

# Is there a fiscal resource curse?

## Resource rents, fiscal capacity and political institutions in developing economies

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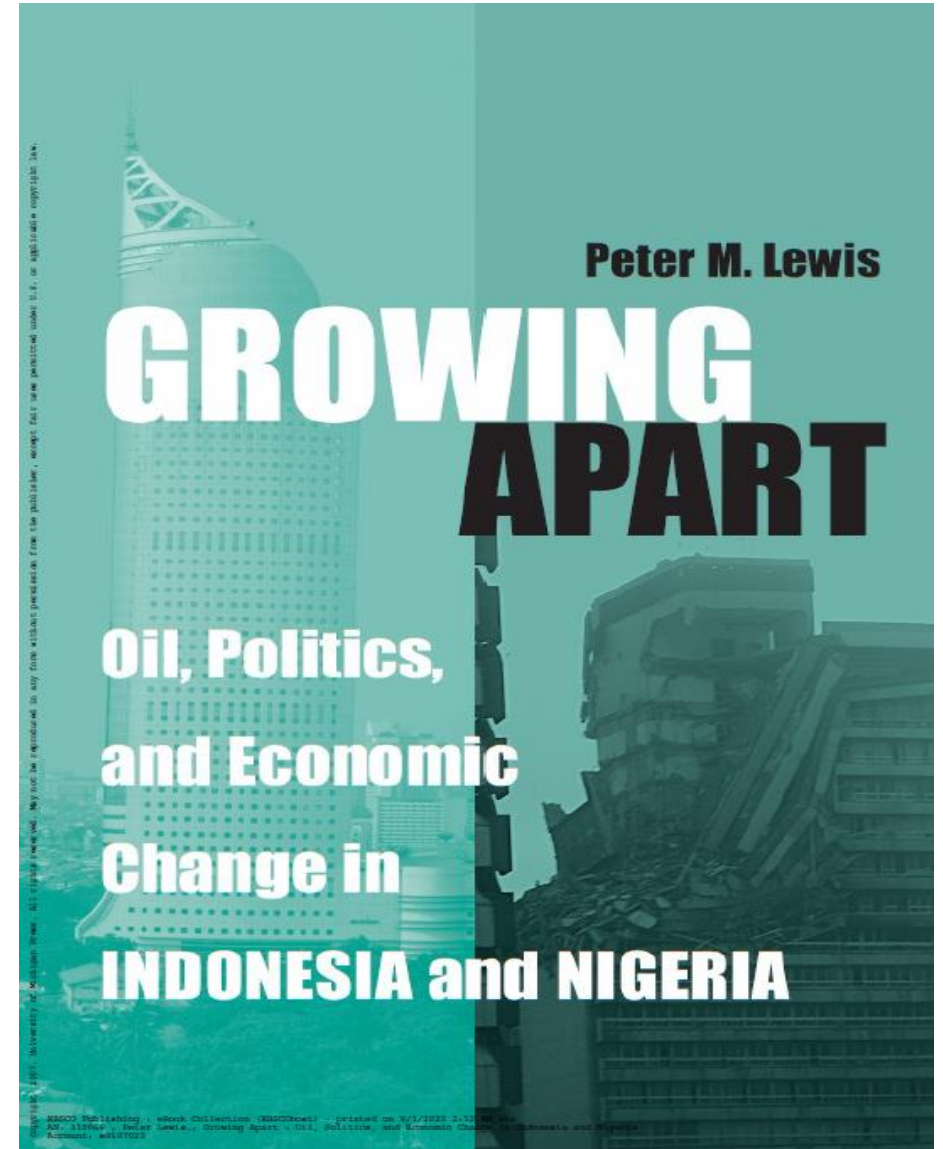
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# Introduction

- The capacity to collect revenues (fiscal capacity) is at the heart of state formation and is indispensable for the provision of public good and investments in infrastructures in less developed economies.
- Natural resources rents may reduce the incentives to invest in the tax system.
- The greater the expected amount of income from natural resources, the greater the incentives to substitute tax revenues with resource revenues, the lower fiscal capacity.
- A fiscal resource curse may materialise or not depending on whether political institutions can limit the power of the executive and on how easy it is to control or appropriate natural resources.

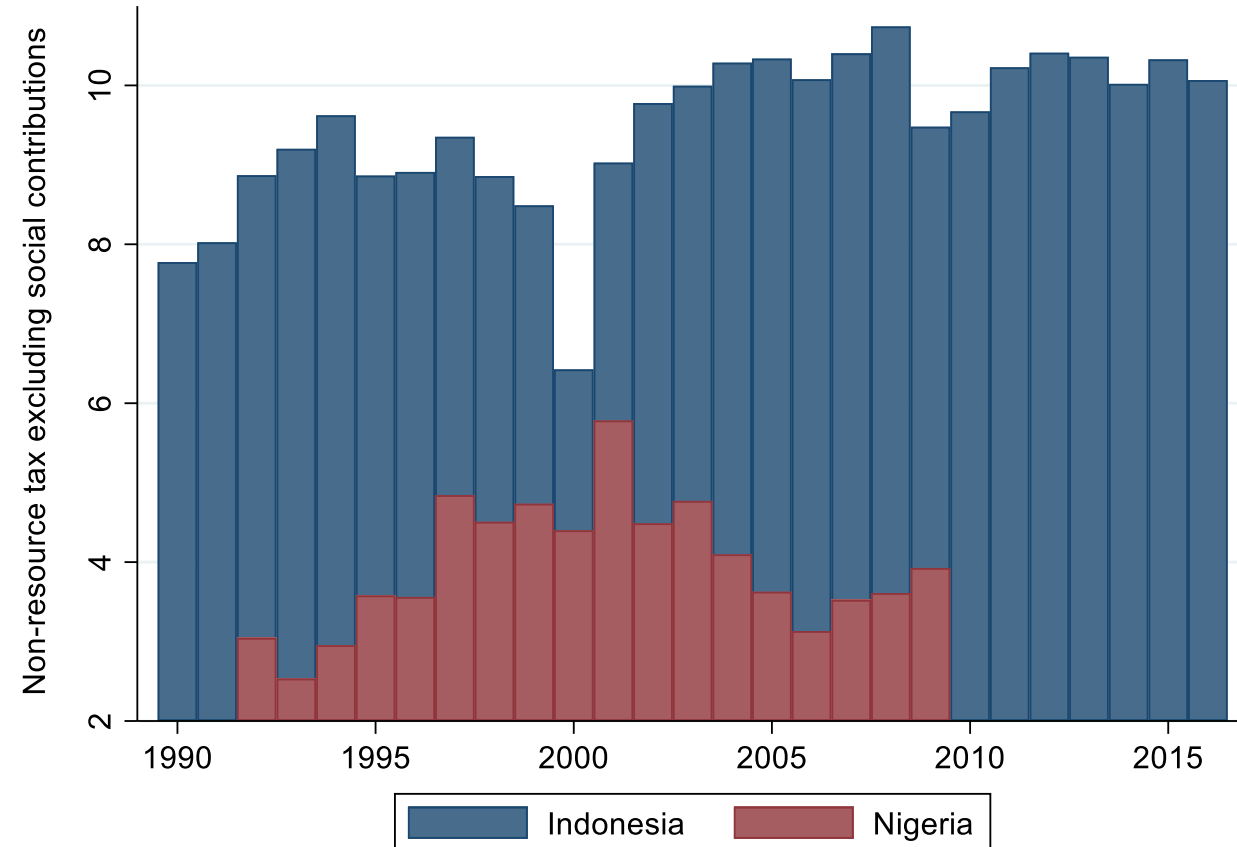
# Introduction

- Indonesia and Nigeria are both populous countries with culturally diverse communities, and both are major oil exporters.
- After the OPEC inspired oil price hikes of 1973-1974, both countries experienced large windfalls from oil in the same period.
- Both Indonesia and Nigeria were authoritarian regimes for the initial period of the resource windfall and for much of the 1970s and 1980s.

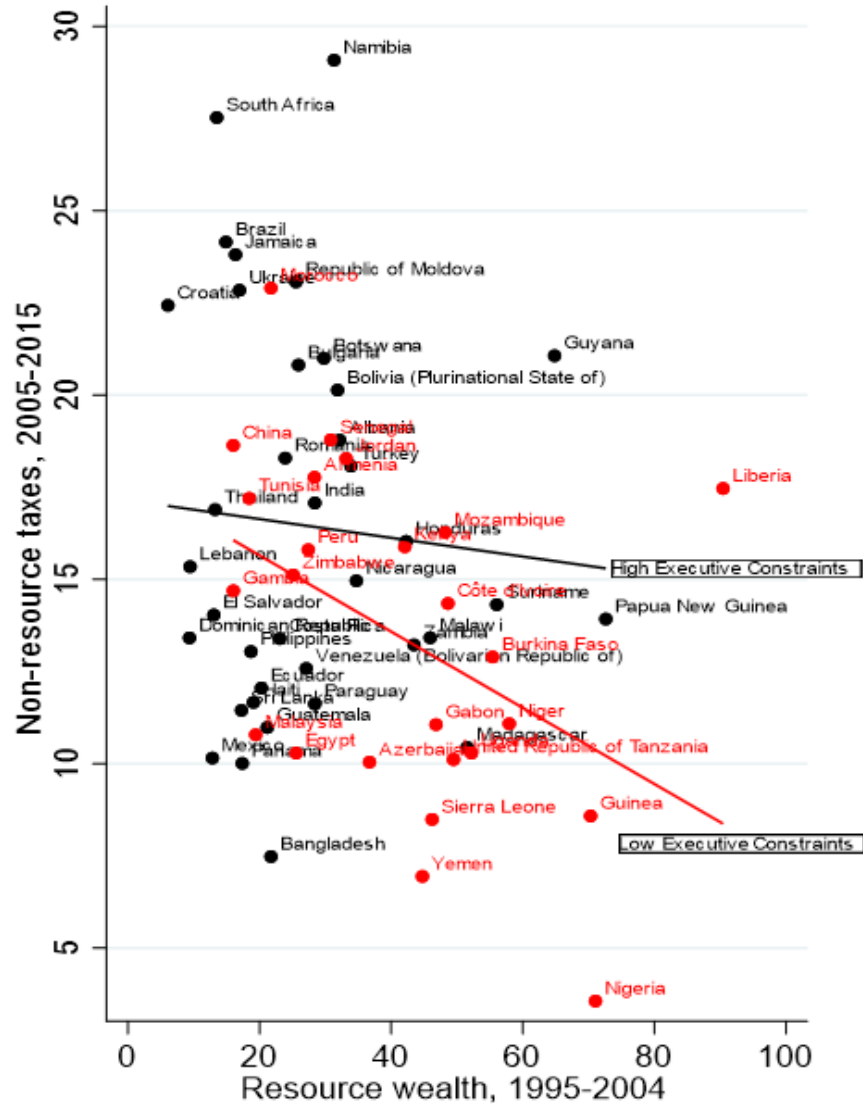
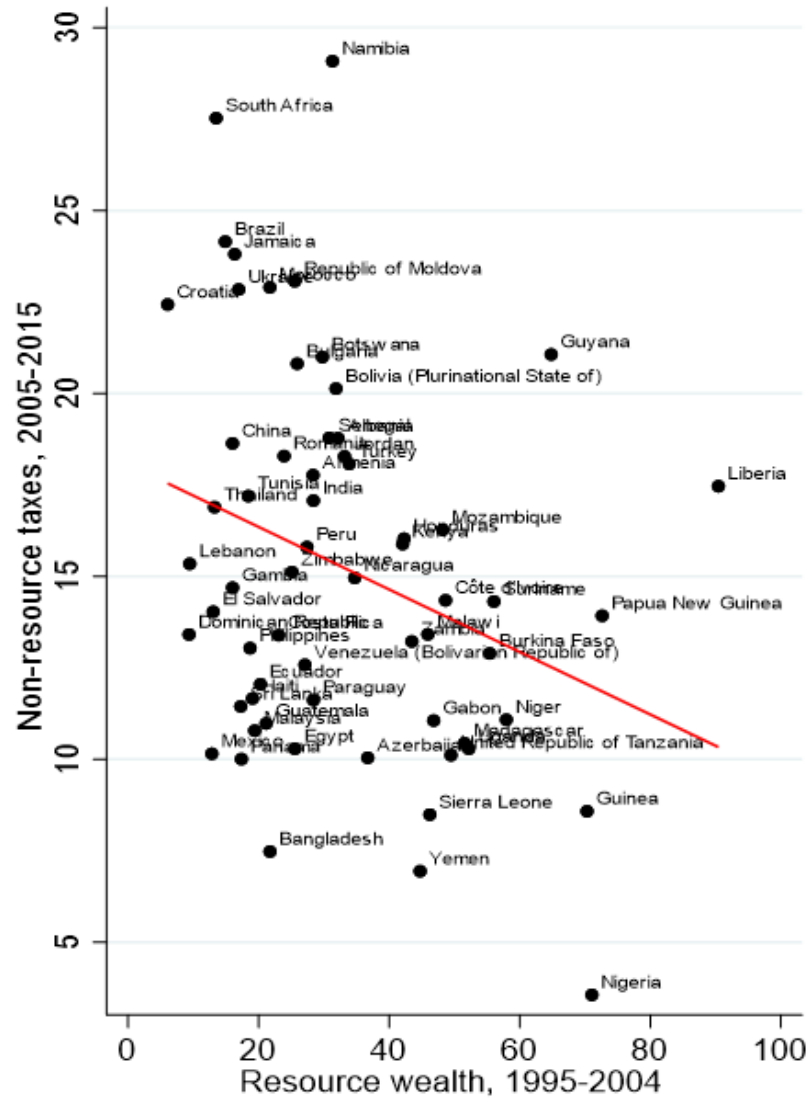


# Introduction

- The outcomes with respect to non-resource taxes were quite different for these two countries.
- There was an important difference in the level of constraints to the executive in the two countries.



# Introduction



# Hypotheses

- The negative effect of natural resources rents on the incentives to invest in fiscal capacity depends on:
  - i. whether countries have political institutions limiting the power of the executive;
  - ii. how it is easy for the rulers to appropriate natural resources rents.

# Resource rents and fiscal capacity

- Governments discovering natural resources see a reduced incentive to invest in the revenue administration, because the availability of natural resources endowments provide a new and easy-to-obtain source of revenues, compared to value-added tax and income taxes (Besley and Persson, 2011).
- Empirical evidence from previous studies is limited:
  - Knack (2009) presents cross-section evidence partly consistent with this hypothesis.
  - Jensen (2011) provides evidence from a panel of thirty hydrocarbon-rich economies, finding that a 1% increase in hydrocarbon revenues is associated with a 1.5% decrease in non-resource tax effort, used as a proxy for fiscal capacity.
  - Bornhorst et al. (2009), on a similar sample of countries and variables, finds a smaller effect: an additional percentage point of revenue from hydrocarbons reduces revenues from other domestic sources by 0.19 percentage points of GDP.

# The role of institutions

- The presence of accountability mechanisms for state leadership can neutralize the perverse incentives that resource rents create for patronage spending.
- When subject to institutionalized checks and balances, a ruler has less discretion over public finance decisions.
- A political leader operating under a system of checks and balances is subject to the scrutiny of public finance institutions.
- Case studies from Africa and Latin America confirm that the emergence of a natural resources sector is not incompatible with the development of state institutions, depending on the type of political coalitions ruling during a resource boom (Peres-Cajías, 2015; Peres-Cajías et al., 2022).



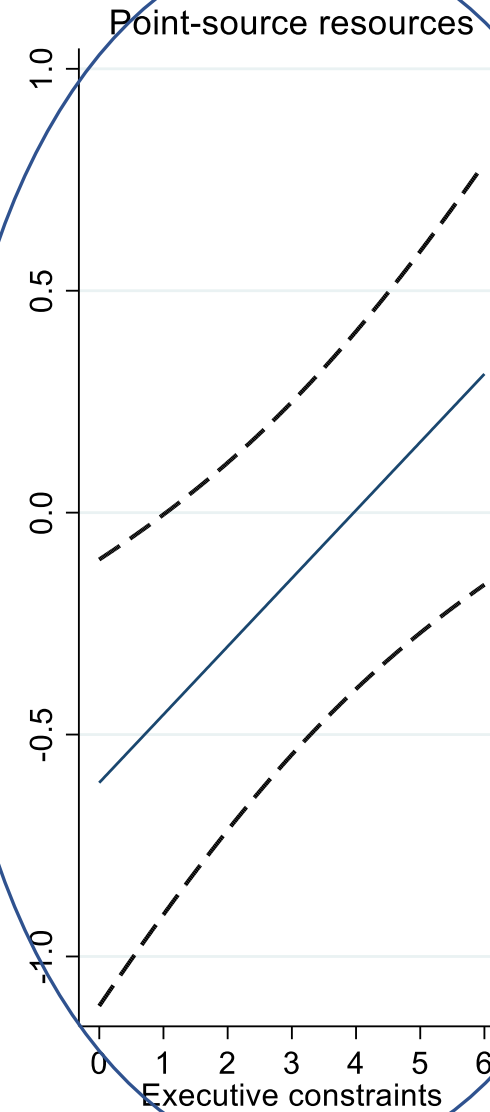
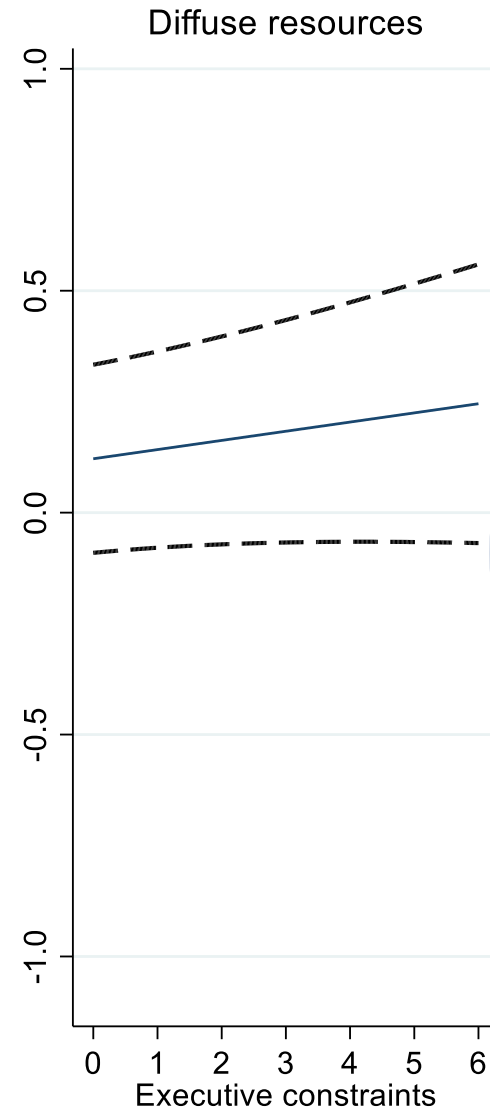
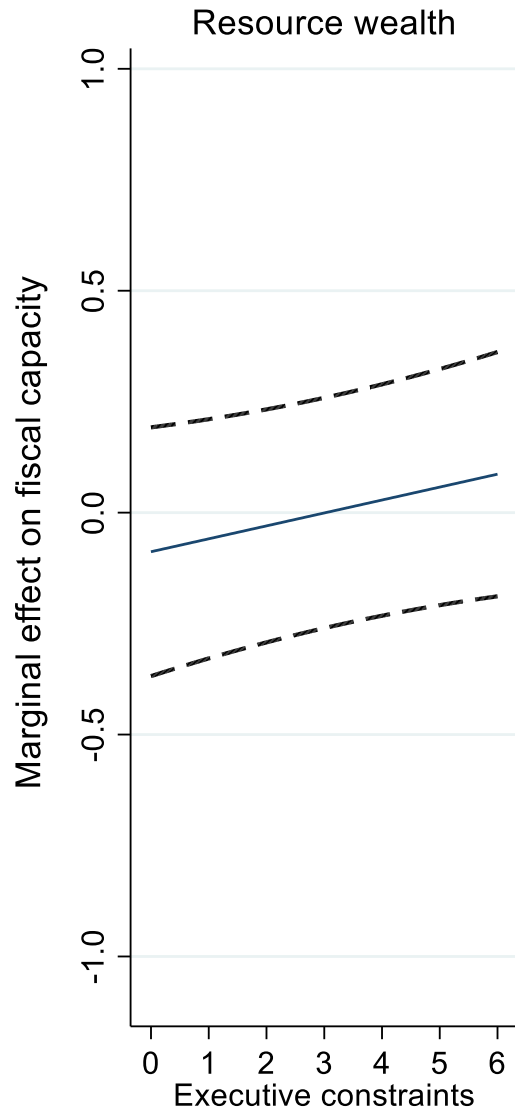
# Type of resources

- Some natural resources may be more susceptible than others to a fiscal resource curse.
- Resources extracted from a narrow geographical base (point-source resources) are easier to control and appropriate for political elites, thus, they offer a greater incentive to substitute taxation with resource revenues (Isham et al., 2005).
- Resource extracted from a broad geographical base (*diffuse natural resources*), are less easy to control and less prone to incentivise such substitution .
- The recent literature, rather than focussing on the geographical characteristics, considers the appropriability of natural resources in terms of appropriability by the state (Vahabi, 2018).
- Incumbent governments will face a stronger incentive to finance state activities via resource rents when it is easier to appropriate the revenues from a specific resource.

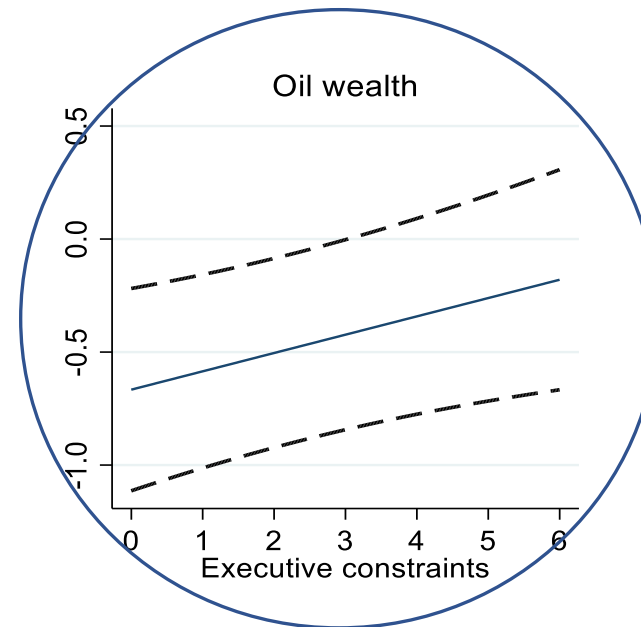
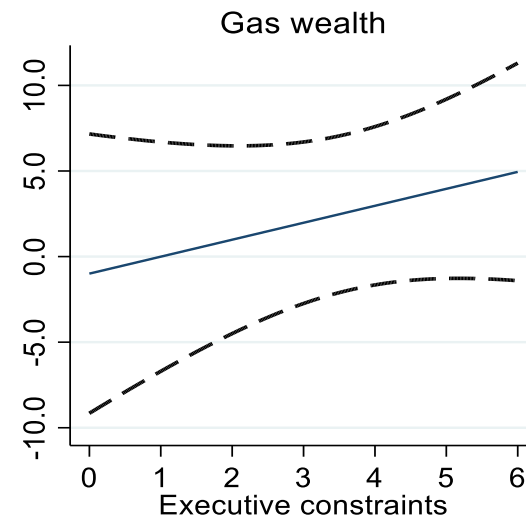
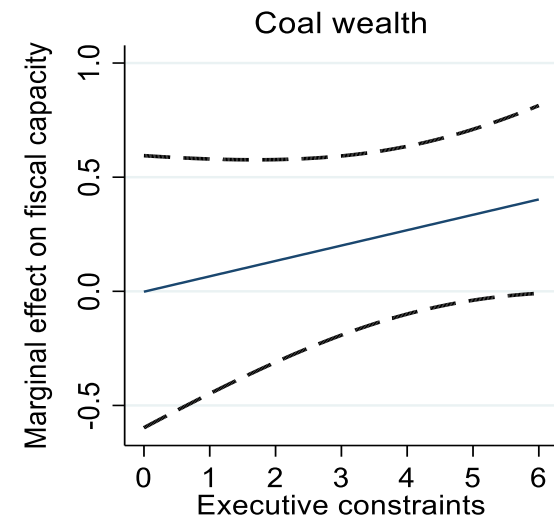
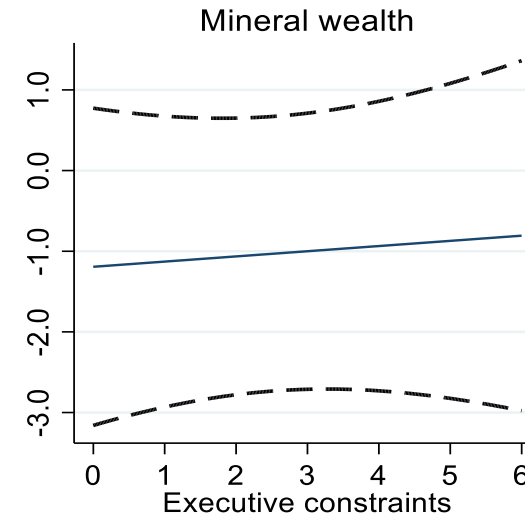
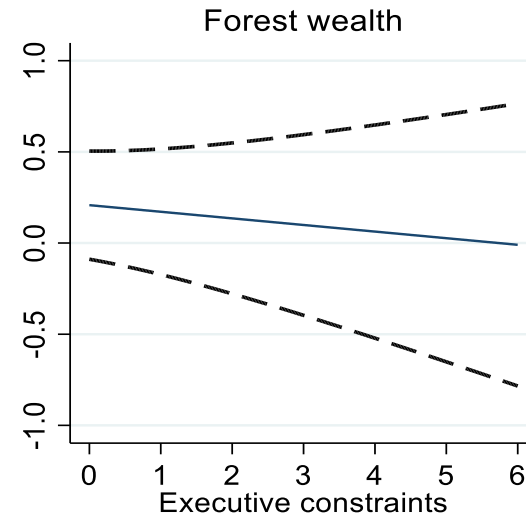
# Empirical strategy

- We use panel analysis covering the period 1995-2015 for 62 developing countries.
- Fiscal capacity is measured as *Non-resource taxes on income, profit, and capital gains / Total (non-resource) tax revenues* (data from ICTD/UNU-WIDER, 2019).
- Resource rents is given by the *share of natural capital wealth over total wealth* (averaged over t-4 to t-1, data from Wealth Accounting dataset).
- The quality of political institutions is captured by *Executive constraints* (at time t-4, data from Polity IV).

# Results - Marginal effects



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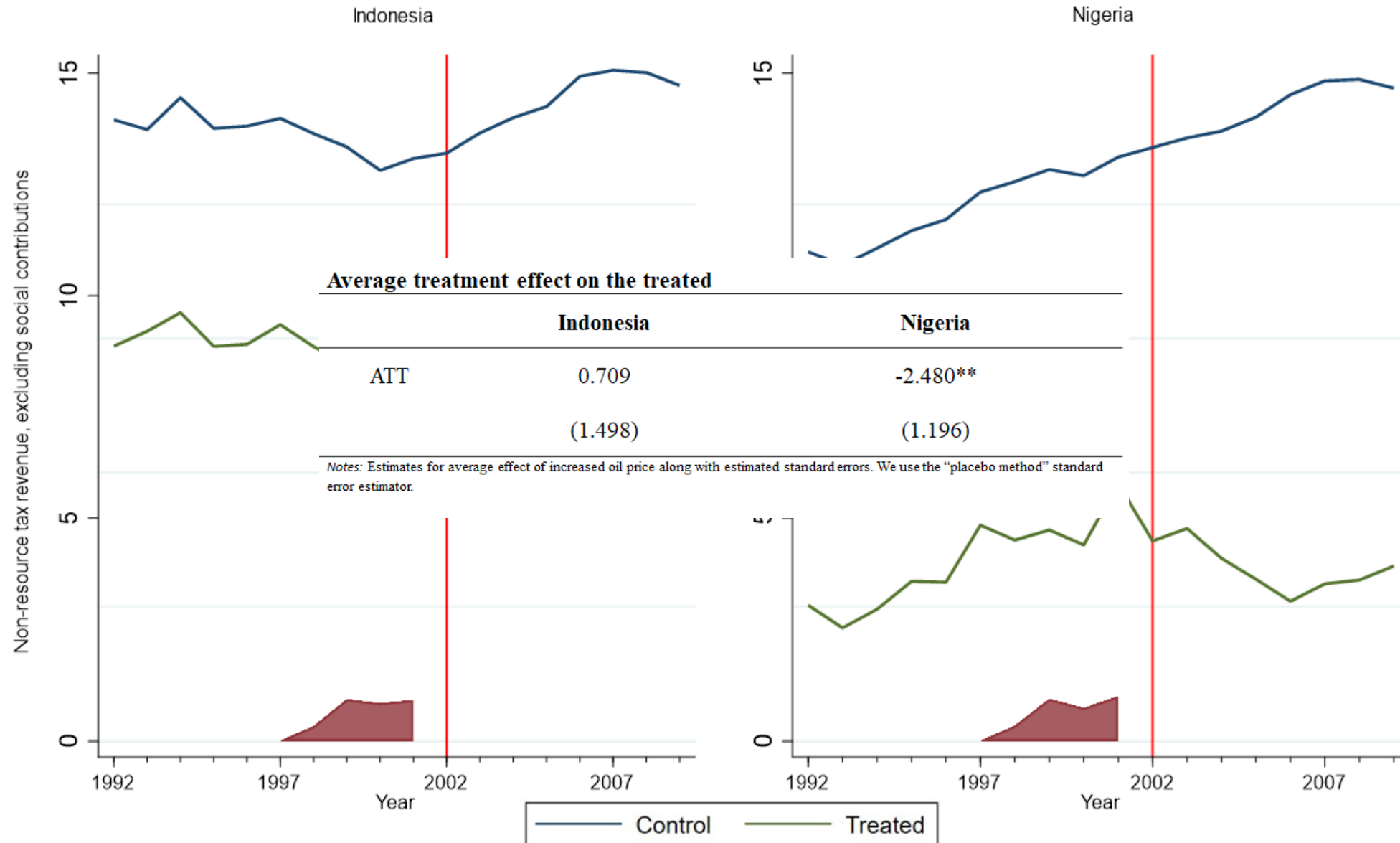
# Robustness checks

- We conduct a series of robustness checks:
  - Adding further controls.
  - Using three alternative dependent variables:
    - Non-resource tax revenues as a share of GDP
    - $(\text{Income taxes} + \text{VAT taxes}) / \text{Total taxes}$
    - $(\text{Income taxes} + \text{VAT taxes}) / \text{GDP}$
  - Excluding from the sample all OPEC members.
  - Excluding from the sample countries accounting for more than 3% of total world production of a certain commodity.

# Synthetic Difference-in-Differences

- Exploiting the oil price boom that began in 2002 as a natural experiment, we provide counterfactual inference based on Synthetic Difference-in-Differences (SDID, Arkhangelsky et al. 2021).
- SDID builds on insight behind the difference-in-differences and synthetic control methods.
- It allows a neat comparison between contexts of high- and low-executive constraints by producing country-specific evidence for those oil-rich economies that display different levels of executive constraints.
- We focus on the effect on non-resource tax levels in Indonesia and Nigeria, relative to a sample of resource-poor countries, following the oil price boom that began in 2002.

# Synthetic Difference-in-Differences



# Conclusions

- The paper offers two main findings:
  - i. point-source resources* are negatively associated with fiscal capacity, while *diffuse resources* are not;
  - ii. developing economies with political institutions placing institutionalised constraints on the executive power can neutralise the negative effect of point-source resources on fiscal capacity.*
- In policy terms, our findings indicate that, in polities providing strong checks and balances on the executive power, it is possible to develop both fiscal capacity and the natural resources sector, without any trade-off.



# Thank you!

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# Empirical strategy

- We use panel analysis covering the period 1995-2015 for 62 developing countries:

$$FC_{it} = b_0 + b_1 RR_{i,t-\bar{bar}} + b_2 EC_{i,t-4} + b_3 RR_{i,t-\bar{bar}} EC_{i,t-4} + \mathbf{b}X_{i,t-\bar{bar}} + \mu_i + \lambda_t + u_{i,t}$$

- $FC_{it}$  : Fiscal capacity: *Non-resource taxes on income, profit, and capital gains / Total (non-resource) tax revenues* (GRD-ICTD/UNU-WIDER)
- $RR_{i,t-\bar{bar}}$  : Resource wealth averaged over t-4 to t-1 (WBWA)
- $EC_{i,t-4}$  : Executive constraints at time t-4 (Polity IV)
- $X_{i,t-\bar{bar}}$  : Time-varying controls averaged over t-4 to t-1:
  - Political stability (Polity IV)
  - Population density (WBI)
  - External conflict (ICRG)
  - Internal conflict (ICRG)
  - External debt (WBI)
  - Trade (WBI)
  - Net ODA and aid per capita (WBI)

# Results

## Fiscal Capacity and Resource wealth

	(1)	(2)	(3)	(4)
	All Resources	Diffuse Resources	Point-source Resources	Diffuse and Point-source Resources
Executive constraints	-0.006 (0.007)	0.002 (0.006)	-0.003 (0.005)	-0.008 (0.008)
Resource wealth	-0.088 (0.167)			
Resource wealth*Exec. constraints	0.029 (0.020)			
Diffuse resources		0.112 (0.153)		0.121 (0.126)
Diffuse resources*Exec. constraints		0.008 (0.021)		0.021 (0.019)
Point-source resources			-0.597* (0.303)	-0.608** (0.300)
Point-source res.*Exec. constraints			0.140** (0.054)	0.153*** (0.057)
Observations	213	213	213	213
Number of countries	62	62	62	62
Joint(p)	0.341	0.658	0.0388	0.0091
Adjusted R-squared	0.409	0.404	0.453	0.457
Year FE	YES	YES	YES	YES
Country FE	YES	YES	YES	YES

Notes: The dependent variable is fiscal capacity measured as non-resource income tax as a percentage of non-resource total tax revenue. Robust standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

# Results

**Table 3 – Marginal effects of resource wealth at different levels of *executive constraints***

Executive Constraints	All Resources	Diffuse Resources	Point-source Resources
	b/se	b/se	b/se
0	-0.088 (0.17)	0.121 (0.13)	-0.608** (0.30)
1	-0.059 (0.16)	0.142 (0.13)	-0.455* (0.27)
2	-0.03 (0.16)	0.163 (0.14)	-0.302 (0.25)
3	-0.001 (0.15)	0.183 (0.15)	-0.148 (0.24)
4	0.028 (0.16)	0.204 (0.16)	0.005 (0.24)
5	0.058 (0.16)	0.225 (0.17)	0.159 (0.26)
6	0.087 (0.16)	0.245 (0.19)	0.312 (0.28)

Notes: The marginal effects of diffuse and point-source resources are calculated using the coefficients from Table 2, Column 4

# Results

**Table 5 – Marginal effects of resource wealth at different levels of executive constraints**

Executive Constraints	Agric. wealth b/se	Forest wealth b/se	Mineral wealth b/se	Coal wealth b/se	Oil wealth b/se	Gas wealth b/se
0	-0.087 (0.15)	0.208 (0.18)	-0.002 (0.35)	-1.193 (1.17)	-0.667** (0.27)	-0.993 (4.84)
1	-0.032 (0.15)	0.172 (0.2)	0.066 (0.31)	-1.129 (1.07)	-0.585** (0.25)	-0.003 (3.98)
2	0.024 (0.16)	0.135 (0.25)	-0.133 (0.26)	-1.064 (1.02)	-0.504** (0.25)	0.988 (3.26)
3	0.079 (0.16)	0.099 (0.29)	0.201 (0.23)	-1.00 (1.02)	-0.423* (0.25)	1.979 (2.8)
4	0.134 (0.17)	0.063 (0.35)	0.268 (0.22)	-0.936 (1.07)	-0.342 (0.26)	2.969 (2.74)
5	0.189 (0.18)	0.027 (0.4)	0.335 (0.22)	-0.872 (1.16)	-0.261 (0.27)	3.96 (3.11)
6	0.244 (0.2)	-0.01 (0.46)	0.403* (0.24)	-0.807 (1.29)	-0.18 (0.29)	4.951 (3.77)

Notes: The marginal effects of diffuse and point-source resources are calculated using the estimates from Table 4, Column 7.

# Robustness checks

## Marginal effects of point-source resources at different levels of *executive constraints*: Robustness checks

Executive Constraints	Adding further controls	Excluding big producers	Excluding OPEC countries	Random Effects
	b/se	b/se	b/se	b/se
0	-0.657*** (0.25)	-0.692** (0.3)	-0.789* (0.47)	-0.436*** (0.15)
1	-0.535** (0.22)	-0.511* (0.27)	-0.694* (0.38)	-0.275** (0.13)
2	-0.413** (0.2)	-0.331 (0.27)	-0.599** (0.3)	-0.114 (0.12)
3	-0.29 (0.2)	-0.15 (0.28)	-0.504* (0.26)	0.047 (0.12)
4	-0.168 (0.21)	0.03 (0.31)	-0.409 (0.27)	0.207 (0.14)
5	-0.046 (0.24)	0.21 (0.36)	-0.314 (0.32)	0.368** (0.17)
6	0.076 (0.28)	0.391 (0.41)	-0.219 (0.4)	0.529*** (0.20)

Notes: The marginal effects of diffuse and point-source resources are calculated using the coefficients from full specifications

# Robustness checks

## Marginal effects of point-source resources at different levels of executive constraints.

Executive Constraints	Total Non-resource taxes/GDP	(Income+VAT taxes)/Total non-resource taxes	(Income+VAT taxes)/GDP
	b/se	b/se	b/se
0	-0.144** (0.07)	-1.198*** (0.15)	-0.140*** (0.05)
1	-0.120** (0.06)	-1.046*** (0.24)	-0.127*** (0.05)
2	-0.097* (0.06)	-0.895*** (0.28)	-0.114** (0.05)
3	-0.073 (0.06)	-0.744* (0.38)	-0.101* (0.06)
4	-0.05 (0.07)	-0.592 (0.52)	-0.088 (0.07)
5	-0.026 (0.08)	-0.441 (0.66)	-0.075 (0.09)
6	-0.002 (0.1)	-0.290 (0.81)	-0.062 (0.11)

Notes: The marginal effects of diffuse and point-source resources are calculated using the coefficients from full specifications



# Synthetic Dif-in-Dif

- We focus on the effect on non-resource tax levels in Indonesia and Nigeria, relative to a sample of resource-poor countries, following the oil price boom that began in 2002.
- We first determine weights  $\hat{\omega}$  which align the pre-exposure trends of the outcome of interest in the control units with those observed in the treated units:

$$\sum_{i=1}^{N_{co}} \hat{\omega}_i^{SDID} Y_{it} \approx Y_{1t} \quad t = 1, \dots, T_{pre}$$

- Then we search for time weights  $\hat{\lambda}$  that balance the pre-exposure and post-exposure time periods.
- Finally, we employ a two-way fixed effects regression to estimate the average causal effect of oil revenues

$$(\hat{\tau}^{SDID}, \hat{\mu}, \hat{\alpha}, \hat{\beta}) = \arg \min \left\{ \sum_{i=1}^N \sum_{t=1}^T (Y_{it} - \mu - \alpha_i - \beta_t - W_{it}\tau)^2 \hat{\omega}_i \hat{\lambda}_t \right\}$$

# Synthetic Dif-in-Dif

