

Oil Rents and State Economic Policy

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The “resource curse”

- Link between large natural resource rents and low economic growth.
 - Cross-Country (Sachs & Werner, 2001).
 - Within the United States (James & Aadland, 2011), Papyrakis & Gerlagh, 2007).
- One potential channel for that relationship is a decline in the quality of institutions (e.g., through rent-seeking).
- We provide the first state-level examination of that relationship b/w resource abundance and institutions.

Secondary Contributions

- Small but growing literature examines the determinants of institutions (measured by “economic freedom”).
- Contribute to the literature on the growth of government.
- We provide the first state-level examination of that relationship that incorporates resource abundance.

Literature

- Contested rents associated with resource abundance may lead to institutional deterioration (Ross, 2015).
- Extensive cross-country literature suggesting a institutional channel for the resource curse.
 - Diminished political rights (Caselli & Tesei, 2015).
 - Increased corruption (Busse & Groning, 2013).
 - Reduced bureaucratic quality (Blanco, Nugent, O'Connor, 2015).
 - Increased propensity for violent conflict (Lei and Michaels, 2014).
- Negative effect of oil rents may be mitigated by high quality economic and political institutions. (Farhadi, Islam, & Moslehi, 2015; Mehlum et al., 2006; O'Reilly & Murphy, 2017).

Literature (cont.)

- O'Reilly and Murphy (2017) found that oil discoveries have no discernable relationship with the overall measure of economic institutions at the country level.
 - Used *Economic Freedom of the World* index (Gwartney, Lawson, & Hall) as measure of institutions.
 - Weak evidence of short run effect of fiscal policy.
- We test the relationship between oil abundance and economic policy using a panel of 50 US states over the period 1981-2014.

Institutions Data

- Institutions are measured with the *Economic Freedom of North America* (EFNA) index (Stansel, Torra, and McMahon, 2016).
- We refer to it as “economic policy” since “economic freedom” may not adequately capture “institutions.”
- EFNA has 10 variables across three areas:
 - 1) government spending
 - 2) taxes
 - 3) labor market freedom
- We use the overall index and the three areas.

Natural Resource Data

- U.S. Energy Information Administration:
 - Oil production
 - Oil reserves
- To measure the economic value we calculate:

$$\text{value of production per capita}_{it} = \frac{\text{onshore production}_{it} * P_t * \left(\frac{100}{CPI_t}\right)}{\text{population}_{it}}$$

$$\text{value of reserves per capita}_{it} = \frac{\text{onshore reserves}_{it} * P_t * \left(\frac{100}{CPI_t}\right)}{\text{population}_{it}}$$

- P_t : the annual average spot price for a barrel of West Texas Intermediate crude oil.
- Production per capita: Thousands of dollars per person
- Reserves per capita: Millions of dollars per person

Control Variables

Following literature on the determinants of state economic freedom, we include variables to control for important characteristics of the median voter:

- 1) Real per capita personal income
- 2) Real GDP
- 3) Partisan Voting Index (created by Jason Sorens): positive values indicate a state leans Democratic, negative values indicate it leans Republican.
- 4) Percentage of population with a college degree
- 5) Poverty rate
- 6) Gini coefficient
- 7) Unemployment rate

Methodology

- We regress each measure of $\Delta Policy_{it}$ on the lagged measure of oil_{it} .
- Our baseline model is:
 - $\Delta Policy_{it} = \beta oil_{it-1} + \delta Policy_{it-1} + \gamma X_{it} + \tau_t + \mu_i + \varepsilon_{it}$
 - X_{it} : set of control variables.
 - τ_t : period fixed effects.
 - μ_i : state fixed effects.
- Each estimate is conducted using data averaged over: 4, 8 and 16 years.
- Oil rents are measured two ways:
 - The value of oil *production* per capita.
 - The value of oil *reserves* per capita.

State Economic Policy Regressed on Oil Production Per Capita: Cross-section Results (16-year averages)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES	Full	Full	Expend	Expend	Tax	Tax	Labor	Labor
Production Per Capita	-0.0031***	-0.0017	-0.0135***	-0.0149***	0.0083***	0.0080**	-0.0045***	-0.0010
	(0.0006)	(0.0023)	(0.0013)	(0.0038)	(0.0006)	(0.0032)	(0.0009)	(0.0023)
Real GDP per capita		-0.0000		0.0000		0.0000		-0.0000
		(0.0000)		(0.0000)		(0.0000)		(0.0000)
Real Income		-0.0000		-0.0000		-0.0000		0.0000
		(0.0000)		(0.0000)		(0.0000)		(0.0000)
Partisan Value Index		0.0088		0.0022		0.0059		0.0074
		(0.0071)		(0.0120)		(0.0106)		(0.0090)
College Graduate		-0.0225		-0.0447		-0.0336		-0.0084
		(0.0320)		(0.0587)		(0.0491)		(0.0373)
Poverty Rate		-0.0273		-0.0251		-0.0255		-0.0128
		(0.0250)		(0.0361)		(0.0316)		(0.0212)
Unemployment Rate		0.0273		0.0200		0.0309		0.0335
		(0.0379)		(0.0605)		(0.0423)		(0.0420)
Gini		-0.8384		-0.1760		1.0612		-3.6585
		(3.5130)		(4.3606)		(3.8253)		(3.8011)
Lag Dependent Var.	0.7685***	0.8349***	0.7675***	0.7862***	0.6678***	0.6837***	0.8100***	0.9604***
	(0.0501)	(0.0546)	(0.0783)	(0.0933)	(0.0519)	(0.0677)	(0.0517)	(0.0900)
Observations	50	50	50	50	50	50	50	50
R-squared	0.8621	0.8845	0.8772	0.8855	0.7924	0.8038	0.7904	0.8547

State Economic Policy Regressed on Oil Production Per Capita: Panel Fixed Effects (8-year averages)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES	Full	Full	Expend	Expend	Tax	Tax	Labor	Labor
Production Per Capita	-0.0011 (0.0008)	0.0012 (0.0024)	-0.0007 (0.0022)	-0.0043 (0.0042)	-0.0041*** (0.0015)	-0.0002 (0.0029)	0.0008 (0.0011)	0.0056* (0.0030)
Real GDP per capita		-0.0000* (0.0000)		0.0000 (0.0000)		-0.0001** (0.0000)		-0.0001*** (0.0000)
Real Income		-0.0000 (0.0000)		-0.0000 (0.0000)		-0.0000 (0.0000)		-0.0000 (0.0000)
Partisan Value Index		0.0100* (0.0051)		0.0118 (0.0087)		0.0135 (0.0095)		0.0013 (0.0077)
College Graduate		-0.0045 (0.0283)		-0.0289 (0.0499)		0.0381 (0.0318)		-0.0311 (0.0321)
Poverty Rate		0.0554*** (0.0163)		0.1477*** (0.0280)		0.0365* (0.0207)		-0.0152 (0.0181)
Unemployment Rate		-0.0063 (0.0206)		0.0001 (0.0447)		-0.0287 (0.0229)		-0.0122 (0.0189)
Gini		-2.3024 (1.9873)		-3.5085 (3.5023)		-2.7519 (2.6204)		-0.8696 (2.6082)
Lag Dependent Var.	-0.8943*** (0.1020)	-0.6702*** (0.0661)	-0.8195*** (0.1387)	-0.6876*** (0.1205)	-0.8390*** (0.0910)	-0.7996*** (0.0728)	-0.8467*** (0.1475)	-0.7744*** (0.1661)
Observations	150	150	150	150	150	150	150	150
R-squared	0.6719	0.7854	0.5413	0.6897	0.6812	0.7520	0.8369	0.8976
Number of States	50	50	50	50	50	50	50	50

State Economic Policy Regressed on Oil Production Per Capita: Panel Fixed Effects (4-year averages)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES	Full	Full	Expend	Expend	Tax	Tax	Labor	Labor
Production Per Capita	-0.0026*** (0.0008)	-0.0000 (0.0007)	-0.0067*** (0.0013)	-0.0048*** (0.0015)	-0.0007 (0.0009)	0.0029** (0.0013)	-0.0018 (0.0012)	0.0004 (0.0012)
Real GDP per capita		-0.0000*** (0.0000)		-0.0000 (0.0000)		-0.0000*** (0.0000)		-0.0000** (0.0000)
Real Income		-0.0000 (0.0000)		-0.0000 (0.0000)		-0.0000* (0.0000)		-0.0000 (0.0000)
Partisan Value Index		0.0001 (0.0033)		0.0019 (0.0065)		0.0022 (0.0043)		-0.0084 (0.0052)
College Graduate		-0.0215* (0.0127)		-0.0512** (0.0253)		-0.0058 (0.0167)		-0.0106 (0.0187)
Poverty Rate		0.0328*** (0.0094)		0.0774*** (0.0183)		0.0212 (0.0127)		-0.0028 (0.0096)
Unemployment Rate		-0.0083 (0.0153)		0.0065 (0.0391)		-0.0262 (0.0171)		-0.0080 (0.0110)
Gini		-0.9635 (0.6426)		-0.3030 (1.7003)		-0.1799 (0.7782)		-2.2002** (0.9457)
Lag Dependent Var.	-0.5251*** (0.0420)	-0.4682*** (0.0507)	-0.4669*** (0.0552)	-0.4114*** (0.0670)	-0.5428*** (0.0507)	-0.5493*** (0.0456)	-0.4798*** (0.0515)	-0.5735*** (0.0701)
Observations	350	350	350	350	350	350	350	350
R-squared	0.6758	0.7224	0.6583	0.7047	0.5446	0.5943	0.8413	0.8642
Number of States	50	50	50	50	50	50	50	50

State Economic Policy Regressed on Oil Reserves Per Capita: Cross-section Results (16-year averages)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES	Full	Full	Expend	Expend	Tax	Tax	Labor	Labor
Reserves Per Capita	-0.5125***	-0.3238	-2.1757***	-2.4851***	1.3205***	1.2957**	-0.7480***	-0.2380
	(0.1015)	(0.3595)	(0.2221)	(0.5721)	(0.1013)	(0.4895)	(0.1663)	(0.3667)
Real GDP per capita		-0.0000		0.0000		-0.0000		-0.0000
		(0.0000)		(0.0000)		(0.0000)		(0.0000)
Real Income		-0.0000		-0.0000		-0.0000		0.0000
		(0.0000)		(0.0000)		(0.0000)		(0.0000)
Partisan Value Index		0.0083		0.0008		0.0063		0.0069
		(0.0070)		(0.0116)		(0.0103)		(0.0089)
College Graduate		-0.0235		-0.0459		-0.0340		-0.0097
		(0.0321)		(0.0572)		(0.0485)		(0.0366)
Poverty Rate		-0.0252		-0.0188		-0.0276		-0.0103
		(0.0247)		(0.0343)		(0.0322)		(0.0214)
Unemployment Rate		0.0266		0.0169		0.0316		0.0329
		(0.0377)		(0.0597)		(0.0422)		(0.0418)
Gini		-0.9245		-0.3931		1.1064		-3.7661
		(3.5082)		(4.2856)		(3.8206)		(3.7992)
Lag Dependent Var.	0.7676***	0.8320***	0.7670***	0.7805***	0.6669***	0.6838***	0.8087***	0.9575***
	(0.0496)	(0.0537)	(0.0775)	(0.0908)	(0.0519)	(0.0669)	(0.0506)	(0.0889)
Observations	50	50	50	50	50	50	50	50
R-squared	0.8636	0.8851	0.8811	0.8890	0.7925	0.8047	0.7931	0.8553

State Economic Policy Regressed on Oil Reserves Per Capita: Panel Fixed Effects (8-year averages)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES	Full	Full	Expend	Expend	Tax	Tax	Labor	Labor
Reserves Per Capita	-0.1399	0.2462	0.0117	-0.3065	-0.6025***	-0.0585	0.1037	0.7338
	(0.1051)	(0.3710)	(0.3271)	(0.6041)	(0.2058)	(0.4362)	(0.1610)	(0.4504)
Real GDP per capita		-0.0000*		0.0000		-0.0001**		-0.0001**
		(0.0000)		(0.0000)		(0.0000)		(0.0000)
Real Income		-0.0000		-0.0000		-0.0000		-0.0000
		(0.0000)		(0.0000)		(0.0000)		(0.0000)
Partisan Value Index		0.0100*		0.0115		0.0135		0.0014
		(0.0051)		(0.0089)		(0.0096)		(0.0077)
College Graduate		-0.0026		-0.0182		0.0373		-0.0347
		(0.0281)		(0.0487)		(0.0319)		(0.0319)
Poverty Rate		0.0541***		0.1423***		0.0370*		-0.0136
		(0.0165)		(0.0278)		(0.0208)		(0.0181)
Unemployment Rate		-0.0059		-0.0018		-0.0288		-0.0116
		(0.0207)		(0.0451)		(0.0230)		(0.0187)
Gini		-2.0796		-2.7613		-2.8282		-0.9846
		(2.0923)		(3.4323)		(2.6924)		(2.7189)
Lag Dependent Var.	-0.8950***	-0.6672***	-0.8307***	-0.6973***	-0.8378***	-0.8010***	-0.8451***	-0.7749***
	(0.1023)	(0.0665)	(0.1406)	(0.1219)	(0.0895)	(0.0722)	(0.1480)	(0.1666)
Observations	150	150	150	150	150	150	150	150
R-squared	0.6713	0.7860	0.5411	0.6865	0.6814	0.7520	0.8367	0.8958
Number of States	50	50	50	50	50	50	50	50

State Economic Policy Regressed on Oil Reserves Per Capita: Panel Fixed Effects (4-year averages)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES	Full	Full	Expend	Expend	Tax	Tax	Labor	Labor
Reserves Per Capita	-0.3198**	0.0470	-0.8271***	-0.5295**	-0.0568	0.5155**	-0.2809	-0.0510
	(0.1303)	(0.1161)	(0.2199)	(0.2490)	(0.1430)	(0.2140)	(0.1688)	(0.1756)
Real GDP per capita		-0.0000***		-0.0000		-0.0000***		-0.0000*
		(0.0000)		(0.0000)		(0.0000)		(0.0000)
Real Income		-0.0000		-0.0000		-0.0000*		-0.0000
		(0.0000)		(0.0000)		(0.0000)		(0.0000)
Partisan Value Index		0.0002		0.0021		0.0024		-0.0083
		(0.0033)		(0.0064)		(0.0044)		(0.0052)
College Graduate		-0.0212		-0.0513*		-0.0044		-0.0112
		(0.0129)		(0.0256)		(0.0171)		(0.0185)
Poverty Rate		0.0329***		0.0781***		0.0210		-0.0029
		(0.0094)		(0.0183)		(0.0127)		(0.0095)
Unemployment Rate		-0.0082		0.0050		-0.0259		-0.0073
		(0.0153)		(0.0388)		(0.0172)		(0.0111)
Gini		-0.9428		-0.4036		-0.0491		-2.2391**
		(0.6363)		(1.7921)		(0.8000)		(0.9373)
Lag Dependent Var.	-0.5245***	-0.4672***	-0.4737***	-0.4163***	-0.5392***	-0.5476***	-0.4797***	-0.5677***
	(0.0419)	(0.0509)	(0.0545)	(0.0668)	(0.0492)	(0.0448)	(0.0515)	(0.0710)
Observations	350	350	350	350	350	350	350	350
R-squared	0.6742	0.7225	0.6554	0.7030	0.5445	0.5951	0.8413	0.8643
Number of States	50	50	50	50	50	50	50	50

Results

- Oil reserves and oil production are most robustly associated with an increase in expenditure.
- Also evidence that oil rents are associated with lower taxation.
- Political process may split rents between interest groups.
 - Increase expenditure and cut taxes.
 - Consistent with the Peltzman (1976) view of interest groups and rent seeking.

Discussion

- Consistent with the results of O'Reilly and Murphy (2017):
 - Evidence that oil rents influence fiscal economic policy.
 - No evidence of influence on non-fiscal channels.
- Evidence of greater state expenditure contributes to literature on the increase in the size of government (Peltzman, 1980).