KAPSARC
مركز الملك عبدالله للدراسات والبحوث البترولية
King Abdullah Petroleum Studies and Research Center

Fiscal Policy in Oil and Gas-Exporting Economies: Good Times, Bad Times and Ugly Times

Olivier Durand-Lasserve and Fatih Karanfil

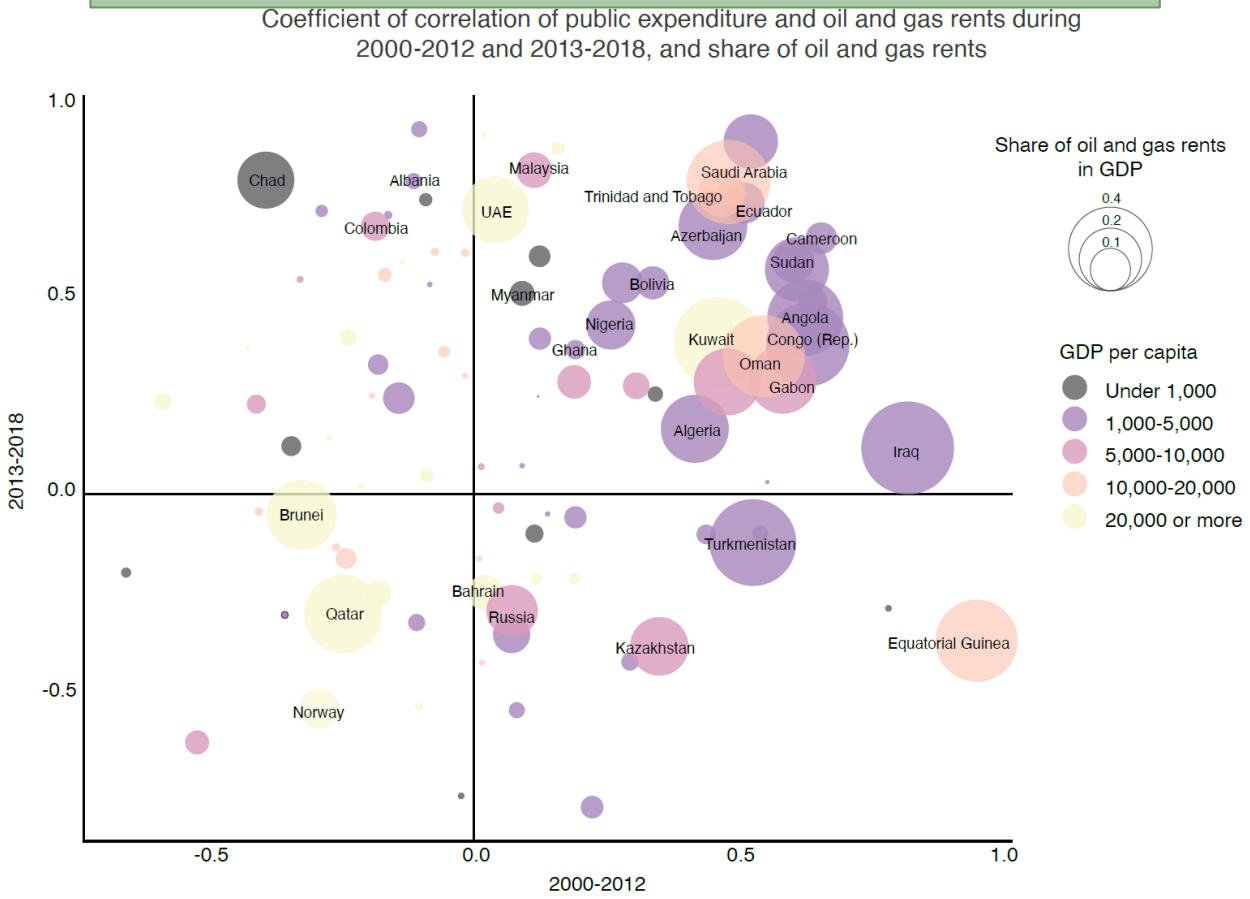
The material presented is based on Durand-Lasserve and Karanfil (*Energy Economics*, Oct. 2023):

"Fiscal policy in oil and gas-exporting economies: Good times, bad times and ugly times"

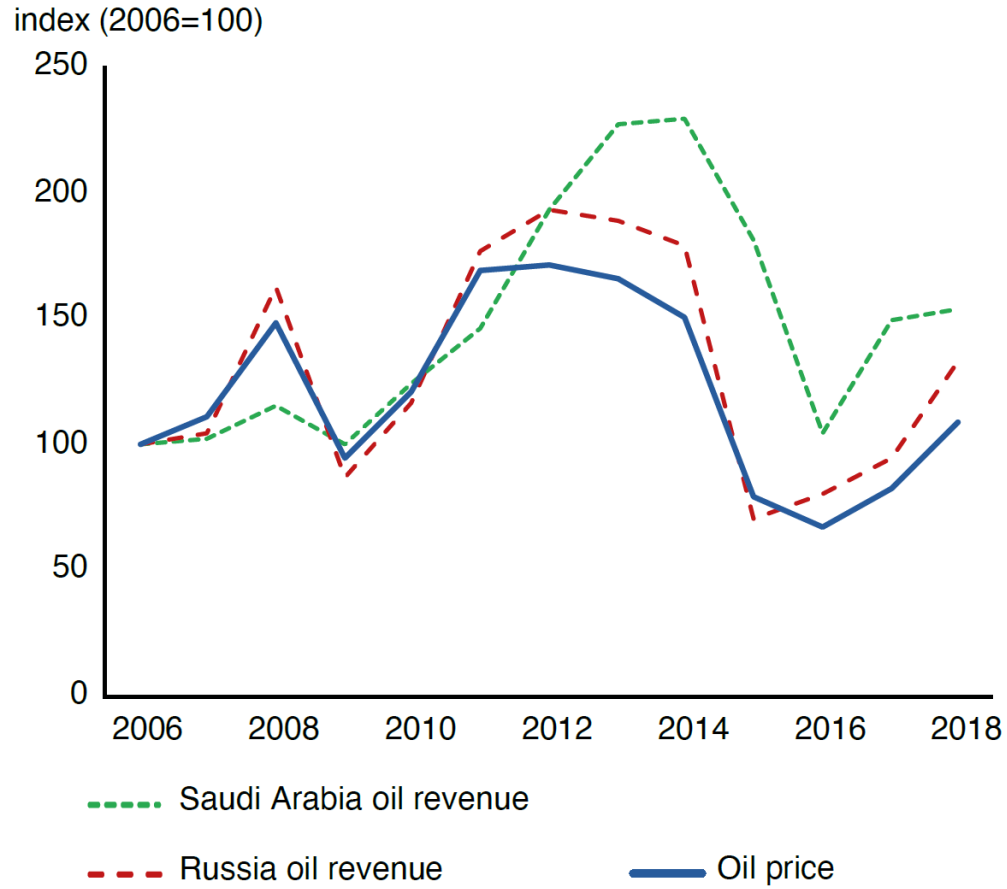
Credit: Hufton+Crow

Cyclical fiscal policies transmit oil price volatility to the economy

Public expenditure and oil and gas revenues are correlated



Variations of oil price and oil revenue in the two largest oil exporters



- Are emerging and developing oil-exporting economies procyclical?
- What factors influence procyclicality?
- What factors influence the fiscal response in specific parts of the cycle?

Baseline model: panel data with interaction terms

30 ED oil and gas-exporting countries, from 2000 to 2020

$$\Delta EXP_{i,t} = \alpha_{1,i} + \beta \Delta RENT_{i,t} + \gamma X_{i,t} + \lambda \Delta RENT_{i,t} \times X_{i,t} + \varepsilon_{i,t}$$

ΔEXP is the variation of the **cyclical component of total expenditure**, investment expenditure or current consumption expenditure

$\Delta RENT$ is the variation of the **cyclical component of the oil and gas rent**

Positive (negative) β denotes **procyclicality** (**countercyclicality**)

X is vector of variables that we **interact** with $\Delta RENT$

Positive (negative) coefficient λ means that variable X **amplifies (reduces) procyclicality**

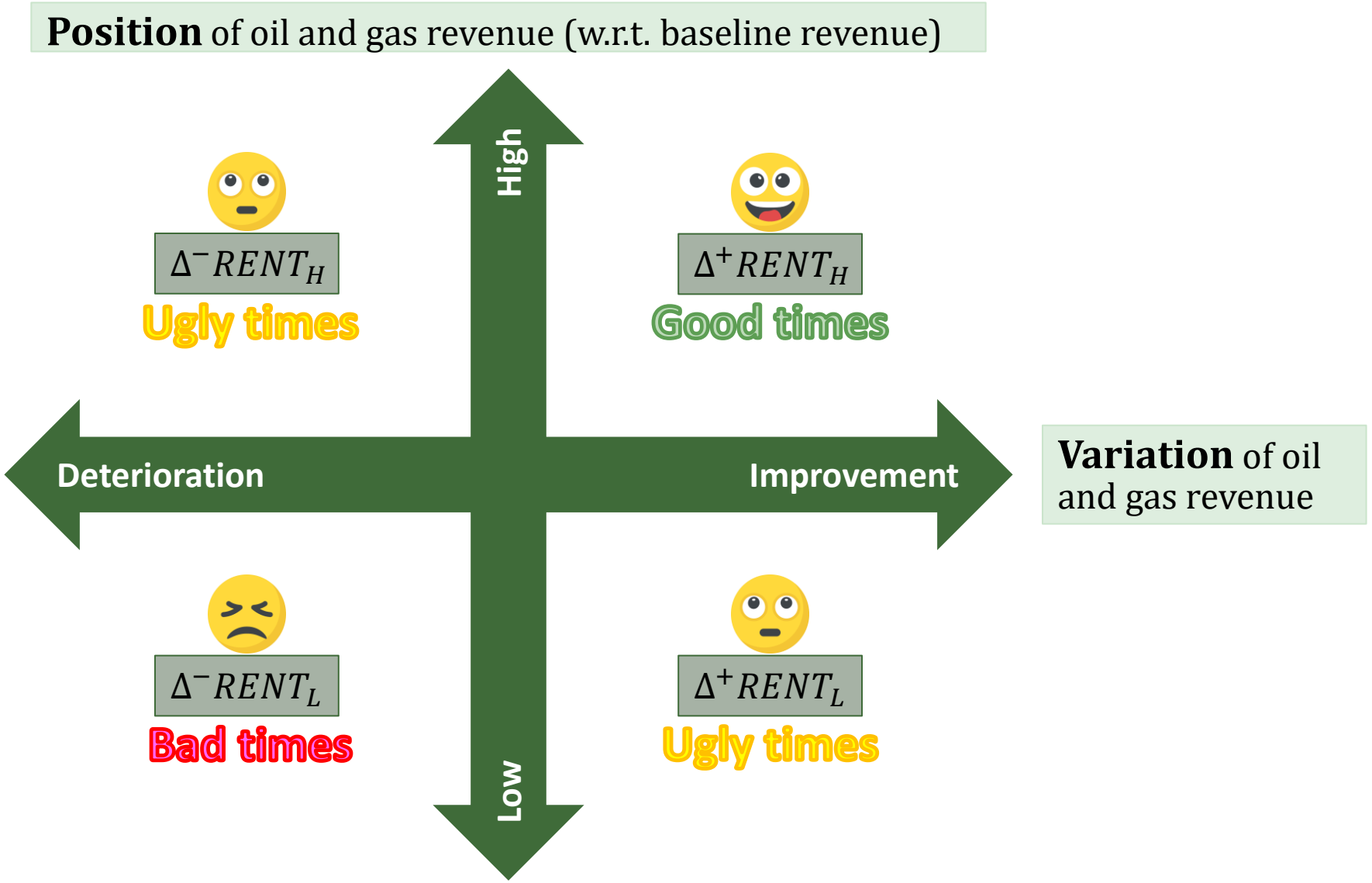
Insights from the model without asymmetries

Procyclicality: The pass-through of oil and gas rents to government expenditure is close to 1

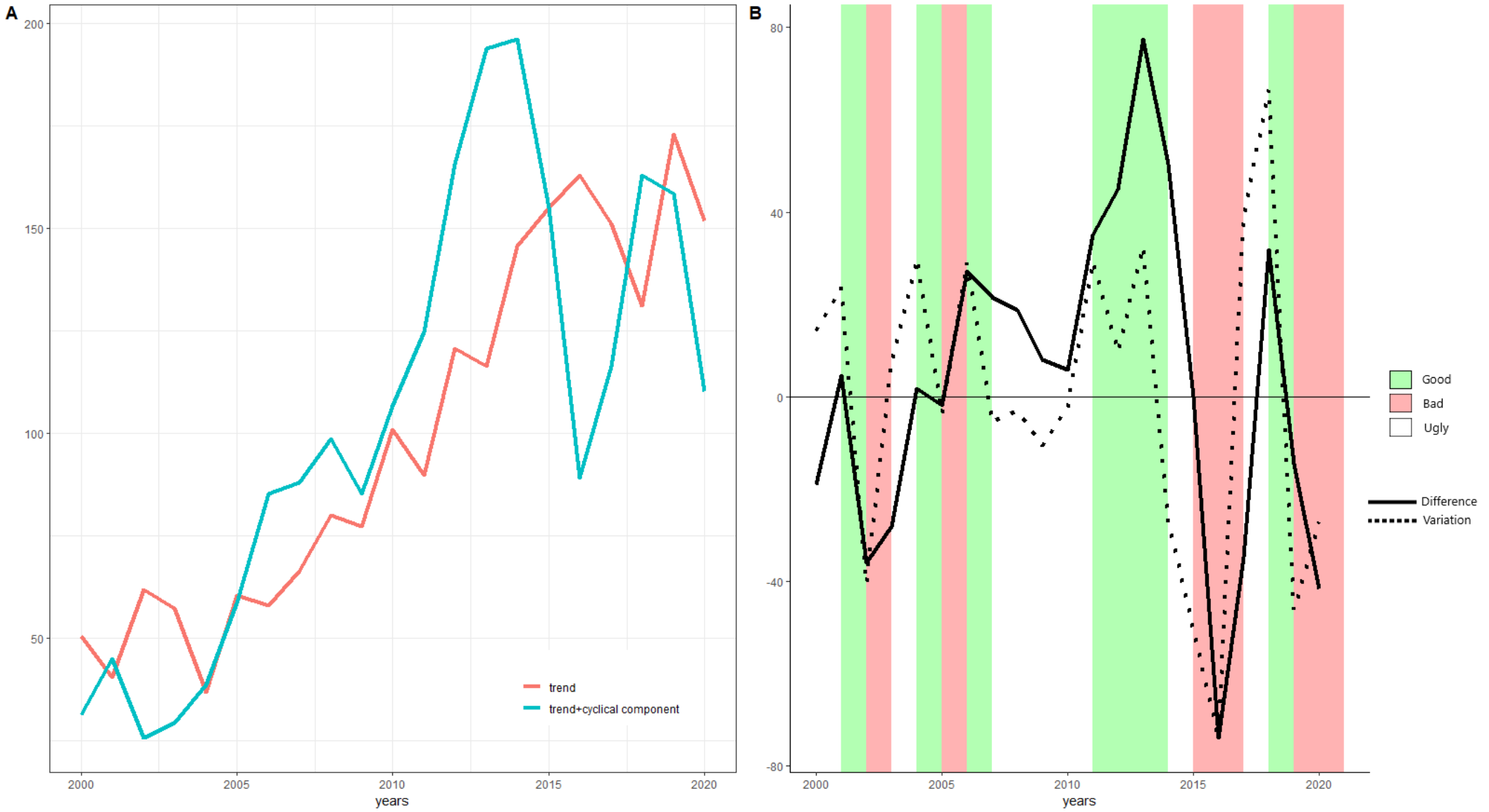
Financial openness increases procyclicality, in line with the financial constraint hypothesis

Institutional quality and fiscal rules reduce procyclicality

We consider four configurations of oil and gas revenue shocks



Asymmetries of variation and position: illustration with Saudi Arabia



Results with asymmetry

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
ΔEXP	Tot	Inv	Cur	Tot	Inv	Cur	Tot	Inv	Cur
$\Delta^{+}RENT$	0.913***	0.153***	0.732**						
	(0.319)	(0.045)	(0.284)						
$\Delta^{-}RENT$	0.873***	0.160***	0.906***						
	(0.258)	(0.027)	(0.289)						
$\Delta RENT_{H}$				0.396***	0.128***	0.323***			
				(0.132)	(0.042)	(0.101)			
$\Delta RENT_{L}$				1.264***	0.181***	1.245***			
				(0.407)	(0.031)	(0.441)			
$\Delta^{+}RENT_{H}$							0.731***	0.168***	0.557***
							(0.244)	(0.056)	(0.202)
$\Delta^{-}RENT_{H}$							-0.341	-0.008	-0.164
							(0.275)	(0.114)	(0.242)
$\Delta^{+}RENT_{L}$							2.119***	0.160***	1.871***
							(0.571)	(0.036)	(0.591)
$\Delta^{-}RENT_{L}$							0.917***	0.176***	0.968***
							(0.277)	(0.030)	(0.325)
Constant	0.618	0.062	0.977***	2.256***	0.21*	1.861***	-0.843	-0.095	-0.373
	(0.504)	(0.149)	(0.203)	(0.614)	(0.07)	(0.517)	(0.629)	(0.203)	(0.469)
Observations	584	546	546	584	546	546	584	546	546
No. of countries	30	30	30	30	30	30	30	30	30
R^2	0.333	0.247	0.323	0.396	0.253	0.413	0.432	0.268	0.436
Wald test	0.07	0.03	8.43***	8.31***	1.49	6.76**	6.34***	1.24	7.17***

Insights from the model asymmetries

Significant asymmetries in expenditure response

Position asymmetry is more pronounced than variation asymmetry

- In low revenue regimes, the pass-through to total and current expenditure is about three times higher than during high revenue regimes

When revenues are above the trend but go down (ugly times), the fiscal policy is neutral

- Suggesting that there is a belief that the revenue will recover
- Inertia in spending, fiscal buffer

High procyclicality during bad times

- Fiscal balance in a bad position, leaving less room to buffer further price drops

Takeaways from interacting asymmetries and explanatory variables

Financial openness

- Financial integration leads to more investment during good times
- But mitigates the drop in investment during bad times

Institutional quality

- Limits the increase in expenditure (in ugly times with low but increasing prices)
- Reduces expenditure (in ugly times with high but decreasing prices)

Fiscal rules

- Reduce procyclicality during good times and bad times

IMF programs

- Countercyclical in ugly times during low revenue regimes and procyclical during bad times

Policy implications

Avoid expenditure cuts during bad times because it is when the social cost is higher

But financial openness and IMF programs, instead of helping smooth fiscal policies, accentuate the procyclicality

Limiting procyclicality in good times would be the optimal solution

Fiscal rules can support such a policy

Rapid growth in capital inflows are challenging if not invested in the right direction

During good times, need for investments that drive economic diversification and long-term economic growth

KAPSARC
مركز الملك عبدالله للدراسات والبحوث البترولية
King Abdullah Petroleum Studies and Research Center

Thank you

Covariates

- **Financial constraints**

  Chinn and Ito (2006) index of capital account openness. The more open the country is to cross-border capital transactions the higher the index values are

- **Institutional quality**

  Sum of the 6 Worldwide Governance Indicators of Kaufmann et al (2010)

- **Fiscal rules**

  Dummy calculated based on the IMF's fiscal rule database of Davoodi et al. (2022)

- **Exchange rate flexibility**

  Index rising from 1 to 6 as flexibility increases, with 1 representing a pegged currency Ilzetzki et al. (2021)

- **IMF programs**

  Dummy if a country is under IMF arrangement (Dreher 2006)

Procyclicality of expenditure to oil revenue: preliminary findings

	(1)	(2)	(3)	(4)	(5)	(6)
ΔEXP	Tot	Inv	Cur	Tot	Inv	Cur
ΔRENT	0.892***	0.157***	0.821***	-0.025	0.201*	-0.047
	(0.278)	(0.0329)	(0.281)	(0.160)	(0.104)	(0.135)
ΔRENT × Financial openness				0.423***	0.012	0.366***
				(0.150)	(0.030)	(0.126)
ΔRENT × Institutional quality				-0.605**	-0.102	-0.465*
				(0.253)	(0.101)	(0.230)
ΔRENT × Fiscal rules				-0.497***	-0.123	-0.413***
				(0.175)	(0.084)	(0.107)
ΔRENT × Exchange rate flexibility				0.332***	-0.004	0.299***
				(0.041)	(0.026)	(0.023)
ΔRENT × IMF program				0.676*	0.038	0.413
				(0.332)	(0.119)	(0.250)
Constant	0.755***	0.037***	0.391***	-4.246	-1.164	-4.281
	(0.096)	(0.005)	(0.050)	(4.430)	(1.877)	(3.078)
Observations	584	546	546	485	477	477
Number of countries	30	30	30	27	27	27
R^2	0.333	0.247	0.326	0.536	0.304	0.492

Models with asymmetries

- Variation asymmetry:

$$\Delta EXP_{i,t} = \alpha_{2,i} + \mu_1 \Delta^{+} RENT_{i,t} + \mu_2 \Delta^{-} RENT_{i,t} + \varepsilon_{i,t}$$

- Position asymmetry:

$$\Delta EXP_{i,t} = \alpha_{3,i} + \delta_1 \Delta RENT_{H\,i,t} + \delta_2 \Delta RENT_{L\,i,t} + \varepsilon_{i,t}$$

- All combined:

$$\Delta EXP_{i,t} = \alpha_{4,i} + \theta_1 \Delta^{+} RENT_{H\,i,t} + \theta_2 \Delta^{-} RENT_{H\,i,t} + \theta_3 \Delta^{+} RENT_{L\,i,t} + \theta_4 \Delta^{-} RENT_{L\,i,t} + \varepsilon_{i,t}$$