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The impact of oil exploitation on wellbeing in Chad

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Contents

Introduction

Oil exploitation is crucial for the chadian economic performance

- 88% of exports since 2004
- over 30% of GDP
- 75% of ordinary budget revenues

But in contrast:

- The country ranks 184th over 187 countries in 2013 according to its HDI
- 46.7% of Chadians live in extreme income poverty in 2011
- The depth of poverty is around 19.7% and, the gap between the rich and the poor has widened
- Important local disparities (among departments or counties)

Introduction (cont'd)

The issue of local resource curse

- Country's capacity to better manage and redistribute oil revenues across localities in order to reduce both poverty and inequality (economic wellbeing)

A better redistribution of oil revenues as a solution to face the local resource course issue

- The Law 001/PR/1999 constituted the legal framework for the management of oil rent taking into account future generation and priority sectors
- The government has set up the National Poverty Reduction Papers and established the National Development Plan (PND) to support the oil revenues management law in order to better reduce the poverty.
- The oil revenues allocated to the priority sectors have been invested for the building of different types of infrastructure in the different departments.

Research question and objective

Question

What is the local impact of oil revenues on multidimensional wellbeingin Chad

Objective

Assess the impact of oil revenues on multidimensional wellbeing at local (county) level in Chad

Data

The two last Chad Household Consumption and Informal Sector surveys (ECOSIT 2 & 3) conducted in 2003 and 2011 respectively by INSEED (National Institute of Statistics and Demographic Studies)

- these household surveys provide unique data sources to conduct analyses of non-monetary wellbeing in Chad
- their stratified sampling design also helps to cover all of the departments within the country
- Samples: 6,695 households in 2003 and 9,259 in 2011
- Offer an interesting pre-intervention (2003) and post-intervention (2011) analysis framework

The CCSRP organ provides data on the amounts of oil revenue allocated between departments since 2005

- 62 counties/departments after harmonization

Methodology (Cont'd)

1. A synthetic MDW index is first estimated using a MCA based on a welfare indicators (housing, education, health and durable goods)

2. The impact evaluation analysis framework :

- It is acknowledged that to better alleviate the resource curse and achieve development goals, natural resource governance requires redistribution mechanisms to be set up according to the development needs in different localities
- Assuming that development needs are highly correlated to the size of the population in each geographic unit (department), it is possible to consider a ratio for each department that indicates whether the redistribution policy has been favorable or not to its demographic needs

$$r_d = \frac{\dfrac{Oil\ Revenues\ Budget_{Department}}{Oil\ Revenues\ Budget_{National}}}{\dfrac{Population_{Department}}{Population_{National}}} = \frac{Oil_d}{Dem_d}$$

Departments (counties) treated $r_d \geq 1$

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Methodology (Cont'd)

DID estimation approach within a linear regression framework

$$Y_{dt} = \alpha + \gamma.T + \lambda.D_d + \delta.(T.D_d) + \beta.X_{dt} + \varepsilon_{dt}$$

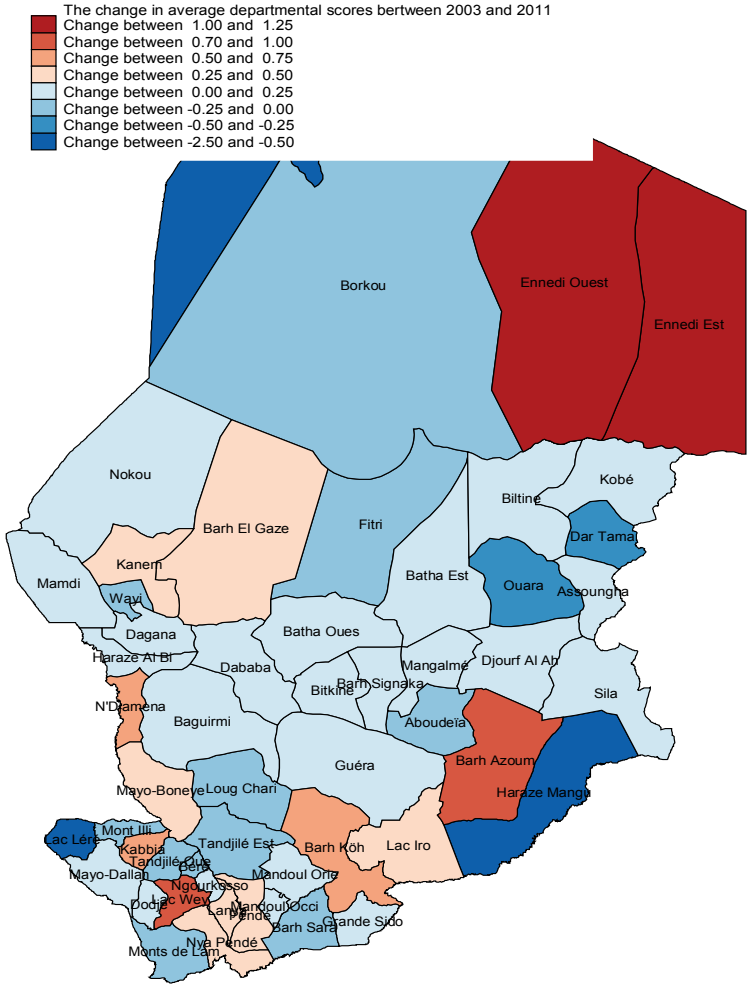
Assuming that the probability to be treated is independent from any observable characteristics of the recipient departments out of their respective demographic weights, the causal effect at the county level is given by $\boldsymbol{Y_d(1) - Y_d(0)}$

Variables	*N*	*Mean*	*S.D.*	*Min.*	*Max.*
MDW (average scores of multidimensional wellbeing index)	124	0.6799	0.5005	0.2682	3.2439
Time (0 = year 2003 ; 1 = year 2011)	124	0.5	0.5020	0	1
Ratio (computed r_d *ratio)*	124	0.8390	1.5270	0.2410	8.9378
Treatment (1 = treated ; 0 = untreated)	124	0.2419	0.4299	0	1
Density of population (habitants of department d */ km²)*	124	49.309	86.942	0.0206	620.07
Squared density of population	124	9929.4	40487.8	0.0004	384496
Distance from department d *to N'Djamena (km²)*	124	441.17	251.033	0	1080.79
Squared distance to N'Djamena	124	257143	286739	0	1168119

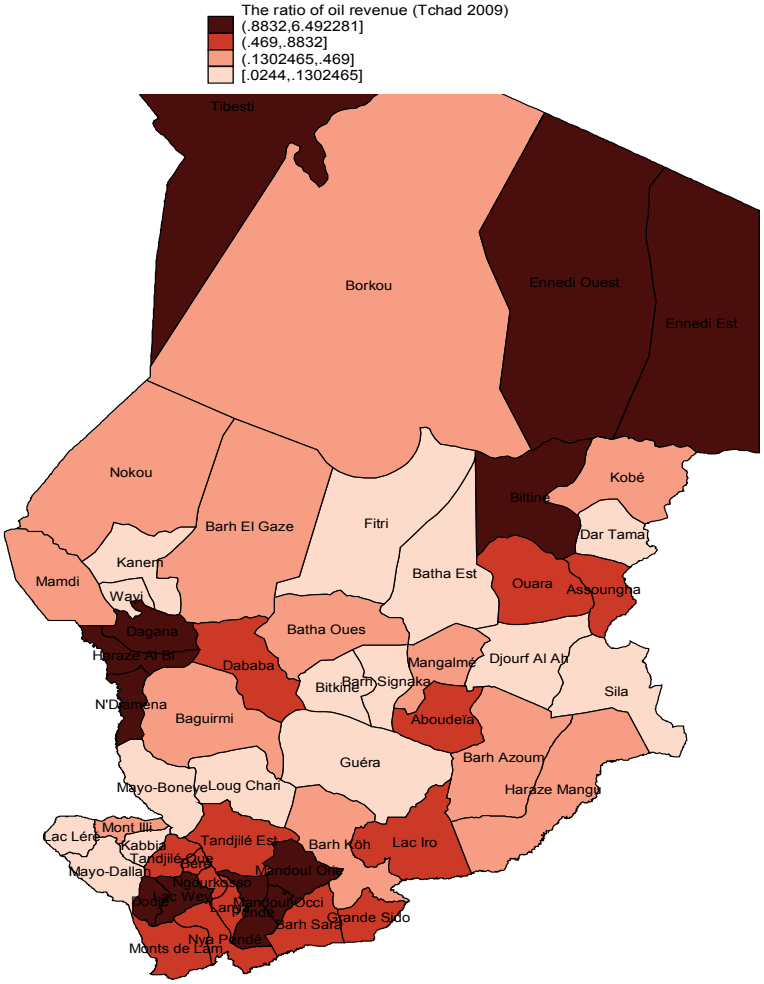
Results

Some stylized facts on wellbeing and oil revenues redistribution in Chad

Evoluation of Multidimensional Well-being



The distribution of oil revenue across departments



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Results (Cont'd)

Discontinuous impacts of intense oil revenues on multidimensional wellbeing

Variables	Treatment $r_d \geq 0.9$		Treatment $r_d \geq 1$		Treatment $r_d \geq 1.1$	
	F.E.	R.E.	F.E.	R.E.	F.E.	R.E.
Basic DID dummy variables						
Time	- .032286	- .088831	- .036982	- .092947	- .031785	- .089126
	(.099154)	(.099840)	(.100738)	(.098978)	(.097432)	(.095309)
Treatment		- .112995		- .099949		- .088026
		(.117875)		(.122242)		(.120165)
Time × Treatment	**.35646****	**.258156***	**.34922****	**.28986****	**.3895*****	**.32514****
	(.143260)	**(.140945)**	**(.136368)**	**(.137958)**	**(.141217)**	**(.144035)**
Department characteristics						
Density of population	- .001504	.001452	- .001114	.001454	- .001150	.001386
	(.001575)	(.001345)	(.001487)	(.001294)	(.001471)	(.001301)
Squared density of population	.000002	- .0000002	.000002	- .0000001	.000002	- .0000001
	(.000002)	(.000002)	(.000002)	(.000002)	(.000002)	(.000002)
Distance to N'Djamena		- .001799		- .001760		- .001703
		(.001305)		(.001281)		(.001269)
Squared distance to N'Djamena		.000001*		.000001*		.000001*
		(.000001)		(.000001)		(.000001)
Constant	.695117***	.957571***	.685042***	.944760***	.686308***	.928670***
	(.051117)	(.310014)	(.047862)	(.304104)	(.047492)	(.302297)
Observations (N)	124	124	124	124	124	124
Within R-squared (R^2)	.075	.042	.074	.048	.080	.055
Between R-squared (R^2)	.001	.259	.021	.261	.029	.262
Overall R-squared (R^2)	.019	.180	.039	.184	.047	.188
Heteroskedasticity (*p-value*)	.000		.000		.000	
Auxiliary test (*p-value*)	.115		.176		.184	

Results (Cont'd)

Sensitivity analyses and robustness checks

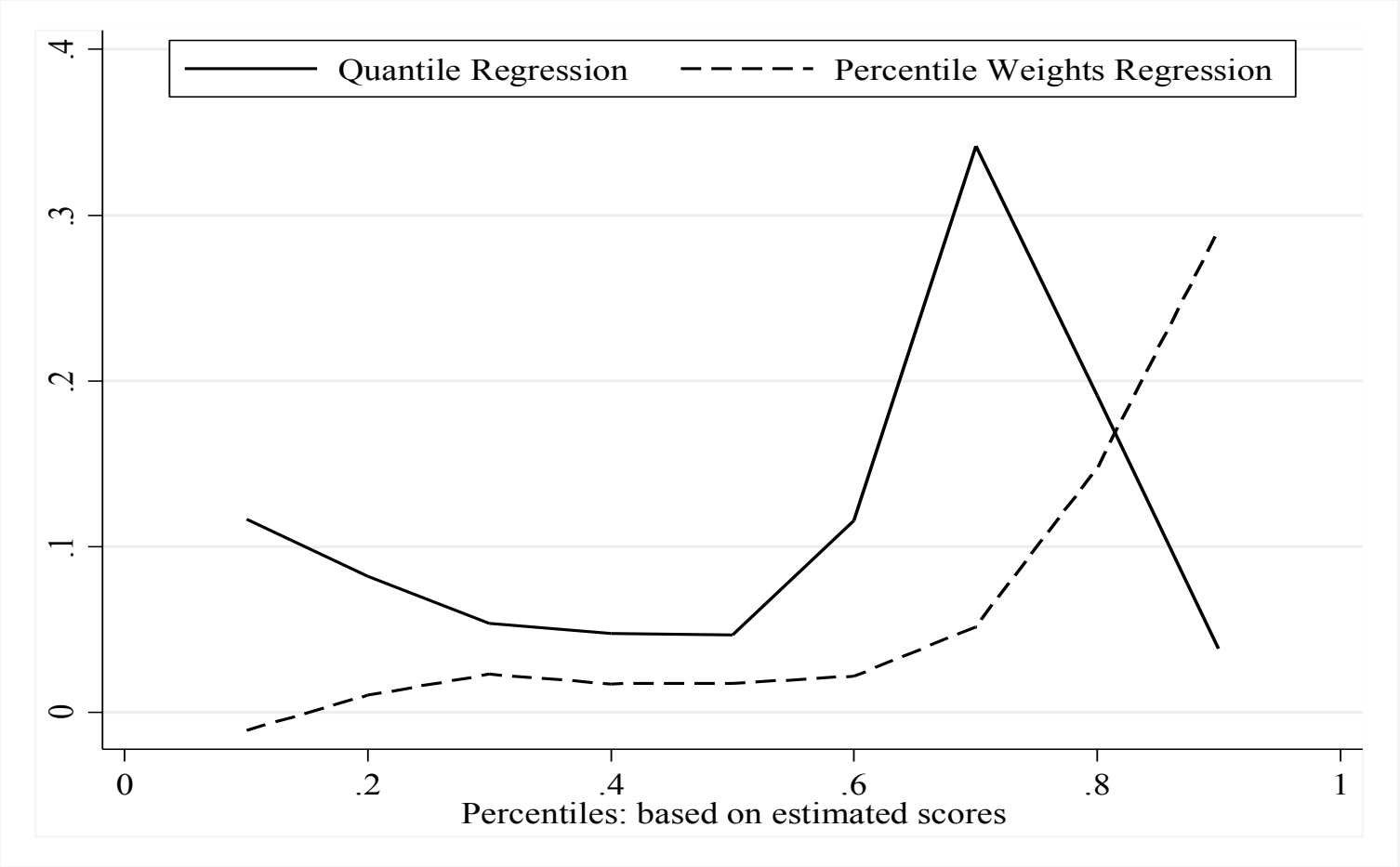
$$Y_{dt} = \alpha + \gamma.T + \delta.(T.r_d) + \beta.X_{dt} + \varepsilon_{dt}$$

Variables	*Without Departmental covariates*		*With Departmental covariates*	
	F.E.	**R.E.**	**F.E.**	**R.E.**
Basic DID dummy variables				
Time	.138026*	.159879	.137901	.054890
	(.080996)	(.099764)	(.112777)	(.095015)
Time × Ratio	**.081546***	**.098846****	**.078836**	**.062755***
	(.045735)	**(.049520)**	**(.047643)**	**(.035961)**
Department characteristics				
Density of population			- .000595	.001658
			(.001574)	(.001325)
Squared density of population			.000001	- .0000007
			(.000002)	(.000002)
Distance to N'Djamena				- .001683
				(.001266)
Squared distance to N'Djamena				.000001*
				(.000001)
Constant	.662438***	.662438***	.673577***	.902900***
	(.036843)	(.072588)	(.047881)	(.303806)
Observations (N)	124	124	124	124
Within R-squared (R^2)	.044	.044	.049	.029
Between R-squared (R^2)	.055	.055	.060	.269
Overall R-squared (R^2)	.049	.049	.053	.184
Heteroskedasticity (p-value)	.000		.000	
Auxiliary test (p-value)	.563		.431	

Results (Cont'd)

Sensitivity analyses and robustness checks

Local impacts of intense oil revenues with the QR and the PWR models



Conclusion

Our contribution

Contibute to the empirical literature on the potential local effects of oil revenues redistribution policy on MDW in Africa, and specifically in Chad.

Propose an "original" framework analysis helping to assess the local impact of oil revenues redistribution policy on welfare indicators such as MDW.

Provide policy evidence on the extent of the local resource curse in Chad

Conclusion (Cont'd)

Main results

There is a significant positive link between oil revenu transfers and MDW

Departments receiving intense oil transfers increased their MDW about 35% more than those disadvantaged by the oil revenues redistribution policy

The farther a department is from the capital city N'Djamena, the lower its average MDW

Economic inclusion may be better promoted in Chad if oil revenues fit local development needs and are effectively directed to the poorest departments.

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