The Future of Oil and Fiscal Sustainability in the GCC Region

FEBRUARY 6, 2020

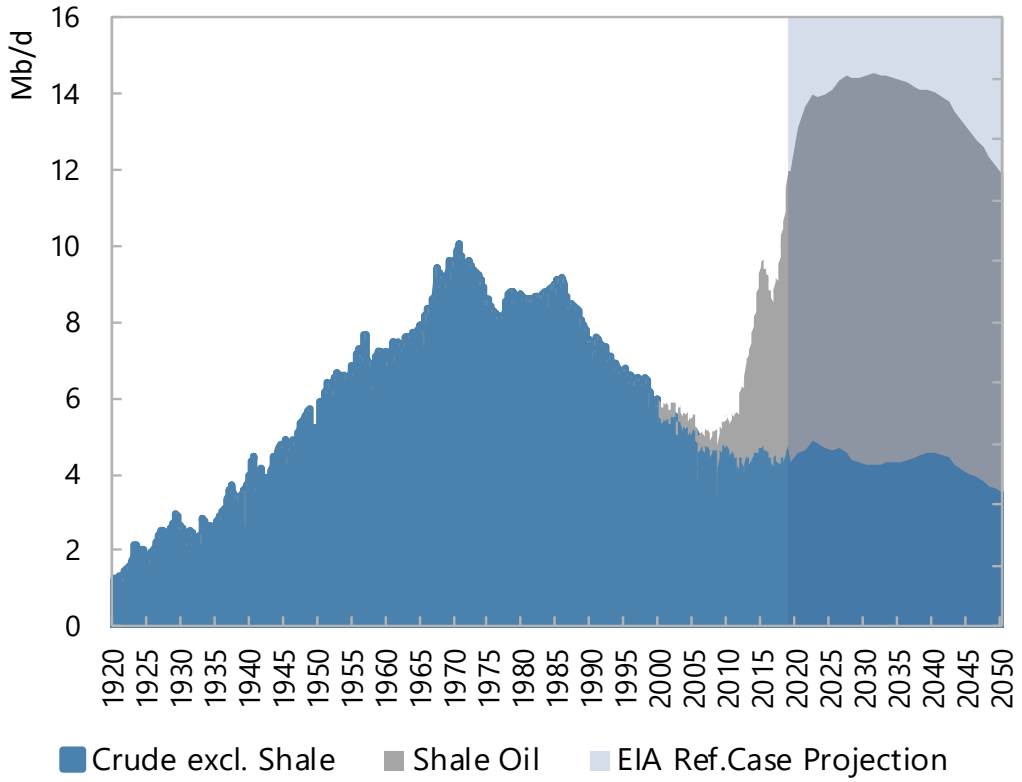
Peterson Institute for International Economics

Part I

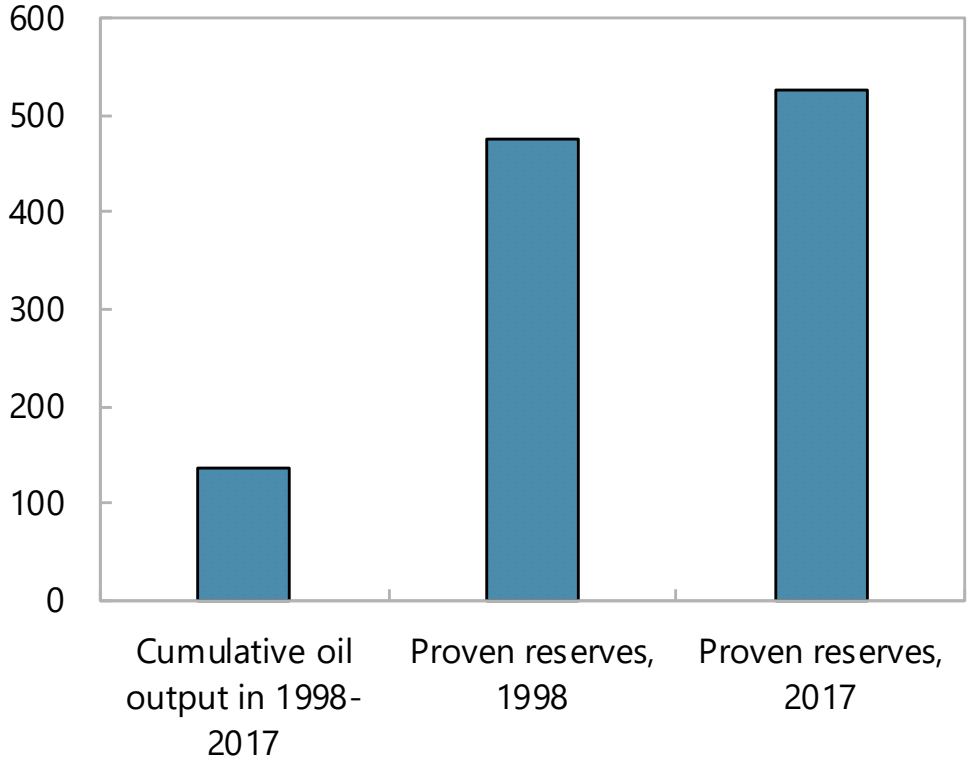
The Future of Oil

Two long-term trends will likely define the future of oil: #1: Increased oil abundance

US Crude Production
(In millions of barrels per day)



Output and Proven Oil Reserves in the GCC Countries (In millions of barrels per day)

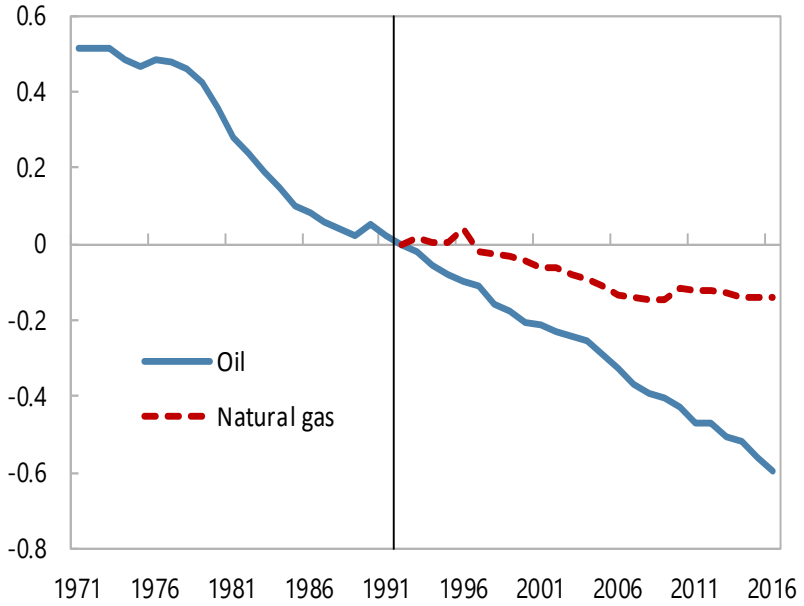


#2: The world moving away from oil

Estimation of global oil demand reveals:

- One-for-one effect of population
- Nonlinear impact of GDP per capita: oil demand income elasticity declines with income
- Declining time trend (energy efficiency and substitution)
- Price elasticity appears to be small: 0 if using annual data, -0.1 if using past 5-year average

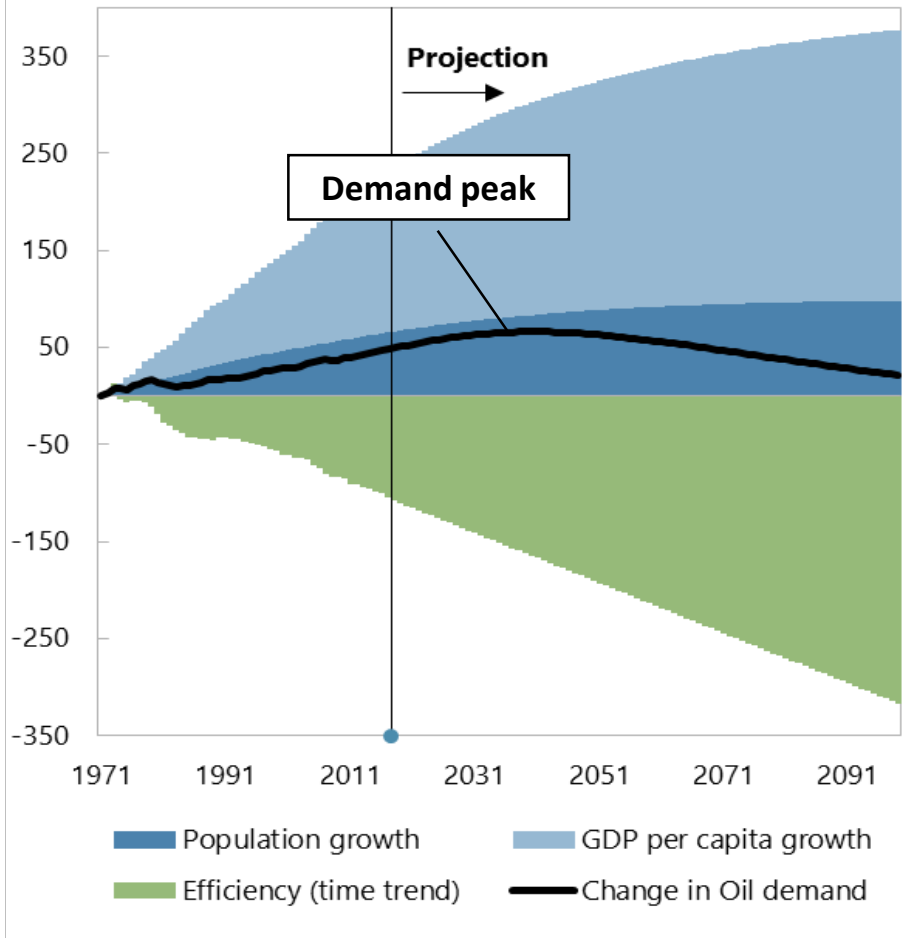
Energy Efficiency and Substitution Trends
(Index; 1992=0)



At current trends, oil demand could peak in ~20 years

- Population growth is expected to slow
- As countries grow richer, their growth will be less oil-intensive
- Energy efficiency improvements will begin to dominate
- Demand for natural gas will continue to grow, but at a slowing pace

Cumulative Change in Oil Demand Since 1971
(In millions of barrels per day)



Scenarios highlight large downside risks

The oil market model

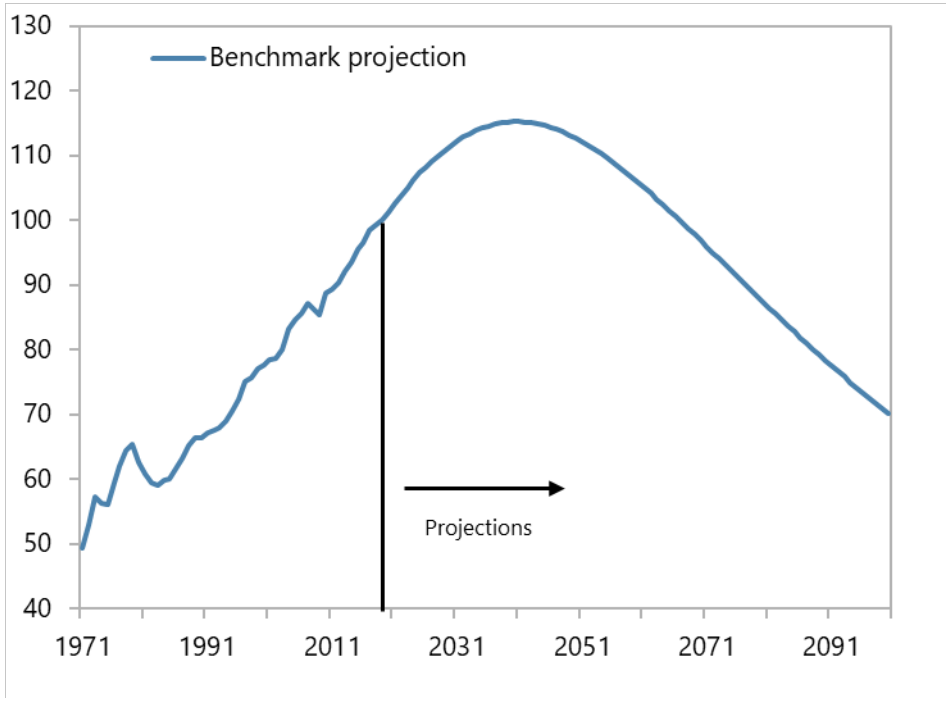
- ***Supply:*** oil output and investment with forward-looking producers
- ***Demand:*** exogenous forces (GDP, population, …) and non-constant price elasticity of oil demand.
- Prices clear the market

Scenarios:

- ***Carbon tax scenario:*** tax introduced in 2024 and gradually increased to bring the cost of CO2 emissions to $50/ton by 2030 and $150/ton by 2050 (to limit increase in global temperature at 2^0C).
- ***Energy efficiency scenario:*** the declining time trend accelerates by an additional 0.6 percentage points (2 st. deviations).

Global Oil Demand

(In millions of barrels per day)



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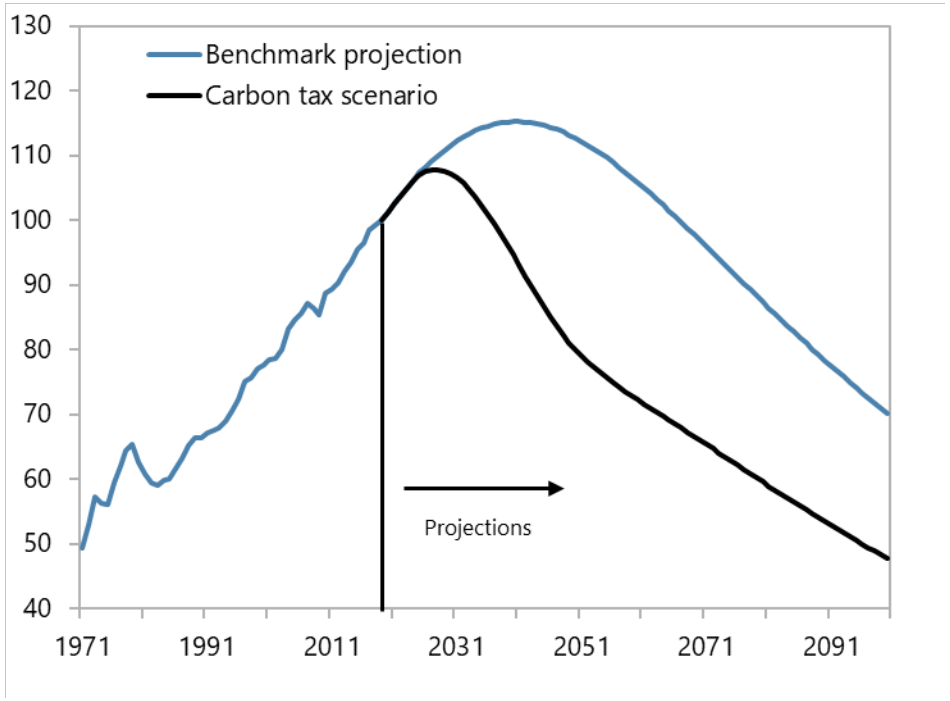

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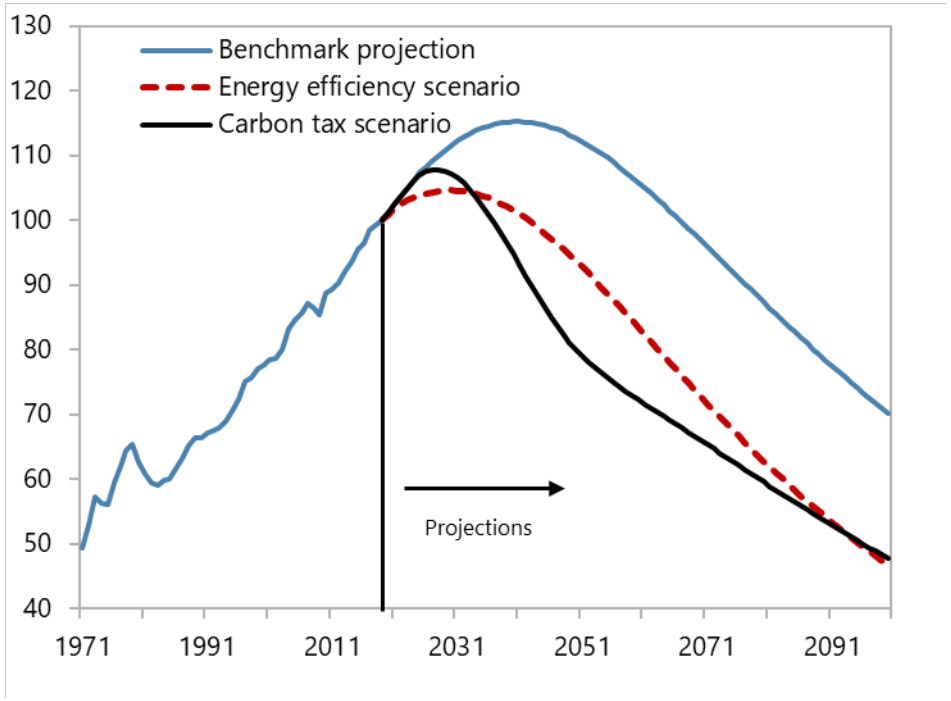
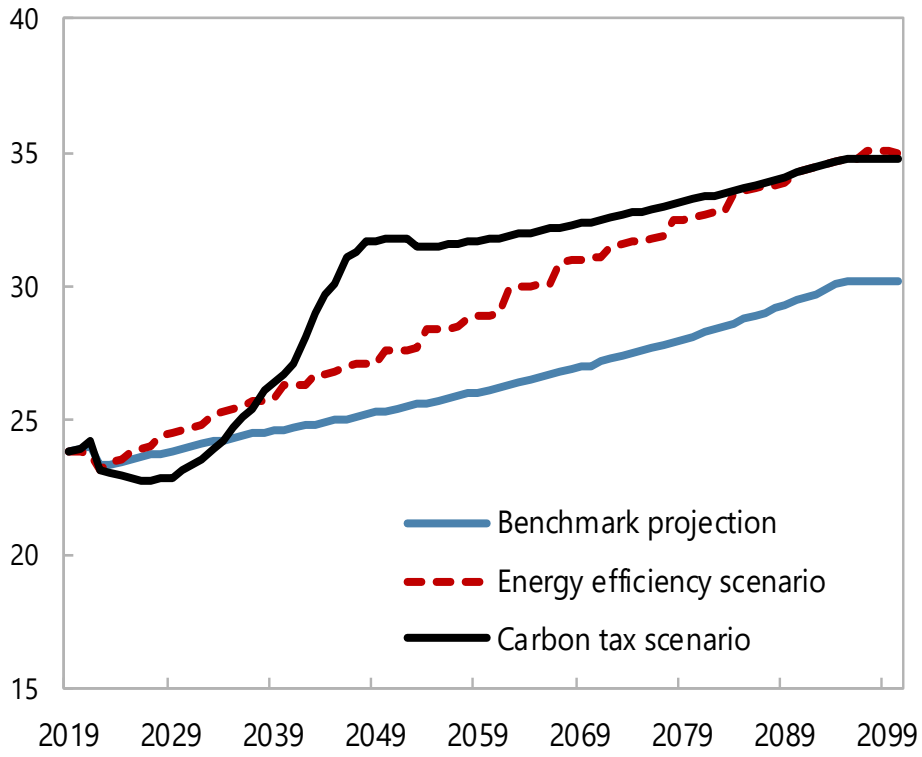


What does it mean for GCC?

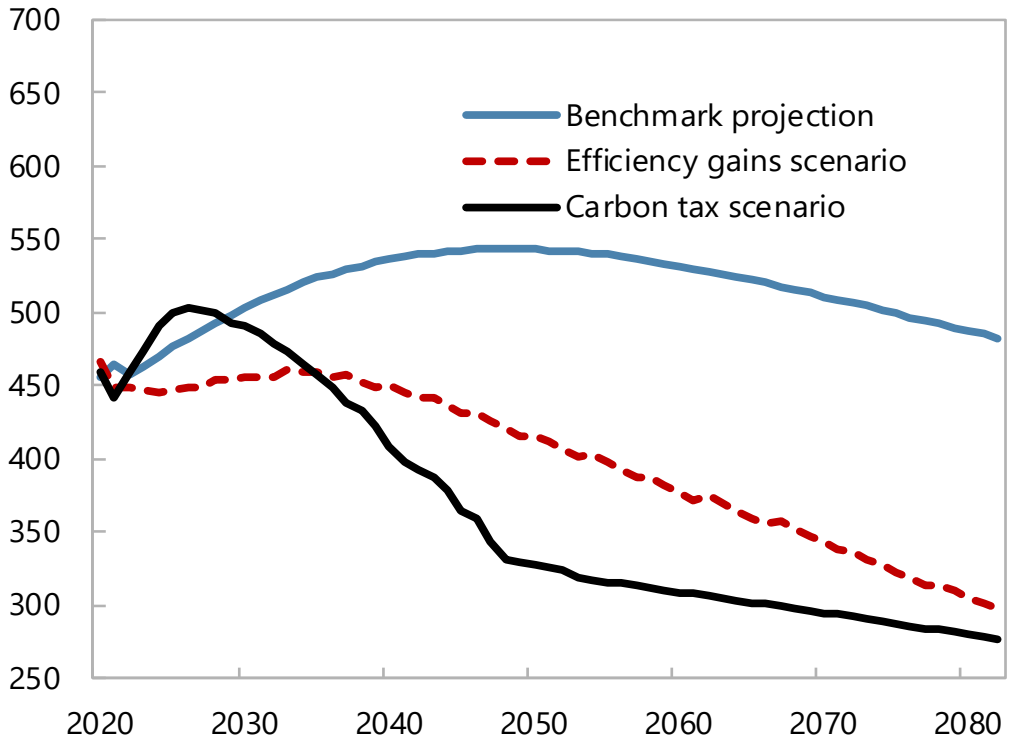
Market share would increase…

GCC Market Share Projection
(In percent)



…but will only delay the peak in GDP.

GCC Hydrocarbon GDP Projection
(In billions of US dollars)

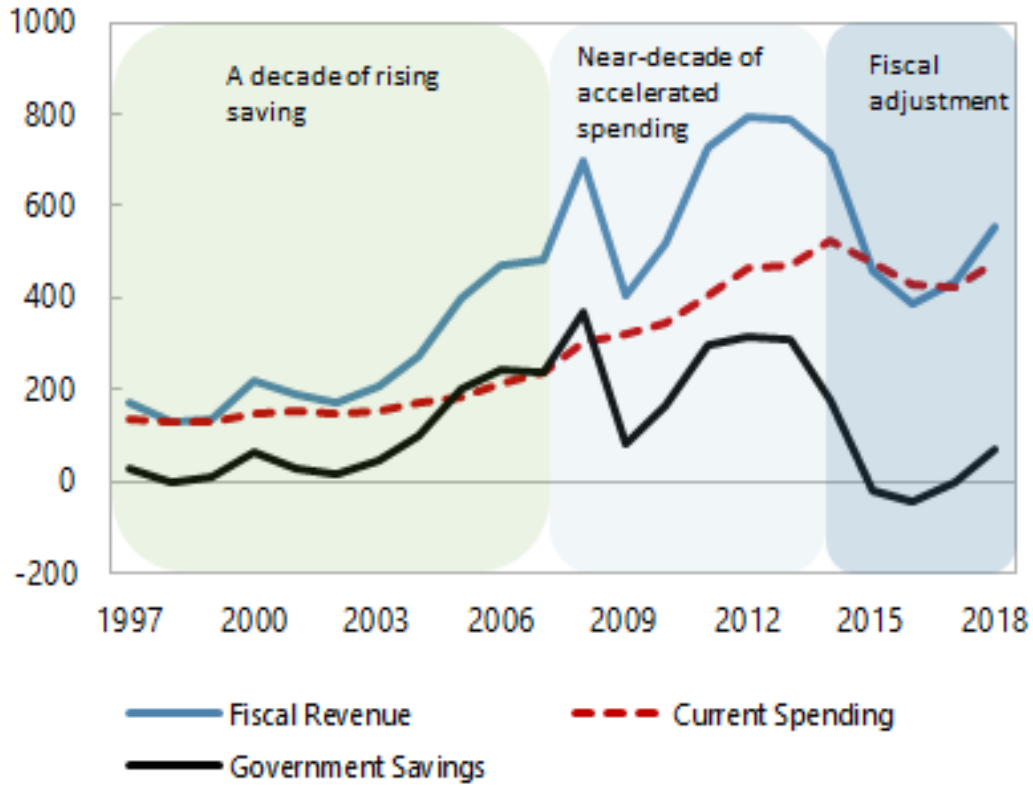


Part II

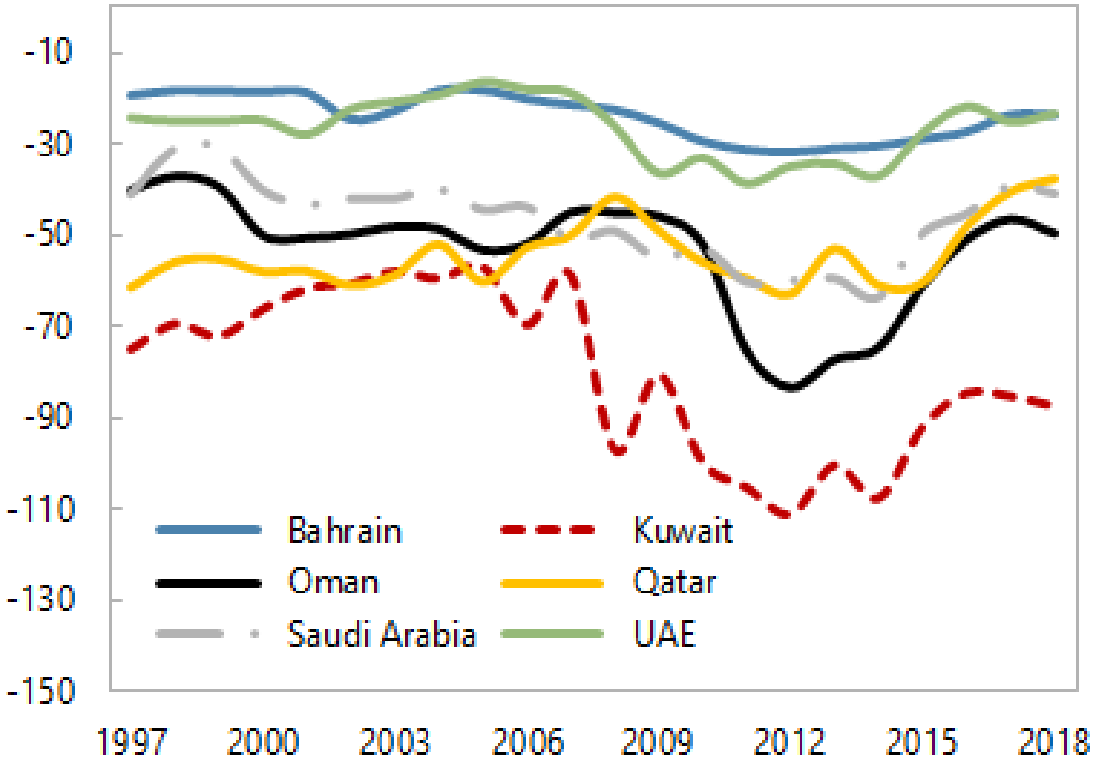
Fiscal Sustainability in the GCC Region

After a near-decade of accelerated spending, fiscal positions have weakened by 2014. Since then, they began to adjust…

GCC Fiscal Revenue, Spending, and Saving
(Real, in billions of 2018 US dollars)

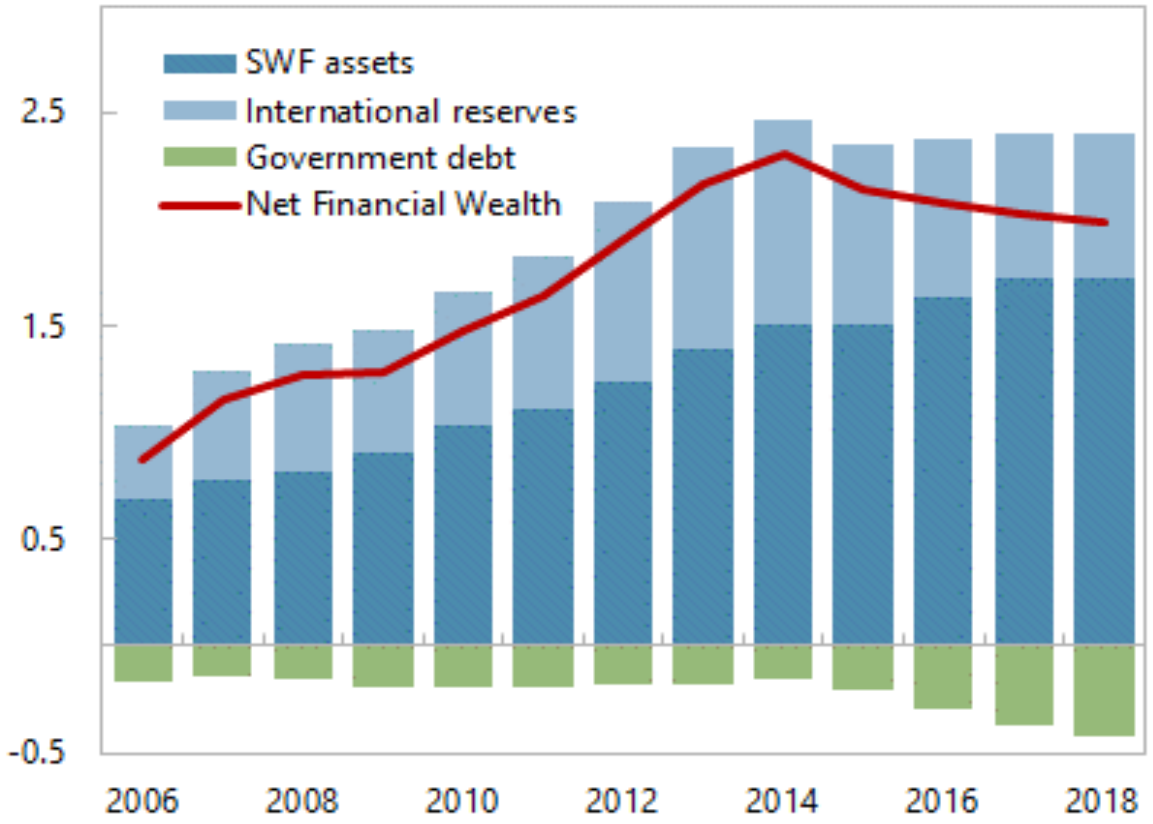


Non-oil Primary Balance
(In percent of non-oil GDP)



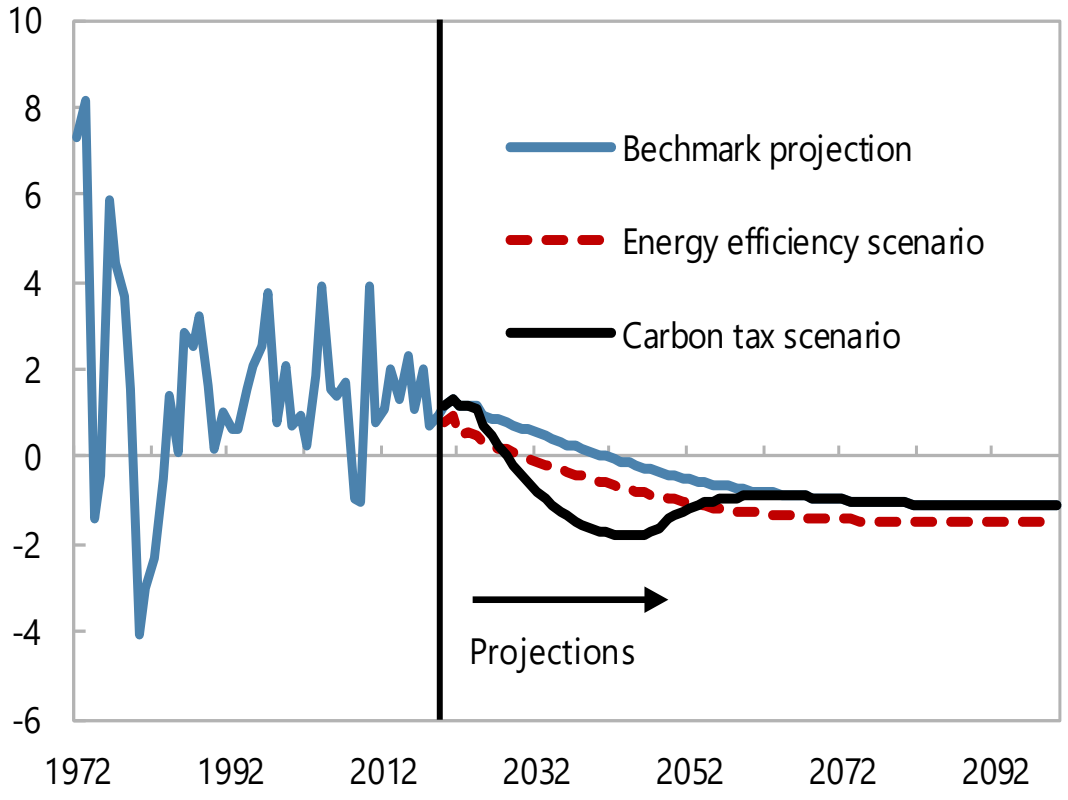
…but financial wealth declined.

Real Net Financial Wealth
(In trillions of 2018 US dollars)

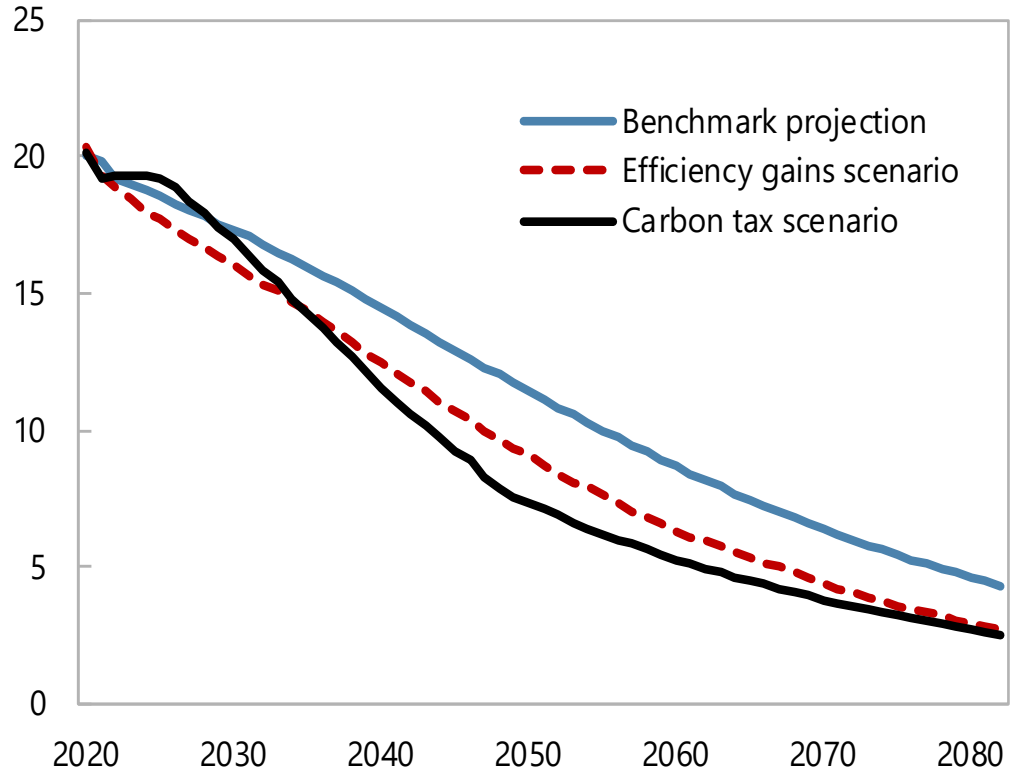


Looking ahead, the fiscal impact will be felt well before the peak…

Annual Growth of Global Oil Demand
(In percent)

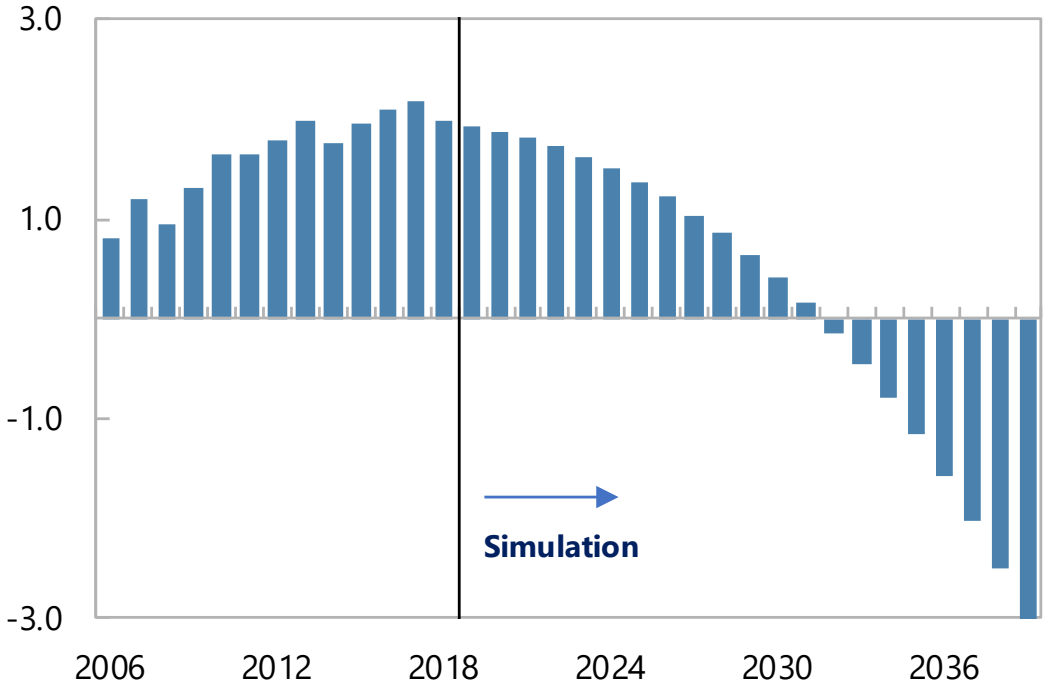


GCC Aggregate Hydrocarbon Revenue
(In percent of GDP)

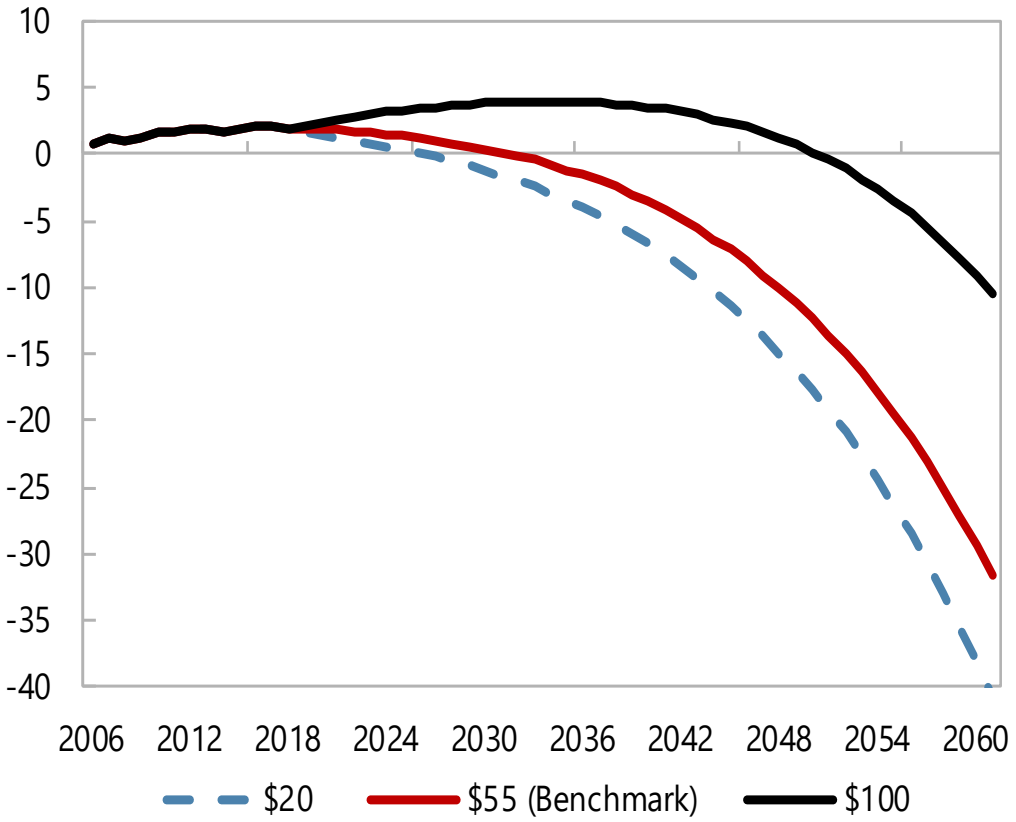


Current fiscal stance could deplete financial buffers by 2035

Net Financial Wealth: Benchmark Projection
(GCC total, in trillions of 2018 US dollars)



Financial Wealth under Alternative Price Assumptions
(GCC total, in trillion of 2018 US dollars)

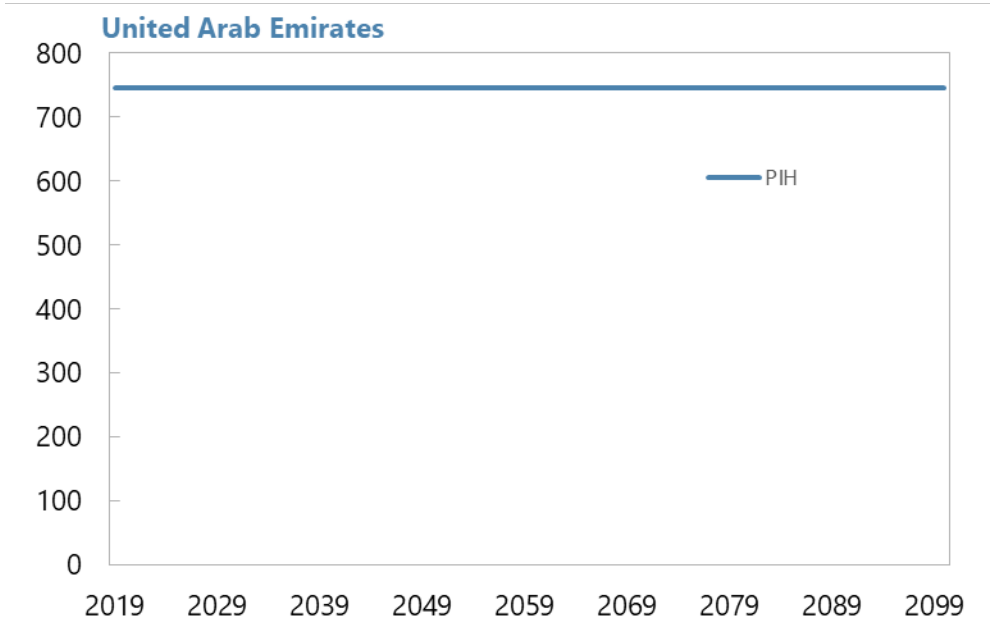


Achieving fiscal sustainability and intergenerational equity

Fiscal sustainability *= stabilization of wealth,*

but how fast and at what level is an ***intergenerational choice***.

Public Wealth
(In percent of non-oil GDP)



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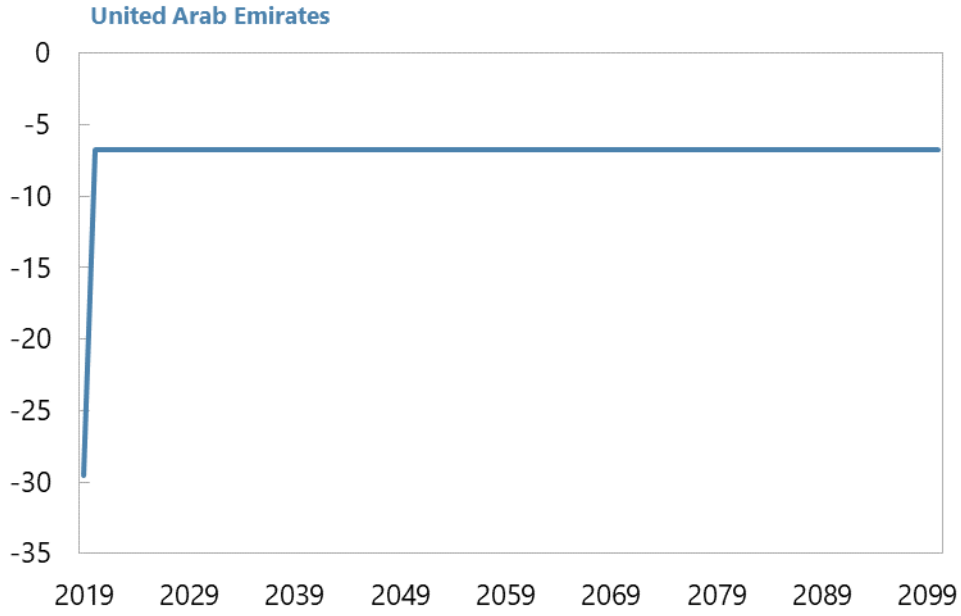

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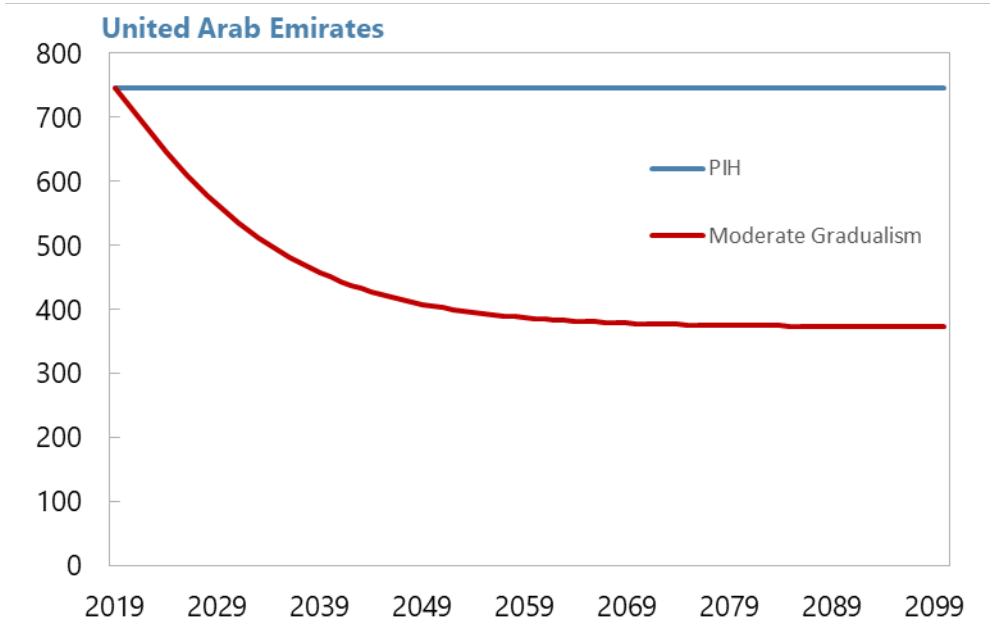

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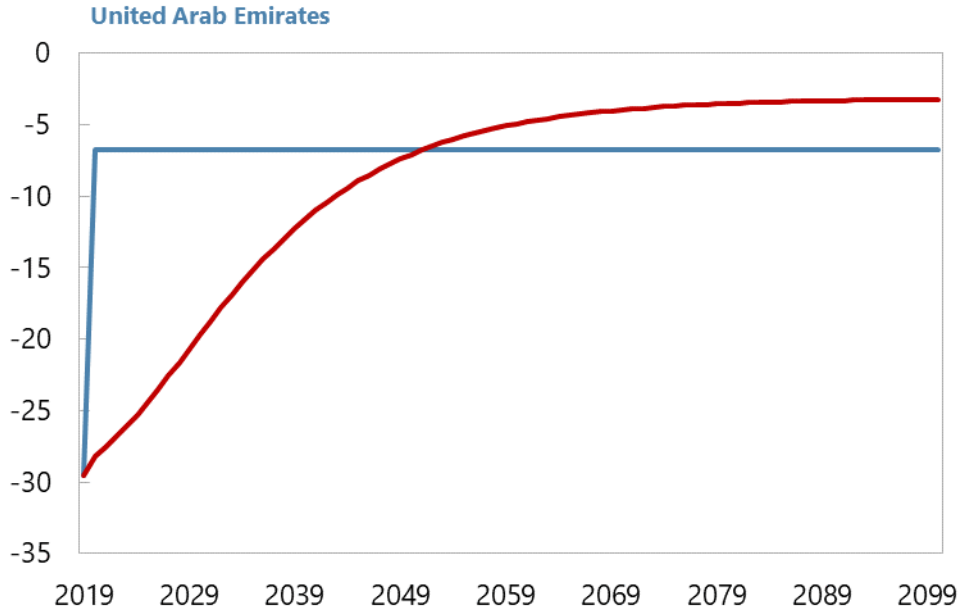

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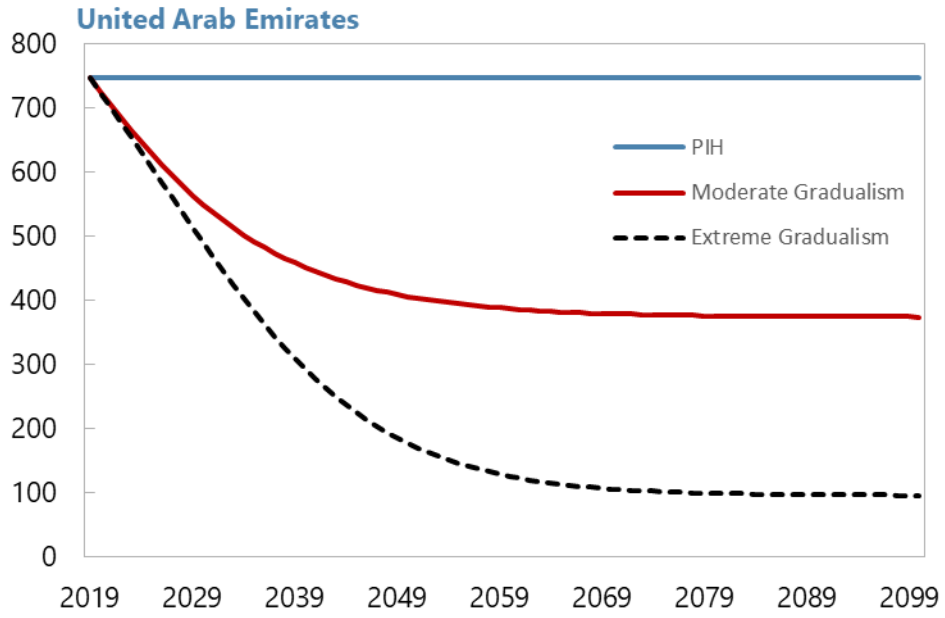

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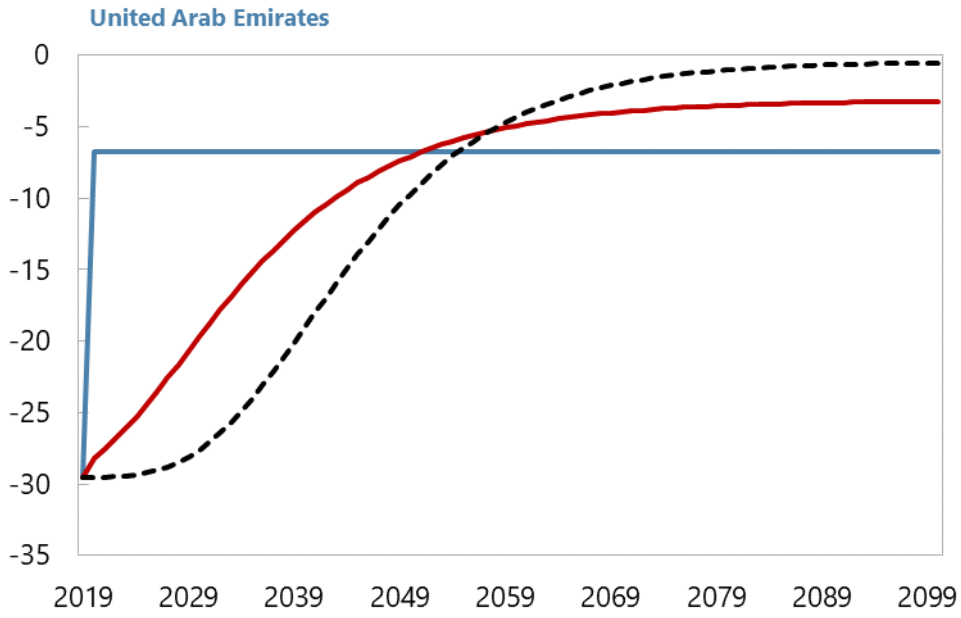
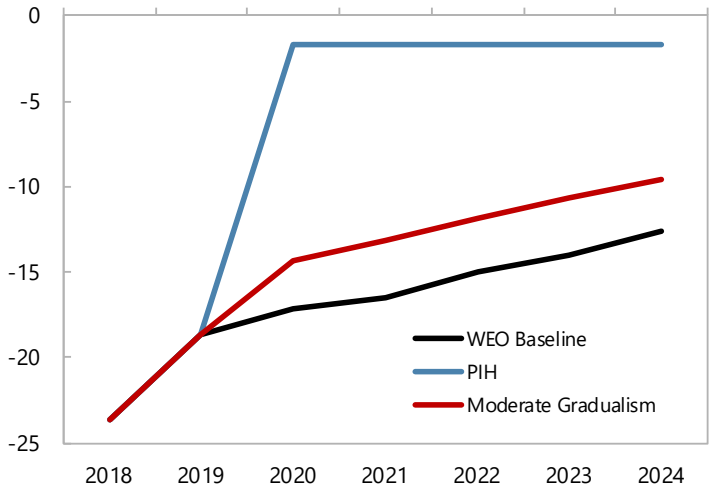
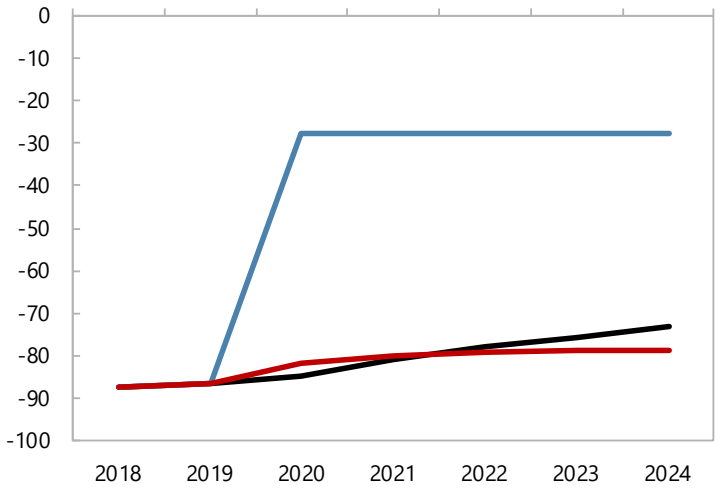


Current plans imply accelerated effort down the road

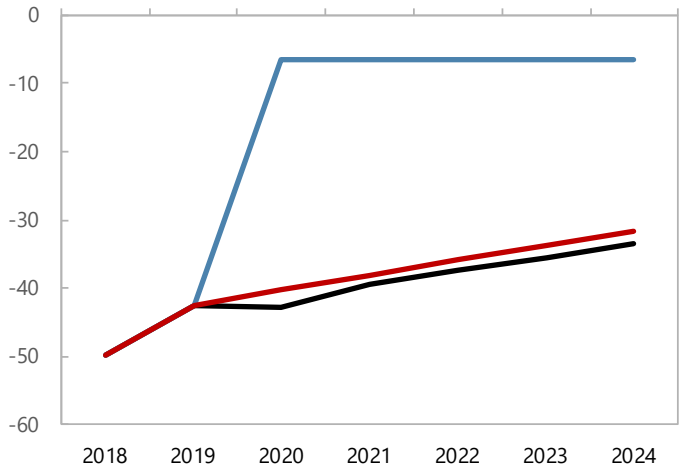
Bahrain



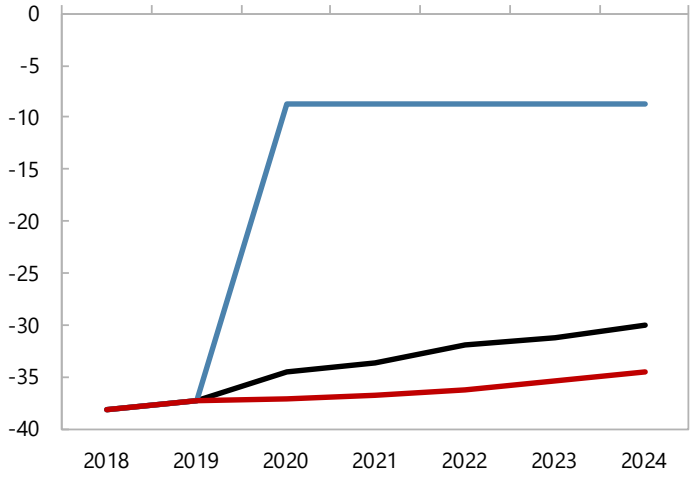
Kuwait



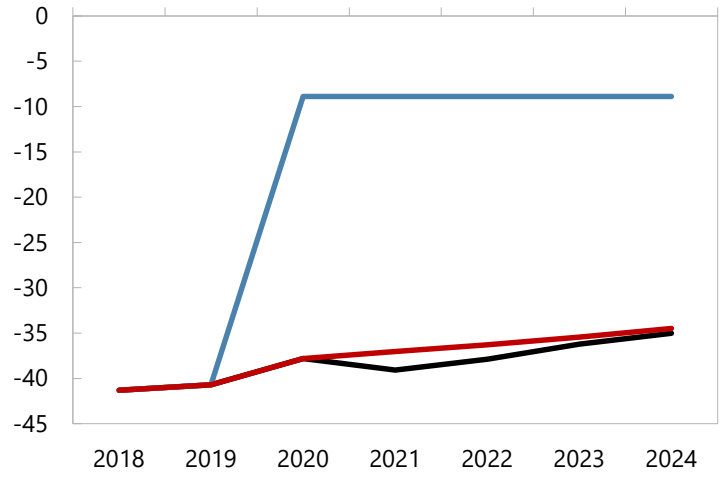
Oman



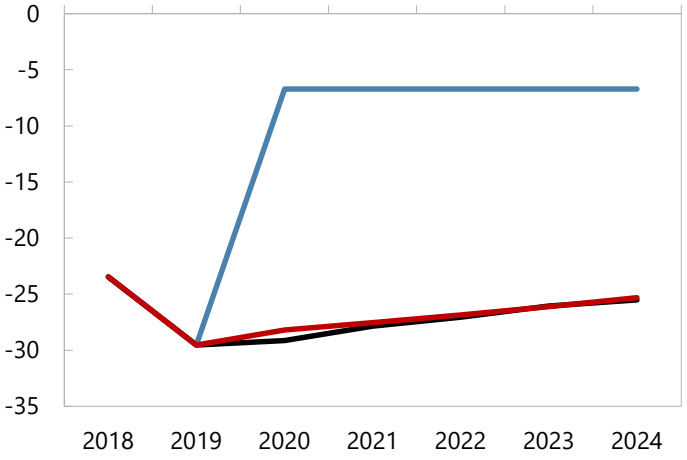
Qatar



Saudi Arabia



United Arab Emirates



What will it take?

- **Economic diversification**
  - *But it alone will not be enough: effective tax on oil output is 80 percent, and only 10 percent on non-oil output*
- **Nonoil revenue will need to grow**
  - *To fully replace oil revenue, effective tax rate must rise to 50 percent of GDP*
- **Governments will need to downsize**
  - *Financial saving will be more important*
- **Biggest challenge: managing the broader socioeconomic consequences**

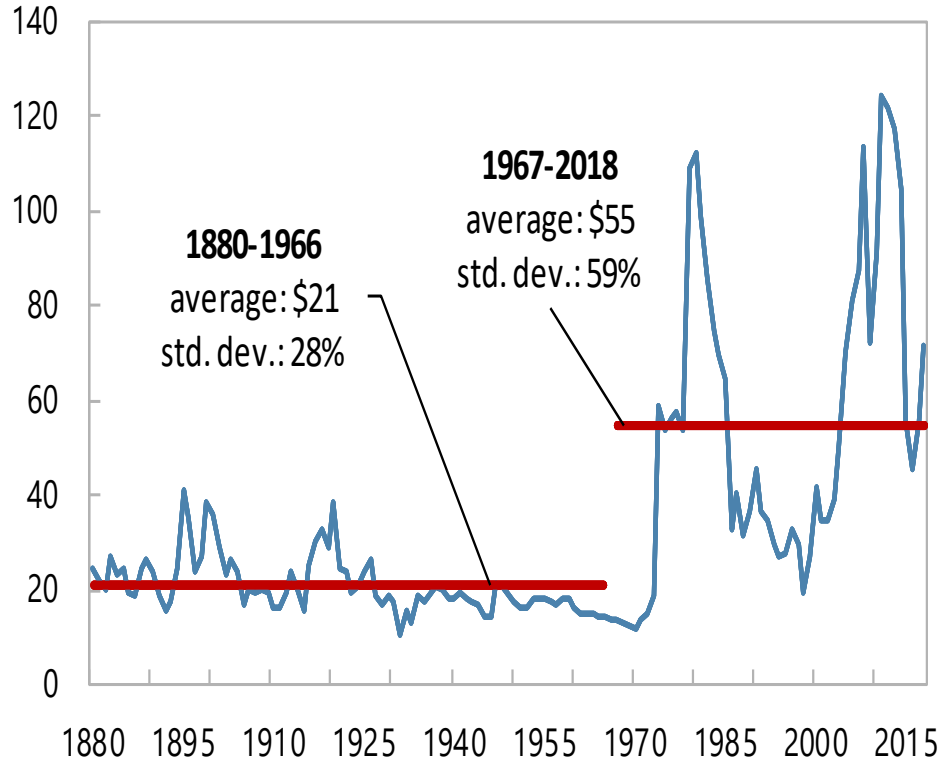
Thank you

Additional Slides

Benchmark Price Assumption: $55/barrel in real terms

- ***Plausible:*** supply follows demand as oil investment responds to price signals.
- ***But…*** Deviations could be large and persistent; market structure could have an impact.
- ***Can we have a better price projection?*** Unlikely
- ***Is it critical to the story?*** Unlikely, since higher (lower) prices would lead to lower (higher) consumption

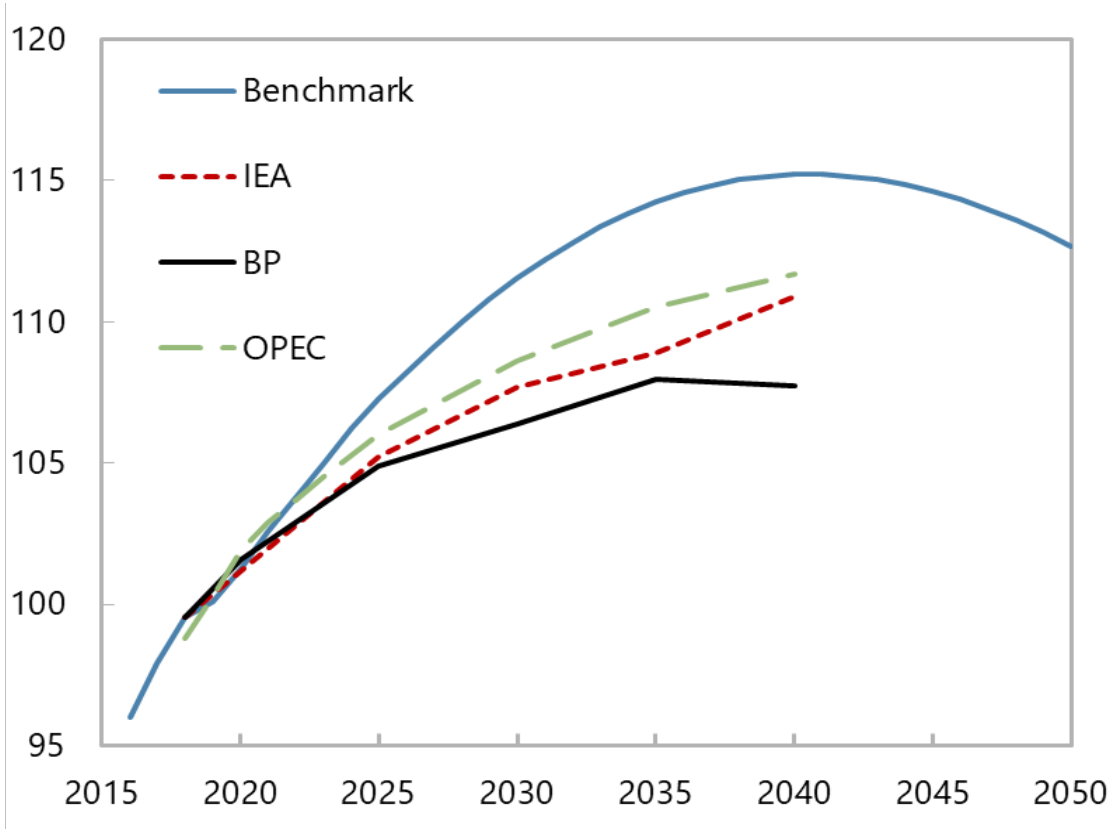
Historical Real Oil Price
(In 2017 US dollars)



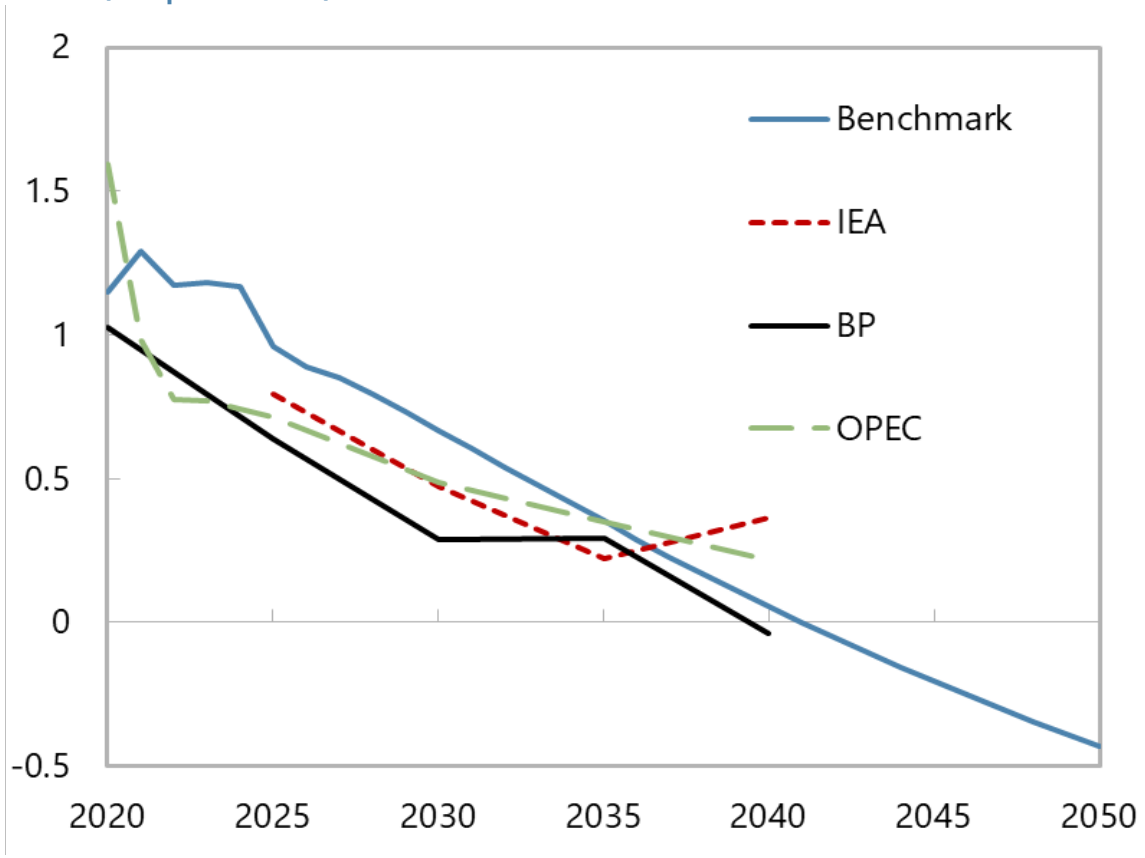
Source: BP, Statisical Review of World Energy, 2019.

Comparison to Central Projections by Other Agencies

Global Oil Demand
(In millions of barrels per day)



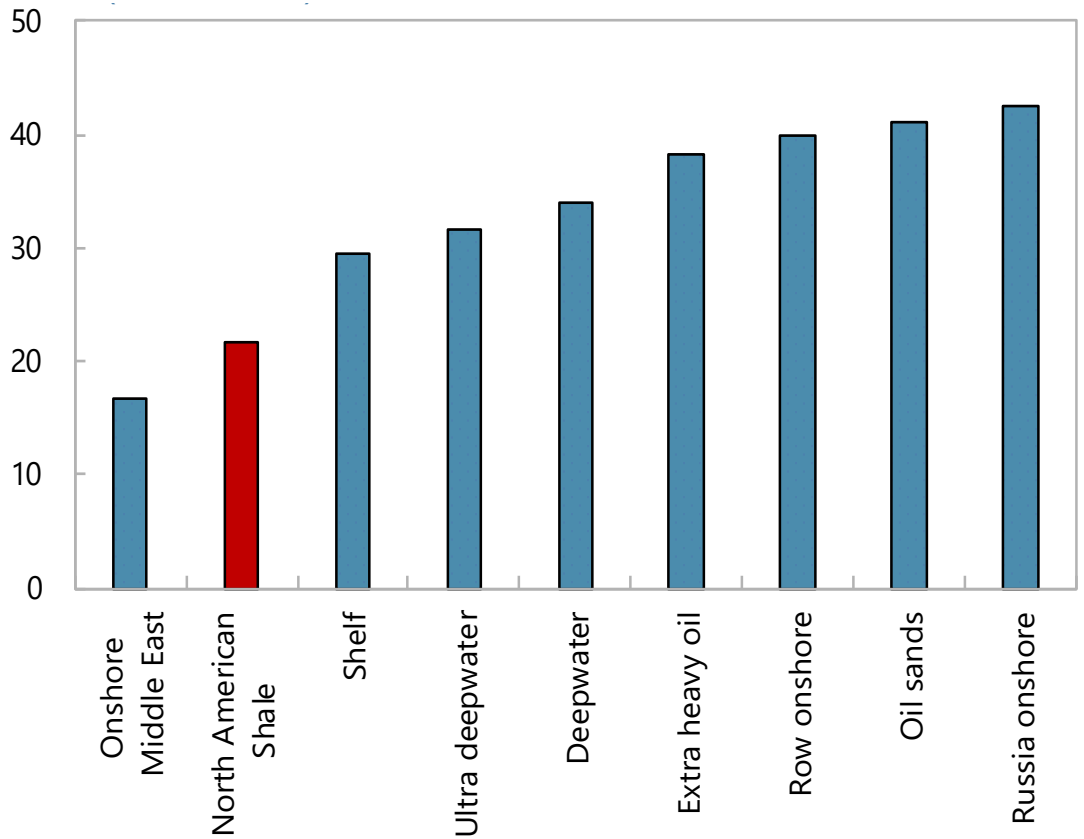
Annual Growth Rate of Global Oil Demand
(In percent)



Competitiveness of Shale Oil and Natural Gas Market Prospects

Breakeven Oil Prices

(In US dollars per barrels)



Projected Global Demand for Natural Gas

(In millions of metric tons of oil equivalent)

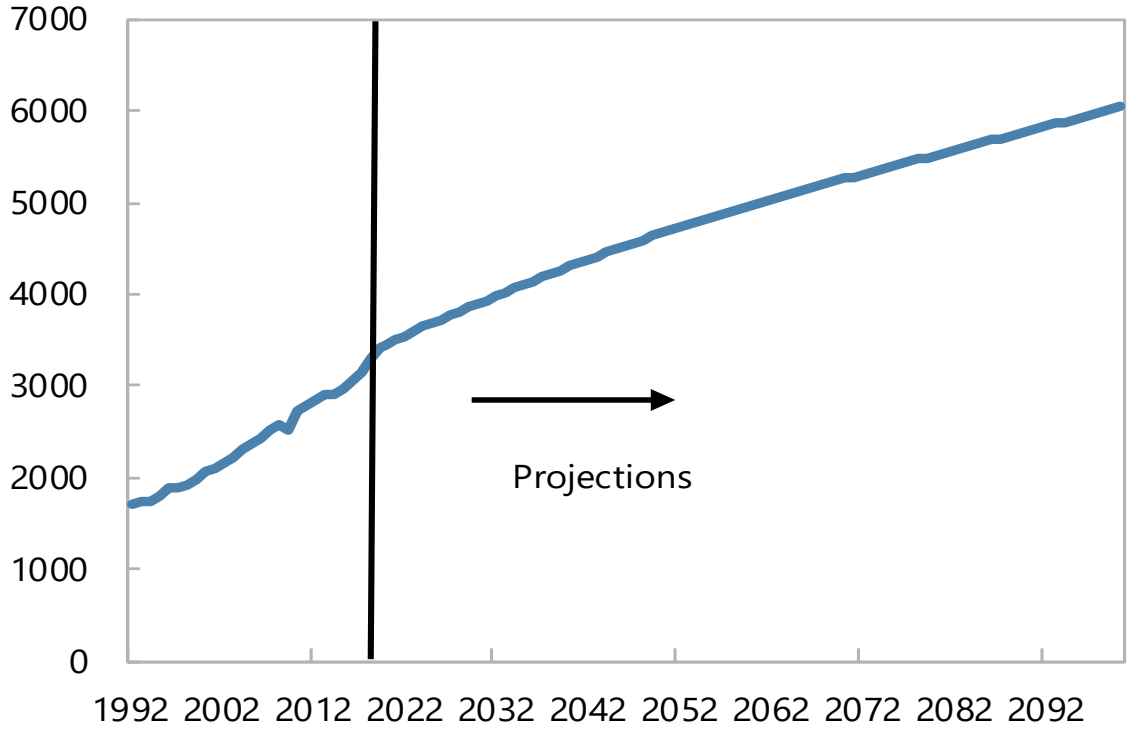
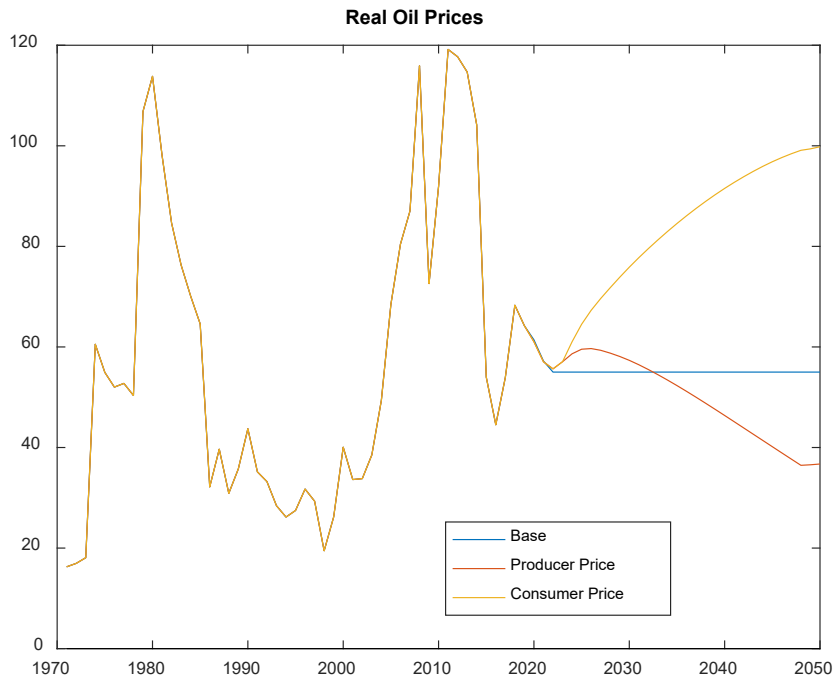


Table A1. Determinants of Global Oil and Gas Demand: Regression Results			
	Oil		Natural Gas
	(1) (time fixed effects)	(2) (linear time trend)	(3)
Population	0.983*** (0.007)	0.975*** (0.007)	0.460*** (0.026)
Land size	0.047*** (0.006)	0.051*** (0.006)	0.324*** (0.020)
GDP per capita	-9.639*** (1.129)	-9.647*** (1.211)	0.795*** (0.033)
(GDP per capita)^2	1.183*** (0.127)	1.172*** (0.136)	
(GDP per capita)^3	-0.049*** (0.005)	-0.042*** (0.005)	
Oil exporter (dummy)	0.172*** (0.027)	0.191*** (0.027)	
Oil Price		-0.108*** (0.026)	
Year		-0.018*** (0.001)	
Observations	5,225	4,815	2,057
R-squared	0.962	0.963	0.714

Notes: The model was estimated in logs. The dependent variable is oil consumption in models (1) and (2) and natural gas consumption in model (3). Time fixed effects are included in the regressions in (1) and (3); global oil price and a linear time trend are used in (2). The oil price included in model (2) is the 5-year average real oil price (using contemporaneous price did not produce a statistically significant coefficient). Heteroskedasticity robust standard errors are in parentheses (. *** p<0.01, ** p<0.05, * p<0.1). The sample periods are 1971-2016 for oil and 1992-2016 for natural gas.
Sources: EIA; Rystad Energy; IEA; BP; and IMF staff estimates.

The impact of carbon tax: prices



Tax burden falls onto consumer initially, becoming more even after consumers cut demand

Producers initially enjoy higher prices as they cut investment anticipating the higher carbon tax,

Tighter oil market conditions in the initial phase.

Carbon tax: from 0 to $150 (in tons of CO2) ~= 0 - $60 per barrel of oil.