

Does accelerating the energy transition affect fiscal sustainability in GCC countries?

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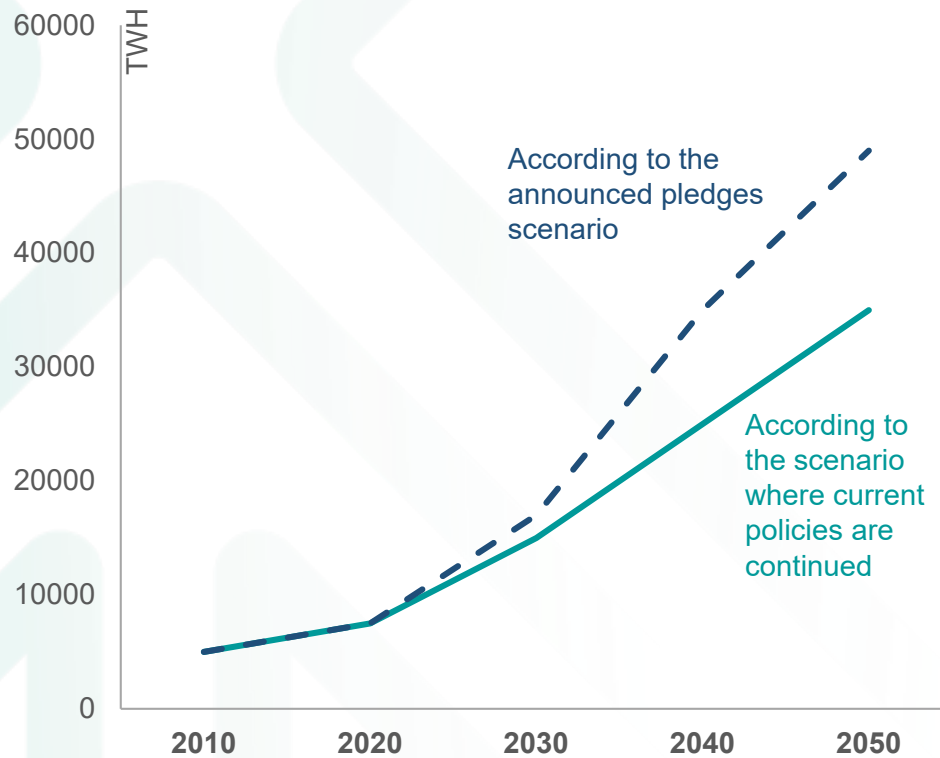
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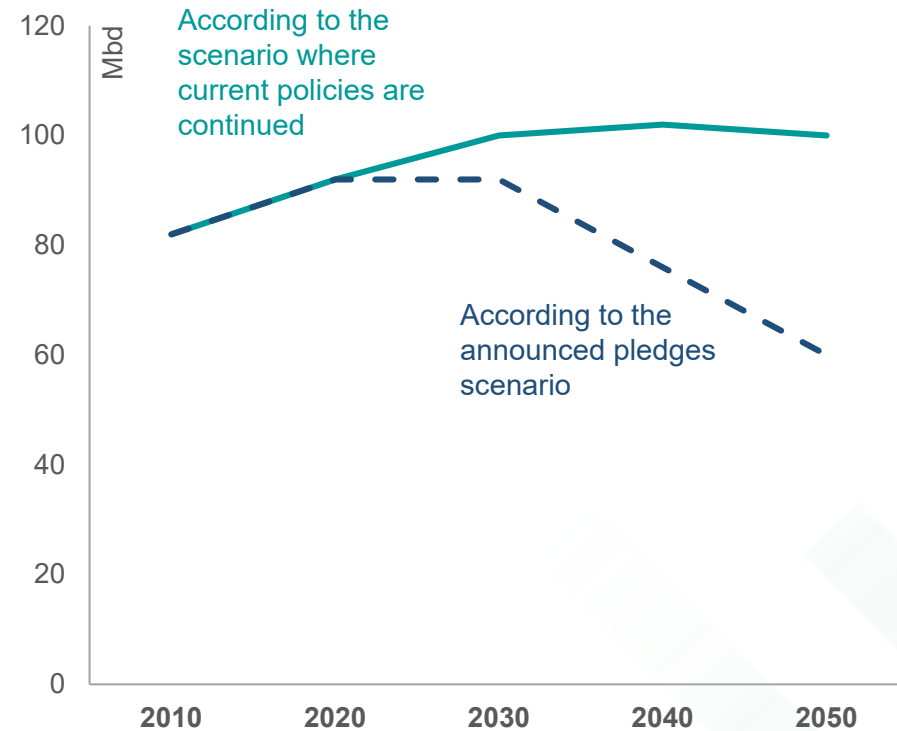
Global Energy transition Outlook

Global Renewable Energy production outlook



Source: International Energy Agency (IEA)

Global Oil production outlook

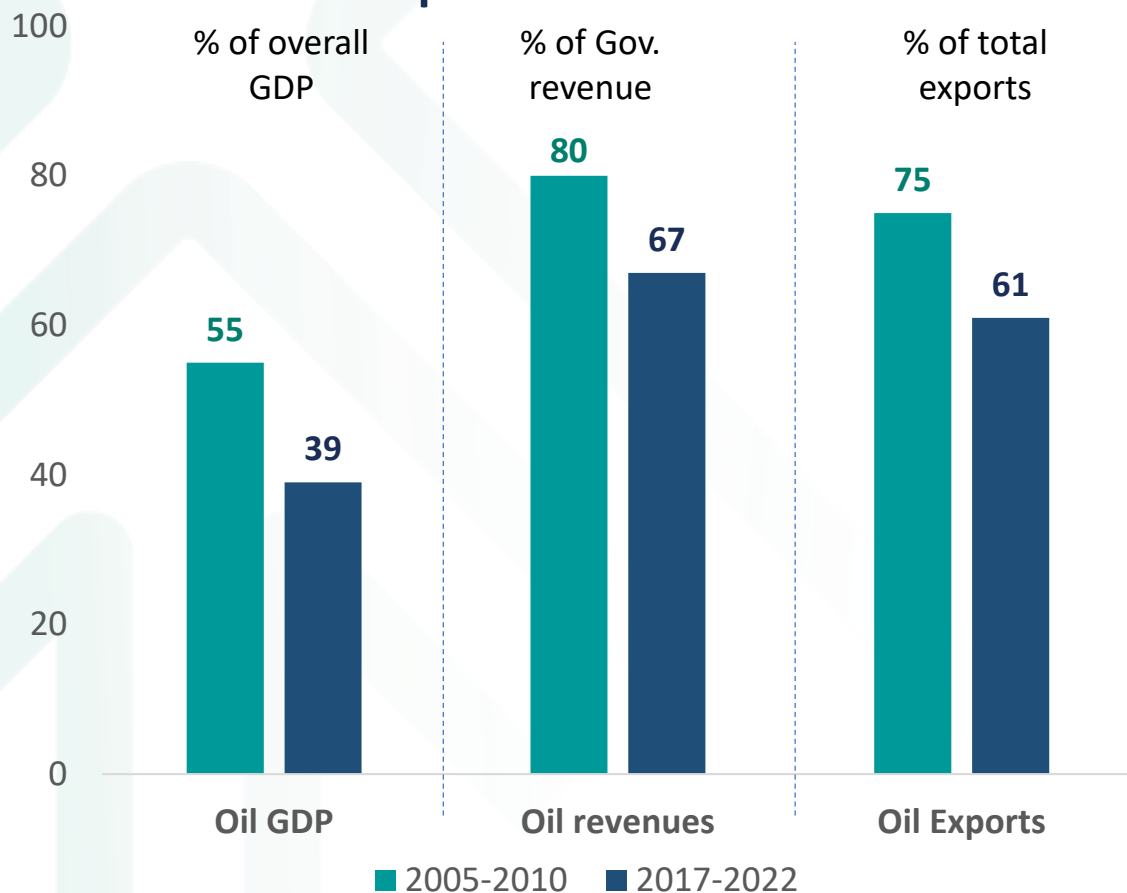


Source: International Energy Agency (IEA)

Energy transition in GCC

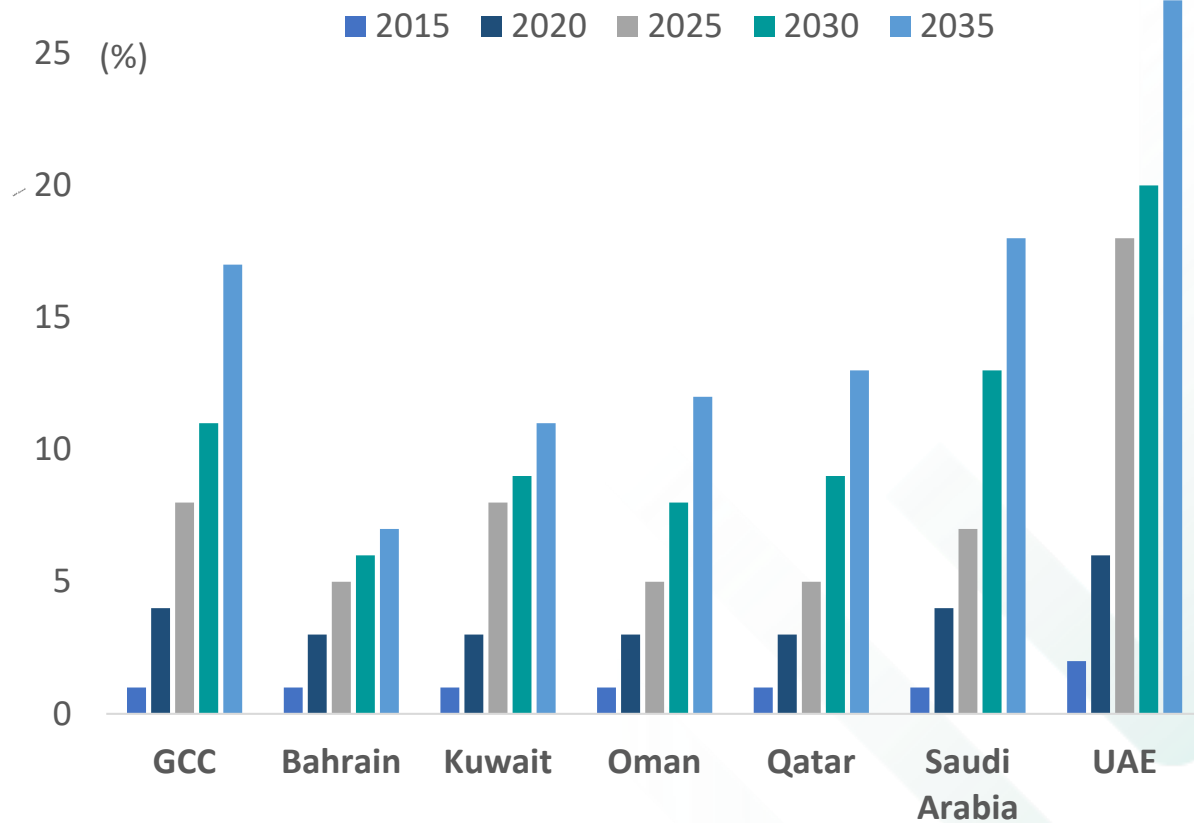


GCC exposure to oil sector



Source: IMF, National Authorities

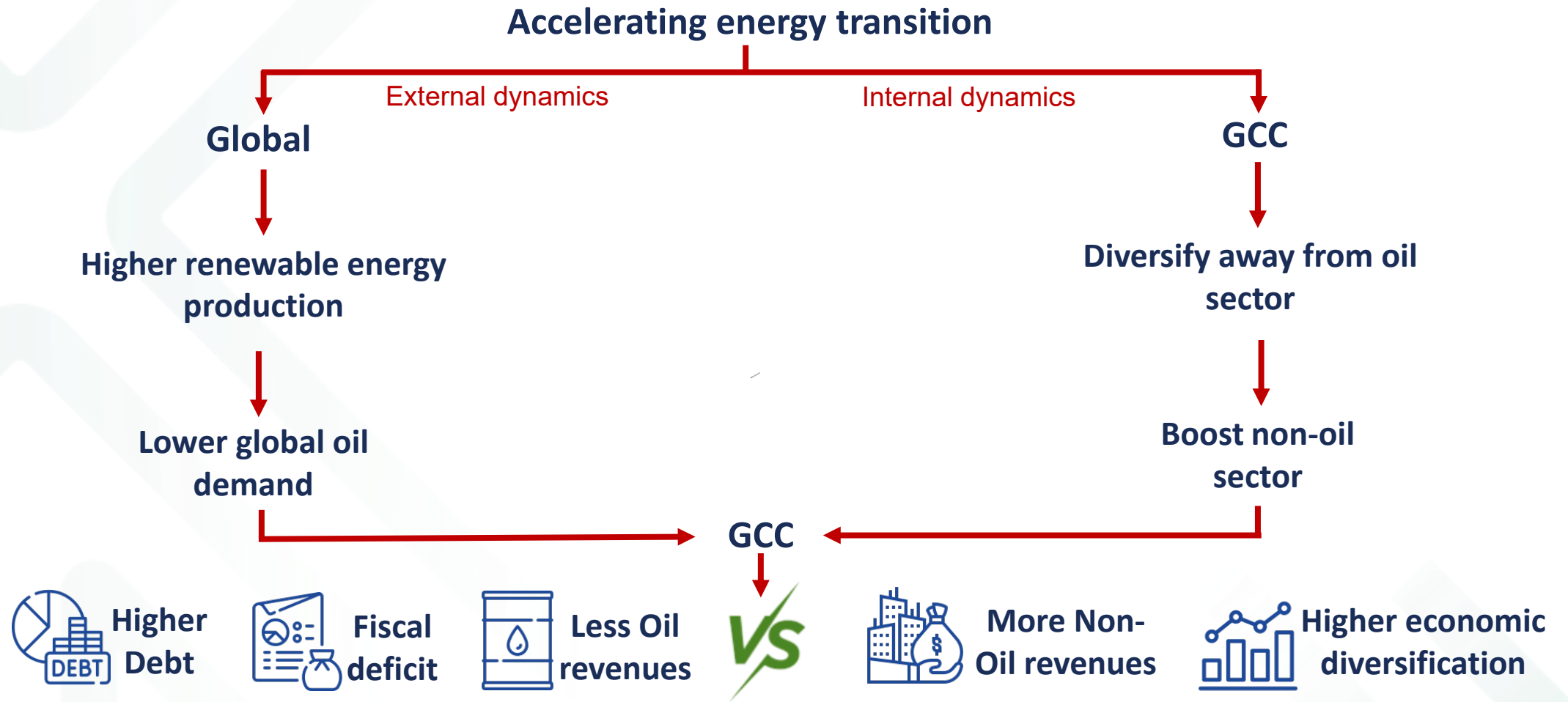
GCC renewable energy generation share, 2015-2035



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Source: The International Renewable Energy Agency (IRENA)

Any impact on GCC?



How could this trend affect fiscal sustainability in GCC countries

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Fiscal sustainability in GCC countries

What is fiscal sustainability?

A sustainable fiscal policy is the state wherein the government budget can be smoothly financed without generating explosive increases in public debt over time.

Fiscal reaction functions

A fiscal reaction function focuses on the relationship between the fiscal balance and the debt level, to help governments to determine the achievement of the fiscal policy in different time periods and to react against some macroeconomic changes. Having the right fiscal reaction function makes fiscal policy and public finance sound and stable. The standard fiscal reaction function used in most of the existing literature is the one developed and expanded by Bohn (1998-2011).

$$PB_{it} = c + \alpha D_{it} + \lambda GS_{it} + \beta X_{it} + \tau_i + \varepsilon_{it}$$

Primary balance Gov. Debt Gov. Spending Macro factors

Bohn conditions for fiscal sustainability

- ❖ Positive relationship between primary balance and debt. This means that government reduces the budget deficit by targeting a higher primary surplus, or smaller primary deficit, in response to the debt growth.
- ❖ Negative relationship between primary balance and Government spending. This means that government should adopt counter-cyclical fiscal measures to ensure a fiscal sustainability.

Global Energy transition

Objective

This paper examines the sustainability of fiscal policy in GCC countries, by exploring governments' reaction to the ongoing energy transition progress via the estimation of a fiscal reaction function, using the ARDL approach over the period 2000 -2022

Adopted fiscal reaction function

The fiscal reaction function is revised in this study, to take into consideration other important factors for GCC countries, such as Oil price, trade openness and energy transition.

$$PB_{it} = c + \alpha D_{it} + \beta GS_{it} + \delta GDPpc_{it} + \lambda Trade_{it} + \gamma Brent_{it} + \theta REEG_{it} + \tau_i + \varepsilon_{it}$$

Primary balance	Gov. Debt	Gov. Spendin g	GDP per capita	Trade Opennes s	Oil price (Level/Volatility)	Energy transition (Global/National)
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Main advantages of this study

- ❖ This paper focuses on the relationship between fiscal sustainability and energy transition.
- ❖ This paper focuses not only on the government's fiscal response to oil price shocks, but also to price volatility.
- ❖ This paper compares the obtained results for the GCC, with other similar and non-similar groups, such as **OPEC**, **Net Oil Exporting Countries (NOEC)**, **G7** and the **Top 10 countries with low-carbon energy investment (Top10ETI)**.



Panel PMG-ARDL results: Main drivers of fiscal sustainability

Variables	GCC	OPEC	NOEC	G7	Top10ETI
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Short term

ECT (error correction term)	-0.423***	-0.497***	-0.427***	-0.374***	-0.366***
Debt	0.281**	0.231**	0.201**	0.098**	0.103**
RGDPpc	0.135*	0.117*	0.112*	0.142*	0.133*
GFCF	0.073**	0.094**	0.063*	-0.034**	-0.036**
Trade Openness	-0.036*	-0.051*	-0.041*	0.031*	0.038*
Oil price	0.238**	0.291**	0.193**	-0.087**	-0.106**

Long term

Debt	0.295**	0.275**	0.277**	0.088**	0.110**
RGDPpc	0.133***	0.121*	0.111*	0.143*	0.131*
GFCF	0.026*	0.094**	0.063*	-0.033**	-0.031**
Trade Openness	-0.156**	-0.114*	-0.106*	0.061*	0.058*
Oil price	0.140*	0.231**	0.213**	-0.187**	-0.210**

Note: *,**,*** design significance At 10%, 5% and 1% respectively.

The Adopted equation:

$$PB=f(\text{Debt, RDGPpc, FBCF, Trade, Oil Price})$$

Main results:

- ❖ Positive relationship between the primary fiscal balance and the debt ratio in the short and long-run, indicating that fiscal authorities react systematically to the rising public debt ratio by raising the primary balance to ensure fiscal sustainability.
- ❖ Positive relationship with the investment for the groups of oil exporting countries in the short and long terms (GCC, OPEC, and NEOC), suggesting the existence of pro-cyclical fiscal policy.
- ❖ Negative impact of openness on Primary balance for GCC, OPEC, and NEOC, as it increases a country's exposure and vulnerabilities to external shocks. In contrast, the impact of openness is positive in G7 and Top10ETI, signifying a more diversified export structure that mobilizes higher openness to generate more fiscal revenues.
- ❖ Positive relationship with the oil prices for the oil exporting countries, as a higher price is expected to increase government revenues, and therefore, boost primary surpluses. Meanwhile, higher oil price increases expenditure in G7 and Top10ETI on imports and subsidies and consequently reduces the primary fiscal balance.

Panel PMG-ARDL results: Oil price volatility impact

Variables	GCC	OPEC	NOEC	G7	Top10ETI
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Short term

ECT (error correction term)	-0.414***	-0.456***	-0.454***	-0.398***	-0.375***
Debt	0.184**	0.241**	0.211**	0.088**	0.113**
RGDPpc	0.123*	0.114*	0.114*	0.143*	0.137*
GFCF	0.075**	0.095**	0.064*	0.036**	0.037**
Trade Openness	-0.037*	-0.049*	-0.048*	0.038*	0.037*
Oil price Volatility	-0.235**	-0.295*	-0.195**	-0.085**	-0.105*

Long term

Debt	0.211**	0.266**	0.267**	0.086**	0.107**
RGDPpc	0.123***	0.122*	0.111*	0.143*	0.136*
GFCF	0.026*	0.099**	0.063*	0.035**	0.035**
Trade Openness	-0.158**	-0.111*	-0.104*	0.064*	0.055*
Oil price Volatility	-0.155*	-0.251**	-0.224**	-0.006**	-0.007**

Note: *,**,*** design significance At 10%, 5% and 1% respectively.

The Adopted equation:

$$PB=f(\text{Debt, RDGPpc, FBCF, Trade, Oil volatility})$$

Main results:

- ❖ The obtained results are generally satisfactory and similar to the previous results.
- ❖ Primary balance is not affected only by oil price fluctuations but also by oil price volatility. In fact, while higher oil prices improve the primary balance only in oil-producing countries, the volatility of the oil price decreases the primary balance of all groups.
- ❖ Negative relationship between oil price volatility and the fiscal primary balance in all the country groups. This is consistent with the high volatility that makes it difficult to sustain a stable stream of revenues in the budget in support of a higher primary balance.
- ❖ High oil price volatility makes it more difficult for fiscal planning to adjust spending plans to continued volatility of the oil price, particularly for oil exporting countries with a high share of the oil revenues in the budget.

Panel PMG-ARDL results: Impact of the global energy transition

Variables	GCC	OPEC	NOEC	G7	Top10ETI
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Short term

ECT (error correction term)	-0.419***	-0.486***	-0.434***	-0.366***	-0.376***
Debt	0.187**	0.246**	0.215**	0.084**	0.112**
RGDPpc	0.125*	0.111*	0.121*	0.153*	0.157*
GFCF	0.085**	0.098**	0.054*	0.032**	0.033**
Trade openness	-0.033*	-0.042*	-0.042*	0.035*	0.035*
Oil price	0.244**	0.294*	0.175**	-0.087**	-0.107*
Global REEG	-0.088**	-0.111**	-0.078**	0.112*	0.166*

Long term

Debt	-0.091**	-0.106**	-0.137**	0.083**	0.103**
RGDPpc	0.105***	0.120*	0.110*	0.141*	0.130*
GFCF	0.025*	0.090**	0.060*	0.031**	0.032**
Trade openness	-0.150**	-0.101*	-0.102*	-0.066*	-0.057*
Oil price	0.151*	0.250**	0.220**	-0.083**	-0.106**
Global REEG	-0.223**	-0.256**	-0.208**	0.312*	0.366*

Note: *,**,*** design significance At 10%, 5% and 1% respectively.

The Adopted equation:

$PB=f(\text{Debt, RDGPpc, FBCF, Trade, Oil price, Global$

REEG)
Main results:

- ❖ The results confirm the findings in the previous section about the main drivers of fiscal sustainability and turn our attention to the impact of the ongoing increase in the share of global renewable energy sources, to understand how this could affect GCC fiscal sustainability.
- ❖ Negative sign in oil exporters means that an increase in the global production of renewable energy sources reduces their primary fiscal balances, as the decline in global demand for oil affects negatively the government revenues in these countries.
- ❖ This trend has a limited effect on fiscal position in the short term but could have a significant negative effect in the long term for oil exporting countries.
- ❖ In contrast, the impact of increasing energy transition is positive on the public finance in G7 and Top10ETI, signifying a more diversified energy structure that relies less on hydrocarbon energy and tends to increase its renewable energy sources.

Panel PMG-ARDL results: Impact of the National energy transition

Variables	GCC	OPEC	NOEC	G7	Top10ETI
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Short term

ECT (error correction term)	-0.432***	-0.490***	-0.455***	-0.332***	-0.388***
Debt	0.181**	0.226**	0.245**	0.094**	0.102**
RGDPpc	0.023*	0.014*	0.024*	0.056*	0.067*
GFCF	0.083**	0.094**	0.053*	0.035**	0.036**
Trade openness	-0.034*	-0.047*	-0.043*	0.034*	0.037*
Oil price	0.204**	0.264*	0.155**	-0.097**	-0.114*
National REEG	0.088**	0.071**	0.098**	0.202*	0.266*

Long term

Debt	0.291**	0.206**	0.237**	0.113**	0.143**
RGDPpc	0.121***	0.125*	0.114*	0.141*	0.130*
GFCF	0.025*	0.090**	0.060*	0.031**	0.032**
Trade openness	-0.150**	-0.101*	-0.102*	-0.066*	-0.057*
Oil price	0.151*	0.250**	0.220**	-0.083**	-0.106**
National REEG	0.113**	0.056**	0.093**	0.309*	0.346*

Note: *,**,*** design significance At 10%, 5% and 1% respectively.

The Adopted equation:

$PB=f(\text{Debt, RDGPpc, FBCF, Trade, Oil price, National REEG})$

Main results:

- ❖ Given the gradual reduction in the share of hydrocarbons in the global energy mix, GCC countries are seeking to develop the production of alternative energy sources.
- ❖ Positive relationship between GCC fiscal primary balance and national energy transition efforts in the short and long run. This could be explained by the role of the renewable energy sector in stimulating economic growth and improving environmental sustainability.
- ❖ This positive relation is confirmed by the G7 and Top10ETI groups, as most of these countries are well-diversified and well-advanced in the energy transition.
- ❖ It's worth noting that the sign of the debt level coefficient is significantly positive in the short and long run with a higher coefficient compared to the previous results, which means that the GCC government increased its debt insurance to sustain its primary balance and ensure fiscal sustainability.

Conclusion

- ❖ GCC still runs a sustainable fiscal policy in the short run and its public finances have improved in response to recent fiscal adjustments. The evidence illustrates that the issuance of debt, which has accelerated since 2015, has helped to diversify sources of financing amid a higher drive for fiscal consolidation to increase the primary balance and render the debt sustainable over time.
- ❖ Enduring fiscal deficits in the near term is not a problem, but managing and financing those deficits without compromising non-energy growth and debt sustainability objectives in the long run is the key challenge.
- ❖ An increase in the global production of renewable energy sources may lead to a decline in global demand for oil, and could affect negatively the government revenues in oil exporting countries. This trend has a limited effect on GCC fiscal position in the short term but could have a significant negative effect in the long term for oil exporting countries.
- ❖ Accelerating GCC energy transition could attenuate the negative effect of global energy transition, and may help to ensure fiscal sustainability in the long term.

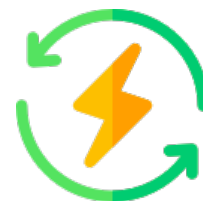
Given the ongoing energy transition, GCC countries have a dual strategy: Over the medium term, to maximize their oil and gas production to benefit from favorable production and market conditions; and in the longer term, to be involved in the development of low-carbon energy sources.

Many thanks



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Adopted groups of the selected countries

GCC	OPEC	NOEC	G7	Top10ETI
Bahrain	Algeria	Algeria	Canada	China
Kuwait	Angola	Angola	France	United States
Oman	Republic of Congo	Azerbaijan	Germany	Germany
Qatar	Equatorial Guinea	Canada	Italy	United Kingdom
Saudi Arabia	Gabon	Colombia	Japan	France
UAE	Iran	Ecuador	United Kingdom	Japan
	Iraq	Iran	United States	India
	Kuwait	Kazakhstan		South Korea
	Libya	Mexico		Brazil
	Nigeria	Nigeria		Spain
	Saudi Arabia	Norway		
	United Arab Emirates	Russia		
	Venezuela	Venezuela		