

Implications of the Iran War for the Energy Transition

Lutz Kilian

Federal Reserve Bank of Dallas

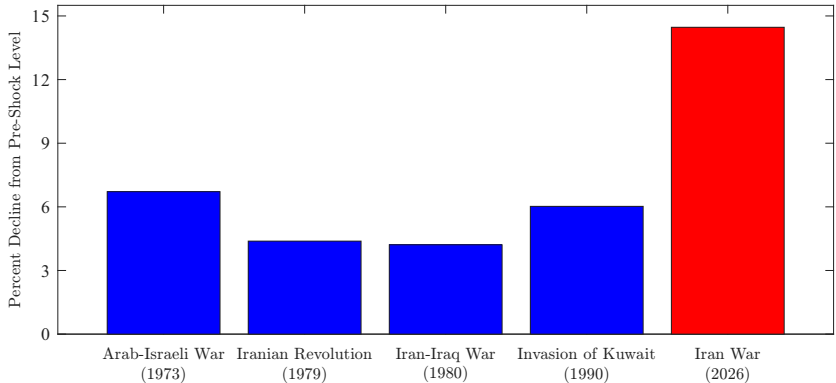
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UNPRECEDENTED OIL SUPPLY DISRUPTION

2026 disruption in global oil supplies is more than twice the peak decline during past geopolitical oil supply disruptions



Source: Energy Information Administration, crude oil production.

LARGE SHOCK, BUT GREATER RESILIENCY?

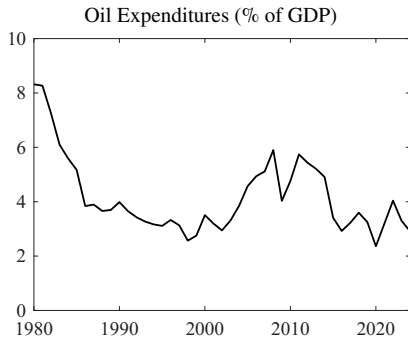
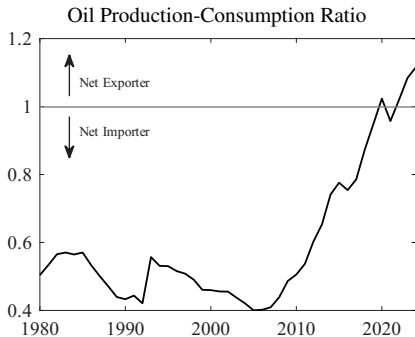
- Given the scale of the shock, it is natural to expect a large slowdown in U.S. and global GDP growth
 - ▶ Oil prices are set in global markets, so disruptions abroad pass through directly to U.S. fuel prices
- But there are also reasons to expect the U.S. economy to be less exposed to such shocks today than in the 1970s–80s

“When economists discuss oil price shocks in the U.S., the example is often the events of the 1970s. While informative, it is important to understand that the U.S. is in a very different position relative to a half-century ago.”

—Fed Vice Chair Philip Jefferson
(March 26, 2026)

WHY THIS TIME MIGHT BE DIFFERENT?

- Shale oil revolution reduced import dependence
- Large decline in the oil expenditure share



Sources: U.S. Energy Information Administration; Bureau of Economic Analysis.

KEY FEATURES OF THE MODEL

- Two-country model of the global economy
 - ▶ Country 1: U.S.
 - ▶ Country 2: Rest of world
- Key features of the model
 - ▶ Both countries supply oil and hold oil inventories
 - ▶ Geopolitical oil supply shock originates abroad
 - ▶ Oil is used as an intermediate input in production
 - ▶ Households consume both oil and non-oil goods
 - ▶ Oil price is determined endogenously
 - ▶ Trade in oil and non-oil goods
- GDP is Chain-weighted as in the national accounts
- Account for structural changes in the oil market

EFFECTS OF THE 2026 OIL SUPPLY SHOCK

Present		Past		Average	
US	ROW	US	ROW	US	ROW
-0.26	-1.98	-4.40	-5.82	-1.49	-2.49

Notes: Impact effects of a 15% oil supply disruption. Values are annualized GDP growth rates.

- Oil price increases by 67%
- Large decline in the U.S. GDP response over time
 - ▶ Past response 16x larger than the present
 - ▶ Average response 6x larger than the present
- ROW also more insulated from the shock than the past
- Present ROW response 8x larger than for the U.S.
- Results are robust to alternative parameter values 

WHAT EXPLAINS THE REDUCED SENSITIVITY?

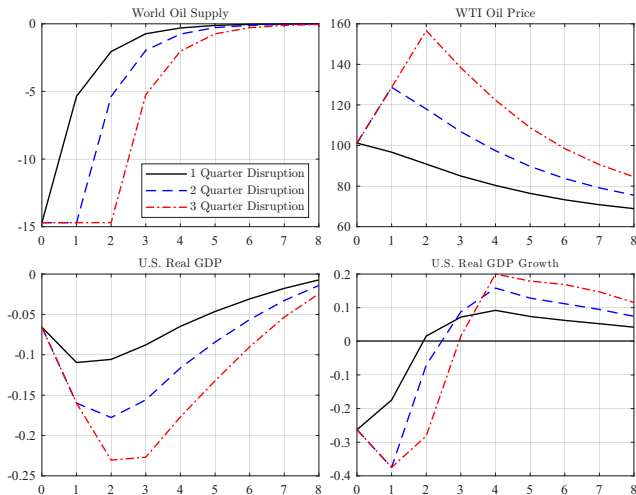
Full Present Calibration	Past Oil Exp Share	Past Oil Trade Balance	Past Oil Exp & Oil Trade	Full Past Calibration
-0.26	-0.41	-1.25	-4.05	-4.40

Notes: Impact effects of a 15% oil supply disruption. Values are annualized GDP growth rates.

Consider the present calibration, and

- Set only the oil expenditure share to its past value
Adverse effects of higher gasoline prices are largely offset by the increase in net oil income because the U.S. is not a net oil exporter
- Set only the oil trade balance to its past value
Net oil income falls, but small expenditure share dampens adverse effect
- Set oil expenditure share and trade balance to past values
Net oil income falls and the expenditure share amplifies adverse effects

DURATION OF THE OIL SUPPLY DISRUPTION



1Q Closure

WTI peak: \$101
4Q GDP: -0.09%

2Q Closure

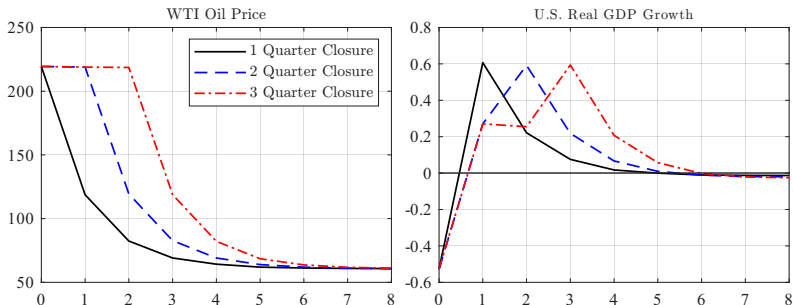
WTI peak: \$129
4Q GDP: -0.16%

3Q Closure

WTI peak: \$157
4Q GDP: -0.23%

Notes: The horizontal axis denotes quarters. The growth rate is annualized.

IMPORTANT ROLE OF OIL INVENTORIES



- Changes in inventories dampen the response to the disruption
 - ▶ Feb–July: U.S. crude inventories fell by 17%
 - ▶ Model: U.S. inventories fall by 20% on impact
- Without inventories, oil market must clear instantaneously
 - ▶ WTI price increases to \$219, compared to \$101
 - ▶ Decline in real GDP loads on the impact quarter

HOW HAS THE MODEL PERFORMED?

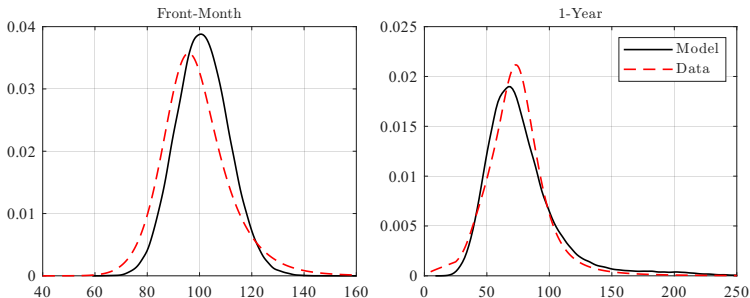
	Spot		6M Futures	
	Data	Model	Data	Model
WTI	97.77	101.22	79.09	89.32
Brent	109.02	111.10	84.70	98.04

	12M Futures		24M Futures	
	Data	Model	Data	Model
WTI	72.92	78.00	69.26	67.43
Brent	78.17	85.61	74.40	74.02

Notes: Prices are in dollars per barrel. Data values are averages of daily spot and futures prices from March–May 2026. The model results are based on a 15% oil supply disruption.

- Evaluate the model over March to May (impact quarter)
- Model closely matches WTI/Brent spot prices
- Model-implied futures curve comes close to the observed curve
- Alignment even closer when using only May
- Consistent with a scenario where the oil supply starts to recover in the next quarter

MODEL AND OPTION-IMPLIED DENSITIES



Notes: The model density is conditional on a 15% oil supply disruption.

- Data is the average density over the first week of May 
- The model and data distributions are closely aligned (e.g., Front-Month IQR: Model \$94-\$108, Data \$90-\$106)
- The model and data show little skewness at either horizon

HOW DOES THE U.S. COMPARE TO IMPORTERS?

- Structural changes in the oil sector may also make the U.S. economy less responsive than many oil importing countries

“[The U.S. is] an oil exporter, so we’re not feeling the same kind of pain . . . that economies in Western Europe and, certainly, in Asia are feeling”

—Former Fed Chair Jerome Powell
(April 29, 2026)

- How much more advantageous the U.S. position really is to geopolitical oil supply shocks has not been quantified
- Recalibrate the model and use Europe as a case study

IMPACT OF THE DISRUPTION IN EUROPE

Present			Past		
U.S. GDP	Euro GDP	Ratio	U.S. GDP	Euro GDP	Ratio
-0.26	-1.11	4.20	-4.40	-4.20	0.95

Notes: Impact effects of a 15% oil supply disruption. The growth rates are annualized.

- Oil price responses in the two models are nearly identical
- European sensitivity to oil supply disruptions has declined
- Past: responses of the two countries were nearly identical
- Today: European response is about 4x the U.S. response

Iran War outlook

Outcome 1: U.S. strangles Iran's maritime exports and imports, while maintaining a sufficient flow of Arab oil exports, forcing Iran to give in at the negotiating table.

Outcome 2: Iran holds out, slows Arab oil exports, and exhausts U.S. ammunitions to the point that the U.S. decides to withdraw from the region. Then Iran decides what Arab oil is allowed to be exported and at what price.

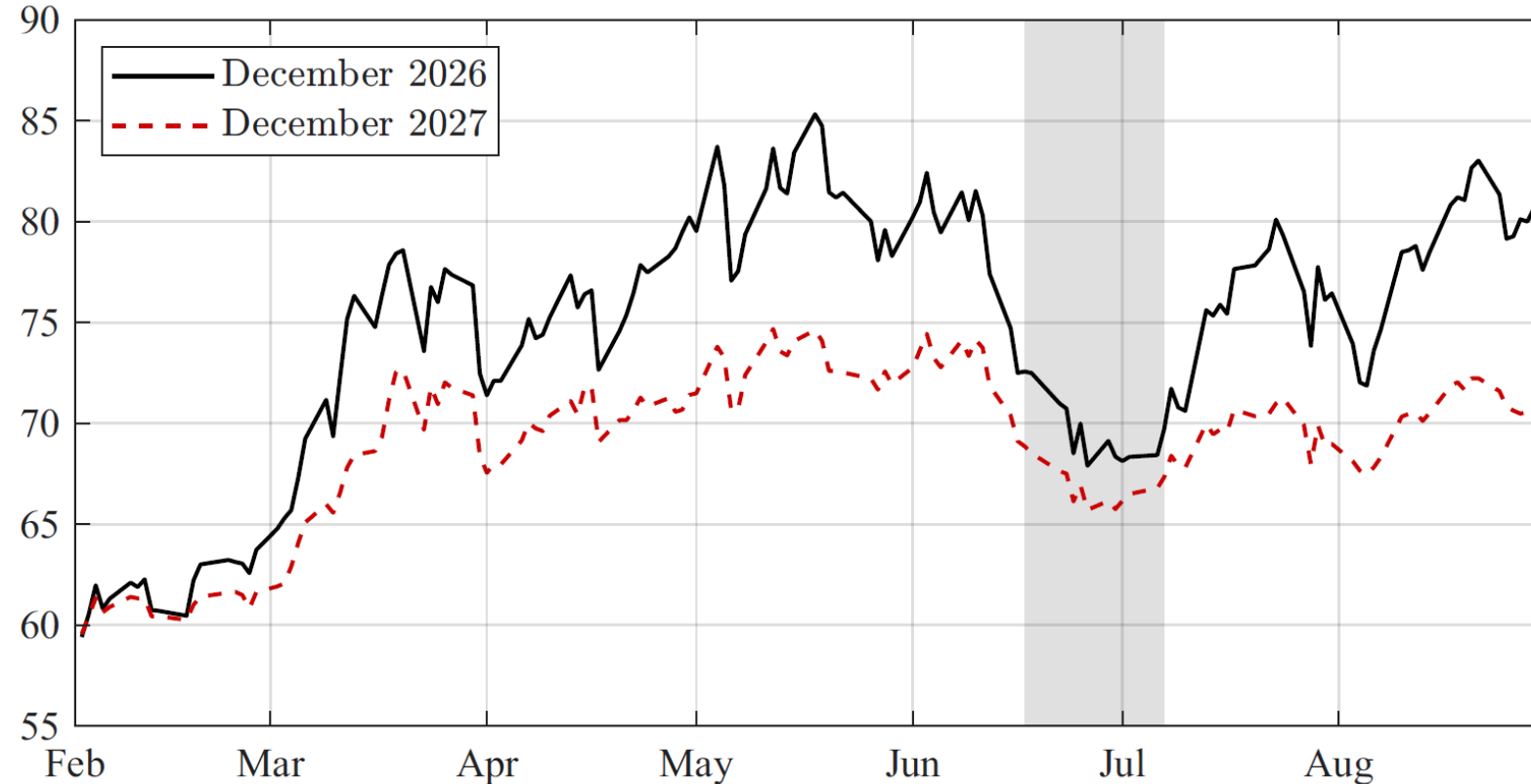
Outcome 3: Iran responds to further U.S. attacks on Iran (or the U.S. choking off Iranian oil exports) by attacking Arab oil infrastructure, causing persistent damage to oil and refining infrastructure in the region.

What does the WTI futures market think?

Model-implied oil price path:

Quarter	1Q-Fast	1Q-Slow	2Q-Slow	3Q-Slow
4	71.66	84.98	106.79	138.34
8	65.67	70.82	79.12	90.62

Daily
WTI
futures
prices:



Notes: The shaded region denotes when the U.S.-Iran memorandum of understanding was in effect.

Why have fuel prices surged more than the crude price?

1. The Middle East exports medium grade crude oil that is well suited for the production of diesel and jet fuel, for which U.S shale oil and Venezuelan heavy crude, for example, are a poor substitute.
2. The Middle East also exports a lot of diesel and jet fuel to Asia. These exports largely ceased with the Iran War.
3. China responded to the shortage of crude by shutting down refineries that used imported crude to produce refined products for customers around the Pacific Rim. This stabilized the oil market, but worsened the supply crisis in the refined product market.
4. Ukrainian attacks on Russian shipping, refining and pipeline infrastructure reduced Russian exports of refined products and Russia started importing fuels.
5. Refineries elsewhere in the world were operating near capacity already, further limiting the gasoline, diesel and jet fuel supply response.

Energy security implications: United States

- The Iran War has also disrupted the exports of LNG from the Middle East and related products such as fertilizer and LPG.
 - Access to comparatively low-cost natural gas gives the U.S. a competitive advantage, as long as U.S. LNG exports remain limited. This matters for the petrochemical industry and electricity production. It allows the U.S. to search for longer-run solutions for electricity generation (e.g., fusion, small nuclear reactors, new battery technology).
 - For oil and fuels, the U.S. advantage is more limited because the prices of oil and fuels are determined in global markets and the U.S. will continue to depend on imports of heavy and medium grades of crude oil as well as fuel imports to the East Coast and West Coast.
 - Oil and fuel exports, however, generate national income and insulate the economy from geopolitical supply disruptions.
- From a geopolitical point of view, the U.S. emphasis on oil and gas makes sense.

Energy security implications: China

- Being the leader in the development and production of EVs, batteries and solar technology (and having control of the refining market for the underlying raw materials), gives China an obvious advantage.
 - It provides the incentive to promote diversification away from fossil fuels elsewhere in the world. The flip side is that China needs export markets for the excess production capacity it has built up or there will be a sharp contraction.
 - This says nothing about China's energy strategy, however. China does not mind using domestic or imported coal and natural gas. Its main concern is about the security of its oil supplies in case of war. China's use of wind and solar is merely part of its menu of options.
- Lowering oil imports is China's way of reducing its economy's geopolitical exposure, whereas raising oil production and oil exports is the U.S. response to the same problem.

Energy security implications: Europe

- Europe used to import oil from Russia. That's no longer an option. Access to oil from the Persian Gulf has also become constrained. This mainly leaves the U.S. and Africa which produce light sweet crude.
 - Light sweet crude is not a good substitute for the medium grade oil preferred for producing diesel and jet fuel.
 - The decline in Europe's partnership with the U.S. suggests that it would be risky to depend too much on oil imports from the U.S.
 - The best Europe can do is to diversify its oil suppliers and move away from oil. Electrification, however, requires increased power generation:
 - Two of the three LNG suppliers to Europe have been eliminated and relying on supplies from the U.S. is risky.
 - Building new nuclear power plants is one option, but takes too much time. Domestic and imported coal is another option.
 - Wind and solar combined with batteries and hybrid engines is yet another option, but creates a geopolitical dependency on China and undermines domestic industry.
- Policymakers will likely follow an “all of the above” strategy. A safe bet is that the price of energy will rise, making it harder to retain industries.

Conclusion

- Geopolitics and economic needs are likely to overshadow environmental concerns going forward.
 - Higher fuel prices will boost the demand for EVs and hybrids. Higher natural gas and heating oil prices will boost the demand for solar technology and heat pumps in new buildings.
 - This new customer base will not be motivated by environmental concerns, but by economic concerns.
 - This does not necessarily mean that the electricity used in these applications will necessarily be clean.
- Overall, the effect on the energy transition will be mixed in the short run with a likely resurgence of coal, especially in developing countries.