, greater liquidity in the market. I would like to put a finer point on something that both Matt and Jason have mentioned but with a little different spin. U.S. refiners have benefited from low natural gas prices as a feedstock, a source for hydrogen, and as a fuel. Lower crude oil costs have furthered that advantage, which has allowed them to increase product exports.

So if domestic prices for oil and gas kind of equilibrated globally, then I’m not sure the full measure of the current refining advantage stays. Just something to keep in mind.

JB: I totally agree with Frank. I think he makes a really important point and I think we tried to be quite careful about the way we characterize it in our study, which was to say the benefits of discounted U.S. crude prices accrued to refiners, not to consumers at the pump.

Directionally, I think there’s broad support that they would lower them by increasing supply, but that is likely to be potentially a small impact, and we talked about the factors that will determine how large it is. Some studies find higher estimates – they make aggressive assumptions about the growth in U.S. supply particularly in light of the recent oil price change. And they may also make conservative estimates about how flexible and accommodating the U.S. refining system can be to make additional investments which leads to a higher U.S. price discount.

I think supporters of easing the restriction can prevail in this argument without overstating the case because there are good economic and geopolitical arguments in support of free trade and energy. I think we should say it will not raise the price for consumer at the pump. Directionally, it might slightly lower them, but that’s uncertain.

MS: These sorts of macro analyses should always be taken with a healthy dose of humility. They adapt a static view of the world: for example, imagining the United States adds another one million barrels a day to the world market and then calculating a price impact based on other key assumptions such as the rest of the world’s supply and demand.

These sorts of calculations should be taken directionally, as both Jason and Frank used that nice adverb. But they should also be taken with a large degree of uncertainty because they hold equal so many things in the global economy that we know almost surely won’t be equal when you look out many years.

The recent drop and now a bit of rebound in oil prices is a great example of the need for this sort of humility. Modeling exercises are sometimes taken too seriously as precise and reliable predictions of the future. Their directional impact may well be accurate, but the magnitude and timing of any changes from these exercises should not be interpreted too literally.

FV: Thank you. That is so true. Forecasts for a 3 cent per gallon change in gasoline prices in 2025 should be taken with a pound rather than a grain of salt.

PC: So, focusing on the geopolitical aspect of exporting LNG and crude, what are the most salient considerations from the past and current situations? What are the considerations with respect to OPEC? Are they maximizing any benefits available from North American alliances?

FV: Well, it’s interesting if we go back five or six years. Canada, our neighbor to the north, thought they would be exporting large amounts of oil sands and natural gas to the United States. But the rise in US production, especially shale gas, changed all that.

And now they’re trying to find other non-US markets to sell their resources. In a similar vein, prior to the LTO surge here, the west African light oil producers thought that they had a pretty secure market on the U.S. East Coast given our gasoline demand and that has also been altered as we have largely backed out African light oil imports, which in turn have struggled to find new markets in Asia.

And when you look at the politics going forward, some of the Middle Eastern producers are very concerned that as we become less dependent on Middle East oil, U.S. diplomatic and military support for the region will also decline.

There are clear benefits to the US and the world by having America reduce its import dependence and produce additional supply. The supplies of (LNG) gas that we’ve moved back into the market (originally destined for US consumption) have increased global supplies. Some of that gas has found its way to Europe, some to Asia. The same is true to a lesser extent for oil so the rise in US oil and gas production has been helpful in that regard already. But the precipitous rise in US production has, as we’ve discussed, also been disruptive.

JB: I think one way to think about it is that there are potentially two channels through which you can have geopolitical impacts. One is the openness to global markets and free trade, and I think we’ve talked about that a lot.

So, I think, easing export restrictions is consistent with our longstanding commitment to free trade principles and builds credibility as we push free trade agreements in Europe and the Pacific region. Export restrictions can hinder our credibility and our attempts to build international support for other policies. I think the ability to persuade countries through diplomatic efforts to reduce their pur-

chases of crude from Iran as part of the Iran sanctions negotiation could be made more challenging if we're saying we're not going to export our own condensate or light oil to make up some of that supply.

So, that's one where I think there are strong arguments: openness to free trade is to our broad geopolitical benefit, generating new trading relationships and maintaining existing ones.

The second is the geopolitical benefits that come from increasing U.S. supply. And there, again to our last comment, directionally, those are positive, although they're probably small and we should be modest about them. So, increasing U.S. supply overall, whether by lifting restrictions or for whatever other reason, has the potential to reduce market share of OPEC and some other countries depending on how they respond, as we've seen in recent months.

Allowing U.S. producers to see the global price signal helps U.S. supply potentially respond more quickly to offset disruptions elsewhere in the world. Lowering our net imports through higher production can reduce the adverse macroeconomic impact of an oil price shock because more of the increased spending on oil would circulate within the U.S. economy.

Directionally, those are all benefits from increased oil production, and then it just comes back to the point that the impact on U.S. oil production of allowing exports to occur is likely small. All of those benefits I just talked about are small relative to the changes we've seen in the last few months in global oil markets, for example.

MS: I will add two quick things. One is to echo something said earlier. It is important to keep in mind that the geopolitics of oil and gas may be very different because while oil is a very integrated world market natural gas is not.

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Point two is a bit subtler but is still important. The energy boom has brought macroeconomic benefits to the United States in terms of a shrinking trade deficit and current account deficit with the rest of the world.

One reason that the American financial crisis became a world financial crisis was the fact that in the early and mid-2000s, the United States ran large trade deficits with the rest of the world that we funded by selling hun-

dreds and hundreds of billions of dollars in assets every year to the rest of the world – many of which were linked to residential real estate in the United States.

This macroeconomic benefit notwithstanding, as Jason rightly said earlier, there is no foreseeable future in which America suddenly becomes a net exporter of oil. Still, a smaller trade deficit in oil is an important macroeconomic change for America and the world.

FV: So, just as a thought for future conversations. To the extent this lower priced environment becomes destabilizing for certain countries – Venezuela, Nigeria, Russia or certain areas in the Middle East for example, we need to be mindful of the potential implications of failed states – not a desirable outcome.

MS: Yes, that's a great point. You guys are more experts than I am in this, but oil persisting at \$40 or \$50 a barrel might really destabilize some of these struggling states. Several countries face large fiscal pressures from low-price oil—especially those like Venezuela with limited access to international capital markets.

PC: Moving on to our last question. Is there anything regarding the environment that's relevant to this discussion? Recently, former Treasury Secretary and Harvard University Professor Larry Summers stated that there is no environmental argument for a policy that distinguishes between oil produced in the United States for domestic consumption and oil produced in the United States for foreign consumption.

Summers seems to suggest that the question of environmental regulation is a different concern than the prohibition on exports. Jason, your recent report also touches on the same point, could you elaborate?

JB: Sure. I worry a lot about climate change. I think it is something that the world needs to move much more quickly to address, and to the extent that allowing exports lowers crude oil and petroleum product prices by increasing supply in the U.S., then there will be some demand response. Probably small, but there will be some demand response along with a concurrent increase in oil-related CO2 emissions.

So you can't have one without the other. If the estimates that supporters of lifting the oil export ban have been putting out about how dramatic an impact this could have on U.S. production, adding millions of barrels a day for example – which we've all said, we might be a little skeptical of – but if the impact is that large, that does have an impact on global prices and on consumption. So that is a negative from a climate change standpoint.

I think the response to that is that export restrictions are not an effective or appropriate climate change tool. I think you need to address greenhouse gas emissions and cli-

mate change through policy tools targeted at that problem. Putting in place trade restrictions to try to achieve some marginal reduction in greenhouse gas emission by slightly pushing up the price relative to what would otherwise be is a very expensive climate policy when you think about the lost economic and geopolitical benefits from free trade.

The cost per ton of CO2 that you would be reducing is very expensive relative to other smarter climate change policies we could put in place, like a price on carbon or things that I think the administration is doing now like trying to address methane emissions.

FV: I'd like to revisit a point that Matt actually made earlier and Jason just made again. It's this notion that price is probably a better way to deal with carbon concerns than using things like export restrictions. And my example relates to the debate over the Keystone XL pipeline.

If Canadian heavy oil were to be railed or shipped to the Canadian coast, put on tankers and then sent to places where refinery emissions are less well regulated than in the United States, that should be a net negative for the environment as opposed to using the Keystone pipeline to deliver crude to US Gulf coast refineries. Instead, Keystone has become a proxy for the environmental movement.

In the absence of a sustainable (economic, environmental, energy and foreign) policy or policies I think we've been kind of straddling the fence on this. We enjoy the economic benefit of lower cost gas and widespread availability, but....

The success of the unconventional development, in my mind, extends the world's reliance on fossil fuels (albeit cleaner, safer and smarter in terms of license to operate) if for no other reason than there is currently no scalable affordable or reliable replacement on the near term horizon. But the current either/or debate with respect to development or the environment seems counterproductive. We can't seem to square the circle yet.

JB: I think underlying this one issue, but it relates to infrastructure more broadly, is the question of whether we can enjoy the benefits of a tremendous U.S. oil and gas boom, supply boom, and also stay on a path to deal with the climate change problem. And I think it's easy to say

we should allow infrastructure to be built where it makes sense. We should allow free trade in energy and then we have to just put a price on carbon and let the market work. The problem is people don't see the latter happening. They don't see the climate policy being put in place as strongly as they need to, so then people revert to, you know, second, third, 10th best solutions like opposing free trade in energy.

So, you know, I think, for me, the takeaway from that is that we need to move more quickly to put robust climate policies in place, and doing this is actually supportive of the kind of things we're just talking about, like free trade in energy. Because if we can demonstrate robust measures are being taken in smarter ways to deal with climate change, then I think that's where the focus should be, rather than on efforts to try to achieve costly and relatively modest reductions by blocking infrastructure or trade.

MS: I worry about climate warming and climate change, and this problem is a global externality—where the key word is “global.” A number of studies have pointed out that what the United States does is increasingly irrelevant because the energy demands of emerging markets are going to play a much larger role in determining global CO2 emissions and other pollutants. This comes back to, as Jason and Frank said, the need to put a price on carbon emissions through a mechanism like a carbon tax.

And paradoxically, the energy revolution in the United States makes it harder, not easier, to garner support for a carbon tax because now we have more U.S. jobs linked to energy production. But that just reinforces the need for some leaders on whatever side of the aisle to step up and try to frame the issue in the right way.

FV: Completely agree. We haven't moved the climate conversation from mitigation to adaptation yet but economic resiliency across the board, is likely to become really important as nations grapple to come to terms with climate change. We've got mega cities developing along the coasts, but if we have appreciable sea level rise, we may have to rethink that. And then you want countries to have the capability to do what they need to do.

I don't think our objectives here are mutually exclusive. We just need to find the right formula for a suitable path forward.