

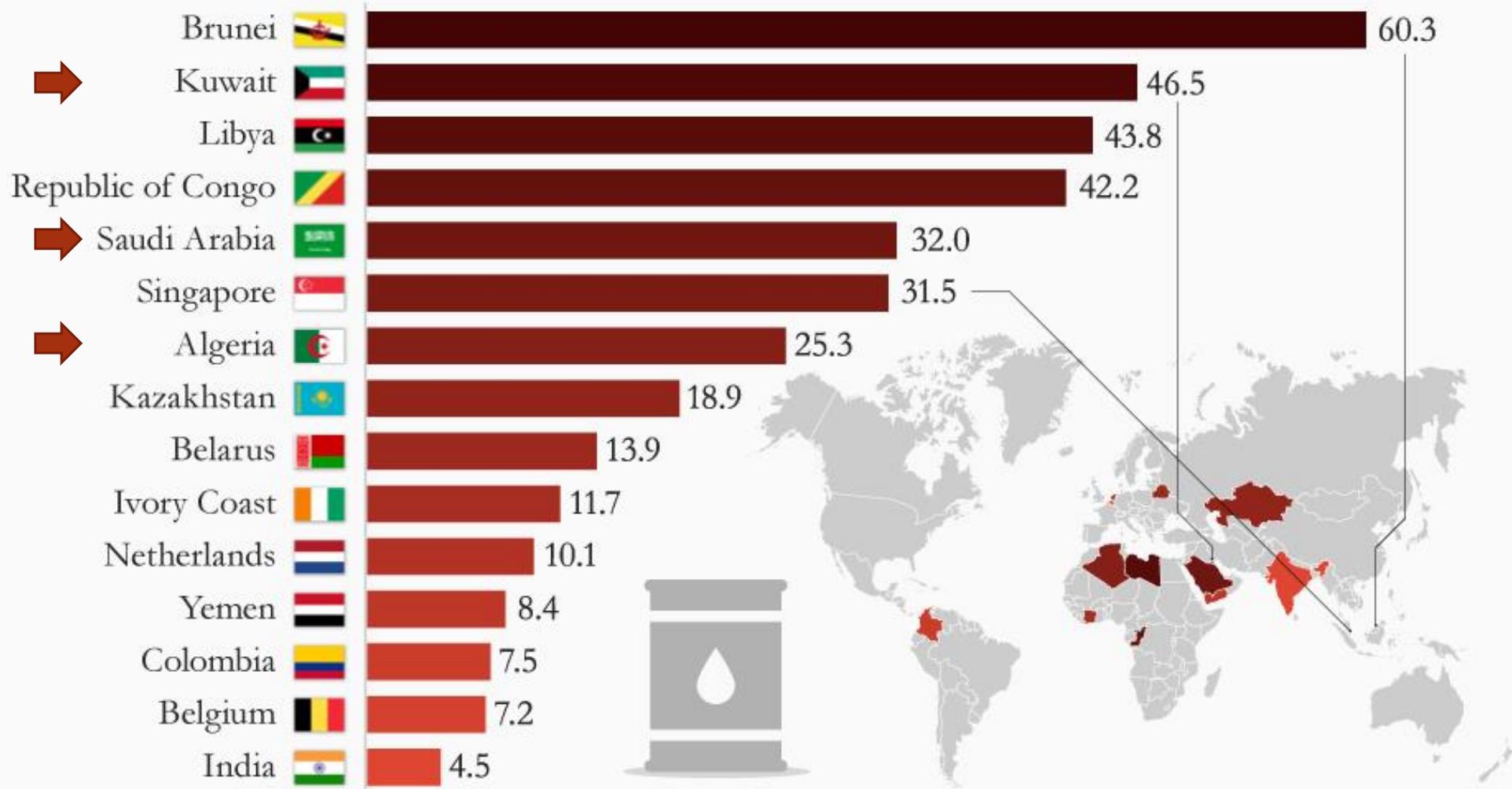


# **Sustainable Development in OPEC Economies**

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# The economies most dependent on oil

Estimated oil exports as a % of GDP in 2018



@StatistaCharts

Source: Bloomberg

INDEPENDENT

statista



# Prior Researches/ Models

## Sachs and Warner (1995)

- ▶ assessed development outcome in terms of GDP growth
- ▶ “one of the surprising features of modern economic growth is that economies abundant in natural resources have tended to grow slower than economies without substantial natural resources” = **Resource Curse**

# Prior Researches / Models

## Carbonnier, Wagner and Brugger (2011)

- ▶ took adjusted net savings (ANS) as an indicator of weak sustainability
- ▶ examined the link between resource dependence and sustainable development
- ▶  $ANS_{it} = \beta_1 ANS_{i,t-1} + \beta_2 GDP_{i,t-1} + \beta_3 POP_{it} + \beta_4 RR_{it} + \beta_5 GOV_{it} + \varepsilon_{it}$

# Theoretical Background

## ► Adjusted Net Savings (Genuine Savings)

- included in the World Bank's Data Book in 2013
- monitors whether depletion of natural capital, such as minerals or forests, is compensated for
- a positive ANS indicates that a country is adding to its overall wealth and that its economic growth is on a sustainable path
- $ANS_{it} = ( GS_{it} - DEPC_{it} ) + EE_{it} - RRD_{it} - CD_{it}$



# Variables / Data Source

- ▶  $i$ : country
- ▶  $t$ : time
- ▶ ANS: per capita genuine savings (2004-2014, World Bank)
- ▶ GDP: per capita gross domestic product (2004-2013, World Bank)
- ▶ POP: population growth (2005-2014, World Bank)
- ▶ RR: total natural resources rents (2005-2014)
- ▶ GOV: governance indicator = size of youth bulge (2005-2014, United Nations)
- ▶ GS: gross national savings
- ▶ DEPC: net of the depreciation of produced capital
- ▶ EE: expenditure on education
- ▶ RRD: rents from depletion of natural capital
- ▶ CD: damages from carbon dioxide emissions



# Samples

## **Oil-Dependent (RR20+%):**

- **Algeria**
- **Kuwait**
- **Saudi Arabia**

## **Oil-Independent:**

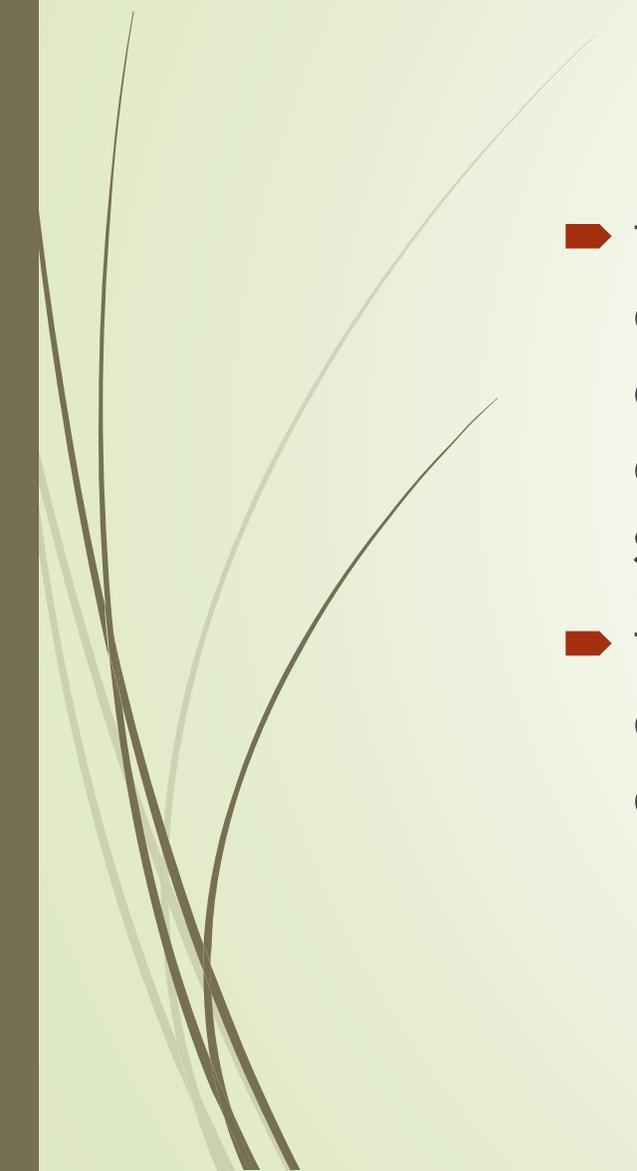
- **Ecuador**
- **Indonesia**
- **Nigeria**
- **Venezuela**

## **Data Insufficient:**

- Angola (insufficient demographic data)
- Iraq (insufficient demographic data)
- Libya (insufficient ANS data)
- Qatar (insufficient ANS data)
- Iran (No ANS Data)
- United Arab Emirates (No ANS Data)



# Research Objectives / Value-Added

- ▶ to clarify the interactions between resource (petroleum) dependence and sustainable development in OPEC countries, while adding to the few existing studies on adjusted net savings as an indicator of weak sustainability
  - ▶ to determine the difference between highly resource-dependent and relatively resource-independent economies
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# Analysis: Resource-Dependent

3	回帰統計								
4	重相関 R	0.9852							
5	重決定 R2	0.97062							
6	補正 R2	0.964499							
7	標準誤差	831.1523							
8	観測数	30							
9									
10	分散分析表								
11		自由度	変動	分散	割られた分散	有意 F			
12	回帰	5	5.48E+08	1.1E+08	158.576	1.44E-17			
13	残差	24	16579540	690814.2					
14	合計	29	5.64E+08						
15									
16		係数	標準誤差	t	P-値	下限 95%	上限 95%	下限 95.0%	上限 95.0%
17	切片	-1882.63	2574.453	-0.73127	0.471692	-7196.04	3430.781	-7196.04	3430.781
18	ANSt-1	0.034285	0.241305	0.142081	0.888202	-0.46374	0.532313	-0.46374	0.532313
19	GDPt-1	0.057931	0.076354	0.758707	0.455415	-0.09966	0.215519	-0.09966	0.215519
20	POP	27.0848	309.3953	0.087541	0.930968	-611.476	665.6453	-611.476	665.6453
21	RR	0.322491	0.043894	7.347083	1.38E-07	0.231899	0.413084	0.231899	0.413084
22	GOV	66.80248	89.38532	0.747354	0.46211	-117.68	251.2847	-117.68	251.2847

# Analysis: Resource-Independent

3	回帰統計								
4	重相関 R	0.948287							
5	重決定 R2	0.899248							
6	補正 R2	0.884432							
7	標準誤差	246.976							
8	観測数	40							
9									
10	分散分析表								
11		自由度	変動	分散	割された分散	有意 F			
12	回帰	5	18510346	3702069	60.69249	5.73E-16			
13	残差	34	2073903	60997.15					
14	合計	39	20584249						
15									
16		係数	標準誤差	t	P-値	下限 95%	上限 95%	下限 95.0%	上限 95.0%
17	切片	10653.44	4278.478	2.490008	0.017824	1958.531	19348.36	1958.531	19348.36
18	ANSt-1	0.199827	0.214526	0.931484	0.358171	-0.23614	0.635796	-0.23614	0.635796
19	GDpt-1	0.07168	0.034363	2.085982	0.044555	0.001847	0.141514	0.001847	0.141514
20	POP	52.21496	107.8617	0.484092	0.631425	-166.986	271.4164	-166.986	271.4164
21	RR	0.380431	0.127482	2.984201	0.005235	0.121357	0.639504	0.121357	0.639504
22	GOV	-406.074	166.154	-2.44396	0.019869	-743.739	-68.4083	-743.739	-68.4083



# Results

## Resource-Dependent

- ▶ slightly positive correlation between ANS and RR

## Resource-Independent

- ▶ strong negative correlation between ANS and GOV
- ▶ weak positive correlation between ANS and RR
- ▶ weak positive correlation between ANS and lagged GDP



# Future Tasks

- ▶ to find and utilize more reliable data for each OPEC economy and include Angola, Iraq, Iran, Libya, Qatar and United Arab Emirates in the analyses
  - ▶ to consider the effect of the richness of other resources in each economy
  - ▶ to examine other governance indicator
  - ▶ to further investigate the relationship between resource dependence and the quality of governance
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# References



- Gilles Carbonnier, Natascha Wagner and Fritz Brugger, *The Impact of Resource-Dependence and Governance on Sustainable Development*, The Centre on Conflict, Development and Peacebuilding, 2011.
- Mohsen Mehrara, Abbas Rezazadeh Karsalari and Fateme Haghiri, *Oil Fund and the Instability of Macro-Economy in Oil-Rich Countries*, World Applied Sciences Journal, 2012.
- Jeffrey D. Sachs and Andrew M. Warner, *Natural Resource Abundance and Economic Growth*, The National Bureau of Economic Research, 1995.
- Jeffrey D. Sachs, Andrew M. Warner, *Natural Resources and Economic Development: The curse of natural resources*, European Economic Review, 2001.
- Rashid Sbia and Helmi Hamdi, *Dynamic relationships between oil revenues, government spending and economic growth in an oil-dependent economy*, Munich Personal RePEc Archive, 2013.