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Congressional Testimony of

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Chairman Murkowski, Ranking Member Cantwell and Members of the Committee, thank you for inviting me here today to discuss factors that impact global oil prices.

My name is Jason Bordoff. I am Professor of Professional Practice at Columbia University's School of International and Public Affairs and Founding Director of Columbia University SIPA's Center on Global Energy Policy.

It is an honor to appear again before this Committee to discuss high oil prices. The last time I was here, in April 2016, I was asked to testify about low oil prices—at a time when prices had collapsed from $115 per barrel in mid-2014 to the high $20's by early 2016. Since then, prices rebounded to $80 per barrel this year, before falling back to today's level in the low $70's. That context is helpful as a reminder that oil prices are hard to predict and inherently volatile, and may be increasingly so in the future, as my fellow panelist Bob McNally has so well explained in his recent book for our series at Columbia's Center on Global Energy Policy.[1]

In my testimony, I will first describe the factors that have affected oil prices over the last several years. Among the most consequential factors are the shale revolution, major geopolitical supply disruptions such as in Venezuela, the supply agreement between Organization of Petroleum Exporting Countries (OPEC) and several non-OPEC countries, strong oil demand, and recent U.S. policy shifts on trade and sanctions on Iran.

Next, I offer three observations about the policy implications of recent oil price movements:

[1] Robert McNally, *Crude Volatility: the History and the Future of Boom-Bust Oil Prices*. New York: Columbia University Press, 2017.

- First, because policymakers cannot predict oil prices and because few policy responses impact oil prices in the near-term, energy policy choices should not be based on today's oil prices. I also explain why the use of the Strategic Petroleum Reserve (SPR), although it may reduce prices in the near-term, is not justified at present.

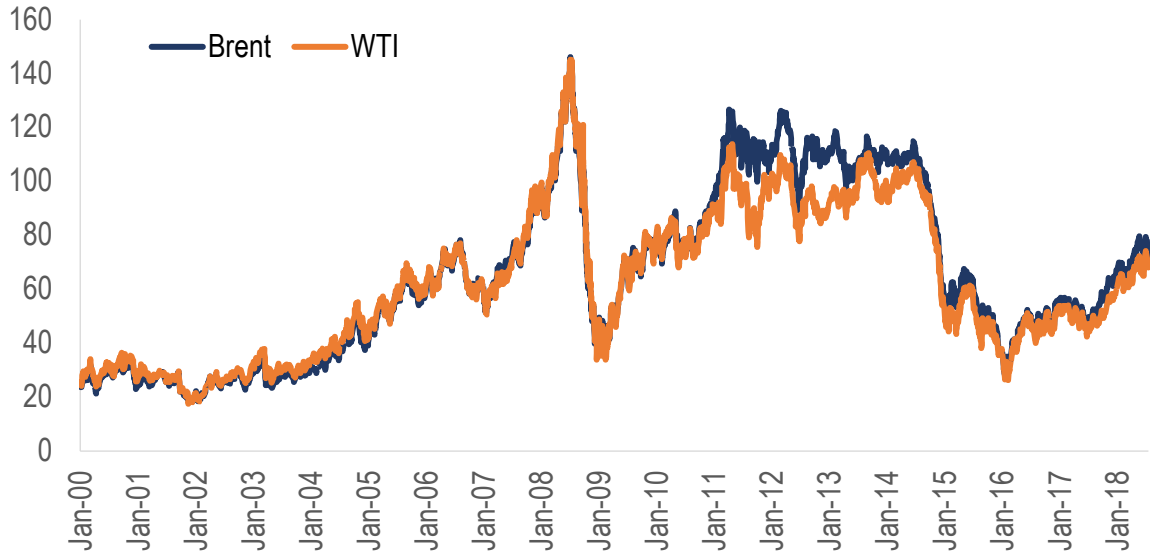
- Second, increased U.S. oil supply does not insulate drivers from higher pump prices, which are largely determined by oil prices set in a globally integrated market. Although shale oil is more responsive to price changes than conventional supply, it cannot serve as a swing supplier to stabilize oil markets in the way true spare capacity (largely held by Saudi Arabia) can.

- Third, the most effective policies to protect consumers from ineluctable oil price spikes are those that reduce the oil intensity of the economy through increased efficiency and alternatives. Reducing oil import dependence, whether through increased supply or reduced consumption, helps mitigate the macroeconomic harm from oil price shocks, even if consumers still see oil price increases at the pump.

The Evolution of Oil Prices in Recent Years

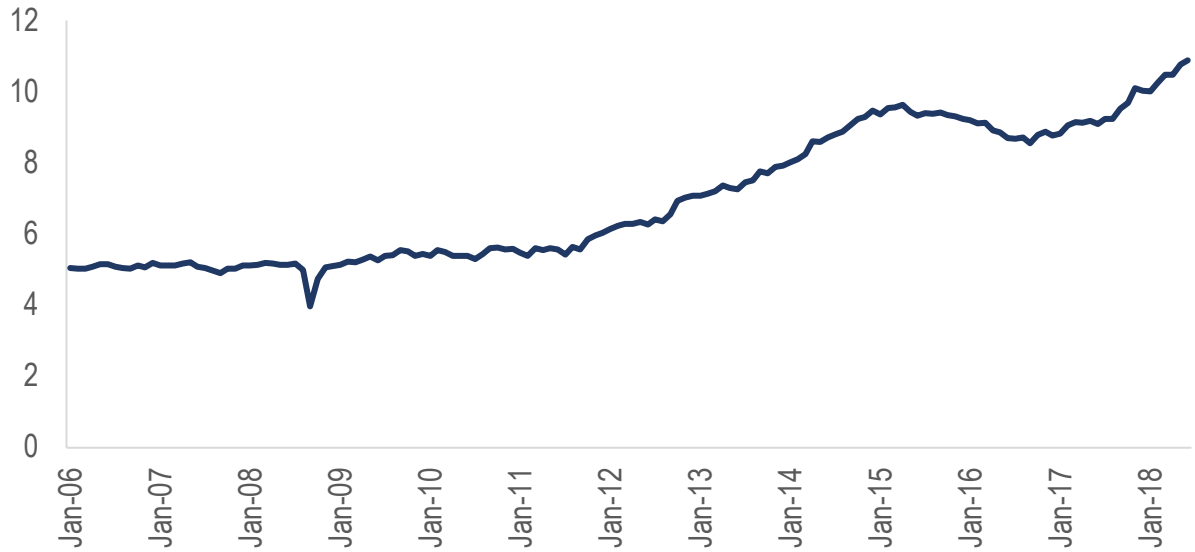
Following a period of sustained high oil prices from 2011 to 2014, in the range of roughly $100 to $120 per barrel (figure 1), oil prices began to slide in the summer of 2014. Several factors explain the oil price decline, but key among them was surging U.S. oil production, which nearly doubled from 2008 to 2015 (figure 2) as a result of the shale revolution.

Figure 1: Crude Oil Price History ($ per barrel)



Source: Bloomberg

Figure 2: US Crude Oil Production (million barrels per day)



Source: EIA Short-Term Energy Outlook (July 2018)

In November 2014, oil prices plummeted, following a decision by OPEC not to cut output to prop up prices. At the time, many commentators viewed the decision as a "war on shale," accusing OPEC of cratering prices to stymie U.S. shale oil production,[2] which was believed to require oil prices of at least $65-70 per barrel to be viable.[3] Oil prices collapsed from a high of $115 per barrel in mid-2014 to below $30 per barrel in early 2016. In a lagged response, U.S. oil production growth slowed and eventually started falling in April of 2015, declining by roughly 1.1 million b/d through September 2016.

In November 2016, OPEC countries came together with non-OPEC producers, most importantly with Russia (known together as OPEC+ or the Vienna Group), to agree to cut production to prop up prices. U.S. oil firms and oil-producing states breathed a sigh of relief. The governor of Oklahoma went so far as to issue a press release thanking OPEC for cutting production.[4]

Many commentators were skeptical at the time that the OPEC+ agreement would hold. Russia, in particular, had promised to participate in production agreements many times in the past, but rarely followed through. In his 2016 memoir, former Saudi Oil Minister Ali Al-Naimi wrote that he thought there was "zero" chance that countries outside the group, notably Russia, would join production cuts.[5]

Yet the production agreement has been far more effective than anticipated. Indeed, OPEC actually cut production more than it promised, largely as a result of the steep involuntary decline in Venezuelan oil production that began in 2016 (figure 3). In response to the OPEC+ cuts, plus strong oil demand growth (figure 4), oil prices gradually recovered, hovering in the mid-$50's per barrel through most of 2017.

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[2] See, e.g., Alex Lawler, Amena Bakr and Dmitry Zhdannikov, "Inside OPEC room, Naimi declares price war on U.S. shale oil," *Reuters*, November 28, 2014, https://www.reuters.com/article/us-opec-meeting-shale/inside-opec-room-naimi-declares-price-war-on-u-s-shale-oil-idUSKCN0JC1GK20141128; Anjli Raval and Neil Hume, "Oil plunges as Opec tests the mettle of US shale industry," *Financial Times*, November 27, 2014, https://www.ft.com/content/eda2b8a6-7645-11e4-a777-00144feabdc0.
[3] "In a bind: Will falling oil prices curb America's shale boom?," *The Economist*, December 4, 2014, https://www.economist.com/finance-and-economics/2014/12/04/in-a-bind.
[4] Oklahoma Governor's Office, "Gov. Fallin Statement on OPEC Agreement," Press Release, December 1, 2016, http://services.ok.gov/triton/modules/newsroom/newsroom_article.php?id=223&article_id=27193.
[5] Ali Al-Naimi, *Out of the Desert: My Journey from Nomadic Bedouin to the Heart of Global Oil*, Penguin, 2016.

Figure 3: Venezuelan Crude Oil Production (million barrels per day)

Source: Bloomberg

Towards the end of 2017, oil prices began rising again. In part, this reflected the success of OPEC+ in achieving its stated goal of drawing down excess global oil inventories. Additionally, global oil demand growth was strong in 2017 at 1.5 million b/d, notwithstanding all the recent talk that oil demand is on the verge of peaking.[6] Indeed, oil demand growth in 2017 (at 1.6%) was much faster than the 10-year average (around 1.2%).

Another factor pushing up prices has been the continuing collapse of production in Venezuela. In November 2017, Venezuela appointed a military general with no oil industry experience to lead the state-run oil firm PDVSA, once a highly respected oil company, which has since fallen apart as a result of mismanagement and corruption. Venezuela's economy has collapsed. China and Russia, Venezuela's last remaining creditors, are increasingly reluctant to provide financing. The country continues to suffer as a result of debt defaults and U.S. financial sanctions, which, together, have closed access to credit and significantly limited PDVSA's access to basic inputs and services. The lack of equipment and investment—along with rampant hyperinflation and a dramatic deterioration of the security situation—have significantly worsened the conditions for foreign companies and workers operating in Venezuela, and led to a significant outflow of oil personnel from the country.

[6] International Energy Agency, Oil Market Report, July 12, 2018, p.51.

ConocoPhillips's seizure of PDVSA's Caribbean assets following an arbitration ruling also threatens 300,000-400,000 b/d of Venezuelan exports.

Factors Driving Up Oil Prices in 2018

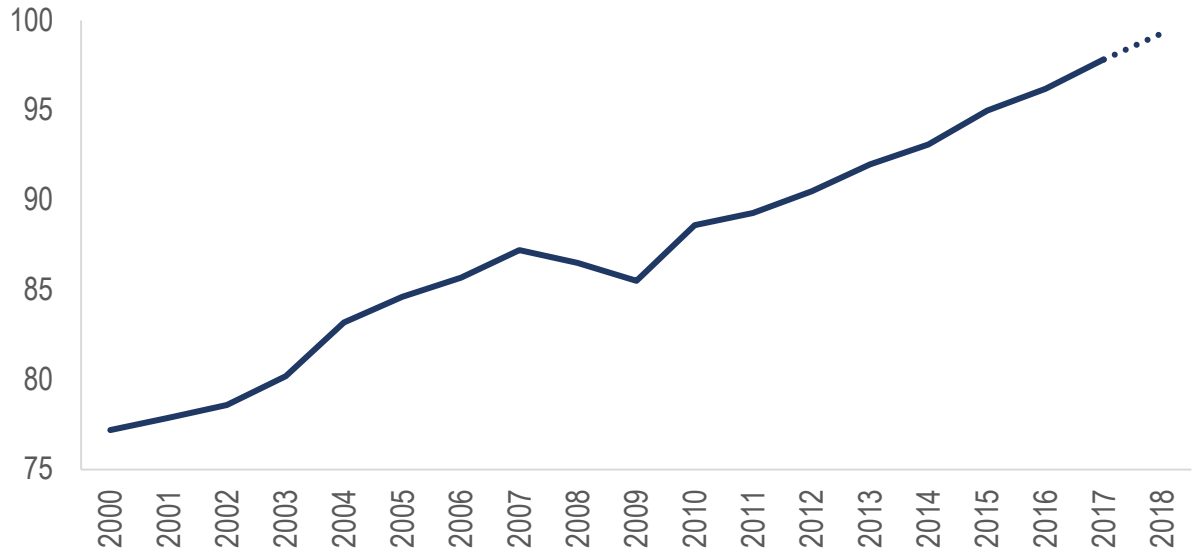
Throughout 2018, oil prices continued to climb higher, breaking the $80 per barrel threshold in May, and approaching it again in late June and early July. Several factors drove the oil price recovery in 2018.

Part of the reason for this surge can be seen in the supply and demand fundamentals. On the demand side, oil demand forecasts remain strong for 2018, with the IEA projecting growth of 1.4 million b/d (figure 4).[7]

On the supply side, the stated OPEC+ goal of bringing global oil stocks back down to the five-year-average level was achieved earlier this year, leading the International Energy Agency (IEA) to declare "mission accomplished" on OPEC's behalf in April 2018.[8] According to the IEA, the global oil market was undersupplied by more than 200,000 b/d in the second quarter of 2018.[9] The OPEC+ agreement aimed to reduce the output of those 24 countries by 1.8 million b/d, but production from those countries actually fell by up to 2.8 million b/d as a result of involuntary cuts by Venezuela, among other countries.

[7] U.S. Energy Information Administration, Short-Term Energy Outlook, July 10, 2018, p.3, https://www.eia.gov/outlooks/steo/pdf/steo_full.pdf.
[8] International Energy Agency, Oil Market Report, April 13, 2018, p.3.
[9] International Energy Agency, Oil Market Report, July 12, 2018, p.49.

Figure 4: Global Oil Demand (million barrels per day)



Source: IEA Oil Market Report (via Bloomberg)

Additionally, geopolitical risk helped push oil prices higher just as the summer driving season was commencing, in at least five ways:

First, and perhaps most importantly, the recent oil price surge was driven by President Donald Trump's decision to withdraw from the Iran nuclear agreement and thus re-impose sanctions on Iranian oil sales. While there is great uncertainty about the ultimate impact of new sanctions, the market was understandably concerned about the potential hit to Iran's oil production (figure 5) and 2.2 million b/d of exports (as of June).[10]

[10] International Energy Agency, Oil Market Report, July 12, 2018, p.19.

Figure 5: Iranian Crude Oil Production (million barrels per day)

Source: Bloomberg

A key question remains whether the Administration will offer exceptions from the imposition of sanctions to countries that significantly reduce their purchases of Iranian crude oil, as permitted under Section 1245 of the FY 2012 National Defense Authorization Act (NDAA), as amended by the relevant sections of FY 2013 NDAA (also known as the Iran Freedom and Counter-Proliferation Act or IFCA). Under this law, foreign financial institutions are subject to sanctions if they process transactions for Iranian crude unless the country housing the financial institution reduced its purchases of Iranian crude oil to a significant degree. Companies can also be subject to sanctions under the terms of Executive Order 13662, which was terminated under the agreement but which will be re-imposed by November 4.

The law gives the Executive Branch the authority to define significant reduction. President Obama defined "significant reduction" as roughly 20 percent by volume in every 180-day evaluation period. After President Trump announced he would withdraw the U.S. from the Iran deal, there was great uncertainty about how the current Administration would its exception authority. On June 26, an unnamed State Department official speaking to reporters said that the Administration would take the hardest line possible on sanctions implementation, not offer any exceptions, and require all

buyers of Iran crude oil to zero out imports by November, the end of the 180-day implementation period.[11] The price for crude oil shot up in response.

The second factor that pushed up prices recently was the unexpected collapse of Libyan production from nearly 1 million b/d in May to around 500,000 b/d in July,[12] following attacks on key export infrastructure and a subsequent blockade of several oil ports by the forces of Libyan military commander Khalifa Haftar, who attempted—unsuccessfully—to hand over control of oil export terminals in Eastern Libya to a newly formed national oil company from the one controlled by the UN-backed government in Tripoli.[13]

Third, Venezuelan production continues to fall, and there is a significant risk that its decline could accelerate further in the near future. The IEA projects Venezuelan production to fall below 1 million b/d by the end of the year from just under 1.4 million b/d in May, but this may well be too conservative an estimate.

Fourth, short-term production outages in Canada, Brazil and the North Sea have further reduced supply in recent months. And other risks of geopolitical supply disruptions in places like Nigeria, Iraq, or around the Strait of Hormuz continue to loom over oil markets.

Fifth, there is a very narrow buffer of spare capacity in today's oil market. Sufficient spare capacity is a critical factor to maintain crude oil stability, as it allows the market to quickly adjust to unexpected supply disruptions. Particularly with Saudi Arabia's recent decision to ramp up production, the level of spare capacity in the market today is at a historic low.

Factors Pushing Prices Back Down in July 2018

In the last two weeks, however, oil prices have fallen again by roughly 10 percent. Several factors are responsible.

First, at the OPEC+ meeting in late June, producers agreed to hike production, following public and private pressure by the U.S. to bring oil prices down, including several tweets by President Trump attacking OPEC for pushing up prices. Following the OPEC+ meeting, Saudi Energy Minister Khalid Al-Falih said he would do "whatever is necessary" to keep the market well-supplied and that

[11] Gardiner Harris and Stanley Reed, "Roiling Markets, U.S. Insists World Must Stop Buying Iranian Oil," *New York Times*, June 26, 2018, https://www.nytimes.com/2018/06/26/world/middleeast/us-iran-oil-sanctions-.html.
[12] International Energy Agency, Oil Market Report, July 12, 2018, p.18.
[13] Aidan Lewis, "How unstable is Libya's oil production?," *Reuters*, July 16, 2018, https://www.reuters.com/article/us-libya-oil-explainer/how-unstable-is-libyas-oil-production-idUSKBN1K61Y6.

an additional 1 million b/d would be added to the market.[14] Saudi Arabia gave itself the flexibility to increase output further if needed to cap prices. Saudi oil production has risen from below 10 million b/d to 10.5 million b/d in June and is expected to rise still further to 11 million b/d.[15]

Second, the Trump administration's surprise announcement of its intention to impose a 10% tariff on an additional $200 billion worth of Chinese goods have raised fears that the escalating trade war between the U.S. and China may lead to a slowdown in global economic growth and thus in commodities generally, including oil demand.[16] Commodity prices across the board, not just oil, fell in response to these escalating trade risks.

Third, General Khalifa Haftar on July 11 handed over Libya's eastern export terminals to the Tripoli-based National Oil Company following several weeks of blockade, allowing operations to resume and expectations of a return to pre-disruption production levels of roughly 1 million b/d as shipments from Eastern ports resumed. However, the instability of the country remains, and this recent increase is not secure and is highly likely to fall again.

Fourth, the Trump Administration softened its rhetoric about the implementation of sanctions against Iran, leading to expectations that the loss of Iranian oil supply would be more gradual.[17] After oil prices rose sharply in response to statements that buyers would be required to reduce Iranian oil imports to zero by November, the State Department reversed course. Administration officials have since clarified that exceptions will be available,[18] although the level of significant reduction necessary to qualify remains unclear.

Fifth, press reports suggested that the Trump Administration may consider releasing oil stocks from the Strategic Petroleum Reserve.[19]

Finally, and more broadly, the price rebound of the last year has given a boost to several sources of non-OPEC production, notably the U.S., Canada and Brazil, all of which are likely to grow robustly this year and next.

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[14] David Sheppard and Anjli Raval, "Russia backs Opec plan to pump more oil," *Financial Times*, June 23, 2018, https://www.ft.com/content/d9e95584-76f7-11e8-8e67-1e1a0846c475.
[15] International Energy Agency, Oil Market Report, July 12, 2018, p.16.
[16] Chris Giles and Robin Wigglesworth, "IMF warns Trump tariffs could hit global growth by 0.5%," *Financial Times*, July 16, 2018, https://www.ft.com/content/b3e31d4a-8901-11e8-b18d-0181731a0340.
[17] Lesley Wroughton, "Mnuchin says U.S. to consider waivers on Iran sanctions," *Reuters*, July 16, 2018, https://in.reuters.com/article/usa-iran-mnuchin/mnuchin-says-u-s-to-consider-waivers-on-iran-sanctions-idINKBN1K61I7.
[18] Nick Wadhams, "State Department Leaves Door Open to Iran Oil Import Exemptions," *Bloomberg*, July 2, 2018, https://www.bloomberg.com/news/articles/2018-07-02/state-department-leaves-door-open-to-iran-oil-import-exemptions.
[19] Ari Natter, "Trump Considers Tapping U.S. Oil Reserve as Prices at the Pump Rise," *Bloomberg*, July 13, 2018, https://www.bloomberg.com/news/articles/2018-07-13/trump-said-to-mull-tapping-u-s-oil-reserve-as-pump-prices-rise.

Implications of High Oil Prices

As I noted at the outset, I last appeared before this Committee two years ago to discuss low oil prices, a reminder of the ineluctable cyclicality of the oil markets. Oil prices will always rise and fall. Indeed, my colleague Bob McNally argues we are likely to see even greater oil price volatility in the future, particularly as global spare capacity wanes—precisely the situation we are facing today.[20]

Few policy responses can meaningfully impact oil prices in the near-term

For policymakers, the uncertainty about future oil prices means that current policy choices should be divorced from near-term oil price movements. Few policy actions can meaningfully affect oil prices in the near term in any case.

There are credible arguments for and against opening new areas to drilling, for example. But these arguments are little changed by movements in oil prices. Whether the oil price is high or low, a careful balance must still be struck between the economic and geopolitical benefits of increasing domestic production and the environmental risks associated with drilling operations, especially in sensitive ecosystems.

Moreover, these policy changes have little bearing on oil prices today. It can take up to a decade or more to bring new supply to the market, even after a new area is opened up for drilling. While the economic benefits of increased production may be greater at higher oil prices, we cannot know what the price of oil will be a decade hence. Even if domestic production could be ramped up more quickly, oil prices are still set in a global market with daily production close to 100 million barrels. The U.S. only accounts for about 10 percent of total oil supply, so the price impact of higher U.S. production is modest at best, absent a historic surge in output like the recent shale boom.

A gasoline tax holiday is another policy measure often suggested to provide consumers relief during times of high oil prices. However, this policy tool has a similarly small impact on fuel prices at the pump, because refineries tend to produce gasoline at close to maximum capacity, especially during summer driving season in America. As the supply of gasoline is largely inelastic (that is, unresponsive to even large price changes) in the short run, the price paid by consumers will rise until demand matches the quantity supplied. A gasoline tax holiday would thus likely benefit refiners and oil producers more than consumers.[21] Moreover, the need to internalize the full externalities of driving—from climate change to air pollution to congestion—not to mention pay for crumbling

[20] Robert McNally, *Crude Volatility: the History and the Future of Boom-Bust Oil Prices*. New York: Columbia University Press, 2017.
[21] Len Burman and Eric Toder, "What Were They Thinking???," Tax Policy Center, April 15, 2008, https://www.taxpolicycenter.org/taxvox/what-were-they-thinking.

infrastructure argues against waiving the modest federal gasoline tax, which has not been raised in a quarter century.

One policy action that *could* potentially reduce oil prices, albeit temporarily, would be a release of oil from the SPR. However, as I have also testified before this Committee, the SPR should generally be reserved for true supply emergencies like the Gulf War or the aftermath of Hurricane Katrina.[22] It would be ill-advised to use the SPR in present circumstances given that large geopolitical and other risks remain to oil supply—from Libya to an unexpected worsening of conditions in Venezuela to hurricane season in the U.S. Gulf Coast, not to mention those risks we cannot anticipate.

The current market dynamic demonstrates few signals of a shortage. While the price of oil has risen over the last year as inventory levels have declined back to more normal levels, crude and refined product markets are not demonstrating the type of physical tightness evident in other periods of SPR releases. Oil market participants, in both the physical and financial markets, generally cite weak physical cash differentials in key global benchmarks as well as soft refining margins as indications of an adequately supplied market.

Although sanctions against Iran could remove a large volume of oil from the market, the SPR is best used to deal with short-term disruptions to global oil supply. It was not designed to restrain oil price increases resulting from long-term supply losses, such as those associated with sustained economic sanctions. If sanctions were to disrupt all of Iran's current 2.2 million b/d of exports, today's SPR could replace that volume for only 300 days, after which the United States would be left with no ability to respond to oil disruptions – including by hostile actors – anywhere in the world. That buffer is getting smaller, too, as planned sales by Congress will reduce the SPR from 665.5 million barrels to 405 million barrels by 2027.[23] Moreover, releasing crude from the SPR might very well blunt the price signal that is needed to allow the market to adjust, as higher prices induce producers to bring more supply online and consumers to curb demand.

Because it can take time for markets to adjust to supply losses, and sharp price spikes can harm consumers and the economy, oil sanctions should be designed with consideration given to the price impacts of lost supply given current oil market conditions. Rather than use the SPR to reduce price impacts of sanctions, that is precisely why the Iran sanctions statute affords the President the flexibility to offer countries exceptions if they significantly reduce purchases of Iranian crude and to define what constitutes a significant reduction. That flexibility allows the Executive Branch to determine by how steep of a glide path to reduce a targeted country's oil sales. The law also allows

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[22] Jason Bordoff, "Testimony before the Senate Committee on Energy and Natural Resources," October 6, 2015, https://www.energy.senate.gov/public/index.cfm/files/serve?File_id=6ffc0bd9-49b8-485d-b961-439ac6b38bd2.
[23] U.S. Government Accountability Office, *Strategic Petroleum Reserve: DOE Needs to Strengthen Its Approach to Planning the Future of the Emergency Stockpile,* GAO-18-477 (Washington, DC 2018), accessed July 20, 2018,https://www.gao.gov/assets/700/692113.pdf

the President to cease oil sanctions entirely if the White House determines there is insufficient oil in the market to make up for any Iranian shortfall.

The recent increase in oil prices stemming from supply disruptions globally is also a reminder of the value of the SPR, despite the drop in U.S. oil imports. The new U.S. energy fortune has given rise to a view that the SPR could be sold off to plug spending holes without creating energy security risks, as reflected in recent Congressional budget sales. I testified before this Committee in October 2015 about the reasons I believed selling off the SPR was misguided.[24] I also argued that further study was needed about the how changes in the oil market and in the U.S. supply outlook should change the size, use and composition of the SPR. The Center on Global Energy Policy undertook such a study and published the results in May 2018.[25]

We find that despite the drop in US oil import dependence, the SPR remains an important national security asset that can help mitigate the economic impacts of oil price shocks. Oil prices are set in a global market, so consumers will see pump prices rise when oil prices rise regardless of whether the U.S. imports oil or not. As a member of the International Energy Agency, the U.S. is required to hold strategic oil stocks equal to 90 days of imports. Yet changes in the global oil market in the last 40 years since the IEA's creation mean that oil import dependence is no longer the right way to measure our vulnerability to global supply disruptions. Rather than physical shortfalls, the risks against which the SPR protects today are oil price spikes that affect U.S. energy prices regardless of our level of net import dependence. Moreover, the SPR protects not only against geopolitical disruptions, but disruptions from severe weather events that are increasing in frequency and severity. Some have argued that a possible transition away from oil in the future also argues for reducing the size of the SPR, but our study finds that the multi-decade period of transition itself is likely to be uneven, disorderly and volatile, and thus actually strengthens the case for a strategic buffer. We also identify ways in which the use and management of the SPR can be improved and modernized to increase its effectiveness.

Energy dominance does not insulate drivers from higher pump prices

The shale oil revolution has been extraordinary. It produced the largest ramp up of oil supply over a five-year period of any country in history, delivering significant economic and geopolitical benefits for the U.S. in the process. But oil prices are still set in a global market, and gasoline prices faced by

[24] Jason Bordoff, "Testimony before the Senate Committee on Energy and Natural Resources," October 6, 2015, https://www.energy.senate.gov/public/index.cfm/files/serve?File_id=6ffc0bd9-49b8-485d-b961-439ac6b38bd2.

[25] Jason Bordoff, Antoine Halff and Akos Losz, "New Realities, New Risks: Rethinking the Strategic Petroleum Reserve," Center on Global Energy Policy, May 2018, https://energypolicy.columbia.edu/sites/default/files/pictures/CGEP_New%20Realities_%20New%20Risks_%20Rethinking%20the%20Strategic%20Petroleum%20Reserve.pdf

U.S. consumers reflect global oil prices. Gasoline prices at the pump in the U.S. are especially sensitive to changes in the global crude oil price due to the relatively low level of fuel taxation compared to other OECD economies. According to data from the IEA, more than 80% of the retail price of gasoline in America is directly or indirectly exposed to fluctuations in the price of crude oil.[26] Because oil and refined petroleum products can be freely traded, surging U.S. production and decreasing import dependence does not protect consumers at the pump from global oil price shocks.

Shale oil production can be ramped up and down more quickly than conventional supply, but the recent run up in oil prices demonstrates the limits of shale oil to function as a "swing supplier" that can stabilize oil prices, as many prominent experts had predicted.[27] While U.S. crude oil production increased by more than 2 million b/d over the past two years, shale oil still takes time to ramp up and down. Shale output reflects the decisions of thousands of private firms, and its flexibility is likely to decline as the sector consolidates among larger companies with stronger balance sheets, capital markets impose greater discipline, and companies plan to better weather price moves to avoid the disruption that comes from frequently ramping up and down personnel, equipment, and services. Additionally, shale oil output in the Permian basin is constrained in the near-term by pipeline takeaway capacity bottlenecks that are likely to persist well into 2019, as well as shortages of workers and equipment.

Although shale oil is much more responsive to oil prices, oil prices still plunged below $30 per barrel at the start of 2016 and soared to $80 per barrel earlier this year. Shale oil could not swing quickly enough to stabilize markets. This role fell to OPEC instead in both cases, first to put a floor under prices by cutting supply and, more recently, to provide relief by ramping up production.

Only a handful of OPEC members, particularly Saudi Arabia, hold a meaningful amount of spare capacity—the ability to ramp up production in a matter of weeks and sustain it over time. That is why, despite the shale boom, President Trump nonetheless was forced to ask Saudi Arabia publicly and privately to provide price relief by increasing production. Without that spare capacity buffer, the only supply tool to stem sharp oil price spikes is government-held strategic stocks. A new article by scholars at a Saudi research institute published in *The Energy Journal*, the quarterly journal of the International Association of Energy Economics, finds that OPEC spare capacity has reduced oil

[26] International Energy Agency, Monthly Oil Price Statistics, July 12, 2018, p.7, http://www.iea.org/media/statistics/surveys/prices/mps.pdf.
[27] Alan Greenspan, "Opec has ceded to the US its power over oil price," *Financial Times*, February 19, 2015, https://www.ft.com/content/92ab80e4-b827-11e4-b6a5-00144feab7de.

price volatility by as much as half over the years.[28] Thus, while pushing OPEC to boost output to its full capacity may offer some modest price relief, running down the spare capacity cushion close to zero poses risks of oil price spikes in the event of additional geopolitical or other supply disruptions. Indeed, by exacerbating market fears of future price spikes, a low margin of spare capacity, by itself, can create upward price pressures.

The most effective policies to protect consumers would reduce the oil intensity of the economy

When oil prices soared in the mid-2000s and many fretted that oil supplies were running out, few people foresaw the shale revolution that would shift the energy landscape from scarcity to abundance. In 2014, former Chevron CEO John Watson noted that new oil supply was so expensive that "*$100* per barrel is becoming the *new $20*."[29] Oil prices plummeted from $115 per barrel to less than $30 per barrel in the two years that followed, only to bounce back to $80 by mid-2018.

The lesson is that policymakers cannot predict oil prices reliably, nor, in an integrated world oil market, can they guarantee consumers low prices. Oil prices will inevitably go up and down, perhaps with more volatility in the future than in the past.[30] The best policy response to high oil prices thus recognizes the inevitability of future oil price shocks, and takes actions that may not be able to provide relief today, but can help protect consumers in the future from the next inevitable price spike.

The best way to reduce our exposure to future oil shocks is by reducing our oil consumption in the first place. Continuing with planned fuel economy increases through CAFE standards is one effective way to reduce the oil intensity of the economy and mitigate the adverse impact of future oil price increases on American drivers. Continuing to invest in R&D in alternative transportation fuels and technologies can also help reduce our society's oil use. In addition to protecting consumers from price volatility, such policies are also needed to address the long-term threat of climate change.

Lower consumption, along with more oil production, can also help lower our net oil import dependence. Although reduced imports do not insulate consumers at the pump from higher global oil prices, they can nonetheless reduce the adverse macroeconomic impacts of higher fuel prices.

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[28] Axel Pierru et al., "OPEC's Impact on Oil Price Volatility: The Role of Spare Capacity." *Energy Journal*, Vol. 39, No. 2, March 2018, p.173-196, https://web.a.ebscohost.com/ehost/pdfviewer/pdfviewer?vid=0&sid=48de64de-0a79-4e6c-8ea5-48a81047ac06%40sessionmgr4008.
[29] Zain Shauk, "Chevron CEO Says $100 a Barrel Is the New $20," *FuelFix*, March 4, 2014, https://fuelfix.com/blog/2014/03/04/chevron-ceo-says-100-a-barrel-is-the-new-20/.
[30] Robert McNally, *Crude Volatility: The History and the Future of Boom Bust Oil Prices*, Columbia University Press, 2017.

Based on historical experience, an oil price drop of the magnitude seen in 2014-2015 should have boosted U.S. GDP by around one percentage point.[31] Instead, recent economic evidence shows that the U.S. economy saw almost no benefit from the latest oil price collapse because the boost in consumer spending was almost entirely offset by a reduction in oil-related investment.[32] U.S. net petroleum import dependence has fallen from around 60 percent to below 20 percent and is projected to decline further. As net oil import dependence approaches zero, more and more of the consumer savings on fuel comes at the expense of American rather than overseas producers.

Importantly, the converse is true as well. Oil prices are set in a global market, so when oil prices rise, consumers see pump prices rise regardless of how much oil the U.S. imports. But the negative effects of oil price spikes on the economy are far more muted when our import dependence is lower, because much more of the increased consumer spending circulates within the U.S. economy rather than flows overseas.

An important caveat, however, is that higher consumer spending on gasoline and diesel may not lead to increased oil investment if constraints exist, such as scarcity of labor, equipment, or pipeline capacity. Such constraints are very much present at the moment. As a result, rising oil prices are more likely to be a net negative for the economy overall, even if falling oil prices delivered little economic benefit during the down cycle.

State and federal policymakers can help overcome these barriers by efficiently and expeditiously permitting necessary energy infrastructure without short-cutting necessary environmental reviews. An escalating trade conflict also threatens the outlook for U.S. production growth, as tariffs raise the costs of steel, aluminum and other materials needed to invest in U.S. energy infrastructure. Moreover, the increase in U.S. energy production and concomitant exports makes U.S. oil and gas a new target for retaliatory tariffs, as China recently threatened.

Conclusion

Oil prices have been on a wild ride. After rising to $115 per barrel in 2014, they fell to less than $30 per barrel in 2016, and rebounded to $80 per barrel earlier in 2018 before easing off to their current level in the low $70s. The primary drivers of the surge in prices this year have been geopolitical supply disruptions, notably in Venezuela and Libya, supply risks from the Trump Administration's decision to re-impose oil sanctions on Iran, and strong demand growth. In recent weeks, oil prices have declined again in response to concerns about the impact of a possible trade war on economic

[31] U.S. Council of Economic Advisers, Economic Report of the President 2016, U.S. Government Publishing Office, February 2016, p.55-58, https://obamawhitehouse.archives.gov/sites/default/files/docs/ERP_2016_Book_Complete%20JA.pdf.
[32] Christiane Baumeister and Lutz Kilian (2016), "Lower oil prices and the U.S. economy: Is this time different?," Brookings Papers on Economic Activity, Fall 2016, https://www.brookings.edu/wp-content/uploads/2016/09/5_baumeisterkilian.pdf.

growth, the return of Libyan production, increased Saudi Arabian supply, and a seeming willingness by the Trump Administration to consider a more gradual path to reduce Iranian oil sales.

The oil market of the past five years should provide all of us with humility to realize that we cannot accurately predict oil prices. Nor do most policy actions that we can take today have an impact on fuel prices in the near term. Consequently, energy policy choices should be made largely independently of today's oil price environment. While increased production and reduced imports can help insulate the U.S. economy from inevitable oil price shocks, in an integrated global oil market American motorists still face higher pump prices when oil prices spike regardless of how much oil the U.S. imports. For that reason, the best way to protect consumers from future oil price shocks is to reduce the overall oil use of our economy in the first place.