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COOPERATION AND CONFLICT: PERSPECTIVES FROM ECONOMICS AND BEYOND

Keeping It in the Family: Lineage Organization and the Scope of Trust in Sub-Saharan Africa[†]

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In the last two decades economists have increasingly come to recognize that economies are embedded in societies. For an economic system to work, a large number of complementary social norms need to exist and these cannot be taken for granted. While such ideas are latent in the debate between substantivists and formalists about how to understand historical economic systems (e.g., Polanyi 1944) and in research by sociologists (Granovetter 1985), their modern articulation is in the guise of "social capital." In his seminal book *Making Democracy Work*, Robert Putnam (1993) argues that the better governance and prosperity of Northern Italy compared to Southern Italy was caused by the North having greater "social capital," which he defines as the "connections among individuals—social networks and the norms of reciprocity and trustworthiness that arise from them" (Putnam 2000, p. 19).

There is now significant evidence that social capital is associated with many important economic outcomes, such as economic development (Tabellini 2010; Algan and Cahuc 2013) and trade (Guiso, Sapienza, and Zingales 2009). Yet, why does social capital vary across societies? Following Putnam, most scholars have thus far emphasized historical political institutions as a source of variation. Tabellini (2010), for example, uses historical constraints on the executive as a source of variation in social capital today, while Guiso, Sapienza, and Zingales (2016) instead use whether or not an Italian city was a commune in the Middle Ages.[1]

This study examines the relationship between traditional political institutions and one aspect of social capital, trust. Within Africa, which is the context of this study, studies of the long run importance of traditional institutional structures have emphasized the role of political centralization (e.g., Gennaioli and Rainer 2007; Michalopoulos and Papaioannou 2013, 2014). However, precolonial African societies also had many other important characteristics besides their level of political centralization, many of which are determined by the social structures of the society. Examples of these social structures include the nature and strength of kin relations; the presence of age-based occupations or political offices; rules of marriage and residence; and settlement patterns.

In this article, we investigate the relationship between a canonical form of social structure in Africa—segmentary lineage organization—and trust. Early anthropological work recognized that many African societies, both centralized and not, were systematically organized on the basis of kinship. Evans-Pritchard (1940), in his study of the Nuer of the South Sudan, classified these groups as a "segmentary lineage society." Such

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[1] An exception to this approach is Nunn and Wantchekon (2011) who show that social capital in Africa is systematically lower in places that were more impacted by the slave trade.

a society is characterized by unilineal descent, which means that people trace their ancestry back, usually to some mythical founder, either through the male (patrilineal), or female line (matrilineal). When such a descent group takes on a corporate form, meaning that it is used to organize economic and political life, it is said to form a lineage. Subsets (segments) of lineages function as coherent corporate groups and are assigned political, administrative, and judicial functions, usually under the guidance of elders. Fortes (1953, p. 26) describes the system as follows: "the individual has no legal or political status except as a member of a lineage; … all legal and political relations in the society take place in the context of the lineage system."

In segmentary lineage societies, family is central. All forms of interaction—social, economic, and political—are structured around family ties and lineages. While this has the benefit of strengthening associations (and most likely trust) among blood relatives, it also reduces associations with those with whom one is not related. Thus, it is likely that this shrinking of, what Putnam (2000) calls "associational life" (i.e., interactions outside of one's kin) would tend to reduce the extent of trust of nonrelatives in society. Putnam (2000) argues that greater social capital is facilitated by more associational life, and the more people are members of and involved with different forms of groups and societies outside of the family.[2] Thus, we expect segmentary lineage organization to limit the extent of generalized trust in a society due to the greater reliance on family which limits associational life.[3]

We test this hypothesis by examining the relationship between an ethnic group's traditional reliance on segmentary lineage organization and the levels of trust today. Our analysis distinguishes between trust of family members and more generalized trust of nonfamily members. We find that segmentary lineage organization is associated with a larger gap between the trust of one's relatives compared to nonrelatives. Disaggregating the difference, we find that this is primarily due to segmentary lineage societies having lower trust of nonrelatives, and not higher trust of relatives. Thus, to use the terminology of Putnam (2000), segmentary lineage organization appears to decrease the level of bridging social capital while having no effect on bonding social capital.

We now turn to a description of the data and our empirical results.

I. Data

Our analysis uses information on the historical presence of segmentary lineage organization as coded by Moscona, Nunn, and Robinson (2016). Commonly used ethnographic sources, including the *Ethnographic Atlas*, do not include information about segmentary lineage organization. Therefore, to identify the presence or absence of segmentary lineage organization, Moscona, Nunn, and Robinson (2016) extract information from the *Ethnographic Survey of Africa*, a multi-volume work compiled during the mid-twentieth century that contains ethnographic information about a large sample of ethnic groups in Africa. In total, 145 ethnic groups were determined to definitively either have (74 in total) or not have (71 in total) a segmentary lineage organization. Ethnic groups in the sample reside across sub-Saharan Africa, including several in Uganda, Tanzania, Kenya, Ethiopia, Mozambique, the Democratic Republic of the Congo, Zambia, Nigeria, Ghana, Liberia, Sudan, and Sierra Leone (see Moscona, Nunn, and Robinson 2016).

Segmentary lineage organization can be found among groups with both centralized and less centralized political administrations. Examples of segmentary lineage societies that are less centralized (i.e., "stateless") include the Nuer, Tiv, and Rega, while examples of segmentary lineage societies that have centralized states include the Somali, Duala, and Ndembu (Moscona, Nunn, and Robinson 2016). However, there is a correlation between the two characteristics. On average, ethnic groups that are less politically

[2] Interestingly, Banfield's (1958) book, which has been the foundation research in the area of social capital, attributes the low levels of social capital in the south of Italy to its social structure. Specifically, it is argued that it can be partially explained by the dominance of the nuclear family in the south.

[3] There are other well-established hypotheses about the social consequences of such social structures. Sahlins (1961), for example, hypothesized that segmentary lineage societies would be "expansionary" territorially and would tend to be associated with conflict. In Moscona, Nunn, and Robinson (2016) we develop the first systematic database of the presence of segmentary lineage societies in Africa and show that the presence of such societies is associated with greater levels of conflict today.

centralized are slightly more likely to have a segmentary lineage organization. Among the 145 ethnic groups in our sample, there is a negative relationship between the presence of segmentary lineage organization and the levels of political hierarchy beyond the local community from the *Ethnographic Atlas* (corr $= -0.21$; $p = 0.01$). Thus, in our analysis, we are sure to control for this historical characteristic of ethnic groups.[4]

To measure the nature of social capital, we focus on responses about trust in others from the 2005 (round 3), 2008 (round 4), and 2015 (round 5) Afrobarometer. The database compiles nationally representative surveys conducted in local languages from 18, 20, and 34 countries, respectively. In all surveys, respondents are asked how much they trust their "relatives." Respondents' answers were coded on a scale of 1–4, where 1 means "not at all" and 4 means "I trust them a lot." Unfortunately, the surveys do not ask individuals how much they trust those that are not their relatives. However, the surveys do have questions that come very close to this. In round 3, respondents were asked how much they trust people from the same country who are members of other ethnic groups (phrased as "trust [Ghanaian/Kenyan/etc.] from other ethnic groups"). In round 4, respondents were also asked how much they trust other people from the same country (phrased as "trust other [Ghanaians/Kenyans/etc.]"). In rounds 4 and 5, respondents were asked how much they trust "other people [they] know." These trust questions have the same answers and are coded on the same 1–4 scale.

Our primary outcome variable is the difference between trust in relatives and trust in nonrelatives. Because there is no measure of trust in nonrelatives that is common in all three survey waves, we estimate our regressions separately for the different waves using the different measures.

We linked individuals in the Afrobarometer survey to ethnic groups in the segmentary lineage database using the self-reported ethnicity of survey respondents. For rounds 3 and 4, we rely on preexisting concordances that have been developed, linking the ethnic groups from the Afrobarometer to the ethnic groups from Murdock's *Map of Africa*. These are from Nunn and Wantchekon (2011) for round 3 and Deconinck and Verpoorten (2013) for round 4. For round 5, we manually matched ethnic groups that were not in the round 3 or 4 surveys. In total, there are 68 ethnic groups (according to Murdock's classification) in our round 3 sample, 73 ethnic groups in our round 4 sample, and 92 ethnic groups in our round 5 sample.[5]

II. Results

To investigate our questions of interest, we use the same basic specification as from Nunn and Wantchekon (2011), but with two important changes. First, our outcome of interest is the difference in trust levels between relatives and others. Second, our independent variable of interest is an indicator variable that equals one if an ethnic group e traditionally has a segmentary lineage structure. We denote this I_e^{SL}. Our estimating equation is as follows:

$$(1)\quad Trust_{i,e,d,c}^{Relatives} - Trust_{i,e,d,c}^{NonRelatives} = \alpha_c + \beta I_e^{SL} + \mathbf{X}'_{i,e,d,c}\boldsymbol{\Gamma} + \mathbf{X}'_e\boldsymbol{\Phi} + \varepsilon_{i,e,d,c},$$

where i indexes individuals, e ethnic groups, d districts, and c countries; $Trust_{i,e,d,c}^{Relatives} - Trust_{i,e,d,c}^{NonRelatives}$ denotes the self-reported difference in trust between relatives and nonrelatives for individual i; I_e^{SL} is our independent variable of interest, an indicator variable that equals one if ethnic group e traditionally structured society using a segmentary lineage organization; α_c denotes country fixed effects; $\mathbf{X}'_{i,e,d,c}$ denotes a vector of individual-level covariates: age, age squared, a gender indicator variable, an indicator variable that equals one if the respondent lives in an urban location, 5 fixed effects for the respondent's living conditions, 10 fixed effects for the educational attainment of the respondent,

[4] We find no relationship between segmentary lineage and historical economic development as measured by the complexity of settlements from the *Ethnographic Atlas* (corr $= 0.01$; $p = 0.90$).

[5] In some regressions, we are able to combine rounds 4 and 5. In this sample there are 96 ethnic groups. In the results below, we report controlled regressions and as a result are forced to drop observations where data on other covariates are missing. As a result, the reported regressions each use a slightly smaller sample of ethnic groups—the number of ethnic groups in each regression is listed in column 6 of each table.

Table 1—OLS Estimates of the Relationship between Segmentary Lineage Systems and the Relatives Trust Gap

Dependent variable: (1)	Segmentary lineage Coefficient (2)	SE (3)	Mean of dependent variable (4)	Observations (5)	Clusters (6)	R^2 (7)
Panel A. The relatives and nonrelatives trust gap						
Difference (trust relatives − trust *x*):						
Non-coethnic (round 3)	0.1334	(0.0781)	0.797	10,105	66	0.047
Others you know (rounds 4 and 5)	0.0873	(0.0410)	0.940	25,499	94	0.088
Fellow countrymen (round 4)	0.1852	(0.0656)	1.043	9,538	72	0.057
Panel B. Trust levels						
Trust measure:						
Relatives (round 3)	0.0289	(0.0592)	3.104	10,246	66	0.152
Relatives (round 4)	−0.0488	(0.0507)	3.338	9,624	72	0.161
Relatives (rounds 4 and 5)	−0.0102	(0.0352)	3.346	25,588	94	0.126
Non-coethnic (round 3)	−0.1098	(0.0857)	2.299	10,113	66	0.148
Fellow countrymen (round 4)	−0.2387	(0.0673)	2.293	9,547	72	0.175
Others you know (rounds 4 and 5)	−0.0971	(0.0473)	2.405	25,534	94	0.170

Notes: Each row of the table summarizes estimates from one regression. The first column of the row reports the dependent variable of the regression. The second and third columns report the coefficient and standard error (clustered at the ethnicity level) for the segmentary lineage indicator variable. The other columns report the number of observations (individuals), the number of clusters (ethnic groups), and the R^2 of the regression. All regressions include country fixed effects, a set of individual-level covariates (age, age squared, a gender indicator variable, an indicator variable that equals one if the respondent lives in an urban location, 5 fixed effects for the respondent's living conditions, 10 fixed effects for the educational attainment of the respondent, 18 religion fixed effects, and 25 occupation fixed effects), and a set of ethnicity-level covariates (the number of jurisdictional political hierarchies beyond the local community, historical settlement pattern complexity, log slave exports normalized by land area, missions normalized by land area, indicator variables for European explorer and railway contact, an indicator variable for the presence of a city in 1400, a malaria ecology index, a tse tse fly suitability index, an agricultural suitability index, absolute latitude, and longitude). In regressions that include data from the round 4 survey, occupation fixed effects are replaced with four employment status fixed effects.

18 religion fixed effects, and 25 occupation fixed effects.[6] We also include a vector of measures of the historical characteristics of ethnic groups, denoted $\mathbf{X}'_e$. These include: jurisdictional hierarchy, historical settlement patterns, log slave exports normalized by land area, missions normalized by land area, indicator variables for explorer and railway contact, an indicator variable for the presence of a city in 1400, and a malaria ecology index (all taken from Nunn and Wantchekon 2011), as well as an agricultural suitability index, absolute latitude, and longitude (from Moscona, Nunn and Robinson 2016), and a tse tse fly suitability index (from Alsan 2015).[7]

The OLS estimates of equation (1) are reported in panel A of Table 1. We report estimates using each of the three different nonrelatives trust measures available (non-coethnic, others you know, and fellow countrymen). As reported in column 4, the means of the dependent variables are always positive, indicating that on average individuals have greater trust in relatives than nonrelatives. Our estimated effects of segmentary lineage on this trust gap are reported in column 2 with the associated standard errors in column 3. In each case, we find a significant positive relationship between segmentary lineage organization and the difference in trust of relatives and nonrelatives. Ethnic

[6] In round 4 of the survey, respondents were not asked to list their occupation. As a result, in all regressions that use trust measures from round 4, we replace occupation fixed effects with four employment status fixed effects (individuals are characterized as either (i) jobless and not looking for a job; (ii) jobless and looking for a job; (iii) employed part time; or (iv) employed full time).

[7] In regressions that combine survey rounds 4 and 5, we also include an indicator variable that equals one if a respondent was interviewed in round 5 of the survey.

Table 2—OLS Estimates of the Relationship between Segmentary Lineage Systems and the Relatives Trust Gap Separately for Urban and Rural Populations

Dependent variable: (1)	Segmentary lineage		Mean of dependent variable (4)	Observations (5)	Clusters (6)	R^2 (7)
	Coefficient (2)	SE (3)				
Panel A. Rural sample						
Difference (trust relatives − trust *x*):						
Non-coethnic (round 3)	0.188	(0.099)	0.821	6,040	60	0.061
Others you know (rounds 4 and 5)	0.115	(0.046)	0.89	16,164	92	0.074
Fellow countrymen (round 4)	0.241	(0.074)	1.044	6,162	70	0.067
Panel B. Urban sample						
Difference (trust relatives − trust *x*):						
Non-coethnic (round 3)	0.029	(0.062)	0.762	4,065	62	0.054
Others you know (rounds 4 and 5)	0.012	(0.046)	1.027	9,335	93	0.111
Fellow countrymen (round 4)	0.065	(0.073)	1.042	3,376	71	0.068

Notes: Each row of the table summarizes estimates from one regression. The first column of the row reports the dependent variable of the regression. The second and third columns report the coefficient and standard error (clustered at the ethnicity level) for the segmentary lineage indicator variable. The other columns report the number of observations (individuals), the number of clusters (ethnic groups), and the R^2 of the regression. All regressions include country fixed effects, a set of individual-level covariates (age, age squared, a gender indicator variable, an indicator variable that equals one if the respondent lives in an urban location, 5 fixed effects for the respondent's living conditions, 10 fixed effects for the educational attainment of the respondent, 18 religion fixed effects, and 25 occupation fixed effects), and a set of ethnicity-level covariates (the number of jurisdictional political hierarchies beyond the local community, historical settlement pattern complexity, log slave exports normalized by land area, missions normalized by land area, indicator variables for European explorer and railway contact, an indicator variable for the presence of a city in 1400, a malaria ecology index, a tse tse fly suitability index, an agricultural suitability index, absolute latitude, and longitude). In regressions that include data from the round 4 survey, occupation fixed effects are replaced with four employment status fixed effects.

groups that traditionally had a segmentary lineage organization have higher trust of relatives compared to nonrelatives today.

The natural question is why the trust gap emerges. Is it because segmentary lineage organization decrease one's trust in others, or because it increases one's trust in relatives, or both? To answer this question, we estimate equation (1) with the trust measures themselves as the outcome variables rather than the differences in the trust measures. These estimates are reported in panel B of Table 1. The estimates show that there is no robust relationship between segmentary lineage organization and trust in relatives.[8] All three coefficients are small and insignificant. By contrast, we do find a negative and sizable relationship between segmentary organization and trust in nonrelatives. All three coefficients are sizable and negative, and two of the three are statistically significant. Thus, segmentary lineage systems are associated with lower levels of trust in nonrelatives.

The estimates speak to the effect that social structures can have on social capital, and particularly on bridging and bonding social capital. Segmentary lineage organization, which relies on lineage and family structure to organize political and economic life, appears to not affect an individual's trust in their relatives (bonding social capital), but it does appear to erode trust with nonrelatives (bridging social capital). This is likely due to the reduced interaction (i.e., shrinking of "associational life") that occurs between nonrelated individuals in a society that is organized by lineage.

As a robustness check, we estimate the regressions of Table 1 separately for urban and rural populations. This heterogeneity provides a test

[8] It is possible that this masks an increase in trust that is offset by the different definition of relatives in segmentary lineage and non-segmentary lineage groups. In segmentary lineage groups, the set of one's relatives is typically larger and tends to include more distant relatives than in non-segmentary lineage societies. A larger set of more distant relatives would tend to reduce the reported level of trust in one's relatives. Thus, it is possible that segmentary lineage societies have more trust in relatives, holding constant the set of relatives in question.

of the causal interpretation of our results. Within urban areas, traditional social structures have been replaced, or weakened, by formal national political institutions. By contrast, in rural areas, the influence of national political institutions is much weaker, and traditional social structures tend to have more influence (see Michalopoulos and Papaioannou 2014). Thus, to the extent that the estimates reported in Table 1 are causal and not spurious, we expect the estimated effects to be weaker in cities than in rural areas. For example, our findings could arise because certain ethnic groups initially had higher trust in relatives compared to nonrelatives, and this caused these ethnic groups to adopt lineage-based social organization. If initial trust levels persist until today, then we would observe that segmentary lineage ethnic groups have higher trust in relatives compared to nonrelatives, even if segmentary lineage has no causal effect on trust. However, in this case, we would expect the relationship between segmentary lineage and trust to be similar in urban and rural settings. Since in this hypothetical the relationship between segmentary lineage and relative trust levels is not causal, it does not matter whether or not segmentary lineage organization is present today.

Estimates of equation (1), for urban and rural populations, are reported in Table 2. We find that the estimated effect of segmentary lineage structure on the trust gap is greater among the rural population than among the urban population. The magnitude of the point estimates for the rural population are 4–10 times greater than for the urban population. In addition, the estimates for the urban population are not statistically different from zero (this is due to small point estimates and not large standard errors). The estimates are consistent with segmentary lineage systems having a causal effect on the difference between individuals' trust of their relatives and others.

III. Conclusions

We have presented preliminary evidence showing that, within sub-Saharan Africa, the structure of traditional society plays an important role in determining the scope of trust. Individuals belonging to ethnic groups that organized society using segmentary lineages exhibit a more limited scope of trust today, as measured by the gap between their trust in relatives and their trust in nonrelatives. We find that this gap arises because segmentary lineage societies have lower levels of trust in nonrelatives and not because they have higher levels of trust in relatives. A causal interpretation of these correlations is supported by the fact that the effects are only found in rural areas where these forms of organization are still prevalent.

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