MEASURING ETHNIC STRATIFICATION AND ITS EFFECT ON TRUST IN AFRICA

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ETHNOLINGUISTIC DIFFERENCES

ECONOMIC DIFFERENCES

ETHNIC STRATIFICATION

COMBINING ETHNOLINGUISTIC AND ECONOMIC DIFFERENCES

ETHNIC STRATIFICATION

TAKING INTO ACCOUNT ETHNOLINGUISTIC DISTANCES

ETHNIC STRATIFICATION

- Alienation (or mistrust) between two individuals depends on their economic and ethnolinguistic distances
- ETHNIC STRATIFICATION: Extent to which the hierarchy in socio-economic positions follows ethnic lines

THE PAPER IN A NUTSHELL

- THEORETICAL PART: Index of ethnic stratification
- EMPIRICAL PART: We show that ethnic stratification on the local level in Africa is related to lower trust towards individuals and institutions

- THEORETICAL LITERATURE ON INEQUALITY AND DIVERSITY MEASUREMENT
 - ▶ Review on inequality and diversity measurement: Chakravarty (2015)
 - ▶ Gini (e.g., Shorrocks 1980), multivariate Gini (e.g., Banerjee 2010)
 - ▶ Univariate fractionalization (Bossert et al. 2011)
 - ▶ Polarization (e.g., Esteban and Ray 1994; Reynal-Querol and Motalvo 2005; Permanyer 2012)
- EMPIRICAL LITERATURES ON BETWEEN-GROUP INEQUALITY AND TRUST
 - ▶ LITERATURE ON POLITICO-ECONOMIC CONSEQUENCES OF BETWEEN-GROUP INEQUALITY: e.g., low GDP per capita (Alesina et al. 2016), low public good provision (Baldwin and Huber 2010), civil conflict (Gubler and Selway 2012, Cederman et al. 2011, Guariso and Rogall 2016, Huber and Mayoral 2014)
 - ▶ LITERATURE ON DETERMINANTS OF TRUST IN AFRICA AND ELSEWHERE: e.g., between-group inequality (Tesei 2015), historical experiences (Nunn and Wantchekon 2011), conflict (Rohner et al. 2013), protests (Sangnier and Zylberberg 2017), ethnic diversity (Robinson 2017)

THEORETICAL PART: INDEX OF ETHNIC STRATIFICATION

INDEX OF ETHNIC STRATIFICATION

- Population P of size $m > 0$
- Distance between wealth levels w_i and w_j : $|w_i - w_j|$
- Distance between ethnicities e_i and e_j : $\lambda(e_i, e_j)$

INDEX OF ETHNIC STRATIFICATION

$$S(f, \lambda) := \frac{1}{m^2} \int_{i \in P} \int_{j \in P} \lambda(e_i, e_j) |w_i - w_j| dj di \quad (1)$$

- Member of general class of measures of expected alienation between a randomly selected pair of individuals
- AXIOMATIC APPROACH: We show that the proposed index fulfills axioms that are desirable properties of a measure of ethnic stratification

GENERALIZATION OF BETWEEN-GROUP INEQUALITY

VILLAGE A

VILLAGE B

DECOMPOSITION OF ETHNIC STRATIFICATION

- AVERAGE WEALTH:

$$\mu(w) := \frac{1}{m} \int_{i \in P} w_i di$$

- GINI COEFFICIENT OF INEQUALITY:

$$G(w) := \frac{1}{2\mu(\gamma_f)m^2} \int_{i \in P} \int_{j \in P} |w_i - w_j| dj di$$

- ETHNIC FRACTIONALIZATION:

$$F(e) := \frac{1}{m^2} \int_{i \in P} \int_{j \in P} \lambda(e_i, e_j) dj di$$

SCALE VS. CO-DIRECTIONALITY

VILLAGE A

VILLAGE B

EMPIRICAL PART: LOCAL ETHNIC STRATIFICATION AND TRUST IN AFRICA

- We measure ethnic stratification on the town and village level in Africa and investigate its effect on trust
- DATA: Afrobarometer survey, rounds 5 (2011-2013) and 3 (2005-2006)
 - ▶ Information on assets, language, ethnicity, trust
 - ▶ Data geocoded by Aiddata

ASSET-BASED WEALTH INDEX:

- First principal component (Principal components analysis)
- Calculated for each survey (country and survey round) separately
- Assets round 5: Radio, television, mobile phone, motorcycle/car, types of water source, toilet, house and roof
- Assets round 3: Radio, television, bicycle, motorcycle and car

DERIVING ETHNOLINGUISTIC DISTANCES

Match Afrobarometer languages
and ethnicities to ETHNOLOGUE

FIGURE 1: Language trees

DERIVING ETHNOLINGUISTIC DISTANCES

Match Afrobarometer languages
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ETHNOLINGUISTIC
DISTANCES BETWEEN
INDIVIDUALS: Distance measure
by Putterman and Weil (2010):

$$\lambda_{ij} = 1 - \sqrt{\frac{2t_{ij}}{T_i + T_j}}$$

FIGURE 1: Language trees

FINAL SAMPLE ROUND 5

MEASURING TRUST

- Round 5: How much do you trust
 - ▶ your relatives?
 - ▶ your neighbors?
 - ▶ other people you know?
 - ▶ your metropolitan, municipal or district assembly?
- Round 3: How much do you trust
 - ▶ people from your own ethnic group?
 - ▶ people from other ethnic groups?
- We build indicator variables that equal one if the respondent answers “a lot” or “somewhat”, and zero if she answers “just a little” or “not at all”.
- Trust differential = 1 if trust in own ethnic group $>$ trust in other ethnic groups

SUMMARY STATISTICS

Variable	Obs.	Mean	Std.Dev.	Min.	Max.
<u>Round 5:</u>					
Trust in relatives	21,544	0.826	0.379	0	1
Trust in neighbors	21,521	0.607	0.488	0	1
Trust in other acquaintances	21,475	0.416	0.493	0	1
Trust in local assembly	19,236	0.493	0.500	0	1
Ethnic stratification (S)	21,579	0.007	0.013	0	0.098
Fractionalization (F)	21,579	0.103	0.147	0	0.696
Wealth inequality (G)	21,579	0.083	0.047	0	0.390
Average wealth (μ)	21,579	0.341	0.069	0.094	0.738
<u>Round 3:</u>					
Trust in own ethnic group	11,833	0.550	0.498	0	1
Trust in other ethnic group	11,710	0.420	0.494	0	1
Higher trust in own group	11,683	0.263	0.440	0	1
Ethnic stratification (S)	11,860	0.013	0.022	0	0.142
Fractionalization (F)	11,860	0.101	0.149	0	0.639
Wealth inequality (G)	11,860	0.252	0.103	0	0.750
Average wealth (μ)	11,860	0.202	0.058	0	0.551

SPECIFICATIONS

$$Trust_{ivce} = \beta S_{vc} + \theta X_{ivce} + FE_c + FE_e + \epsilon_{ivce}$$

- $Trust_{ivce}$: trust indicator for respondent i living in town / village v of country c and belonging to ethnolinguistic group e
- S_{vc} : ethnic stratification in town / village v
- X_{ivce} : control variables (wealth, age, age squared, religion, education, urban/rural)
- FE_c : country fixed effects
- FE_e : ethnolinguistic group fixed effects

$$Trust_{ivce} = \beta S_{vc} + \gamma F_{vc} + \delta G_{vc} + \psi \mu_{vc} + \theta X_{ivce} + FE_c + FE_e + \epsilon_{ivce}$$

- F_{vc} : local ethnic fractionalization
- G_{vc} : local wealth inequality (Gini)
- μ_{vc} : local average wealth

We estimate linear probability models. Standard errors are clustered at the level of ADM1 regions and ethnolinguistic groups.

ETHNIC STRATIFICATION AND TRUST IN INDIVIDUALS AND INSTITUTIONS

	(1)	(2)	(3)	(4)
Dep. variable:	Trust in relatives	Trust in neighbors	Trust in other acquaintances	Trust in local assembly
Stratification	-1.30** (0.52)	-2.19*** (0.44)	-1.73*** (0.34)	-1.31** (0.55)
R^2	0.16	0.18	0.12	0.13
Stratification	-1.64* (0.94)	-2.09*** (0.78)	-2.02*** (0.69)	-1.94*** (0.70)
Fractionalization	0.07 (0.07)	0.03 (0.07)	0.06 (0.07)	0.09 (0.07)
Gini	-0.09 (0.09)	-0.09 (0.11)	-0.03 (0.12)	0.01 (0.17)
Average wealth	-0.24*** (0.08)	-0.51*** (0.14)	-0.40*** (0.14)	-0.36** (0.15)
R^2	0.16	0.19	0.12	0.13
Observations	21,544	21,521	21,475	19,236

Notes: ***, **, * indicate significance at the 1, 5 and 10%-level, respectively.

ETHNIC STRATIFICATION AND TRUST IN OWN/OTHER ETHNIC GROUPS

	(1)	(2)	(3)
Dep. variable:	Trust in own ethnic group	Trust in other ethnic group	Higher trust in own ethnic group
Stratification	0.23 (0.43)	-0.01 (0.43)	-0.14 (0.28)
R^2	0.14	0.13	0.07
Stratification	0.28 (0.57)	-0.16 (0.72)	0.99* (0.51)
Fractionalization	0.00 (0.10)	0.05 (0.12)	-0.18** (0.08)
Gini	0.00 (0.07)	-0.02 (0.07)	-0.07 (0.07)
Average wealth	-0.15 (0.15)	-0.19 (0.17)	-0.07 (0.14)
R^2	0.14	0.13	0.07
Observations	11,833	11,710	11,683

Notes: ***, **, * indicate significance at the 1, 5 and 10%-level, respectively.

CONCLUSION

- We propose a new index of ethnic stratification based on both economic and ethnic distances between pairs of individuals.
- We calculate ethnic stratification on the town and village level in 26 African countries.
- Findings: Higher local ethnic stratification...
 - ▶ decreases trust in people an individual knows and in local political institutions.
 - ▶ makes it more likely that respondents trust people from their own ethnic group more than people from other ethnic groups.

APPENDIX

FINAL SAMPLE ROUND 3

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ROBUSTNESS TESTS

- Using index based primarily on ethnicity instead of language
- Compute ethnolinguistic distances using the formula by Fearon (2003) instead of Putterman and Weil (2010)
- Measure economic distances using the perception-based lived poverty index instead of wealth index
- Controlling for respondent's generalized trust and for cluster-level average of generalized trust
- Controlling for trustworthiness of people and local political institutions
- Use categorical answers to trust questions to build variables that can take values 0 ("not at all"), 1 ("just a little"), 2 ("somewhat"), or 3 ("a lot")
- Estimate Probit maximum likelihood models instead of linear probability models
- Round 5: sample restricted to countries from round 3

MOST ROBUSTNESS TESTS SUPPORT THE GENERAL PATTERN OF OUR RESULTS.

AXIOMATIC CHARACTERIZATION OF ETHNIC STRATIFICATION

We can show that (2) satisfies the following axioms

- Co-directionality by wealth creation or transfer
- Bi-polarization by wealth transfer
- Co-directionality by linguistic change

CO-DIRECTIONALITY BY WEALTH CREATION OR TRANSFER

CO-DIRECTIONALITY BY WEALTH CREATION OR TRANSFER

BI-POLARIZATION BY WEALTH TRANSFER

BI-POLARIZATION BY WEALTH TRANSFER

CO-DIRECTIONALITY BY LINGUISTIC CHANGE

CO-DIRECTIONALITY BY LINGUISTIC CHANGE