Ethnically Asymmetric Political Representation and the Provision of Public Goods:

Theory and Evidence from Ethiopia

Teferi Mergo, Alain-Désiré Nimubona, Horatiu A. Rus

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Introduction

Background and Motivation

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- The internal boundaries of the country were redrawn mainly along ethno-linguistic lines.

Background and Motivation

Map 1: Former provinces of Ethiopia before 1995 (Source: *https : / / www.mapsopensource.com / ethiopia − provinces − map.html*.)

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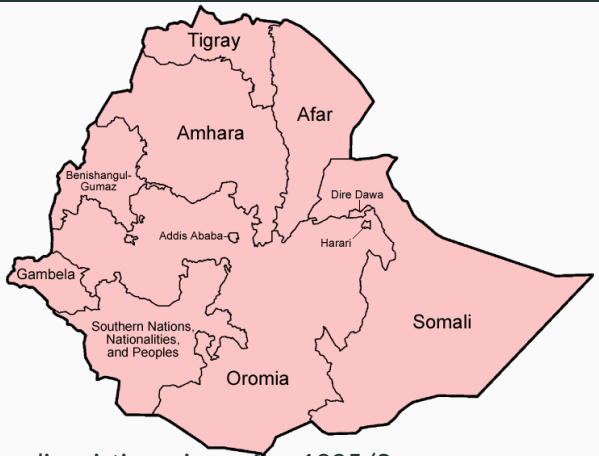

Map 2: Current ethno-linguistic regions after 1995 (Source: *https : / / commons.wikimedia.org / wiki / File : Ethiopia_regions_english.png# / media / File : Ethiopia_regions_english.png*.)

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- Dominance is measured here by cabinet share proportionality (CSP);
- In non-democratic polities, CSP is indicative of how political power and economic rent is distributed (Burgess et al, 2015).

Background and Motivation: The ethnic composition of the cabinet

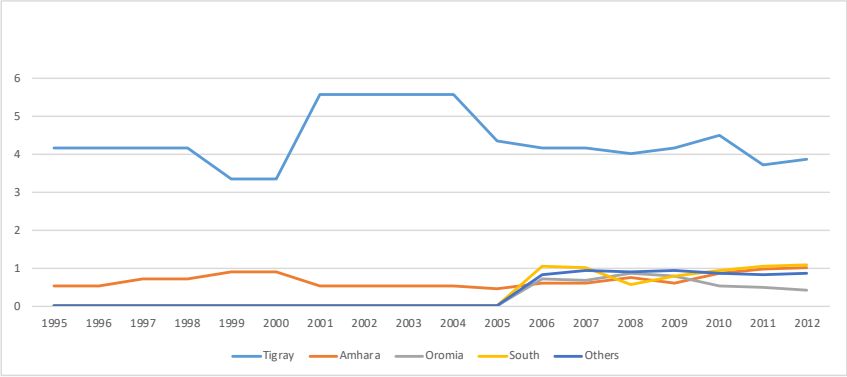

Figure 3: Distribution of the proportion of **all** cabinet-level positions to population by Ethnic groups (regions), 1995 - 2012

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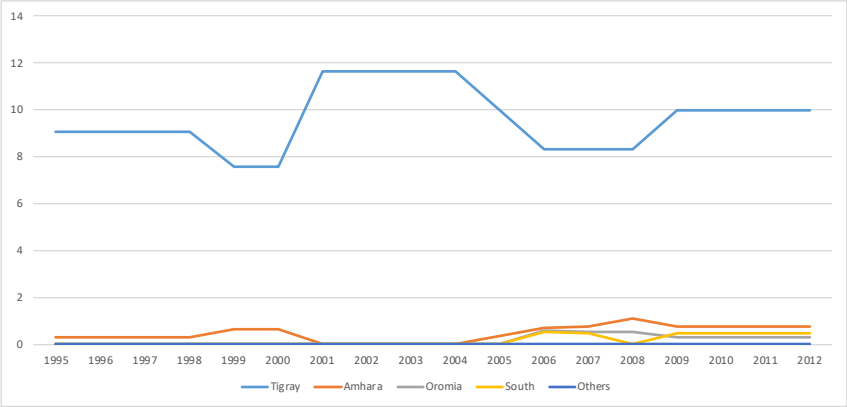

Figure 4: Distribution of the proportion of **key** cabinet positions to population by ethnic groups (regions), 1995 - 2012

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- More suggestive evidences that arrangement might have favored Tigray:

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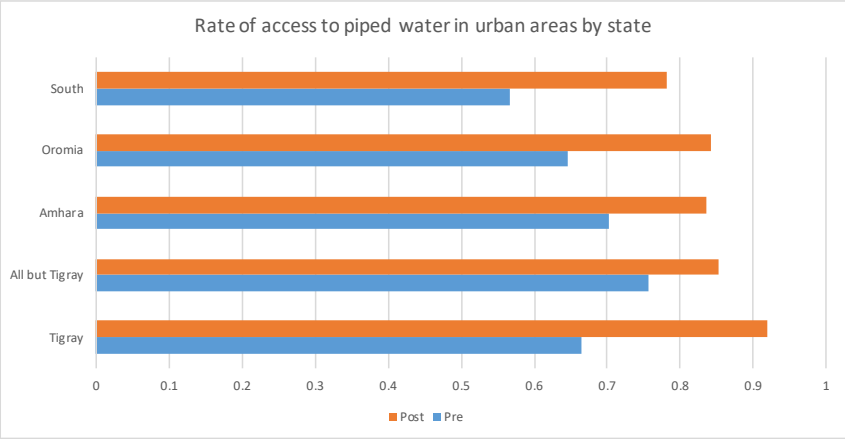

Figure 5: Access to piped water (urban)

Background and Motivation

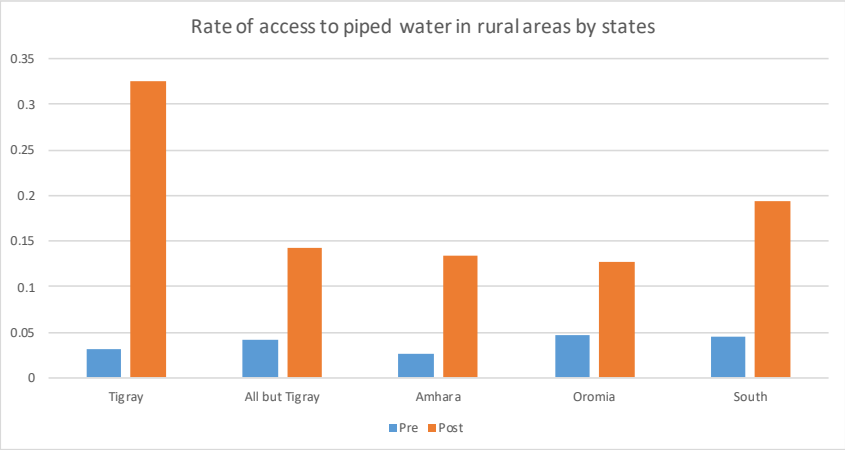

Figure 6: Access to piped water (rural)

Background and Motivation

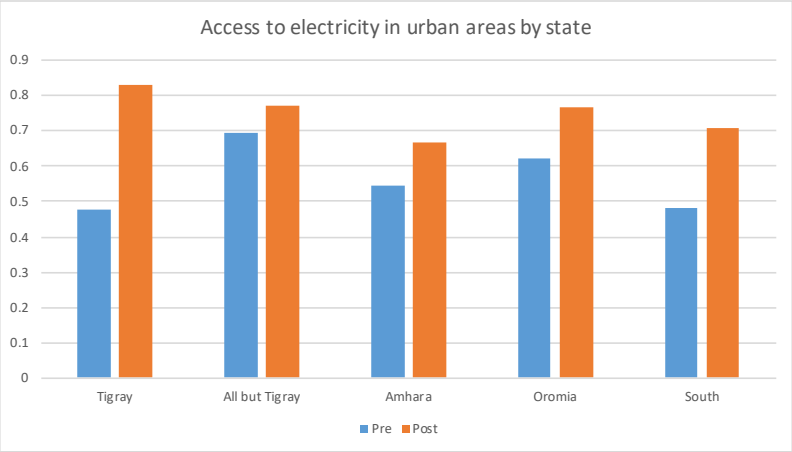

Figure 7: Access to electricity (urban)

Background and Motivation

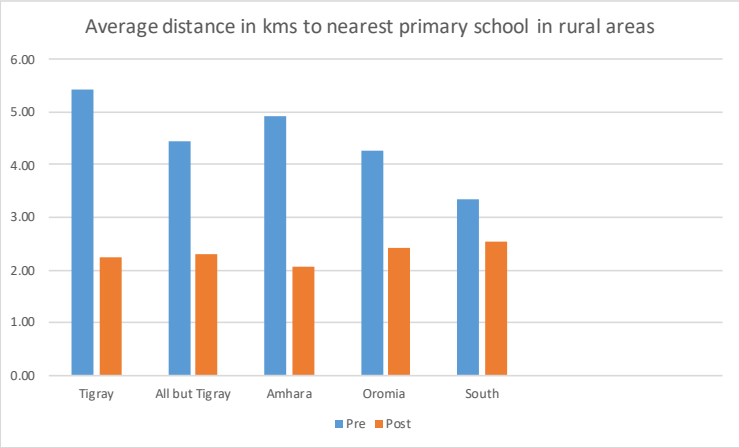

Figure 8: Access to primary school (rural)

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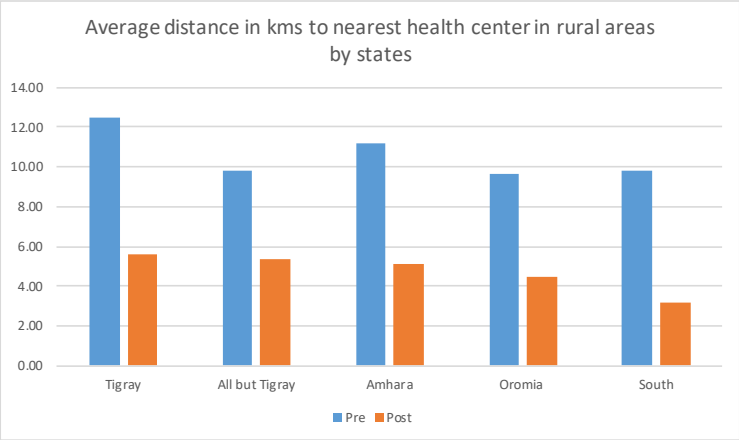

Figure 9: Access to health center (rural)

Comparison of 'Before' Asset Ownership Rates in Tigray vs. Control Regions

Variable: Assets	*Year*	*Other states*		*Tigray*			
		Mean	Sd	Mean	Sd	Mean Diff.	p value
Plough and Yoke	1995	1.56170	0.49620	1.55994	0.49673	0.00176	0.92666
	1994	1.54937	0.49758	1.55858	0.49689	-0.00920	0.63121
Plough	1995	1.53926	0.49848	1.55115	0.49771	-0.01189	0.53619
	1994	1.52829	0.49922	1.55722	0.49705	-0.02892	0.13268
Sprayer	1995	1.99358	0.07981	2	0	-0.00641	0.02958
	1994	1.99420	0.07590	1.99318	0.08230	0.00101	0.72993
Tractor	1995	1.99852	0.03843	1.99863	0.03691	-0.00011	0.93681
	1994	1.99802	0.04437	1.99318	0.08230	0.00483	0.00988
Farming Animals	1995	1.60263	0.48938	1.62261	0.48506	-0.01997	0.28924
	1994	1.58821	0.49218	1.62670	0.48400	-0.03848	0.04222
Transport	1995	1.84958	0.35749	1.83787	0.36881	0.01171	0.39662
Animals	1994	1.83984	0.36677	1.83651	0.37006	0.00333	0.81366
Bicycle	1995	1.98606	0.11721	1.97820	0.14612	0.00786	0.08869
	1994	1.98717	0.11251	1.98501	0.12158	0.00216	0.62017
Motorbike	1995	1.99926	0.02718	1.99455	0.07367	0.00470	0.00028
	1994	1.99938	0.02482	1.99591	0.06384	0.00347	0.00274
Vehicle	1995	1.99297	0.08354	1.99046	0.09725	0.00250	0.44248
	1994	1.99272	0.08498	1.99318	0.08230	-0.00046	0.88753
Refrigerator	1995	1.98643	0.11567	1.98228	0.13198	0.00414	0.35800
	1994	1.98754	0.11089	1.98773	0.11012	-0.00019	0.96441
Home	1995	1.17087	0.37642	1.25340	0.43525	-0.08252	0.00000
Land	1995	1.17287	0.37816	1.24523	0.43051	-0.07235	0.00000

Question

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- *Do effective representation issues associated with ethnic federalism contribute to observed disparities in economic outcomes among different ethnic groups?*

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- We construct a simple theoretical model capturing some of the stylized facts of the Ethiopian political-economy over the last three decades.
- We assemble a unique dataset using the Ethiopian Censuses of 1994 and 2007, as well as the Welfare Monitoring Surveys of 1995 and 2011.
- We estimate the effect of ethnically uneven distribution of political power on the provision of public goods in different regions of Ethiopia.

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- We find that the disparities in terms of access to public goods are more pronounced in rural areas than in urban areas.
- The magnitude of the advantage that households in Tigray enjoy varies from one comparison region to another.
- Our estimates are robust to accounting for household characteristics.

Literature

Contribution to the Literature

- Recently emerging empirical literature studying relationship between Ethnic favoritism and development:Franck and Rainer (2012), Hodler and Raschky (2014), Kramon and Posner (2013), Kramon and Posner (2016), De Luca et al. (2018), etc.
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- Second generation literature on fiscal federalism:Seabright (1996), Lockwood (2002), Besley and Coate (2003), Bardhan and Mookherjee (2006), Joanis (2014), Mookherjee (2015), etc.
  Use Ethiopian microdata to offer some insights on the role of fiscal decentralization

Contribution to the Literature

- Local public finance literature (largely theoretical):Grossman (1994), Atlas et al. (1995), Pereira (1996), Schady (2000), Case (2001), Porto et al. (2001), Maaser (2016), etc.
  Highlight the impact of ethnically asymmetric political representation, the role of minority-rule and/or aid donors.

Model

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- Income collected by the Center via taxes from region i is $y_i(t_i, \rho_i)p_i$:
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  - $y_{t_i} > 0$, $y_{t_i t_i} < 0$, $y_{\rho_i} > 0$, and $y_{t_i \rho_i} > 0$.
- $C = \sum_i C_i(t_i, \rho_i)p_i$ is the total cost of containing political conflicts in the regions in the form of appeasement and/or repression.
  - $C_{t_i} < 0$, $C_{i\rho_i} < 0$, $C_{t_i t_i} > 0$, and $C_{t_i \rho_i} < 0$.

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  - $C_{i_{t_i}} < 0$, $C_{i_{\rho_i}} < 0$, $C_{i_{t_i t_i}} > 0$, and $C_{i_{t_i \rho_i}} < 0$.
- The Center also receives foreign aid $A(C)$.
  - $A_C \leq 0$

Equilibrium

The Center maximizes its net surplus $\{Y - T - C\}$ and solves the following problem:[1]

$$\max_{t_i} \left\{ A \left(\sum_i C_i(t_i, \rho_i) p_i \right) + \sum_i [y_i(\rho_i, t_i) p_i - t_i p_i - C_i(t_i, \rho_i) p_i] \right\}. \quad (1)$$

For each region i, the first order condition consists of the following:

$$A_C C_{i_{t_i}} p_i + y_{i_{t_i}} p_i - p_i - C_{i_{t_i}} p_i = 0. \quad (2)$$

[1] Notice that transfers are not a direct function of the degree of political representation/ethic favoritism: in fact $t_i(\rho_i)$ would largely amount to assuming the result. In fact $C(t_i, \rho_i)$ and $y_i(t_i, \rho_i)$ are - without loss of generality - assumed to be additively separable in t and ρ.

Effects of political representation on the optimal level of transfers

Proposition 1:
When $A_C = 0$ *or* $A_{CC} = 0$, *then* $\frac{dt_i}{d\rho_i} > 0$.

Proposition 2:
(i) When $A_{CC} < 0$, *then* $\frac{dt_i}{d\rho_i} > 0 \left(\frac{dt_i}{d\rho_i} < 0 \right)$ *if* p_i *is small (large) enough and/or if* $|c_{i_{t_j}}|$ *and* $|c_{i_{\rho_i}}|$ *are small (large) enough;*

(ii) When $A_{CC} > 0$, *then* $\frac{dt_i}{d\rho_i} > 0 \left(\frac{dt_i}{d\rho_i} < 0 \right)$ *if* p_i *is small (large) enough and/or if* $|c_{i_{t_j}}|$ *is small (large) enough.*

Unifying Hypothesis

- Proposition 2 shows that the effect of representation on transfers is ambiguous when the marginal change in foreign aid varies with the level of political unrest.
- However, the Center can still discriminate against regions with less political representation or co-ethnic affinity, if their respective population sizes are small.
- Hence: when political power is dominated at the center by a political party representing the interests of a minority ethnic group, both propositions of the model support the testable implication that *transfers from the center to the regions increase with their respective degrees of political representation.*

Empirical Framework

Identification

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- Divide the contemporary political history of Ethiopia into pre/post TPLF era; 1995 constitution marks the point.
- Before 1995 strong central government, internal boundaries weren't based on ethnicity, post 1995 they were.
- Switch of regimes and provision of public goods by ethnic regions helps. A rare quasi-experimental setting, facilitating identification, which is normally difficult to achieve (Burgess et al., 2015)

Empirical Specification

- Effect of higher degree of political representation can be estimated with the following DD empirical framework:

$$Y_{irt} = \alpha + \beta * Treat_r + \lambda * Post_t + \delta * (Treat_r * Post_t) + \gamma * X_{irt} + \epsilon_{irt}, \quad (3)$$

- Outcome variables include HHs ($i's$) access to public education, public health, clean water supply, electricity, public transportation and telecommunications facilities.

Empirical Specification

- $Treat_r$ is a dummy variable for Tigray; switched off for all other regions; $Post_t$ is an indicator variable that is turned on for observations after 1995.
- $Treat_r * Post_t$ is one for Tigray post 1995, otherwise, it is zero. δ captures the effect of having a more representative or ethnically favorable government in place.
- X_{irt} include: size of agricultural plots, radio ownership, roof quality, number of homes owned, TV ownership, floor quality, and household size. The error terms are assumed to be independent and identically distributed (i.i.d.).

Results

Results: Average Distance to Public Schools and a Public Health Facility - Table 1

VARIABLES	*Primary School*		*Secondary School*		*Health Facility*	
Region	0.980***	0.982***	6.601***	6.634***	2.733***	2.749***
	(0.317)	(0.317)	(1.111)	(1.115)	(0.521)	(0.520)
Year	-2.158***	-2.011***	-9.072***	-7.888***	-4.435***	-4.062***
	(0.0855)	(0.0864)	(0.343)	(0.370)	(0.192)	(0.237)
RegionYear	-1.039***	-1.035***	-7.532***	-8.094***	-2.463***	-2.472***
	(0.328)	(0.329)	(1.177)	(1.185)	(0.565)	(0.570)
Plots		-0.0348**		-0.585***		-0.278***
		(0.0154)		(0.0747)		(0.0413)
Radio		-0.353***		-2.533***		-0.478**
		(0.0868)		(0.354)		(0.218)
Constant	4.455***	4.554***	27.32***	28.70***	9.777***	10.37***
	(0.0766)	(0.0824)	(0.289)	(0.325)	(0.116)	(0.145)
Observations	16,206	15,671	16,363	15,812	16,223	15,663

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Results: Average Distance to Public Transportation and Communication Facilities in Rural Areas - Table 2

VARIABLES	*Transportation*		*Public Telephone*	
Region	4.068***	4.078***	4.546***	4.584***
	(1.139)	(1.145)	(1.142)	(1.147)
Year	-7.544***	-6.657***	-11.91***	-10.31***
	(0.361)	(0.380)	(0.370)	(0.397)
RegionYear	-5.907***	-6.072***	-11.31***	-11.71***
	(1.198)	(1.207)	(1.192)	(1.199)
Plots		-0.165**		-0.651***
		(0.0720)		(0.0809)
Radio		-3.507***		-4.223***
		(0.345)		(0.372)
Constant	21.00***	21.63***	26.06***	27.72***
	(0.314)	(0.346)	(0.306)	(0.344)
Observations	16,360	15,802	16,435	15,867

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Results: Proximity to Schools and a Health Center in Urban Areas - Table 3

VARIABLES	*Primary School*		*Secondary School*		*Health Center*	
Region	-0.244***	-0.242***	-0.223	-0.334	-0.475***	-0.495***
	(0.0423)	(0.0424)	(0.245)	(0.251)	(0.0606)	(0.0636)
Year	0.176***	0.402***	-0.687***	0.176	4.511***	4.176***
	(0.0301)	(0.0403)	(0.119)	(0.154)	(0.0864)	(0.145)
RegionYear	0.0797	-0.00632	2.039***	2.670***	-0.191	-0.191
	(0.0504)	(0.0613)	(0.377)	(0.536)	(0.162)	(0.224)
Dwellings		-0.0355***		0.151**		0.0692
		(0.0108)		(0.0657)		(0.0644)
TV		-0.245***		-1.559***		0.0686
		(0.0333)		(0.112)		(0.181)
Constant	0.585***	0.636***	2.710***	2.786***	1.172***	1.119***
	(0.0279)	(0.0319)	(0.114)	(0.111)	(0.0342)	(0.0559)
Observations	20,660	12,048	20,541	11,972	20,191	11,798

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Results: Proximity to Public Transportation and Communication Facilities in Urban Areas - Table 4

VARIABLES	*Public Transportation*		*Public Telephone*	
Region	-0.844***	-1.068***	-1.572***	-1.774***
	(0.141)	(0.160)	(0.132)	(0.147)
Year	0.979***	3.353***	-1.004***	0.969***
	(0.167)	(0.299)	(0.143)	(0.271)
RegionYear	-0.806***	-1.489***	0.865***	0.373
	(0.187)	(0.283)	(0.161)	(0.235)
Dwellings		0.204*		0.181**
		(0.105)		(0.0836)
TV		-3.525***		-3.158***
		(0.273)		(0.235)
Constant	1.357***	1.618***	2.286***	2.522***
	(0.135)	(0.140)	(0.121)	(0.126)
Observations	20,706	12,057	21,103	12,252

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Results: Access to Clean Water Supply and Electricity in Urban Areas - Table 5

VARIABLES	Models							
	Linear Probability				Probit			
	Water		*Electricity*		*Water*		*Electricity*	
Region	-0.0910***	-0.0838***	-0.216***	-0.195***	-0.267***	-0.244***	-0.562***	-0.523***
	(0.00998)	(0.00995)	(0.0106)	(0.0104)	(0.0277)	(0.0285)	(0.0268)	(0.0280)
Year	0.0952***	0.0474***	0.0789***	0.0113***	0.349***	0.177***	0.241***	0.0424***
	(0.00304)	(0.00325)	(0.00335)	(0.00352)	(0.0107)	(0.0117)	(0.0100)	(0.0112)
RegionYear	0.158***	0.150***	0.272***	0.253***	0.620***	0.609***	0.762***	0.750***
	(0.0109)	(0.0108)	(0.0121)	(0.0119)	(0.0392)	(0.0413)	(0.0352)	(0.0378)
TV		0.111***		0.189***		0.774***		1.251***
		(0.00250)		(0.00260)		(0.0212)		(0.0245)
Floorq		0.134***		0.209***		0.705***		0.939***
		(0.00239)		(0.00259)		(0.0154)		(0.0151)
HHsize		-0.00804***		-0.00338***		-0.0338***		-0.0116***
		(0.000561)		(0.000604)		(0.00217)		(0.00213)
Constant	0.756***	0.758***	0.694***	0.652***	0.695***	0.701***	0.507***	0.363***
	(0.00261)	(0.00381)	(0.00280)	(0.00413)	(0.00832)	(0.0137)	(0.00797)	(0.0132)
	86,063	85,795	86,099	85,835	86,063	85,795	86,099	85,835
Observations	-0.0910***	-0.0838***	-0.216***	-0.195***	-0.267***	-0.244***	-0.562***	-0.523***

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Results: Access to Clean Water Supply and Electricity in Rural Areas - Table 6

VARIABLES	*Water*		*Electricity*	
Region	-0.0101***	-0.00450***	-0.128***	-0.0886***
	(0.00166)	(0.00167)	(0.0233)	(0.0234)
Year	0.101***	0.0850***	0.666***	0.594***
	(0.000891)	(0.000927)	(0.00642)	(0.00668)
RegionYear	0.193***	0.190***	0.745***	0.729***
	(0.00437)	(0.00435)	(0.0260)	(0.0261)
Roof		0.0644***		0.319***
		(0.00142)		(0.00634)
Radio		0.0355***		0.170***
		(0.00137)		(0.00639)
Constant	0.0413***	0.0293***	-1.736***	-1.815***
	(0.000486)	(0.000496)	(0.00550)	(0.00560)
Observations	412,212	411,754	412,212	411,754
R-squared	-0.0101***	-0.00450***	-0.128***	-0.0886***
	0.710	0.712	0.951	0.952

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

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- In nearly all cases, co-ethnicity with the federally-dominant ethnic group improves access to public goods.
- There is a rural-bias of the advantages of higher political representation due to ethnic affiliation in this case:
- Potential explanations: TPLF's ideological orientation as a political party. Results consistent with other studies (e.g. Hodler and Raschky, 2014).

Robustness Checks

Robustness Checks

- Relaxing the parallel trend assumption could offer a check on the causal interpretation of the estimated DD parameters (Angrist and Pischke, 2014).
- Consider the non-treated states driving causal comparisons separately. Amhara, Oromia and SNNPR (where close to 85 percent of the population live) are considered for this.

Robustness: Proximity to Schooling, Health, Transportation and Communication Facilities in rural areas by regions

Variables	*Oromia*		*Amhara*		*South*	
	No Covariates	Covariates	No Covariates	Covariates	No Covariates	Covariates
Primary School	-1.360***	-1.325***	-0.326	-0.311	-2.390***	-2.365***
	(0.348)	(0.348)	(0.360)	(0.361)	(0.335)	(0.336)
Secondary School	-6.580***	-7.438***	-4.280***	-4.459***	-9.053***	-9.424***
	(1.267)	(1.279)	(1.325)	(1.337)	(1.289)	(1.292)
Public Health Facility	-1.735***	-1.879***	-0.868	-1.005	-0.298	-0.295
	(0.571)	(0.575)	(0.615)	(0.625)	(0.595)	(0.598)
Public Transportation Facility	-8.476***	-9.027***	-2.814**	-2.599*	-6.883***	-6.879***
	(1.271)	(1.278)	(1.375)	(1.390)	(1.368)	(1.373)
Public Telephone Facilty	-15.04***	-15.91***	-5.451***	-5.695***	-10.08***	-10.30***
	(1.279)	(1.291)	(1.338)	(1.350)	(1.409)	(1.416)

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Robustness: Improved access to clean water supply and electricity vs. comparison regions (Urban)

	Amhara				*Oromia*				*South*			
VARIABLES	*Water*		*Electricity*		*Water*		*Electricity*		*Water*		*Electricity*	
Region	-0.0373***	-0.0472***	-0.0690***	-0.0796***	0.0196*	0.0182*	-0.143***	-0.137***	0.0997***	0.115***	-0.00411	0.0302**
	(0.0113)	(0.0113)	(0.0121)	(0.0118)	(0.0109)	(0.0109)	(0.0115)	(0.0113)	(0.0132)	(0.0131)	(0.0137)	(0.0132)
Year	0.133***	0.113***	0.121***	0.0931***	0.195***	0.158***	0.145***	0.0914***	0.215***	0.180***	0.227***	0.173***
	(0.00681)	(0.00711)	(0.00773)	(0.00790)	(0.00591)	(0.00616)	(0.00619)	(0.00640)	(0.0104)	(0.0105)	(0.0107)	(0.0103)
RegionYear	0.120***	0.0929***	0.229***	0.173***	0.0581***	0.0454***	0.206***	0.179***	0.0384***	0.0182	0.123***	0.0866***
	(0.0125)	(0.0124)	(0.0140)	(0.0137)	(0.0120)	(0.0119)	(0.0132)	(0.0129)	(0.0147)	(0.0145)	(0.0158)	(0.0151)
TVown		0.0837***		0.201***		0.0784***		0.170***		0.0755***		0.144***
		(0.00518)		(0.00634)		(0.00485)		(0.00469)		(0.00695)		(0.00680)
Floorq		0.130***		0.206***		0.132***		0.199***		0.162***		0.281***
		(0.00475)		(0.00644)		(0.00440)		(0.00468)		(0.00634)		(0.00672)
HHsize		-0.00443***		0.00364***		-0.00970***		-0.00292***		-0.00970***		-0.00207
		(0.00118)		(0.00134)		(0.00103)		(0.00109)		(0.00142)		(0.00147)
Constant	0.703***	0.709***	0.547***	0.509***	0.646***	0.664***	0.622***	0.594***	0.566***	0.563***	0.482***	0.412***
	(0.00591)	(0.00791)	(0.00643)	(0.00862)	(0.00517)	(0.00698)	(0.00524)	(0.00729)	(0.00909)	(0.0113)	(0.00915)	(0.0112)
Observations	24,965	24,875	24,968	24,882	31,928	31,800	31,938	31,810	16,634	16,561	16,635	16,563

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Robustness: Improved access to clean water supply vs. comparison regions (Rural)

VARIABLES	*Water*					
	Amhara		Oromia		South	
Region	0.00374**	0.00707***	-0.0156***	-0.00666***	-0.0149***	-0.0122***
	(0.00174)	(0.00174)	(0.00179)	(0.00179)	(0.00190)	(0.00190)
Year	0.107***	0.0886***	0.0814***	0.0645***	0.147***	0.131***
	(0.00151)	(0.00161)	(0.00140)	(0.00145)	(0.00203)	(0.00207)
RegionYear	0.188***	0.190***	0.213***	0.210***	0.148***	0.135***
	(0.00454)	(0.00452)	(0.00450)	(0.00448)	(0.00473)	(0.00474)
Roof		0.0463***		0.0746***		0.108***
		(0.00215)		(0.00211)		(0.00393)
Radio		0.0401***		0.0310***		0.0407***
		(0.00273)		(0.00193)		(0.00288)
Constant	0.0274***	0.0183***	0.0468***	0.0313***	0.0461***	0.0342***
	(0.000696)	(0.000718)	(0.000812)	(0.000832)	(0.00104)	(0.00106)
Observations	145,267	145,047	179,390	179,176	117,758	117,655
R-squared	0.084	0.091	0.060	0.073	0.079	0.092

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Results

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- None of the comparison states have fared better than Tigray in terms of improvements in access to public goods
- Amhara appears to be less disadvantaged than Oromia and SNNPR in terms of access to public schools, public transportation and telephone networks. Perhaps a reflection of the political pecking order in the country.

Conclusion

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Conclusion

- We investigate whether the ethnic cooptation of elites at the top - which also applies to the Ethiopian regime - had equitable outcomes on the ground in ethnically-based Ethiopian regions.
- We study the effects of instituting an ethnic federalism characterized by asymmetric political representation on economic development as represented by the provision of public goods.
- We exploit a regime change that took place in Ethiopia in the early 1990s that transformed the Ethiopian state to a multi-national federation dominated by one of the minority groups, the Tigray ethno-linguistic group.

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- Through a theoretical model, we establish a potential link between the degree of political representation (driven by ethnicity) and the magnitude of public goods provision.
- Using a repeated cross-section data and a difference-in-difference estimation strategy, we find that the Tigray regional state has enjoyed better access to public goods than other federal states of the country.
- We also find that the disparities in terms of access to public goods are more pronounced in rural areas than in urban areas.