Revenue Mobilization for a Resilient and Inclusive Recovery in the Middle East and Central Asia

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IMF

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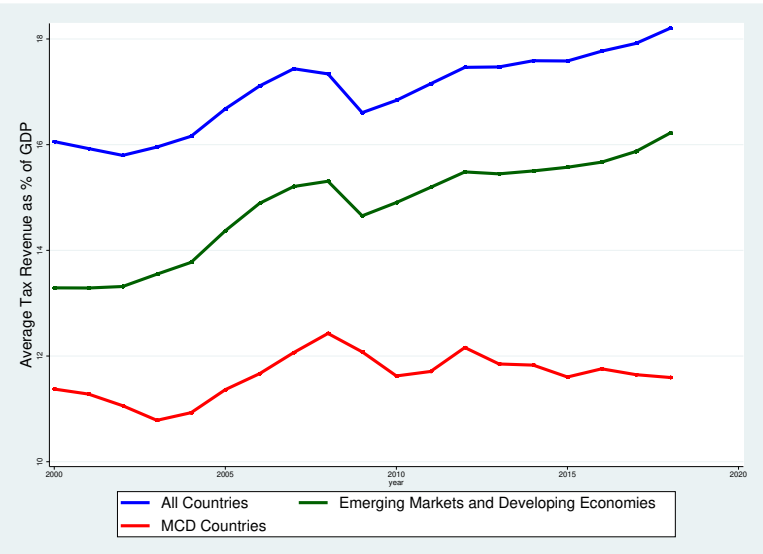
Motivation

- Weak performance of MCD countries compared to their peers
- Hydrocarbon-importing MCD countries are faring better than hydrocarbon-exporting countries



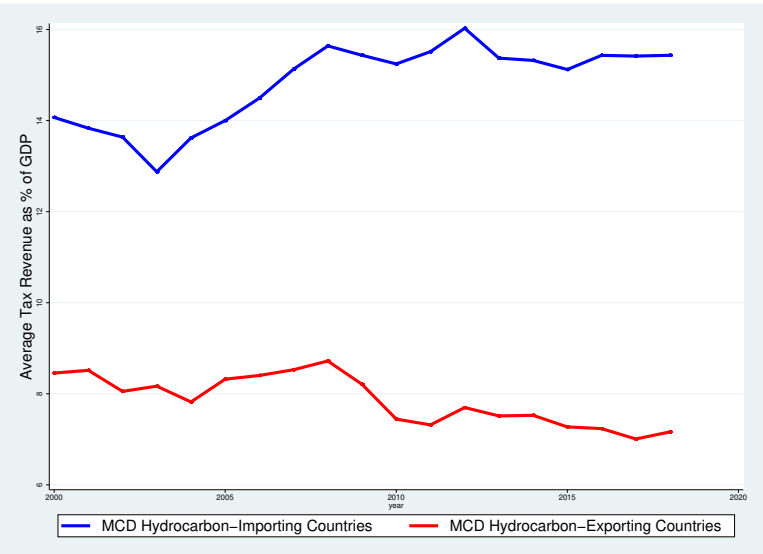
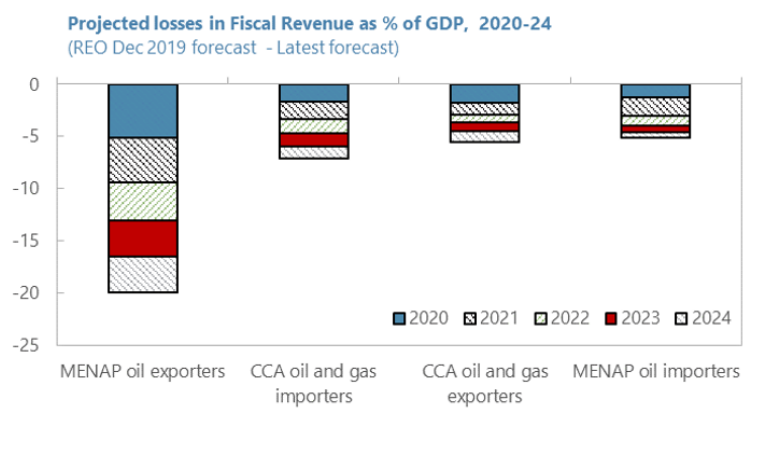


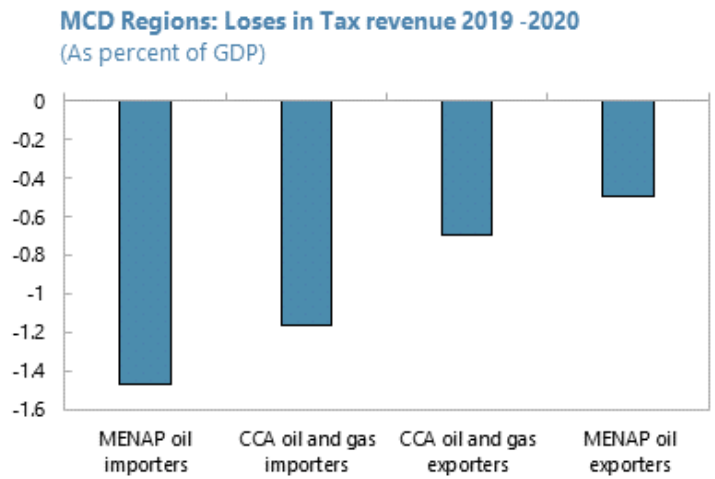
Figure: Average Tax Revenue as % of GDP.
Note 1: Non-MCD hydrocarbon-exporting countries are excluded.
Note 2: The ratio for the hydrocarbon-exporting countries is non-hydrocarbon tax revenues as % of non-hydrocarbon GDP.

Motivation

- Trends prior to the pandemic:
  - On average, tax revenue as percent of GDP is lower by 3.4 percent than EMDE over the last two decades.
  - Declining fiscal space, higher financing needs and important debt accumulation (REO, October 2020).

- The COVID-19 pandemic reinforced interests to this topic
  - MCD countries were hard-hit by compounded-shocks: virus outbreak, sharp decline in oil prices and drop in tourism and remittances.
  - Heightened financing needs and further debt accumulation.
  - High risk of long-term effect on growth and development.





Questions to be answered

- 2 Questions to be answered:
  - What is the maximum revenue that a country can collect without altering and distorting incentives (tax capacity)?
  - How far actual tax revenue is from its tax capacity (tax revenue gap)?

How To Tackle These Questions?

- Focusing on tax revenue:
  - Tax revenue makes up the highest share of total revenue in oil-importing countries in MCD.
  - The high share of oil revenues in oil-exporting countries and volatility of oil prices complicates the assessment of countries' performance in revenue mobilization.
  - Tax revenue reflect fiscal policy choices and efforts.

- Assessing the tax capacity
  - Find the key determinants of the tax capacity
  - Estimate tax effort
  - Estimate the tax revenue gaps/inefficiency in MCD countries

- Building a "Stochastic Tax Frontier" for panel data with time-variant inefficiency.

How do we contribute to the literature?

- Focusing specifically on MCD countries
  - Fenochietto and Pessino (2010): no specific country groups were the main focus of this study.
  - Fenochietto and Pessino (2013): estimation over the sample of 130 countries, but no specific country groups were the main focus of this study.
  - Regional Economic Outlook: Sub-Saharan Africa 2018 (Chapter 2): focus on SSA Countries
  - Fiscal Monitor (2013): no specific country groups were the main focus of this study.
- Identify the key drivers of revenue gaps by refining the analysis of tax revenue gap and look at the tax subcategories (VAT, CIT, PIT, direct taxes vs. indirect taxes, etc)
- Longer data coverage: most of the previous studies only cover the tax revenue data until 2015.
- Incorporating some variables that haven't been used for this purpose.

Model Specification

- The stochastic frontier model specification

$$Y_{it} = f(X_{it}; \beta).exp(v_{it}).exp(-u_{it}) \tag{1}$$

- Take natural log from both sides and assume the tax frontier function (f) is exponential with respect to its inputs

$$y_{it} = \alpha + \beta' X_{it} + v_{it} - u_{it} \tag{2}$$

where

y_{it} = log of the tax revenue as % to GDP for country i at period t

$X_{it} = (\log(\text{real GDP per Capita}), \log(\text{Real GDP per Capita})^2, \mathit{Inflation}, \mathit{Agriculture}, \mathit{Industry}, \mathit{FDI}, \mathit{Oil}, \mathit{Control\_of\_Corruption})$

and β is a vector of unknown parameters, u_{it} is the inefficiency, v_{it} and is the statistical noise.

Model Specification

- Assumptions:
  - the distribution of u_{it} is truncated normal distribution ($u_{it} > 0$)
  - v_{it} has a standard normal distribution
  - u_{it} and v_{it} are statistically independent of each other

- Tax effort (TE) is defined as the ratio between actual tax revenue and the corresponding stochastic frontier tax revenue (tax capacity):

$$TE_{it} = \frac{Y_{it}}{\tau_{it}} = \frac{\exp(\alpha + \beta' X_{it} + v_{it} - u_{it})}{\exp(\alpha + \beta' X_{it} + v_{it})} = \exp(-u_{it})$$

Data

- The estimation is based on annual data, covering the period of 2000-2019 for 25 MCD countries and 120 EMDEs.
- Non-MCD hydrocarbon-exporting countries are dropped due to unavailability of data for annual non-hydrocarbon tax revenues as % of non-hydrocarbon GDP.
- Libya and Syria are dropped out of the sample due to data unavailability.
- Botswana, Eswatini, Lesotho and Namibia are dropped due to the substantial Southern Africa Customs Union (SACU) revenue transfers which overstate domestic revenue collections.

Data: Descriptive Statistics

Variable	Mean	Std. Dev.	Min	Max	Observations	Countries
	Emerging Market and Developing Economies (EMDE)					
Tax Revenue as % of GDP	14.9	6.2	0.5	36.9	2,482	132
GDP per Capita (PPP, 2017)	11,257	13,516	630	102,494	2,580	130
Inflation	6.4	15.2	-18.1	513.9	2,318	123
Agriculture as % of GDP	15.1	11.7	0.1	79.1	2,519	132
Industry as % of GDP	25.6	11.9	0.9	84.8	2,478	131
FDI as % of GDP	4.5	6.5	-40.3	103.3	2,593	133
Control of Corruption Index	-0.4	0.7	-1.9	1.7	2,514	133
	Middle East and Central Asia Countries (MCD)					
Tax Revenue as % of GDP	11.5	6.8	0.7	26.8	546	29
GDP per Capita (PPP, 2017)	19,856	23,909	1,189	102,494	525	27
Inflation	6.3	7.8	-10.1	63.3	487	26
Agriculture as % of GDP	11.2	9.5	0.1	41.2	526	28
Industry as % of GDP	36.2	16.2	0.9	84.8	501	28
FDI as % of GDP	4.3	5.6	-11.6	55.1	564	29
Control of Corruption Index	-0.5	0.7	-1.8	1.5	551	29

Estimation Results: Stochastic Frontier Analysis

	Tax Revenue as % of GDP		
	MCD	*EMDE*	*All Countries*
log(GDP per Capita)	4.340***	1.845***	1.642***
	(6.22)	(10.50)	(11.10)
log(GDP per Capita)^2	-0.242***	-0.103***	-0.091***
	(-6.09)	(-10.30)	(-11.66)
Inflation	-0.004**	-0.004***	-0.004***
	(-2.73)	(-15.70)	(-16.53)
Agriculture as % of GDP	-0.007	-0.005***	-0.007***
	(-1.45)	(-4.59)	(-6.12)
FDI as % of GDP	0.006**	0.004***	0.0004*
	(2.70)	(7.61)	(2.48)
Industry as % of GDP	0.006**	0.002*	0.002*
	(2.64)	(1.98)	(1.98)
Control of Corruption Index	0.121*	0.044**	0.063***
	(2.27)	(2.75)	(4.65)
Oil Dummy	-0.302*	-0.428***	-0.930***
	(-1.97)	(-8.46)	(-14.07)
Intercept	-16.10***	-4.831***	-3.403***
	(-5.22)	(-6.41)	(-4.91)
μ (u)	-0.237	0.247	0.929
	(-0.17)	(1.09)	(15.78)
η	0.018***	0.016***	0.010***
	(6.47)	(14.82)	(13.21)
Number of Observations	392	1980	2,563
Number of Countries	25	120	154
σ^2	0.991	0.317	0.171
γ	0.968	0.947	0.915

t statistics in parentheses

Note 1: *p<0.05; **p<0.01; ***p<0.001

Note 2: η is the parameter for time varying inefficiency.

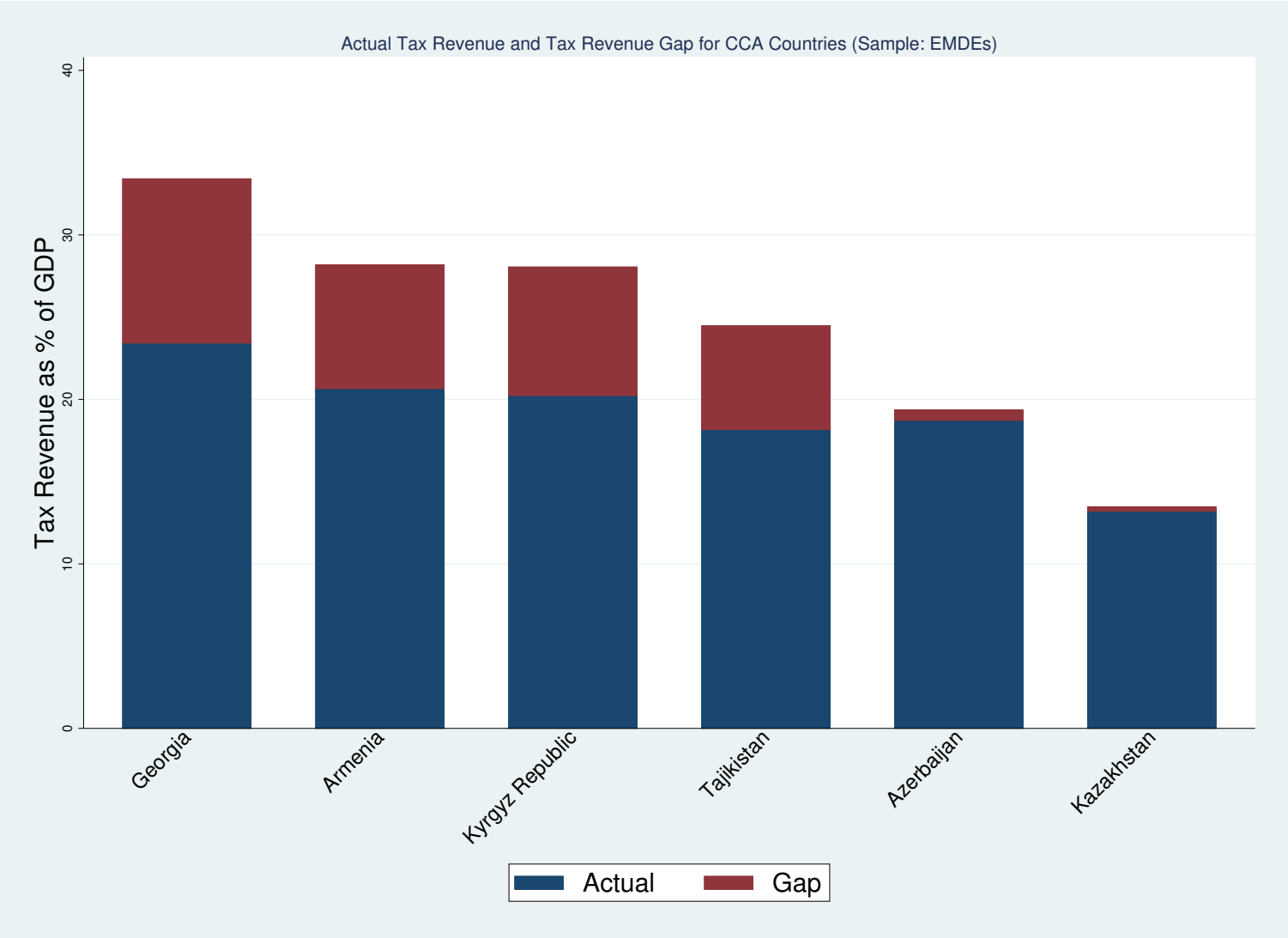
Note 3: μ is the mean of the truncated normal distribution for u_{it}.

Estimation Results: Tax Effort, Capacity and Revenue Gap

Country	Year	Tax Revenue	Tax Effort	Tax Capacity	Tax Revenue Gap
	Hydrocarbon-Exporting Countries				
Iraq	2019	2.1	0.13	15.7	13.6
United Arab Emirates	2019	2.7	0.18	15.3	12.6
Kuwait	2019	3.1	0.20	15.2	12.1
Bahrain	2019	3.3	0.11	30.3	26.9
Qatar	2019	4.1	0.29	14.1	10.1
Oman	2019	6.8	0.35	19.2	12.4
Iran, Islamic Rep.	2019	7.7	0.47	16.4	8.6
Saudi Arabia	2019	11.4	0.42	27.1	15.7
Kazakhstan	2019	13.2	0.98	13.5	0.27
Algeria	2019	17.3	0.86	20.1	2.8
Azerbaijan	2019	18.7	0.97	19.4	0.64
	Hydrocarbon-Importing Countries				
Sudan	2019	5.4	0.32	16.9	11.5
Afghanistan	2018	8.4	0.38	22.2	13.8
Djibouti	2019	12.0	0.47	25.3	13.3
Pakistan	2018	12.9	0.48	26.8	13.9
Egypt, Arab Rep.	2019	13.8	0.53	25.7	11.9
Mauritania	2018	15.3	0.46	32.8	17.5
Lebanon	2018	15.4	0.57	26.5	11.1
Jordan	2019	15.5	0.58	26.7	11.2
Kyrgyz Republic	2018	20.2	0.72	28.1	7.8
Armenia	2018	20.6	0.73	28.1	7.5
Morocco	2019	21.6	0.78	27.5	5.9
Tunisia	2018	23.3	0.72	32.2	8.9
Georgia	2018	23.4	0.70	33.4	9.9

Note 1: Tax revenue, tax capacity and tax revenue reported as percent of GDP.
Note 2: Tax effort is the ratio of tax revenue divided by tax capacity.

Estimation Results: Estimated Tax Revenue Capacity vs. Actual



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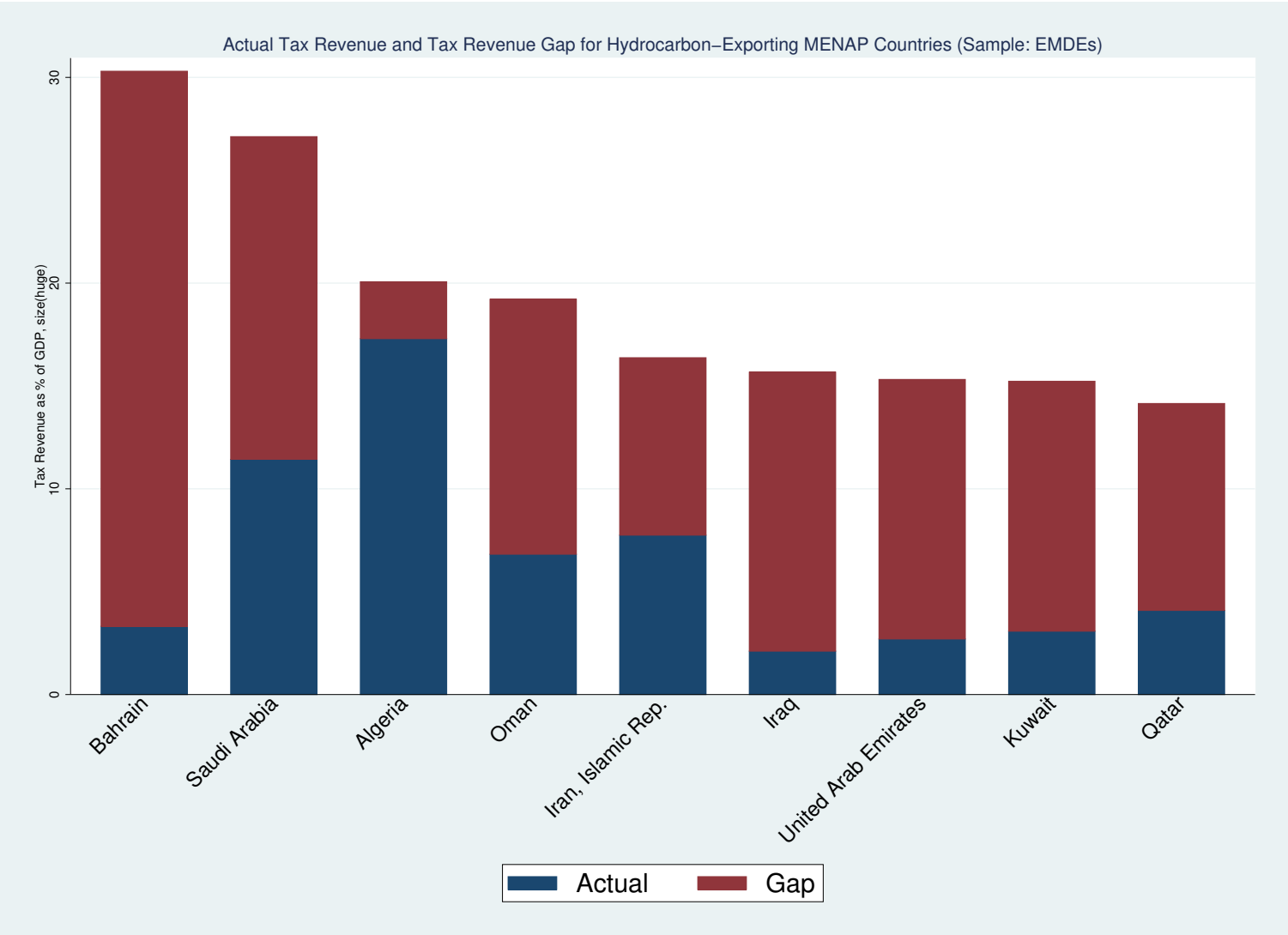

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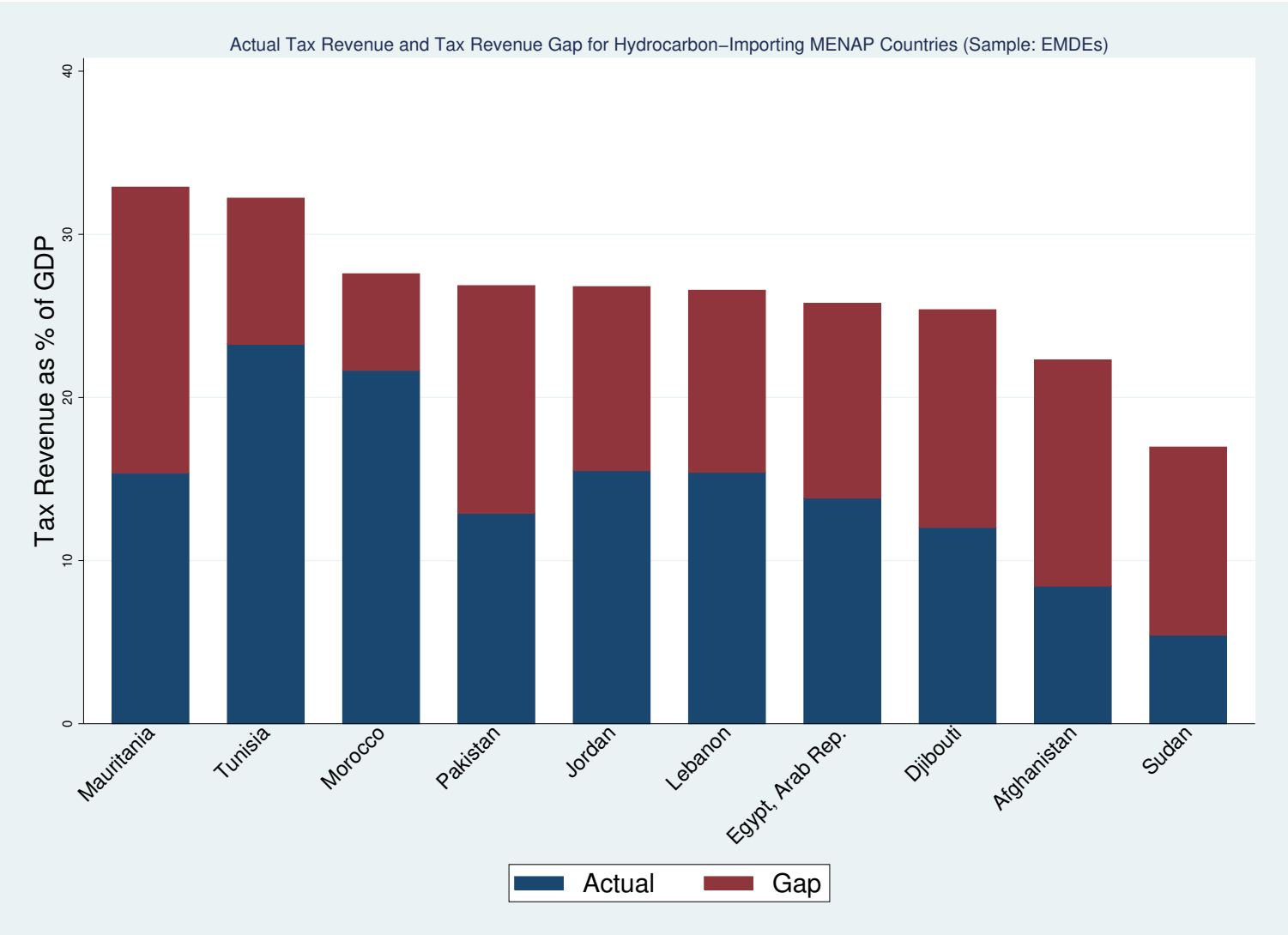
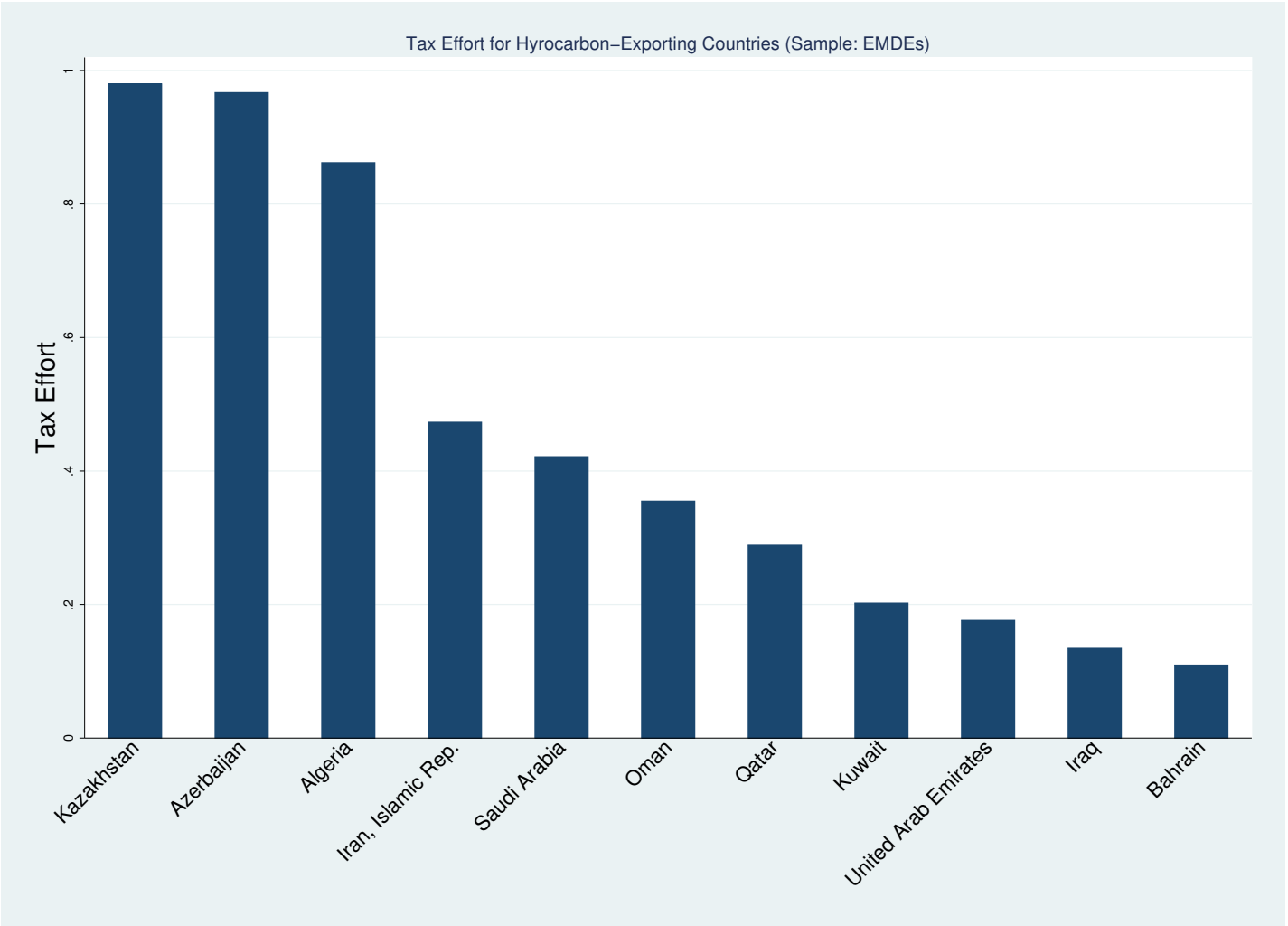


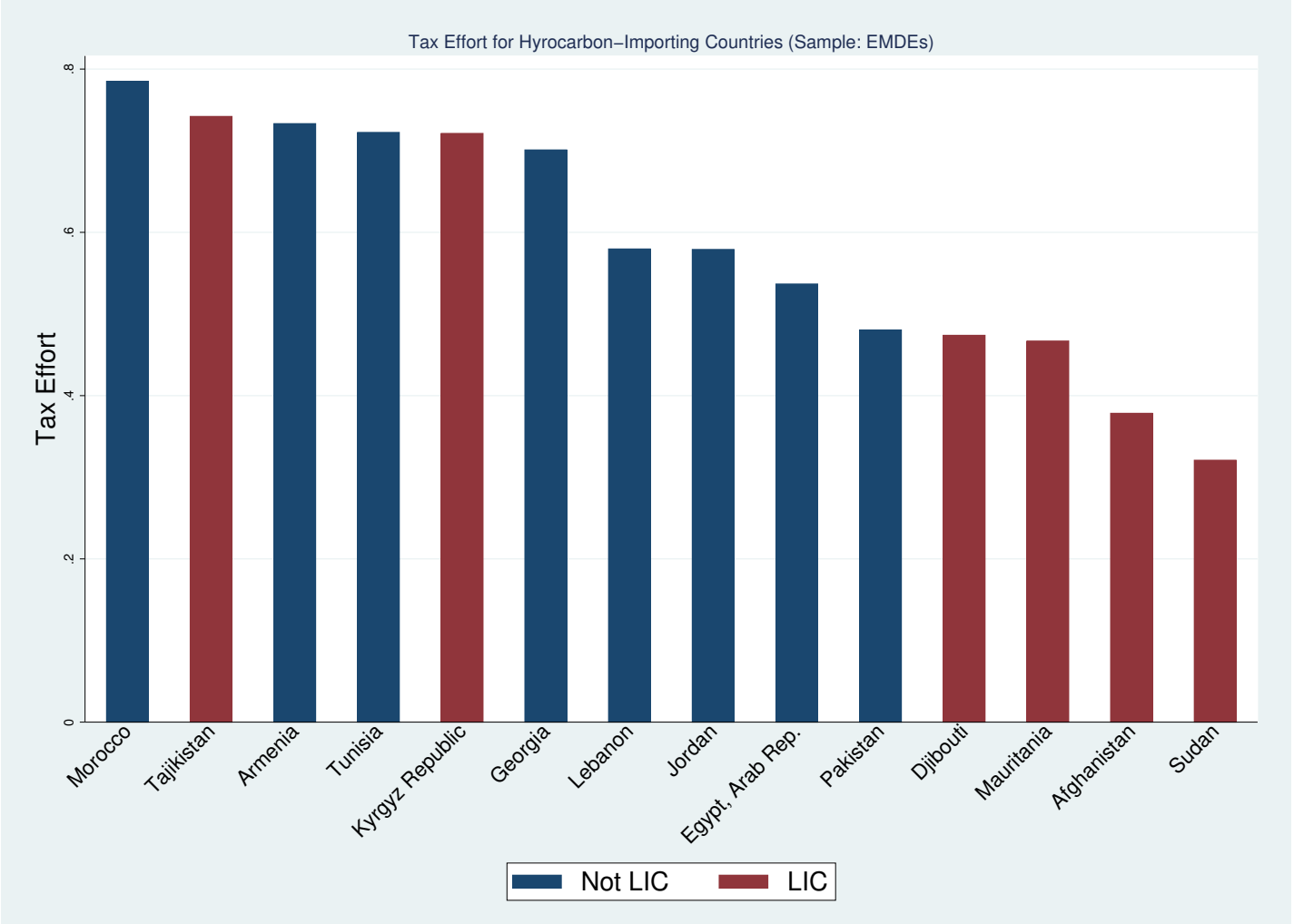
Estimation Results: Estimated Tax Effort

- The higher the dependence on hydrocarbon revenues, the lower the tax effort.
- Large level of exemptions, low tax rates and alternative revenue sources explain in part the low level of tax effort in GCC countries.



Estimation Results: Estimated Tax Effort

- The low income countries have the lowest tax effort among hydrocarbon-importing countries.
- Exceptions of LICs in the CCA (Tajikistan and Kyrgyz Republic) with low level of development, but having a tax effort among the highest.



Concluding Remarks

- Tax effort in MCD countries is much lower than in EMDEs - there is space for improvement to reach capacity
- Tax effort in MENA countries is lower than tax effort in CCA
- Tax effort in GCC countries is the lowest in the region due to lower taxation, lack of economic diversification and availability of alternative revenue (oil)
- Among MENAP hydrocarbon-importing countries, tax effort is the lowest in LICs due to structural issues: poor design of tax regime and weak compliance
- Next Steps: estimate the tax revenue gap for more granular tax data (VAT, direct vs indirect, ...)