

THE ECONOMIC ORIGINS OF TRUST: EVIDENCE FROM TRANSHUMANT PASTORALIST SOCIETIES*

Etienne Le Rossignol[†]

CES

Sara Lowes[‡]

UC San Diego and NBER

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ABSTRACT: We examine the hypothesis from anthropology that the economic requirements of transhumant pastoralism made pastoralists highly interdependent within groups but hostile to individuals beyond the radius of extended kin. We find that historical reliance on transhumant pastoralism led to the emergence of in-group oriented and family-centered individuals. Specifically, transhumant pastoralism explains part of the contemporary variation in in-group relative to out-group trust. This result is valid across countries, between residents of the same country, among second-generation migrants and with an instrumental variable strategy. We also examine the implications of this cultural trait for cooperation and firm development. In a quasi-experimental setting, we find that individuals from transhumant pastoralist groups are perceived as more hostile, more suspicious, and less cooperative. Additionally, we find evidence that in-group bias may constrain firm growth. Greater reliance on transhumant pastoralism is associated with less objective promotion criteria within firms and smaller firm size. This paper contributes to our understanding of how forms of economic production shape the scope and extent of trust.

Keywords: Pastoralism, trust, kinship.

JEL Classification: N47, Z10

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[†] CES. Email: etienne.le-rossignol@univ-paris1.fr. Website: <https://etiennelerossignol.com/>.

[‡] UC San Diego, NBER, and CIFAR. Email: slowes@ucsd.edu. Website: www.saralowes.com.

1. Introduction

Trust beyond the radius of close in-group members is an essential component of growth and economic development (Knack and Keefer, 1997, Algan and Cahuc, 2010, Butler, Giuliano and Guiso, 2016). However, we observe substantial variation in willingness to trust outsiders (see Figure 1). There is increasing interest in how social structures shape the extent and scope of trust (Moscona, Nunn and Robinson, 2017, Lowes, 2020, Enke, 2019). However, there is limited evidence on how traditional forms of economic production shape trust. We examine how reliance on transhumant pastoralism affects incentives for in-group relative to out-group trust.

Transhumant pastoralism is the reliance on animal herding for economic production. Transhumant pastoralist societies are characterized by raising livestock such as cattle, sheep, and camelids, and by the frequent need to move location so that the animals can graze. They are often located in difficult environments and faced threats of pests, of raids or hostilities from other groups such that survival necessitates cooperation among group members. Though pastoralists were frequently required to take decisive independent action, they relied strongly on their community for mutual assistance and protection. Anthropologists hypothesized that this resulted in tightly knit kin groups and higher levels of in-group trust. We take this hypothesis to the data.

To examine the effects of transhumant pastoralism, we construct a measure of transhumant pastoralism based on the Ethnographic Atlas's coding of reliance on animal husbandry, herding animals, and settlement permanence. This measure is similar to (Becker, 2019); however, it accounts for the extent to which the society is transhumant – by that we mean the extent to which the society is mobile. Given that the psychological effects of pastoralism are affected by the mobility of the society, we view this as an important modification of the pastoralism measure.¹

Our key outcome of interest is a measure of in-group relative to out-group trust. We use data from the Integrated Value Survey (IVS) for over 280,000 individuals across 97 countries. Following Delhey, Newton and Welzel (2011), we construct a measure of in-group relative to out-group trust by taking the difference between the extent to which individuals report trusting family members, neighbors, and other people known by the respondent relative to people met for the first time, people of another religion, and foreigners.

We pursue several strategies to measure the effects of transhumant pastoralism on trust. First,

¹ This modification has also been used in related papers (McGuirk and Nunn, 2020b).

we examine the correlation across countries between our measure of transhumant pastoralism and in-group relative to out-group trust. We find that transhumant pastoralism has a positive and significant effect on in-group relative to out-group trust. These results are robust to a wide variety of controls, including individual, geographic, and ethnographic controls, as well as continent fixed effects and Lasso-selected controls (Belloni, Chernozhukov and Hansen, 2014a,b).

Second, we examine within country variation using country fixed effects. We assign exposure to transhumant pastoralism based on an individual's self-reported ethnic identity and an ethnic group's historical reliance on transhumant pastoralism. Consistent with our cross-country results, we find a strong positive correlation between transhumant pastoralism and greater in-group relative to out-group trust. As a form of robustness, we also present IV estimates using data from Beck and Sieber (2010), who construct a measure of how suitable land is for pastoralism. The IV results are positive, significant and of similar magnitude for both the cross-country and within-country estimates.

Additionally, we disaggregate our results by in-group and out-group trust. We find evidence of both greater trust in in-group members (specifically, relatives and neighbors) and less trust in all out group members.

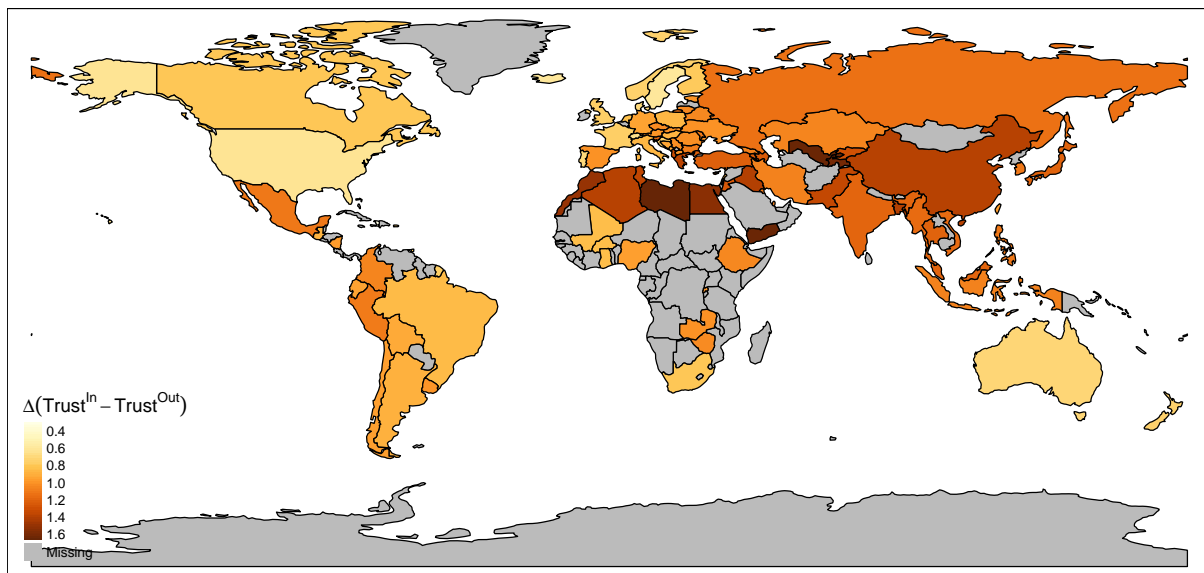
Finally, we take advantage of a quasi-experiment using data from the Afrobarometer. The Afrobarometer includes exit questions for the enumerator on the attitude of the respondent during the interview. Enumerators are asked to rate the extent to which the respondent is friendly cooperative, honest, and at ease. Across these various measures we find that individuals with greater exposure to transhumant pastoralism are rated as less friendly, less cooperative, less honest, and less at ease. This is the case regardless of whether the respondent and enumerator share the same mother tongue.

Across the various identification strategies we find that transhumant pastoralism is associated with greater in-group relative to out-group trust. We then explore mechanisms for persistence, given that individuals may no longer rely on transhumant pastoralism as their primary means of economic production. We document several key facts. First, the effect size is larger among women relative to men. Second, we examine the effect by age-cohort. While the effect size is relatively stable across generations of women, the effect size has diminished overtime for men, with older men having a similar effect size as women.

In an exercise similar to that in Alesina, Giuliano and Nunn (2013), we examine which

parent is most important in explaining the transmission of the cultural trait using a sample of second-generation immigrants for whom we have information on the parents' country of origin. While both the father and the mother's country of origin's level of reliance on transhumant pastoralism is associated with the respondent's in-group relative to out-group trust, the effect size is larger for mothers than for fathers. Finally, we examine the traits that an individual feels are important to transmit to children. We focus on three cultural traits particularly related to transhumant pastoralism: independence and responsibility, which were highly valued and required for survival, and tolerance and respect for other people, which is negatively related to the culture of honor which permeated pastoralist societies. We find that women are more likely to report that it is important for children to be independent and responsible, and less likely to report that tolerance and respect of others are important. Thus, women continue to inculcate values associated with transhumant pastoralism while men no longer do.

Figure 1: Distribution of Trust In versus Out-Group Around the World



Notes: This map displays the distribution of trust in in-group relative to out-group by country. Data is from the Integrated Value Survey TimeSeries 2005-2014. When a country's *Delta In versus Out-Group Trust* equal zero, the population of that country trusts in-group and out-group members equally; positive values measure the degree of in-group bias.

Finally, we examine the economic implications of greater in-group trust bias. Specifically, we explore whether in-group trust may constrain firm growth. Recent work on firm size in developing countries has highlighted that limited managerial capacity – and the over reliance on family members – may explain the lack of large firms (Bloom, Eifert, Mahajan, McKenzie and Roberts, 2013). In areas where there is greater in-group trust bias, individuals may tend

to rely on family members and those known to them for the management of firms, rather than to hire managers outside of their network. Using detailed firm-level data from the Enterprise Survey for 46 countries we find that, conditional on industry and continent fixed effects, firms located in countries where transhumant pastoralism played a dominant role in populations' ancestral lifestyles rely less on objective criteria such as achievements and abilities and more on the length of tenure or family ties for the promotion of non-managers. We then investigate how our transhumant pastoralism index of interest correlates with average firm size. As conjectured, our index of historical reliance on transhumant pastoralism is significantly negatively correlated with average firm size taken from the same Enterprise Survey for 124 countries, especially for firms at the top of the distribution.

This paper contributes to several stands in the literature. First, it contributes to the literature on the structural determinants of trust: land productivity (Litina, 2016), bio-geographical conditions (Falk, Becker, Dohmen, Enke, Huffman and Sunde, 2018), ancestral irrigation (Bugge et al., 2017, Talhelm and English, 2020), and social organization (Moscona et al., 2017, Enke, 2019). We contribute to this literature by demonstrating how historical subsistence strategies can shape levels of trust.

Second, we contribute to the literature connecting specific cultural traits to traditional reliance on pastoralism, and transhumant pastoralism: restrictions on women's agency (Becker, 2019), honor (Grosjean, 2014, Falk et al., 2018, Michalopoulos and Xue, 2019), conflict (McGuirk and Nunn, 2020a), and genetic adaptation (Tishkoff, Reed, Ranciaro, Voight, Babbitt, Silverman, Powell, Mortensen, Hirbo, Osman et al., 2007). For example, Cao, Enke, Falk, Giuliano and Nunn (2020) find that historical reliance on herding is associated with greater conflict and negative reciprocity. Our findings suggest that the requirements of transhumant pastoralism – in which kin groups needed to cooperate to survive – has led to greater in group relative to out group trust. Furthermore, we present evidence on how this trait persists; women from pastoralist groups are more likely to report that it is important to invest in related psychological traits.

Third, it contributes to the literature in trade and development economics focusing on understanding the origins of different managerial cultures that are at the root of the large productivity gap we observe between countries. Bloom et al. (2013) note that firms in developing countries tend to be small and highlight the role that family ties may play in constraining firm growth. We provide empirical evidence consistent with this hypothesis; firms located in areas with greater

reliance on transhumant pastoralism use less objective criteria in promotion and tend to have smaller sizes.

We organize the paper as follows. Section 2 develops the hypothesis, section 3 introduces the data and investigates the correlates of transhumant pastoralism, section 4 presents our empirical strategy and the results, and section 5 concludes.

2. Hypothesis

Transhumant pastoralist groups are mainly found along an axis stretching from the Sahel to Central Asia and passing through the Middle East and the horn of Africa (see figure 2). They raise livestock such as cattle, sheep, horses and camelids for the production of milk, meat, skins, wool or for trade (Salzman, 2018). They keep animals in herds that graze in impermanent natural pastures, usually in settings where agriculture is limited or cannot be sustained without advanced agricultural technologies due to aridity, infertile soils, or extreme temperature. This livelihood allowed humans to inhabit regions of the world otherwise unsuitable for sedentary human existence.

Among these groups, the routines and settlement patterns of transhumant pastoralists are tied directly to the need to provide food and water for their livestock (Goldschmidt, 1971). Keeping healthy livestock in the harsh ecosystems in which transhumant pastoralists exist requires moving, sometimes over long distances, in small groups to search for food and water. The timing and location of the seasonal migration are crucial, since herds cannot survive in certain regions during part of the year. Hence, particularly in the face of threats, transhumant pastoralists must make fast and independent decisions for the survival of the group's herds. Edgerton (1971) document the more independent-minded orientation of pastoralist's behavior as compared to farmers. However, pastoralist groups "display more cohesiveness despite their greater independence of actions" (Edgerton, 1971, Bolton, Bolton, Gross, Koel, Michelson, Munroe and Munroe, 1976, Goldschmidt, 1971). Although highly independent and assertive individuals, the economic requirements of pastoralism made households highly interdependent (Spencer, 2013).

Transhumant pastoralists' cohesiveness is essential to direct herds towards dedicated grazing areas. For example, cohesiveness and trust are necessary for information sharing within the group about the location of resources. Reciprocity between group members is also important to prevent the risk of overgrazing natural resources managed in common. Finally, given that

cattle herding is labor-intensive, cohesiveness allows pastoralists to rotate livestock surveillance. The capacity to form a unique whole is also fundamental in transhumant pastoralists' ability to design responses to the other challenges of their lifestyle. For example, during the dry season, pastoralists would cooperate to dig shared water holes (Evans-Pritchard, 1940, Vansina, 2004). Furthermore, the consequences and coping strategies associated with extreme weather events favored social innovations that strengthened within-group ties. For instance, episodes of severe droughts or diseases outbreaks that decimate herds are anticipated and prevented by entrusting part of one's capital (i.e., livestock) with "cattle kin", which allows to spread the risk (Salzman, 2018, Boutrais, 2008). Finally, given the high degree of spatial mobility of pastoralists' wealth, cooperation within groups allowed pastoralists to both defend the group's herds against raids and capture other groups' herds to recover from severe droughts and outbreaks (Evans-Pritchard, 1940).

Based upon this description of some of the characteristics shared by transhumant pastoral groups we test the hypothesis that the high degree of interdependence between neighboring households in transhumant pastoralist communities led to the development of norms of greater in-group trust.

3. Data

3.1. *Measuring Transhumant Pastoralism*

Data on historical reliance on transhumant pastoralism is not available in existing cross-cultural samples. The literature has proposed several methodologies to construct indexes of historical reliance on pastoralism using variables in the Ethnographic Atlas² (Murdock, 1967, Gray, 1999, Giuliano and Nunn, 2017). Early contributions identified pastoralist societies as those that historically relied on herding for 45 to 100 percent of their subsistence, relative to other subsistence activities, and on agriculture for less than 25 percent (variables v5 and v4 in the EA respectively) (Cone, 1979). More recently Becker (2019) proposed a continuous measure of pastoralism based on reliance on herding and the predominant type of animal husbandry (v5 and v40 in the EA). In this framework pastoral societies are those societies that historically relied on raising herding

² The Ethnographic Atlas is an anthropological database widely used in Economics and other social sciences covering more than 1,200 pre-industrial societies. This database is generally thought as a valid source of information in Economics (Bahrami-Rad, Becker and Henrich, 2021)

animals, such as goats, cattle, or camelids, rather than chickens or pigs. Although [Becker \(2019\)](#)'s measure performs well in measuring livestock husbandry, it lacks the mobility dimension that characterizes transhumant pastoralist groups. In line with this, as shown in [Figure B8](#), this measure classifies many sedentary groups practicing agriculture and livestock husbandry as pastoralist.

Based on our reading of the ethnographic literature, the mobility of pastoralist groups is particularly important for shaping norms of cooperation and trust. Thus, we construct a new measure of pastoralism that incorporates information on the permanence of a society's settlement. We interact the measure developed in ([Becker, 2019](#)) with a dummy variable equal one if a society's settlement pattern is impermanent (variable *v30* in the EA). Thus, *TranshumantPastoralism* is an index [0;100] in 10 percent intervals. We construct the index as follows:

$$\textit{TranshumantPastoralism} = \textit{AnimalHusbandry} * \textit{HerdingAnimals} * \textit{ImpermanentSettlement} \quad (1)$$

where *AnimalHusbandry* \in [0;100]; *HerdingAnimals* equal one if a society raises sheep, goats, equine animals, deers, camelids, or bovine animals, and zero otherwise; and *ImpermanentSettlement* equal one if a society's settlement pattern is either "nomadic or fully migratory", "seminomadic", "semisedentary", "compact but impermanent settlements", or "neighborhoods of dispersed family homes", and zero otherwise. [Map 2](#) displays the distribution of mobile pastoral groups in the Ethnographic Atlas.

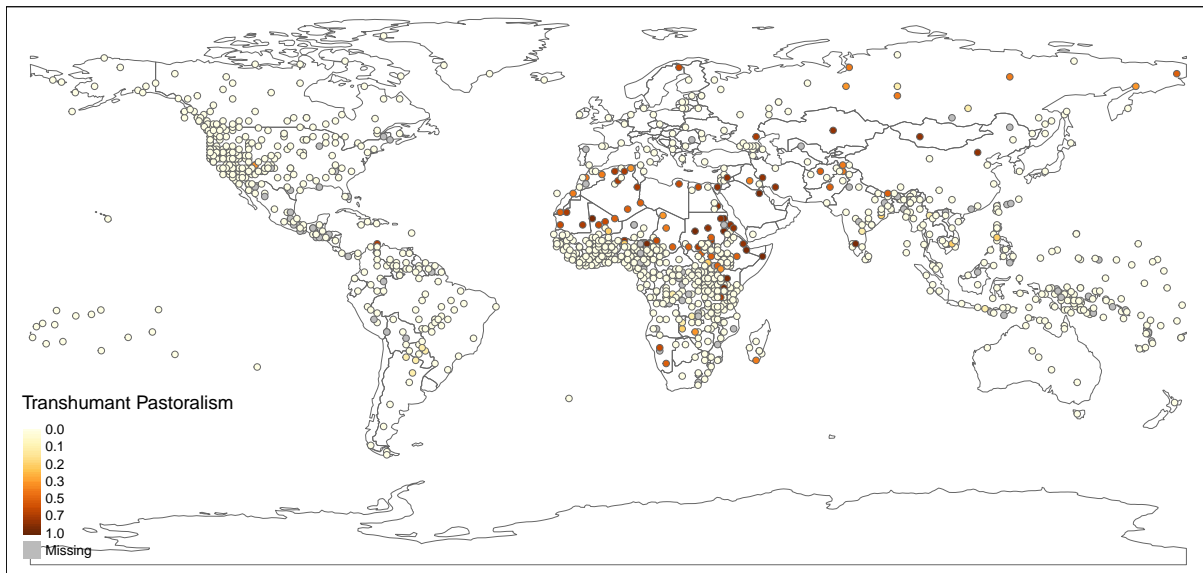
3.2. Correlates of Transhumant Pastoralism

We first examine the geographic and cultural correlates of transhumant pastoralism. We estimate the following specification:

$$Y_e = \alpha + \beta \textit{TranshumantPastoralism}_e + \mathbf{X}'_e \boldsymbol{\Gamma} + \epsilon_e \quad (2)$$

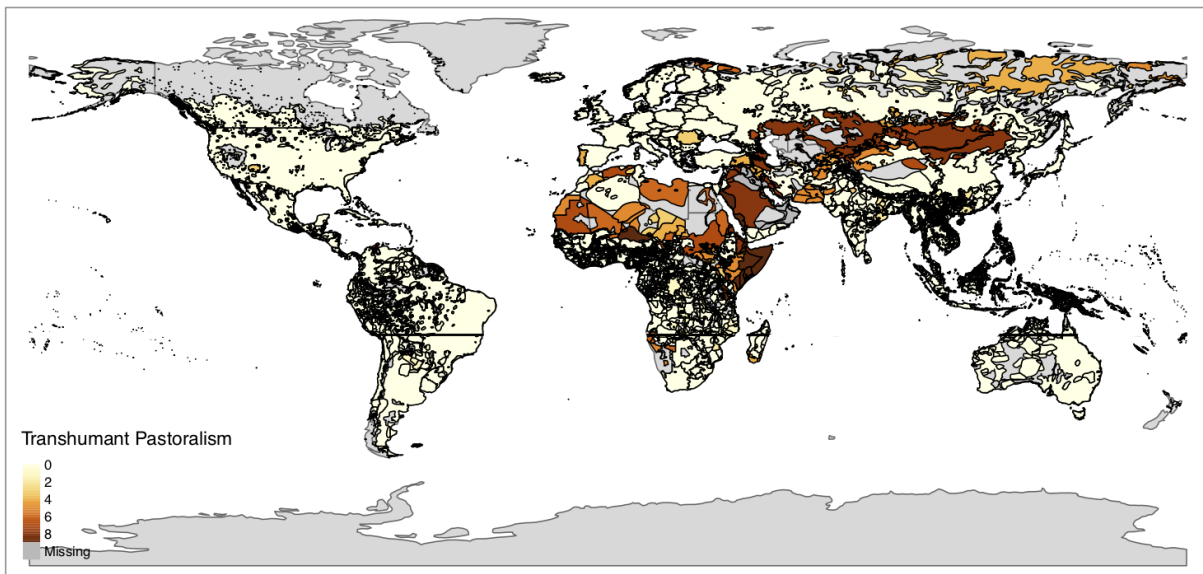
where, Y_e is the outcome of interest, e.g. geographic, climatic, or ethnographic outcomes, $\textit{TranshumantPastoralism}_e$ is our measure of reliance on transhumant pastoralism at the ethnicity level, \mathbf{X}'_e is a set of 6 continent fixed effects, and the term ϵ_e is the error term. Two additional variables enter the matrix \mathbf{X} : the log number of years since an ethnic group was recorded in the E.A. and an ethnic group's past reliance on animal husbandry. First, the Ethnographic Atlas does not constitute a picture of the world's ethnic groups at a single time, but rather a collection of

Figure 2: Distribution of Transhumant Pastoral Groups in the Ethnographic Atlas



Notes: This figure displays the distribution of transhumant pastoralists groups in the Ethnographic Atlas (Murdock, 1967, Gray, 1999, Giuliano and Nunn, 2017). Transhumant Pastoralism $\in [0;1]$, is based on variable v4 (animal husbandry), variable v40 (predominant type of animal husbandry), and v30 (impermanant settlement).

Figure 3: Distribution of Transhumant Pastoral Groups in the Ethnographic Atlas Matched to Ethnologue Data



Notes: This figure displays the distribution of transhumant pastoralists groups in the Ethnographic Atlas matched to Ethnologue Data (Murdock, 1967, Gray, 1999, Giuliano and Nunn, 2017). Transhumant Pastoralism $\in [0;1]$, is based on variable v4 (animal husbandry), variable v40 (predominant type of animal husbandry), and v30 (impermanant settlement).

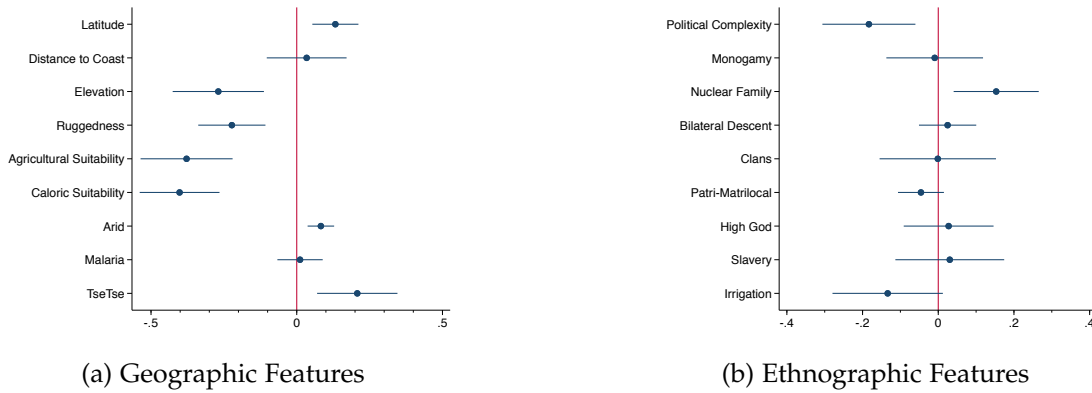
ethnographic knowledge for societies surveyed by ethnographers and anthropologists at varying points in time. Given that ethnic groups are not monolithic, and evolve through time adopting new livelihoods as new conditions arise, the log number of years is part of our baseline set

of controls.³ Second, by construction, our index of transhumant pastoralism is correlated with animal husbandry, one of the five dominant types of subsistence economy recorded in the E.A. ($\rho = .74$). To ensure that our investigation is not capturing the direct effects of reliance on animal husbandry, we include this as part of our baseline set of controls. Finally, to account for spillovers between neighboring groups we cluster the standard errors at the language-subfamily level.

In this exercise we examine several outcomes that may be correlated with transhumant pastoralism and may also affect levels of trust. For example, we investigate agricultural suitability in an ethnic groups' homeland because previous literature has shown that higher suitability for agriculture is associated with lower generalized trust (Litina, 2016).⁴

Similarly we investigate former presence of slavery and historical reliance on irrigation as both factors are strong predictors of variation in trust levels (Nunn and Wantchekon, 2011, Bugge et al., 2017). We also investigate separately the relationship between transhumant pastoralism and the four components of the kinship tightness index proposed in Enke (2019), Schulz, Bahrami-Rad, Beauchamp and Henrich (2018).

Figure 4: Correlates of Transhumant Pastoralism



Notes: The figure plots the standardized δ regression coefficient of *TranshumantPastoralism_e* for different geographic (left panel) and ethnographic (right panel) features. The unit of analysis is an ethnic group from the Ethnographic Atlas. *TranshumantPastoralism_e* is an index [0;1] measuring an ethnic group's historical reliance on transhumant pastoralism. Controls include: the (log) number of years since a group entered the EA and a group's historical reliance on animal husbandry, and a set of six continent fixed effects. Geographic characteristics are averaged within 100 kilometers around an ethnic group's homeland. Standard errors are clustered at the language sub-family level.

In Appendix B.2 we report the estimated coefficient β from equation 2 (see Figure B4 and

³ At the time Evans Pritchard surveyed the "Nuer" the group was slowly reducing its reliance on pastoralism for horticulture following episodes of rinderpest in the late XIX Century Evans-Pritchard (1940, p. 57).

⁴ Throughout the study, geographic controls – including agricultural and caloric suitability, suitability for malaria, tsetse fly suitability, elevation, ruggedness, and share of land in arid climate – are measured within a 100-kilometers radius around each ethnic group's homeland as defined in the Ethnographic Atlas.

Tables B1 and B2). To ease interpretation of the coefficient, both the outcome variable and $TranshumantPastoralism_e$ are standardized so that each point estimate represents standard deviation change in Y_e when $TranshumantPastoralism_e$ increases by one standard deviation. Panel 4a shows that, conditional on historical animal husbandry and continent fixed effects, transhumant pastoral groups tend to originate from regions that are more arid, less suitable for agriculture, and with poorer soil quality. Furthermore, they are located farther from the equator, in less rugged terrain, and at altitudes that are lower than where other groups herding animals live. Finally, within Africa (the only continent with the tsetse fly), they are in areas with greater tsetse fly suitability. Hence, while people who historically relied on animal husbandry for their living, a sedentary activity, had to settle in areas free from Tsetse fly. However, because they could move, mobile pastoralists could occupy areas where Tsetse is more prevalent.

Panel 4b presents ethnographic correlates of reliance on transhumant pastoralism. Historically, they have less complex political institutions as measured by the number of jurisdictions beyond the local community, are more likely to be domestically organized around independent nuclear families, and are less likely to have adopted irrigation. Together, these variables represent the set of geo-climatic and ethnographic covariates that we consider in our empirical analysis.

3.3. Measuring Trust

To construct our measure of in-group relative to out-group trust, we use the Integrated Value Survey. The full dataset contains data on trust for 285,569 respondents residing in 97 countries. Early contributions to the literature on both the origins and consequences of trust have relied on versions of the standard trust question: “Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?”, which captures generalized trust in strangers. Despite its availability in most preference surveys, this measure suffers from the problem that concept of a generic stranger differs between societies making between countries and between individuals comparisons problematic (Delhey et al., 2011).⁵ Additionally, we are interested in-group relative to out-group trust, which is not captured by this measure.

Therefore, we rely on six trust questions to construct a measure of in-group relative to out-group trust. In-group trust is measured as average trust in: (i) family members, (ii) neighbors, (iii) other people known by the respondent. Out-group trust is measured as average trust in:

⁵ Appendix B.4 presents robustness of our main results to using this more conventional measure of trust.

(iv) people met for the first time, (v) people of other religion, and (vi) foreigners.⁶ Our outcome variable is defined as: $\Delta(Trust^{In} - Trust^{Out}) = AveTrust(i,ii,iii) - AveTrust(iv,v,vi)$. The measure varies from -3 to 3. People who do not differentially trust their in-group more relative to their out-group score 0. People that are perfectly out-group biased score -3, and people scoring 3 are perfectly in-group biased. Variations of this trust measure have been extensively used in the recent literature (Moscona et al., 2017, Buggle et al., 2017, Enke, 2019).

Appendix Figure B1 plots the distribution across countries of our main outcome variable. Among the sampled countries Libya, Uzbekistan, and Yemen have the highest level of in-group trust with a $\Delta(Trust^{In} - Trust^{Out})$ around 1.65; Iceland, Sweden, and the United States have the lowest levels of in-group relative to out-group trust with scores below .65.

4. Empirical Strategy and Results

This section describes our empirical strategy and presents the results. We start by documenting how a historical reliance on transhumant pastoralism correlates with average in-group relative to out-group trust across countries. We then leverage within country variation in ancestral reliance on transhumant pastoralism across individuals belonging to different ethnic groups living in a same country.

Throughout the paper, we estimate variations on the following equation:

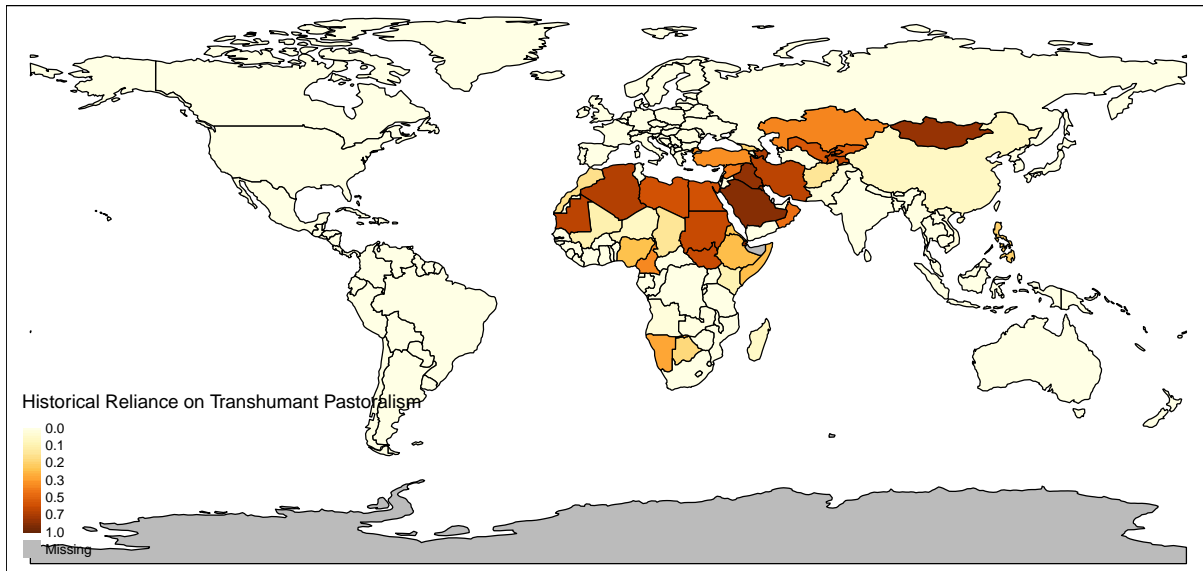
$$\Delta(Trust^{In} - Trust^{Out}) = \alpha + \beta TranshumantPastoralism + \mathbf{X}'\boldsymbol{\Gamma} + \epsilon \quad (3)$$

where $\Delta(Trust^{In} - Trust^{Out})$ is average in-group relative to out-group trust measured at the country or individual level. *TranshumantPastoralism* is our index of historical reliance on transhumant pastoralism measured at the country or ethnic group level, \mathbf{X}' a vector of geographic and ethnographic control variables that are strong correlates of transhumant pastoralism and that may be correlated with trust through alternative independent channels: latitude, elevation, ruggedness, suitability for agriculture and caloric suitability, political complexity, domestic organization around nuclear family, and irrigation (see section 3.1). Our baseline set of control variables include historical reliance on animal husbandry and the log number of years since an ethnic group entered the E.A. ϵ is the error term.

⁶ The exact wording of the survey question is as follows: "I'd like to ask you how much you trust people from various groups. Could you tell me for each whether you trust people from this group completely, somewhat, not very much or not at all?" (Read out and code one answer each) [Your family ; Your neighborhood, People you know personally, People you meet for the first time, People of another religion, People of another nationality].

In the cross-country analysis $\Delta(Trust^{In} - Trust^{Out})$ is averaged at the country level across all respondents in the Integrated Value Survey. *TranshumantPastoralism*, as well as all other covariates, is ancestry-adjusted and computed following the methodology developed in [Giuliano and Nunn \(2017\)](#), which consists of matching contemporary populations to their ancestors in the EA based on the language they speak. This method allows us to construct a population-weighted average of ancestral reliance on transhumant pastoralism for every country in the world.⁷ Map 5 displays the distribution of our index of transhumant pastoralism across countries. The spatial distribution closely follows the distribution of transhumant pastoralist groups presented in Figure 2.

Figure 5: Distribution of Transhumant Pastoralism Across Countries



Notes: This map displays the distribution of our population-weighted index of *Transhumant Pastoralism* across countries.

4.1. Cross-Country Estimates

The first exercise we conduct aims at investigating the broad correlation between our ancestry-adjusted index of historical reliance on transhumant pastoralism and in-group trust bias across countries. Following an evolutionary perspective, we expect that the more a country's population historically relied on transhumant pastoralism, the higher the trust in in-group's relative to out-groups.

⁷ Formally, this is represented by: $MobilePastoralism_c^{aa} = \sum_c \frac{Pop_{e,c} * v4 * v40 * v30'}{Pop_c}$.

Table 1: Cross-Country Estimates: Transhumant Pastoralism and In-Group Trust Bias

	Dependent Variable: Δ (Trust ^{In} - Trust ^{Out})					
	(1)	(2)	(3)	(4)	(5)	(6)
Transhumant Pastoralism [std.]	0.426*** (0.083)	0.555*** (0.129)	0.302** (0.130)	0.283** (0.132)	0.325** (0.137)	0.304** (0.151)
Mean Dep. Var.	1.03	1.03	1.03	1.03	1.03	1.03
Observations	97	97	97	97	97	97
Baseline Controls	No	Yes	Yes	Yes	Yes	Yes
Geographic Controls	No	No	Yes	Yes	Yes	Yes
Ethnographic Controls	No	No	No	Yes	Yes	Yes
Continent FE	No	No	No	No	Yes	Yes
Lasso-Selected Controls	No	No	No	No	No	Yes
R^2	0.228	0.241	0.422	0.508	0.575	

Notes: OLS estimates with robust standard errors in parentheses. The unit of observation is a country and data is from the IVS. Transhumant Pastoralism is an index [0;1] measuring a country's population historical reliance on transhumant pastoralism. Dependent variable in every column is the difference between average in-group trust (family, neighbors, people known) and average trust in out-group (people first met, people of another religion, foreigners). Baseline controls include a country's historical reliance on animal husbandry, and log number of years since a country's ethnic groups were observed in the E.A. Geographic controls are ancestry-adjusted and include: latitude, suitability for agriculture, caloric suitability, share of land in arid climate, elevation, and ruggedness. Ethnographic controls are ancestry-adjusted and include: political complexity, domestic organization around nuclear family, and past irrigation. * p < 0.1; ** p < 0.05; *** p < 0.01

Table 1 presents the estimates from Equation 3. Appendix Figure B3a in Appendix B.5 displays which countries are represented in the sample. Column (1) presents the unconditional estimate of the relationship between transhumant pastoralism and in-group trust. To ensure that our measure of transhumant pastoralism is not capturing the effects of a country's population's historical reliance on animal husbandry we control for ancestry-adjusted animal husbandry in columns (2) to (5). Column (3) conditions the estimation on ancestry-adjusted geographic and ethnographic baseline characteristics. Column (4) reports the estimated coefficient when we restrict our comparison to within continent variation. Finally, given that there are many possible potential choices of covariates, in column (5) we use Lasso to select which covariates to include in the estimation of our coefficient of interest (Belloni et al., 2014a,b).

The estimated coefficients imply that a one standard deviation increase in historical reliance on transhumant pastoralism implies a 25 to 55% increase in in-group trust bias. To give one concrete example: Iraq scores .8 in our transhumant pastoralism index (highest among the sampled countries) and 1.4 (90th percentile) in delta trust. According to our point estimate, if the population of Iraq had not relied on transhumant pastoralism in the past, Iraq's average delta trust would have been 1.03 (50th percentile), a level similar to Czech Republic who scores 0 in our

transhumant pastoralism index. Noticeably, our index of transhumant pastoralism alone explains one fifth of the in-sample variance in in-group trust bias.

In Appendix B.3 Table B3, we show that the results are robust to controlling for proxies for historical and contemporary development: population in 1500 CE and income per capita in the year 2000, and societal characteristics: ethnic fractionalization, democracy, legal origin, proportion of a country's population belonging to the three most popular religions.

4.2. *Within Countries Estimates*

We now turn to a within country analysis. In this section, we use rounds five to seven of the World Value Survey which contains data on both trust and a respondent's ethnic affiliation. Historical reliance on transhumant pastoralism is assigned to a respondent based on their self-reported ethnicity. Across the three waves of the WVS we are able to merge about 40,000 respondents originating from 33 countries to their respective ethnic group in the Ethnographic Atlas.⁸ This analysis complements the previous country-level analysis by leveraging variation between individuals residing in a same country. This allows us to include country fixed effects to address any country-level time invariant characteristics that affect our outcome of interest.

Table 2 documents that the pattern we observe between countries is also present when examine within country variation. Although the size of the coefficient is smaller than in the across-country analysis, the effect implies that a one standard deviation increase in historical reliance on transhumant pastoralism is associated with a 7% increase in in-group relative to out-group trust.

Robustness: Table B4 in Appendix B.3 shows similar results when we condition the estimation on endogenous covariates including: religion, religiosity, education, social class, employment status, and scale of income. Furthermore, given the skewed distribution of variable v4 (AnimalHusbandry) from the Ethnographic Atlas we winsorize this variable at the 95th percentile in the construction of our transhumant pastoralism index. We do this to ensure that our baseline results are not driven by a few groups with very high transhumant pastoralism scores and very low $\Delta(Trust^{In} - Trust^{Out})$. The estimates presented in B7 in Appendix B.3 suggest that the relationship we observe is not driven by outliers. Finally, in Table B14 we show that our main result is robust to the inclusion of region fixed effects instead of the country fixed effects used so far.

⁸ A list of all ethnic groups by country is available in Appendix A.5.

Table 2: Individual Level Estimates: Transhumant Pastoralism and In-Group Trust Bias

	Dependent Variable: $\Delta(\text{Trust}^{In} - \text{Trust}^{Out})$				
	(1)	(2)	(3)	(4)	(5)
Transhumant Pastoralism [std.]	0.072*** (0.020)	0.073** (0.032)	0.071** (0.036)	0.072** (0.029)	0.065** (0.029)
Mean Dep. Var.	1.12	1.12	1.12	1.12	1.12
Num. of Clusters	114	108	106	103	103
Observations	45902	44891	43573	43466	43466
Individual Controls	Yes	Yes	Yes	Yes	Yes
Baseline Controls	No	Yes	Yes	Yes	Yes
Geographic Controls	No	Yes	No	Yes	Yes
Ethnographic Controls	No	No	Yes	Yes	Yes
Lasso-Selected Controls	No	No	No	No	Yes
Country FE	Yes	Yes	Yes	Yes	Yes
Survey-Wave FE	Yes	Yes	Yes	Yes	Yes
R^2	0.101	0.098	0.098	0.100	

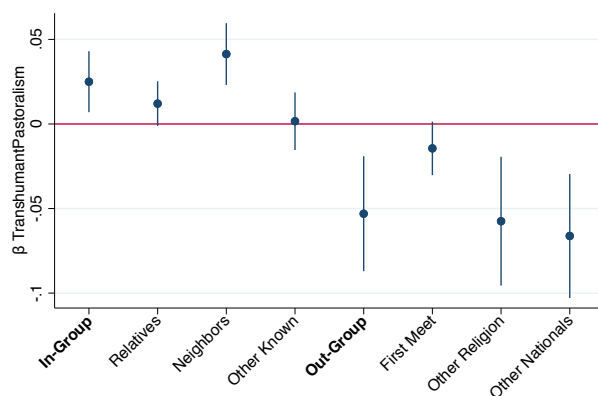
Notes: OLS estimates with robust standard errors clustered at the ethnic group level in parentheses. The unit of observation is a respondent in the WVS. *transhumant Pastoralism* is an index [0;1] measuring an ethnic group historical reliance on transhumant pastoralism. Dependent variable in all columns is the difference between average in-group trust (family, neighbors, people known) and average trust in out-group (people first met, people of another religion, foreigners). Each specification controls for the respondent's age, age squared, and gender. Baseline controls include an ethnic group's historical reliance on animal husbandry, and the log number of years since a given ethnic groups was observed in the E.A. Geographic controls include: latitude, suitability for agriculture, caloric suitability, share of land in arid climate, elevation, and ruggedness. Ethnographic controls include: political complexity, domestic organization around nuclear family, and past irrigation. Survey-round fixed effects are included in every specification. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

The effect we highlight is present for most of the 15 countries for which we have sufficient variation between respondents in the historical reliance of their respective ethnic groups on transhumant pastoralism to estimate coefficient β separately (left panel of Appendix Figure B2 in B.1). Indeed, among these countries, 8 have a positive sign and this positive sign is significant at the 90% threshold in 7 countries. The estimated β coefficient is not significantly different from zero in five countries, and negative and significant in the remaining two countries. Finally, the relationship between a country's population's historical reliance on transhumant pastoralism and the magnitude of our point estimate at the individual level follows an inverted u-shaped pattern (right panel of Appendix Figure B2), suggesting that the reference group is key in detecting any relation between past transhumant pastoralism and the pattern of trust within countries.

Next, we disaggregate the effect of transhumant pastoralism on $\Delta(\text{Trust}^{In} - \text{Trust}^{Out})$ and investigate where the gap emerges. Figure 6 estimates our model for every component of the trust index separately.⁹ Transhumant pastoral groups exhibit both greater in-group trust and

⁹ Corresponding Table B5.

Figure 6: Transhumant Pastoralism and Trust: Disaggregated Effect



Notes: This figure disaggregates the effect of Transhumant Pastoralism on Delta.

lower levels of out-group trust. Within the in-group category, relatives and neighbors appear to be particularly trusted by individuals originating from transhumant pastoral groups. The opposite happens for all out-group measures: transhumant pastoralists trust people they meet for the first time, people from different religions, and foreigners less. The result on out-group trust is in line with the literature on pastoralists' culture of honor. The following two citations, gathered from the anthropology literature, are consistent with our empirical results:

“A village comprises a community, linked by common residence and by a network of kinship and affinal ties, the members of which, [...], form a common cam, co-operate in many activities, and eat in one another's byres and windscreens. [...] The people of a village have a feeling of strong solidarity against other villages and great affection for their site [...]. Members of a village fight side by side and support each other in feuds.” (Evans-Pritchard (1940, p. 115)).

“Neighboring families are essentially interdependent, [...], this lack of real economic independence within the homestead is concurrent with a lack of social autonomy: to a significant extent each Samburu is answerable to others for his actions and in the final resort the running of his homestead is not solely his concern.” (Spencer (2013, p. 17)).

So far, we have presented the correlation between reliance on transhumant pastoralism and in-group trust bias, controlling for a wide variety of geo-climatic and ethnographic factors. However, the analysis may suffer from reverse causality: transhumant pastoralism may not generate in-group trust bias; rather, in-group bias may make it feasible to engage in transhumant pastoralism. To address this issue, Appendix Table B12 in Appendix B.7 presents results using an instrumental variable. The instrumental variable is the extent to which a place is suitable for transhumant

pastoralism (Beck and Sieber, 2010). The core of the instrumental variable approach is analogous to (Becker, 2019) and is described in section B.7 in Appendix B. The IV estimates for the across country and within country analysis are consistent with the OLS estimates. The magnitude of the coefficient is slightly larger: the effect of transhumant pastoralism on in-group relative to out-group trust increases by a factor of one-fifth.

4.3. Quasi-Experimental Analysis

Our analysis suggests a strong relationship between historical reliance on transhumant pastoralism and in-group trust bias. This bias stems from both more trust inside the group and less trust outside the group. We now investigate its implications. We examine how the behaviors and attitudes of individuals originating from groups that historically practiced transhumant pastoralism are perceived in social interactions.

People's perceived character is key in determining the success or failure of social interactions. A natural question that arises from our results is: how are individuals originating from transhumant pastoralist groups perceived in their interactions with others? A straightforward hypothesis stemming from our previous result is that individuals from transhumant pastoralist groups may be perceived less favorably.

To test these hypothesis, an ideal experiment would ask an individual i to perform a collaborative task with an individual j . This individual j may or may not be a member of a group that historically relied on transhumant pastoralism. To be fulfilled, the task would require cooperation and multiple spoken exchanges. Individual i would perform the task multiple times, each time with a different individual j who has a different level of ancestral reliance on transhumant pastoralism.

At the end of each iteration, individual i would be asked to record their perception of individual j . Given that individual i interacts with multiple individuals from different backgrounds, this would also allow for inclusion of individual i fixed effects.

Although we have not conducted such an experiment, the Afrobarometer allows for a similar quasi-experiment similar to the ideal setting. In all rounds of Afrobarometer, interviewers are asked to answer a few exit questions about the respondent they interviewed at the end of every interview. These questions aim at assessing how the respondent appeared during the interview.

Specifically, the question is asked as follows: “What was the respondent’s attitude towards you during the interview? Was he or she friendly, in between, or hostile?”.

The setting is very close to the ideal setting we presented above: an individual i (the interviewer), is asked to interact with an individual j (the respondent), to complete a task (the survey). Individual j , may or may not originate from a group that historically relied on transhumant pastoralism. Individual i is asked to repeat the task N times and at the end of each iteration, individual i is asked to assess the respondent’s attitude during the task.

On average, interviewers in the Afrobarometer surveys assess the perceived attitudes of 35 respondents. We take advantage of this setting to test our hypothesis that attitudes of individuals from groups that historically relied on transhumant pastoralism are perceived as less cooperative by their partners. This is because the contact person is most likely an out-group member and hence not trusted.

We estimate the following specification where the unit of observation is an interview conducted by an interviewer i with a respondent j .

$$PerceivedAttitude_{ijc} = \alpha + \beta TranshumantPastoralism_j + \mathbf{X}'_j \boldsymbol{\Gamma}_1 + \mathbf{Z}'_j \boldsymbol{\Gamma}_2 + \mathbf{Z}'_i \boldsymbol{\Gamma}_3 + \mu_c + \epsilon_{ijc} \quad (4)$$

where \mathbf{X}_j is the set of variables correlated with transhumant pastoralism identified in section 3.2. \mathbf{Z}'_i , and \mathbf{Z}'_j are interviewer and respondent socio-demographic controls (age, age squared, gender, education, urban status). μ_c represent country fixed-effects and ϵ is the error term. $TranshumantPastoralism_j$ is our variable of interest.

Given that how attitudes are perceived may between interviewers, we exploit the fact that individual i (interviewer) conducted multiple iterations of the task (the survey) with different individuals j (respondents) originating from ethnic groups that vary in historical reliance on transhumant pastoralism to identify the effect of $TranshumantPastoralism$. Hence, our preferred specification includes interviewer fixed effects, ρ_i :

$$PerceivedAttitude_{ij} = \alpha + \beta TranshumantPastoralism_j + \mathbf{X}'_j \boldsymbol{\Gamma}_1 + \mathbf{Z}'_j \boldsymbol{\Gamma}_2 + \rho_i + \epsilon_{ijc} \quad (5)$$

We examine four outcome variables: the extent to which the respondent’s attitude toward the interview was perceived as friendly, cooperative, honest, and at ease.

Table 3: Perceived Attitudes: Evidence from Exit Questions Afrobarometer

	Dependent Variable: The Respondent Is:							
	Friendly		Cooperative		Honest		At Ease	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Transhumant Pastoralism [std.]	-0.030* (0.012)	-0.024*** (0.007)	-0.018 (0.011)	-0.015** (0.006)	-0.026 (0.016)	-0.020** (0.007)	-0.018 (0.014)	-0.029** (0.009)
Mean Dep. Var.	0.89	0.89	0.86	0.86	0.81	0.81	0.76	0.76
Observations	140537	140430	140591	140484	140815	140708	140845	140737
Baseline Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Geographic Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Ethnographic Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	No	Yes	No	Yes	No	Yes	No
Survey-Wave FE	Yes	No	Yes	No	Yes	No	Yes	No
Interviewer FE	No	Yes	No	Yes	No	Yes	No	Yes

Notes: OLS estimates with robust standard errors clustered at the respondent's ethnic group level in parentheses. The unit of observation is a survey in the Afrobarometer surveys. *Transhumant Pastoralism* is an index [0;1] measuring a respondent's ethnic group historical reliance on transhumant pastoralism. Across specifications the dependent variables are exit questions from the Afrobarometer surveys and measure to what extent a respondent appeared *friendly*, *cooperative*, *honest*, or *at ease* an enumerator. The dependent variables are -1 to 1 categorical variables. For the outcome considered in columns (1) and (2), -1 stands for hostile, 0 for in between, and 1 for friendly. Each specification controls for the respondent's age, age squared, gender, urban status, and education. Specifications in columns (1), (3), (5), and (7) control for the symmetric characteristics of the interviewer. Baseline controls include an ethnic group's historical reliance on animal husbandry, and the log number of years since a given ethnic groups was observed in the E.A. Geographic controls include: latitude, suitability for agriculture, caloric suitability, share of land in arid climate, elevation, and ruggedness. Ethnographic controls include: political complexity, domestic organization around nuclear family, and past irrigation. Survey-round fixed effects are included in all specifications except column (2). * p < 0.1; ** p < 0.05; *** p < 0.01

Table 3 presents the results. Odd columns display the coefficient estimates of *TranshumantPastoralism* from equation 4. The attitudes of individuals from groups that historically relied on transhumant pastoralism are perceived in negative terms by interviewers: they are seen as less friendly, less cooperative, less honest, and less at ease. As before, the coefficient we report are standardized into z-scores. Even columns report the coefficient estimates of *TranshumantPastoralism* from equation 5, which includes interviewer fixed effects. In these columns, identification comes from within interviewer variation in *TranshumantPastoralism* of the respondents interviewed. The estimates follow the same pattern as in odd columns and gain in statistical significance. These estimates are in line with our hypothesis and suggest that the attitudes of individuals originating from transhumant pastoral groups are perceived as less prosocial.

Overall, the effect of individual j 's level of historical reliance on transhumant pastoralism remains in line with the within individual point estimates in that a higher reliance on transhumant pastoralism is associated being perceived more negatively.

4.4. Explaining Persistence

Our main result is that reliance on transhumant pastoralism in pre-industrial times has shaped in group relative to out group trust. We now examine how this cultural trait has persisted and been transmitted across generations. We intend to answer this question by investigating (i) heterogeneity based on gender and cohort of birth, (ii) the role of parents and specifically mothers in transmitting this cultural trait, and (iii) values transmitted.

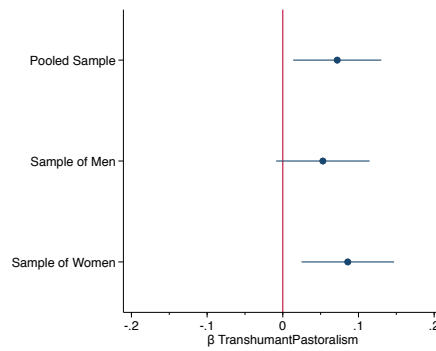
Heterogeneity based on gender and cohort of birth: We first examine gender differences in the effect of transhumant pastoralism. In Figure 7, we plot coefficient β associated with *TranshumantPastoralism* using our baseline specification estimated for the full sample, the sample of men, and the sample of women. The magnitude of the effect we observe is strongest among women: the point estimate is higher than for men by about 60%.

This result is interesting and may be surprising. Indeed, early studies on pastoralism described this livelihood as being highly male-dominated (Dupire, 1963). Because men are primarily in charge of managing herds, the early literature has tended to primarily focus on the roles of men in pastoralist societies, to the neglect of the role of women. However, recent literature gives a more nuanced view of women in pastoralism and acknowledge their important economic role (Hodgson, 2000). For example, Nuer women are the only community members allowed to milk cows, a resource at the base of the group's diet (Evans-Pritchard, 1940). In different groups such as the Peulh in Burkina Faso, women are also the members selling pastoral-related products at marketplaces (Hodgson, 2000). In addition to these economic contributions central to pastoral life, women play an essential role as transmitters of culture and values.

To understand the gender heterogeneity in the magnitude of the effect, we take advantage of the multiple rounds of the WVS and the availability of data on respondents' years of birth to investigate the evolution of our coefficient of interest over time. Around the world, reliance on transhumant pastoralism has declined with modernization. Here we aim at assessing the magnitude of the coefficient for older generations, supposedly immersed in declination of pastoral culture close to the main branch, and for younger generations, believably on more distant ramifications.

We present the results in the three panels of Figure B2. Panel 8a displays the estimated β coefficient of *TranshumantPastoralism* using our baseline specification estimated separately for each decade of birth between 1940 and 1990: the intensity of the effect of transhumant pastoralism

Figure 7: Transhumant Pastoralism and In-Group Trust Bias: Gender Differences

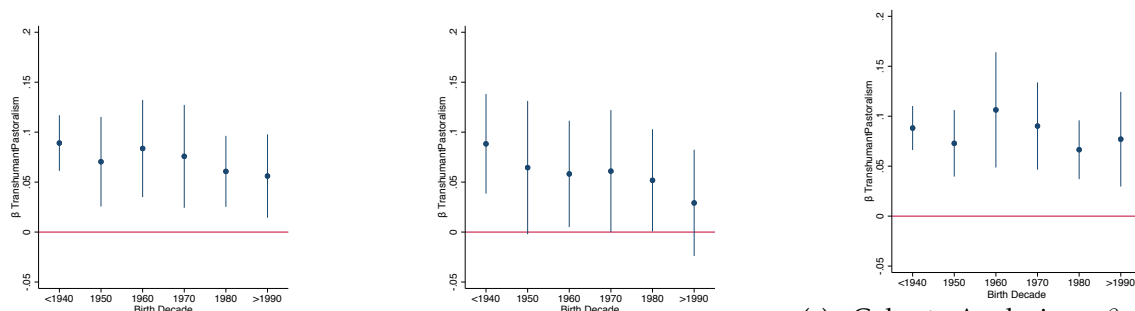


Notes: This figure plots the coefficient estimates of *TranshumantPastoralism* for the subsample of men ($N = 20,678$) and women ($N = 22,788$). Regression coefficients reported in Table B6 in Appendix B.3.

is slowly decreasing since the 1960s. In panels 8b, and 8c, we conduct the same analysis but this time stratified by gender. Here again we find that there are gender idiosyncrasies in the effect we observe. For the sample of men, over the period, the influence on the pattern of trust of inherited traits stemming from one's ancestor reliance on transhumant pastoralism has converged slowly towards zero (panel 8b). In contrast, among women, transhumant pastoralism remained a stable predictor of in-group trust bias (panel 8c).

These two empirical results tend to indicate that the intergenerational transmission of the transhumant pastoralists's cultural bundle has been less influential for trust over the last decades among men than among women. Put differently, for the youngest generations of men, the cultural trait of interest, which originates in the economic requirements of transhumant pastoralism, has slowly vanished while it has remained stable through time for women.

Figure 8: Transhumant Pastoralism and In-Group Trust Bias: Heterogeneity by Birth Cohort



(a) Cohort Analysis: β Transhumant Pastoralism: Pulled Sample

(b) Cohort Analysis: β Transhumant Pastoralism: Sample of Men

(c) Cohort Analysis: β Transhumant Pastoralism: Sample of Women

Notes: This figure investigates heterogeneity. The unit of analysis in these graphs is a respondent in the WVS survey. Transhumant Pastoralism is measured at the ethnic group level. Panel 8a displays the estimated β coefficient of Transhumant Pastoralism for each birth cohort separately for the sample of both men and women. Panel 8b displays the estimated β coefficient of Transhumant Pastoralism for the sample of men, and panel 8c displays the coefficient for the sample of women.

Parent’s role in the transmission of this cultural trait: Here we investigate the relation between historical reliance on transhumant pastoralism and trust among second-generations migrants. In this section, the unit of observation is a second-generation migrant surveyed in the IVS. As in [Alesina et al. \(2013\)](#), respondents are assigned a transhumant pastoralism score equal the score of their mother or father’s country of birth. The results presented in Table B13 in Appendix B.8 are in line with what we have found throughout the paper: second-generation migrants with mothers or fathers who originate from a country with greater historical reliance on transhumant pastoralism have greater in group trust bias. These results are remarkable given the high selection issue that the sample faces as individuals migrating out of transhumant pastoralist groups are likely to be the ones that are the least in-group biased. Here again, the results point towards the role of women in explaining persistence as the magnitude of β is 60% higher for the mother’s country of birth than for the father’s country of birth.

Values transmitted: To better capture the role that women play in the persistence of this cultural trait, we investigate what qualities do women from transhumant pastoralist groups value in children. The idea behind this approach is that if women are the main vectors explaining persistence across generations, and given their role in the education of young children, differences must originate in what cultural norms they value.

Here we take advantage of the WVS that contains information on important child qualities.

In the survey, respondents were presented a series of twelve to fifteen qualities that children can be encouraged to learn at home. After the recitation of the pre-specified list of qualities by the interviewer, respondents were asked to select up to five qualities that they consider to be especially important. From the original list we picked several qualities related to transhumant pastoralists' culture:

1. *Independence, Responsibility, and Determination*, which are dominant characteristics that transhumant pastoralists share (Edgerton (1971) ; Bolton et al. (1976) ; Goldschmidt (1971)).
2. *Tolerance and respect for other people*, which speaks to the culture of honor.
3. In addition we present estimates for other qualities that do not necessarily speak to transhumant pastoralists' culture. This includes, *Obedience, Unselfishness, Thrift, Hard Work, and Imagination*.

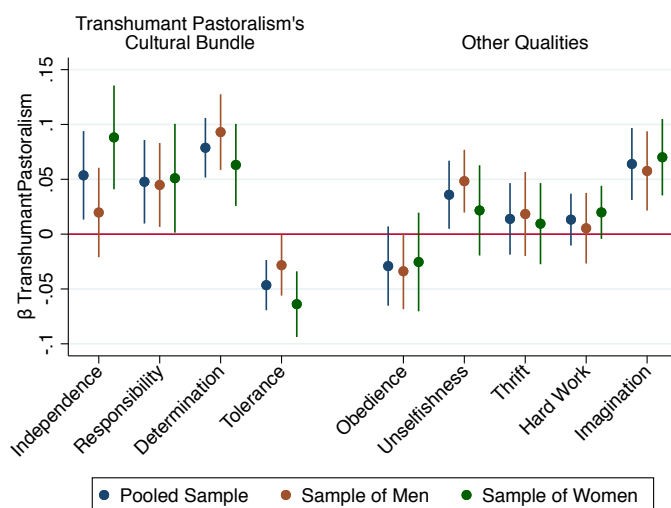
We investigate all outcomes in Figure 9. The left-hand side of the plot displays the estimated coefficient associated with transhumant pastoralism for transhumant culturally-related child qualities. As expected, respondents originating from transhumant pastoralist groups tend to value positively *independence, responsibility and determination*, but dismiss *tolerance and respect for others*. Interestingly, for two central traits: *independence* and *tolerance*, women are the ones for which the effect departs disproportionately from the reference group.

Regarding the estimates presented in the right-hand side part of the plot, which are not explicitly related to the transhumant pastoralism' cultural bundle, the gap between men and women is lower.¹⁰

We interpret these results as men slowly transitioning away from the main branch of transhumant pastoralism culture towards other ramifications where new economic requirements shape new cultural traits. For women, divergence has been slower.

¹⁰ The result on unselfishness speaks to the anthropological literature describing mobile pastoralists as highly interdependent. One would expect that groups that are mobile pastoralists, who must cooperate to avoid the tragedy of the commons in their use of the natural resources (i.e. fodder and water), value unselfishness.

Figure 9: Transhumant Pastoralism and Important Child Qualities



(a) Important Qualities in Child

Notes: This figure investigates important qualities in child and gender heterogeneity. The unit of analysis in these graphs is a respondent in the WVS survey. Transhumant Pastoralism is measured at the ethnic group level. Panel 9a displays the estimated β coefficient of Transhumant Pastoralism for importance of *Independence*, *Responsibility*, *Determination*, *Tolerance*, *Obedience*, *Unselfishness*, *Thrift*, *Hard Work*, and *Imagination*.

4.5. Economic Implications

We now investigate one real-world implication of our finding – how reliance on pastoralism affects firm management and constrains firm growth.

There exists extensive literature in trade and development documenting the lack of firms in the middle of the firm-size distribution in developing countries and, in the same group of countries, the high survival rate of unproductive firms (Tybout, 2000). From an economic standpoint, the coexistence of a large number of unproductive (small) firms and no firm able to scale up and acquire these less productive competitors is a puzzle. In a recent study on managerial practices in Indian textile firms, Bloom et al. (2013) suggest an interesting mechanism to explain the existence of unproductive and poorly managed firms out of the market. The authors posit that a constraint on firm growth is that business owners' incapacity to trust and delegate decision-making positions to employees who are not members of their own family. Consequently, competitors do not acquire less productive firms, and hence no competitors can climb up the firms' size distribution.

In the study, the authors find that the dominant factor explaining in-sample firm size is the

number of male members of the owning family working in the firm. Here, we examine whether transhumant pastoralism, which affects in-group trust bias, shapes hiring practices within firms and the distribution of firm sizes across industries and countries.

We use data from the World Bank's Enterprise Survey. The Enterprise Survey's sample is representative of firms of five employees or more operating in the private manufacturing and services sectors in over 120 countries¹¹. Figure B5a displays the sampled countries.

We investigate two outcome variables. First, we investigate whether respondents in the Enterprise Survey who are business owners and firms' top managers report promoting non-managers based on objective criteria. Specifically, in the survey, respondents are asked to describe the primary criteria for promoting non-managers in their respective firm. Enumerators then categorized responses into one of four pre-specified items that best described the respondent's answer.¹² These categories are: (i) *based solely on performance and ability*, (ii) *based partly on performance and ability, and partly on other factors (for example, tenure or family connections)*, (iii) *based mainly on factors other than performance and ability (for example, tenure or family connections)*, and (iv) *non-managers are normally not promoted*. From these four categories, among the establishment promoting non-managers, we create a variable measuring the degree of objective criteria in a firm's non-managers promotion practices.¹³ Our outcome variable takes the value -1 if a firm's promotion policy for non-managers is based mainly on factors other than performance and ability (for example, tenure or family connections), 0 if based partly on performance and ability, and partly on other factors, and 1 if based solely on performance and ability. With this outcome variable we intend to capture the degree of in-group favoritism of a firm's promotion culture. Second, we investigate "firm size", measured by the log number of permanent employees in a firm adjusted for temporary workers and provided by the E.S. database.

In the analysis that follows, the unit of observation is a firm operating in an industry (i.e., a sector) in a country. For firm size, the Enterprise Survey (ES) provides data on more than 80,000 firms operating in 51 sectors across 124 countries. The ES provides data on criteria for non-managers promotion for fewer countries (46) because the question was added to the survey

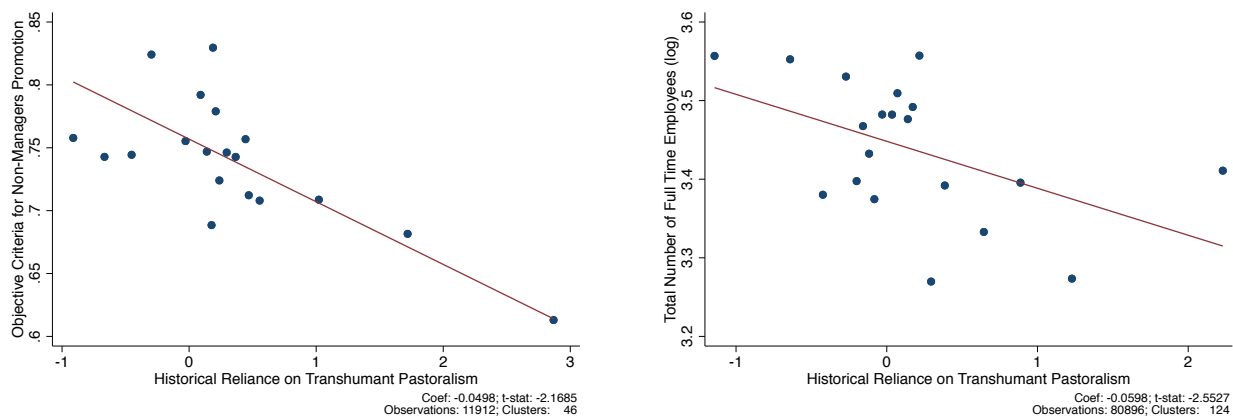
¹¹ In the Enterprise Survey, 1200 to 1800 firm interviews are conducted in larger economies, 360 in medium size economies, and 150 in small economies. In each country, interviews are conducted in cities and regions of major economic activities.

¹² In the Enterprise Survey, the question is asked as follows: Primary way of promotion of non-managers: by non-managers we mean workers excluding managers as defined in r7. Answer that best describes the management practices in the establishment should be chosen. [Section R, R10, Management Practices.]

¹³ We discard firms who do not promote non-managers. These firms represent 19% of the E.S. sample.

recently in 2018. Hence we have information on promotion practices only for firms surveyed after that date (11,912).¹⁴

Figure 10: Transhumant Pastoralism: Economic Implications



(a) Objective Criteria for Non-Managers Promotion

(b) Firm Size

Notes: Binscatter plot of the relationship between a country’s historical reliance on transhumant pastoralism and firm size in that country (Panel 10b), and adoption of objective criteria in the decisions to promote non-managers (Panel 10a). The unit of observation is a firm, and data is from the World Bank’s Enterprise Survey. *Total Number of Full Time Employees* is the log transformed number of full time employees in a firm adjusted for temporary workers and is computed by the Enterprise Survey. *Objective Criteria for Non- Managers Promotion* is a -1 to 1 variable. It takes the value -1 if in a firm’s practice for non-managers promotion is based mainly on factors other than performance and ability (for example, tenure or family connections), 0 if based partly on performance and ability, and partly on other factors (for example, tenure or family connections), and 1 if based solely on performance and ability. Each dot represents the mean outcome variable for a range of our index of historical reliance on transhumant pastoralism. In the graphs we control for the ancestry-adjusted log number of years since a country’s ethnic groups were observed in the E.A., a set of 51 industry fixed effects, survey-round fixed effects and continent fixed effects.

We condition the effect of our index of transhumant pastoralism, measured at the country level, on industry and continent fixed effects. Figure 10 presents the relationship between our index of ancestral reliance on transhumant pastoralism and practices for non-manager promotion (panel 10a), and firm size (panel 10b). In line with Bloom et al. (2013), we find that in countries where the population historically relied more on transhumant pastoralism for their living, top managers and business owners put less emphasis on objective criteria in their decision to promote non-managers. This result is important given the discussion above regarding firms’ limited managerial capacity. This result is also important given the literature on favoritism which shows that the practice of selecting the best liked over the best ables, proves harmful to organization: directly through the promotion of wrong people, and indirectly through worker’s effort supply when they anticipate the organization’s promotion policy (Berger, Herbertz and Sliwka, 2011).

¹⁴ Technically, we have data for 17,999 firms for which data is available on non-managers promotion practices. Among them, for 13.2% the question does not apply, 1.82% are classified as do not know, and 18.73% report no promotion of non-firm managers.

In line with our hypothesis, Panel 10b shows that a country's population's historical reliance on transhumant pastoralism is significantly correlated with firm size. The effect is sizable – a one standard deviation increase in our index of transhumant pastoralism is associated with a five per cent decrease in average firm size. In Figure B7 in B.7, we present estimates from decile regression. In this analysis, outcome variables are dummy variables that equal one if a firm's size belongs to a given decile of the firm size distribution. The estimates suggest that the negative relationship we observe between a country's population historical reliance on transhumant pastoralism and the size of firms in that country indeed stems from a lack of large firms at the top of the distribution. These new empirical results are evidence that ancestral activities have real-world implications for contemporary development.

5. Conclusion

This paper investigates the economic origins of trust. We document and test the hypothesis that the economic requirements of transhumant pastoralism, which made in-group members highly interdependent but hostile to individuals beyond the radius of extended kin, favored the emergence of in-group oriented and family centered individuals.

To test our hypothesis we use three main sources of information: information about historical reliance on transhumant pastoralism from the Ethnographic Atlas (Murdock, 1967), survey data from Integrated Value Survey and Afrobarometer, and data from the World Bank's Enterprise Survey.

We find that historical reliance on transhumant pastoralism is a strong predictor of contemporary variation in in-group relative to out-group trust. This result is valid across countries, between residents of a same country, and between second-generations migrants who reside in a same country but whom parents originate from different countries. We provide evidence for a causal interpretation of our main result using an instrumental variable approach based on the suitability for transhumant pastoralism of an individual's ethnic group homeland.

We then investigate the implications of in-group trust bias for how individuals from groups that relied on transhumant pastoralism are perceived. Using information from interviewers about their perception of their respective respondent's attitudes during the Afrobarometer survey we show that individuals from groups that relied historically on transhumant pastoralism are perceived more negatively by interviewers.

Furthermore, we study the economic implications of our findings. We show that firms are smaller where transhumant pastoralism played a more substantial role in shaping people's cultures. Specifically, there are fewer firms at the top of the firms' size distribution. In line with recent contributions to the Economic literature, we show that this may be one consequence of managers' and business owners' incapacity to trust others beyond their respective in-group.

This paper contributes to our understanding of how forms of economic production shape the scope and extent of trust. Furthermore, it connects these findings to real-world applications.

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Web Appendix for
THE ECONOMIC ORIGINS OF TRUST

ETIENNE LE ROSSIGNOL

CES

SARA LOWES

UC San Diego

14 October 2021

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Appendix A. Data Sources and Variable Definitions

A.1. Variables from the Ethnographic Atlas

Transhumant Pastoralism: is based on variable $v_4 \in [0;100]$ in 10 percent intervals (animal husbandry), v_{40} (predominant type of animal husbandry), and v_{30} (settlement pattern) from the EA. From variable v_4 , we create one dummy variable (v_4') that equals one if the predominant type of animal raised is a herding animal such as cattle, sheep, or camelids. From variable v_{30} , we create one dummy variable (v_{30}') that equals one if group's settlement pattern is either nomadic, semi-nomadic, semi-sedentary, or impermanent. We measure transhumant pastoralism by multiplying variable v_4 by variables v_4' and v_{30}' .

Mean Size Communities: is based on variable v_{31} (average population of local communities) a categorical variable ranging from 1 less than 50 inhabitants, to 8 more than 50,000 inhabitants. In the study we employ the variable as coded in the EA.

Political Complexity: is based on variable variable v_{33} (jurisdictional hierarchy beyond local communities) a categorical variable ranging from zero *acephalous societies* to three *three levels*. We make use of this variable as coded in the EA.

Monogamy: is based on variable v_{09} (marital composition of family units). Monogamy takes the value one if a group's dominant form of marital composition is monogamous.

Patrilineal: is based on variable v_{43} (major mode of descent). Variable v_{43} was not included in the original Ethnographic Atlas and was derived from variables v_{17} , v_{19} , and v_{21} , describing patrilineal and matrilineal kin groups. Our measure takes the value one if a group's major mode of descent is patrilineal as opposed to any other mode of descent.

Patrilocal: is based on variable v_{11} (prevailing pattern of transfer of residence at marriage). Our measure is coded one if the wife commutes to the husband's place, and zero otherwise.

Equal Inheritance: is based on variable v_{77} (inheritance distribution for movable property). Our measure is coded as one if movable properties are equally distributed.

High God: is based on variable v_{34} (religion: high god). Our measure is coded as one if a group believes in a moralizing god and zero otherwise.

Male Circumcision: is based on variable v_{37} (male genital mutilations). Our measure is coded as one if a group practices male circumcision, or any of its variants, and zero if circumcision is absent in the society.

Presence of Slavery: is based on variable v70 (slavery: type). Our measure is coded as one if a group either practices hereditary or non-hereditary slavery, and zero if slavery is absent in the society.

A.2. Geographic Variables

Mean Temperature: is the monthly-average temperature over the years 1901-1949.

Mean Precipitation: is the monthly-average precipitation over the years 1901-1949.

std Precipitation: is the variance in monthly-average precipitation over the years 1901-1949.

Elevation: is measured in meters above the sea level. Source: Global Multi-resolution Terrain Elevation Data 2010.

Slope: is measured as the mean inclined in the terrain (degrees). Source: Global Multi-resolution Terrain Elevation Data 2010.

Distance to Coast: is the distance to the nearest sea coast in kilometers from the ethnic group's homeland.

Malaria Suitability: is measured using the malaria ecology raster constructed by ([Kiszewski, Mellinger, Spielman, Malaney, Sachs and Sachs, 2004](#)).

Distance Equator: is the absolute distance between the ethnic group's homeland and the Equator.

Tsetse Fly Suitability: is measured using the Tsetse fly suitability map from ([Alsan, 2015](#)).

A.3. Country-level Variables

Log [Population in 1500 CE]: is the log population density in persons per square kilometer in the year 1500 CE as calculated by [Ashraf and Galor \(2013\)](#) using population data from from ([McEvedy, Jones et al., 1978](#)).

Log [income per capita in 2000 CE]: is the real GDP per capita, in constant 2000 USD, from the Penn World Table.

Ethnic fractionalization: comes from ([Alesina, Devleeschauwer, Easterly, Kurlat and Wacziarg, 2003](#)). The index [0;1] represents the probability that two persons randomly drawn from a country's population belong to different ethnic groups.

Democracy: is measured in 2000 using variable polity2 from the Polity IV dataset. Democracy equals one if polity2 [-10;10] is positive and zero otherwise.

British/French/Socialist legal origin dummies: are three dummy variables capturing a country's Company Law or Commercial Code legal origin. The original data is from (La Porta, Lopez-de Silanes, Shleifer and Vishny, 1999).

Buddhists/Christians/Hindus/Jews/Muslims [%]: is a set of five variables representing the share of a country's population belonging to each of the five major religions. Data is from the PEW RESEARCH CENTER.

A.4. European Value Survey, and World Value Survey

Trust: Survey Question: "I'd like to ask you how much you trust people from various groups. Could you tell me for each whether you trust people from this group completely, somewhat, not very much or not at all?" (Read out and code one answer each) [**Your family ; Your neighborhood, People you know personally, People you meet for the first time, People of another religion, People of another nationality**]. 0 Do not trust at all to 3 Trust completely.

A.5. WVS Countries and Ethnic Groups

ALGERIA: Arabe, Kabyle, Chaoui

ARMENIA: Armenian, Kurd/Esid, Russian

BELARUS: Belorussian, Polish, Russian, Ukrainian

BOLIVIA: Quechua, Aymara, Chiquitano

ETHIOPIA: Amhara, Tigre, Oromiya, Gurage, Gamo, Somali, Afar, Sidama, Wolayta

GHANA: French, Ga Afangbe, Akan, Ewe, Dagbani, Hausa, Guan, Krobo, Ningo, Ada, Kotokoli, Bono, Komkomba, Nzema, Busanga, Dagari, Bimba, Ijaw, Esako

HUNGARY: Gypsy, Hungarian

INDONESIA: Lombok/Sumbawa, Javanese, Malay, Sundanese, Chinese, Lampung, Makassar, Mandar, Manggarai, Minangkabau, Toraja

IRAN: Turk/Azeri, Kurd, Baluch, Lor

IRAQ: Kurdish, Turk

JORDAN: Jordan

KAZAKHSTAN: Armenian, Azerbaijanian, Azeri, Bashkir, Belorussian, Bulgarian, Chechen, Chinese, Dungan, Georgian, German, Kazah, Koreans, Kurd/Esid, Kyrgyz, Moldovan, Mordvin, Polish, Russian, Tajik, Tatar, Turkish, Udmurt, Ukrainian

KYRGYZSTAN: Azerbaijanian, Dungan, German, Kalmyk, Koreans, Kurd/Esid, Kyrgyz, Russian, Tatar, Turkish, Ukrainian, Ruso, Kazajo

MALAYSIA: Chinese, Brunei Malay, Malay, Kadazan, Bajau, Iban, Kelabit, Rungus

MOLDOVA: Bulgarian, Gagaus, Moldovian, Russian, Ukrainian

MOROCCO: Bereber

MYANMAR: Rakhine, Shan, Mon

NIGERIA: Yoruba, Hausa, Igbo, Fulani, Tiv, Ibibio, Krobo, Bono, Dagari, Bimba, Yala, Bassa, Gbagi, Ijaw, Esan, Edo, Esako, Urhobo, Nupe, Chamba, Bachama, Yungur, Tangale, Ogoja, Boki, Efik, Ejagam, Baribari

PAKISTAN: Punjabi, Pathan, Baluchi, Sindhi, Urdu, Seraiki

PERU: Quechua, Aymara

PHILIPPINES: Tagalog, Chabacano, Yakan, Dabawenyo, Chinese, Sama, Cebuano, Pangasinense, Kankana-ay, Ibaloy

RUSSIA: Armenian, Azerbaijani, Azeri, Belorussian, Georgian, Kazah, Kyrgyz, Moldovian, Russian, Tadjic, Tatar, Ukrainian, German, Italian, Moldovan, Russian, Ukrainian, Iranian

SERBIA: Albanian, Hungarian, Montenegrin, Serbian

SINGAPORE: Chinese, Malay

SWEDEN: Swedish

TAIWAN: Hakka

TAJIKISTAN: Russian, Tajik

THAILAND: Thai, Malayu

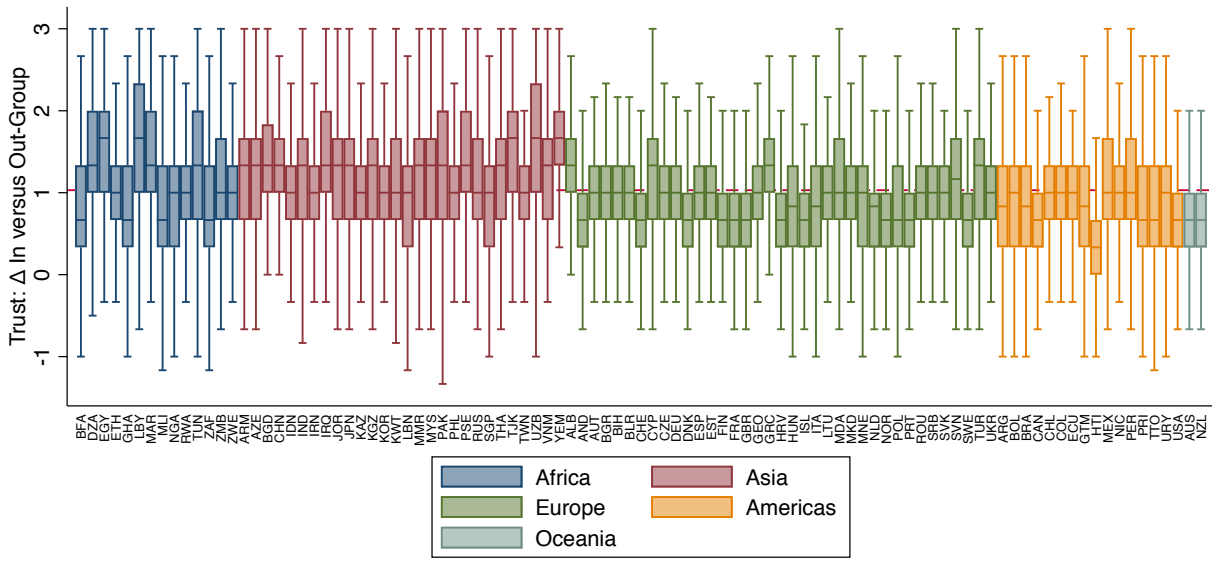
TUNISIA: Arabic

UKRAINE: Armenian, Belorussian, Bulgarian, Georgian, Greek, Hungarian, Koreans, Moldovian, Polish, Russian, Tatar, Ukrainian

UZBEKISTAN: Kazah, Kyrgyz, Russian, Tadjic, Tatar, Turkmenian

VIETNAM: Vietnamese, Muong

Figure B1: Box Plot: $\Delta(Trust^{In} - Trust^{Out})$

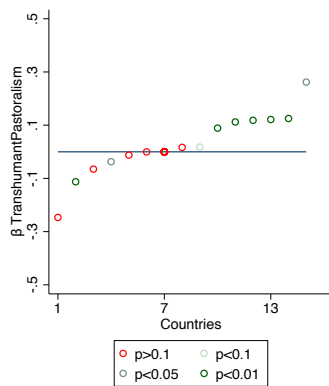


Notes: This figure plots the mean, q1, q3, min and max of $\Delta(Trust^{In} - Trust^{Out})$ across countries. Data is from the WVS/EVS.

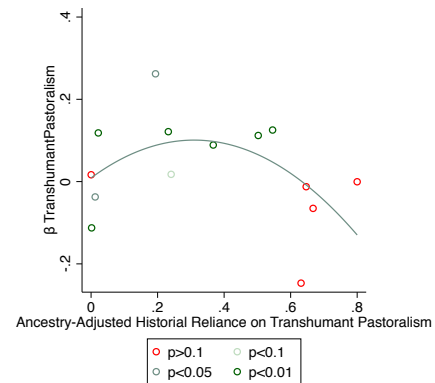
Appendix B. Additional Tables and Figures

B.1. Within Countries Estimates: Discussion

Figure B2: Transhumant Pastoralism and Trust: Heterogeneity



(a) Country-specific β Transhumant Pastoralism



(b) β Transhumant Pastoralism and Ancestry-Adjusted Transhumant Pastoralism

Notes: This figure investigates heterogeneity. The unit of analysis in these graphs is a respondent in the WVS survey. Transhumant Pastoralism is measured at the ethnic group level. The left panel displays the estimated β coefficient of Transhumant Pastoralism for each country separately. The right panel plots the estimated Transhumant Pastoralism coefficient β against a country's historical reliance on Transhumant Pastoralism.

B.2. Correlates of Transhumant Pastoralism

This section investigates the correlates of transhumant pastoralism¹⁵. We do so by regressing our measure of pastoralism on geographic and ethnographic characteristics as in Equation 2. Table B1 examines the relationship between pastoralism and some important geographic features. Table B2 presents the correlation between pastoralism and some ethnographic characteristics measured in the Ethnographic Atlas.

¹⁵ Transhumant pastoralism is our index of historical reliance on transhumant pastoralism as described in section 3.

Table B1: Correlates of Transhumant Pastoralism: Geographic Characteristics

	Dependent Variable:								
	Latitude (1)	Dist. Coast (2)	Elevation (3)	Ruggedness (4)	Agri. Suit. (5)	Calo. Suit. (6)	Arid (7)	Malaria (8)	Tsetse (9)
Transhumant Pastoralism [std.]	0.133*** (0.040)	0.034 (0.069)	-0.269*** (0.079)	-0.223*** (0.058)	-0.378*** (0.080)	-0.402*** (0.069)	0.228*** (0.063)	0.011 (0.039)	0.208* (0.110)
Observations	1154	1154	1154	1154	1062	1150	1154	1154	491
ln(Years since Obs.)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Continent FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R ²	0.653	0.168	0.152	0.209	0.121	0.242	0.232	0.482	0.179

Notes: The unit of observation is an ethnic group in the Ethnographic Atlas. Standard errors presented in parentheses are clustered at the language sub-family level. Dependent variables and Transhumant Pastoralism are standardized. In column (9) the sample is restricted to Africa as the only region where the TseTse fly is present. Given the small number of clusters in column (9) the standard error is bootstrapped clustered and calculated over 500 iterations. In every specification, the (log) number of years since a group entered the EA and a group's historical reliance on animal husbandry are controlled for along with a set of six continent fixed effects. Detailed information on all variables definitions and sources is presented in [Appendix A](#). Geographic characteristics are averaged within 100 kilometers around an ethnic group's homeland. Continent fixed effect is a set of 6 dummy variables {Africa, North America, South America, Europe, Asia, Oceania}. * $p < 0.10$, ** $p < 0.51$, *** $p < 0.01$

Table B2: Correlates of Transhumant Pastoralism: Ethnographic Characteristics

	Dependent Variable:								
	Pol. Compl. (1)	Monogamy (2)	Nucl. Fam. (3)	Patrilineal (4)	Clans (5)	Patrilocal (6)	High God (7)	Slavery (8)	Irrigation (9)
Transhumant Pastoralism [std.]	-0.183*** (0.062)	-0.009 (0.065)	0.153*** (0.057)	0.025 (0.038)	-0.001 (0.078)	-0.046 (0.031)	0.027 (0.060)	0.030 (0.073)	-0.134* (0.074)
Observations	1121	1139	1154	1154	1006	1139	757		1154
ln(Years since Obs.)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Continent FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R ²	0.327	0.181	0.104	0.421	0.075	0.208	0.403	0.338	0.095

Notes: The unit of observation is an ethnic group in the Ethnographic Atlas. Standard errors presented in parentheses are clustered at the language sub-family level. Dependent variables and Transhumant Pastoralism are standardized. Detailed information on all variables definitions and sources is presented in [Appendix A](#). Continent fixed effect is a set of 6 dummy variables {Africa, North America, South America, Europe, Asia, Oceania}. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

B.3. Robustness Tables

Table B3: Robustness: Cross-Country Estimates: Transhumant Pastoralism and In-Group Trust Bias

	Dependent Variable: $\Delta (\text{Trust}^{In} - \text{Trust}^{Out})$					
	(1)	(2)	(3)	(4)	(5)	(6)
Transhumant Pastoralism [std.]	0.315** (0.145)	0.288* (0.154)	0.400*** (0.150)	0.290* (0.158)	0.314** (0.135)	0.244* (0.137)
Mean Dep. Var.	1.03	1.03	1.03	1.04	1.03	1.03
Observations	91	90	89	91	91	97
Log [Population in 1500 CE]	Yes					
Log [income per capita in 2000 CE]		Yes				
Ethnic fractionalization			Yes			
Democracy				Yes		
British/French/Socialist legal origin dummies					Yes	
Christians/Jews/Muslims [%]						Yes
Baseline Controls	Yes	Yes	Yes	Yes	Yes	Yes
Geographic Controls	Yes	Yes	Yes	Yes	Yes	Yes
Ethnographic Controls	Yes	Yes	Yes	Yes	Yes	Yes
Continent FE	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.585	0.624	0.547	0.557	0.610	0.597

Notes: OLS estimates with robust standard errors in parentheses. The unit of observation is a country and data is from the IVS. Transhumant Pastoralism is an index [0;1] measuring a country's population historical reliance on transhumant pastoralism. Dependent variable in every columns is the difference between average in-group trust (family, neighbors, people known) and average trust in out-group (people first met, people of another religion, foreigners). Baseline controls include a country's historical reliance on animal husbandry, and log number of years since a country's ethnic groups were observed in the E.A. Geographic controls are ancestry-adjusted and include: latitude, suitability for agriculture, caloric suitability, share of land in arid climate, elevation, and ruggedness. Ethnographic controls are ancestry-adjusted and include: political complexity, domestic organization around nuclear family, and past irrigation. * p < 0.1; ** p < 0.05; *** p < 0.01

Table B4: Individual Level Estimates: Transhumant Pastoralism and In-Group Trust Bias

	Dependent Variable: Δ (Trust ^{In} - Trust ^{Out})				
	(1)	(2)	(3)	(4)	(5)
Transhumant Pastoralism [std.]	0.060*** (0.019)	0.074** (0.031)	0.066* (0.035)	0.077** (0.031)	0.059* (0.034)
Mean Dep. Var.	1.11	1.12	1.11	1.11	1.11
Num. of Clusters	114	108	106	103	103
Observations	37910	37084	36094	36014	36014
Individual Controls	Yes	Yes	Yes	Yes	Yes
Baseline Controls	No	Yes	Yes	Yes	Yes
Endogenous Controls	Yes	Yes	Yes	Yes	Yes
Geographic Controls	No	Yes	No	Yes	Yes
Ethnographic Controls	No	No	Yes	Yes	Yes
Lasso-Selected Controls	No	No	No	No	Yes
Country FE	Yes	Yes	Yes	Yes	Yes
Survey-Wave FE	Yes	Yes	Yes	Yes	Yes
R ²	0.112	0.108	0.109	0.110	

Notes: OLS estimates with robust standard errors in parentheses. The unit of observation is a respondent in the WVS. *Transhumant Pastoralism* is an index [0;1] measuring an ethnic group historical reliance on transhumant pastoralism. Dependent variable in all columns is the difference between average in-group trust (family, neighbors, people known) and average trust in out-group (people first met, people of another religion, foreigners). Each specification controls for the respondent's age, age squared, gender, education, religion, religiosity, social class, employment status, and scale of income. Baseline controls include an ethnic group's historical reliance on animal husbandry, and the log number of years since a given ethnic groups was observed in the E.A. Geographic controls include: latitude, suitability for agriculture, caloric suitability, share of land in arid climate, elevation, and ruggedness. Ethnographic controls include: political complexity, domestic organization around nuclear family, and past irrigation. Survey-round fixed effects are included in every specification. * p < 0.1; ** p < 0.05; *** p < 0.01

Table B5: Individual Level Estimates: Transhumant Pastoralism and Trust

	Dependent Variable:							
	Trust ^{In}				Trust ^{Out}			
	In-Group (1)	Relatives (2)	Neighbors (3)	Other Known (4)	Out-Group (5)	First Meet (6)	Other Religion (7)	Other Nationals (8)
Transhumant Pastoralism [std.]	0.025*** (0.009)	0.012* (0.007)	0.041*** (0.009)	0.002 (0.009)	-0.053*** (0.017)	-0.014* (0.008)	-0.057*** (0.019)	-0.066*** (0.019)
Mean Dep. Var.	2.19	2.79	1.87	1.89	1.07	1.21	1.11	1.11
Observations	46202	46102	45972	45970	45906	45673	44553	44400
Num. of Clusters	114	Yes	114	114	Yes	114	114	114
Individual Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Survey-Wave FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R ²	0.091	0.078	0.079	0.065	0.113	0.073	0.115	0.112

Notes: OLS estimates with robust standard errors in parentheses. The unit of observation is a respondent in the WVS. *Transhumant Pastoralism* is an index [0;1] measuring an ethnic group historical reliance on transhumant pastoralism. Dependent variables in columns (1) to (3) are: trust in relatives, neighbors, and other people the respondent knows. Dependent variables in columns (4) to (6) are: trust in someone the respondent meets for the first time, trust people who believes in another religion, trust foreigners. Each specification controls for the respondent's age, age squared, and gender. Survey-round fixed effects are included in every specification. * p < 0.1; ** p < 0.05; *** p < 0.01

Table B6: Gender Differences

	Dependent Variable: $\Delta (\text{Trust}^{In} - \text{Trust}^{Out})$			
	Pulled Sample	Pulled Sample	Sample of Men	Sample of Women
	(1)	(2)	(3)	(4)
Transhumant Pastoralism [std.]	0.072** (0.029)	0.075** (0.031)	0.053* (0.031)	0.086*** (0.031)
Male		-0.017 (0.012)		
Male # Transhumant Pastoralism [std.]		-0.007 (0.011)		
Mean Dep. Var.	1.12	1.12	1.12	1.12
Num. of Clusters	103	103	96	94
Observations	43466	43466	20678	22788
Individual Controls	Yes	Yes	Yes	Yes
Baseline Controls	Yes	Yes	Yes	Yes
Geographic Controls	Yes	Yes	Yes	Yes
Ethnographic Controls	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes
Survey-Wave FE	Yes	Yes	Yes	Yes
R^2	0.100	0.100	0.106	0.098

Notes: OLS estimates with robust standard errors clustered at the ethnic group level in parentheses. The unit of observation is a respondent in the WVS. *Mobile Pastoralism* is an index [0;1] measuring an ethnic group historical reliance on transhumant pastoralism. Dependent variable in all columns is the difference between average in-group trust (family, neighbors, people known) and average trust in out-group (people first met, people of another religion, foreigners). Specifications reported in columns (1) and (2) control for the respondent's age, age squared, and gender. Column (3) restricts the sample to only men, and column (4) restricts the sample to only women. Baseline controls include an ethnic group's historical reliance on animal husbandry, and the log number of years since a given ethnic groups was observed in the E.A. Geographic controls include: latitude, suitability for agriculture, caloric suitability, share of land in arid climate, elevation, and ruggedness. Ethnographic controls include: political complexity, domestic organization around nuclear family, and past irrigation. Survey-round fixed effects are included in every specification. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

B.4. Trust In a Generic Stranger

In this section we investigate the relation between historical reliance on transhumant pastoralism, measured at the various levels investigated in our main results, and trust in a generic stranger. We estimate variations of the following specification:

$$\text{Trust} = \alpha + \beta \text{TranshumantPastoralism} + \gamma X' + \epsilon \quad (\text{A1})$$

Table B8 presents the coefficients estimates of *TranshumantPastoralism*. In column (1), the unit of observation is a country and historical reliance is measured at the country level using the same procedure as in section 3.1. Although our point estimate is not significant at conventional threshold the sign and the magnitude of the standardized effect are in line with our country-level results. In column (2), the unit of observation is a respondent in the WVS whom ethnic group could be match to the E.A. Here again the estimated coefficient is consistent with our within country estimates in that the higher one's ancestors historically subsisted on transhumant pastoralism the lower is trust in an unknown stranger today. Finally, columns (3) to (5), present the results for second generation migrants who are assigned a score of ancestral transhumant pastoralism based on the country of origin of their mother in column (3),

Table B7: Transhumant Pastoralism - v4 winsorized

	Dependent Variable: Δ (Trust ^{In} - Trust ^{Out})			
	(1)	(2)	(3)	(4)
Transhumant Pastoralism (winsorized) [std.]	0.449*** (0.074)	0.384*** (0.127)	0.078*** (0.020)	0.074*** (0.022)
Mean Dep. Var.	1.03	1.03	1.12	1.12
Num. of Clusters			114	103
Observations	97	97	45902	43466
Individual Controls	No	No	Yes	Yes
Baseline Controls	No	Yes	No	Yes
Geographic Controls	No	Yes	No	Yes
Ethnographic Controls	No	Yes	No	Yes
Continent FE	No	Yes	No	No
Country FE	No	Yes	Yes	Yes
Survey-Wave FE	No	No	Yes	Yes
R^2	0.258	0.589	0.101	0.100

Notes: In columns (1) and (2) OLS estimates with robust standard errors in parentheses. The unit of observation is a country and data is from the IVS. *Transhumant Pastoralism* is an index [0;1] measuring a country's population historical reliance on transhumant pastoralism. In columns (3) and (4) OLS estimates with robust standard errors clustered at the ethnic group level. The unit of observation is a respondent in the IVS. *Transhumant Pastoralism* is an index [0;1] measuring an ethnic group historical reliance on transhumant pastoralism. Animal husbandry, which serves to construct Transhumant Pastoralism, is winsorized at 95th percentile. Dependent variable in every columns is the difference between average in-group trust (family, neighbors, people known) and average trust in out-group (people first met, people of another religion, foreigners). Baseline controls include a country's historical reliance on animal husbandry, and log number of years since a country's ethnic groups were observed in the E.A. Geographic controls are ancestry-adjusted and include: latitude, suitability for agriculture, caloric suitability, share of land in arid climate, elevation, and ruggedness. Ethnographic controls are ancestry-adjusted and include: political complexity, domestic organization around nuclear family, and past irrigation. Survey-round fixed effects are included in specifications (3) and (4). * p < 0.1; ** p < 0.05; *** p < 0.01

of their father in column (4), or of both in the last column. Results are mostly consistent with our previous results although more imprecise.

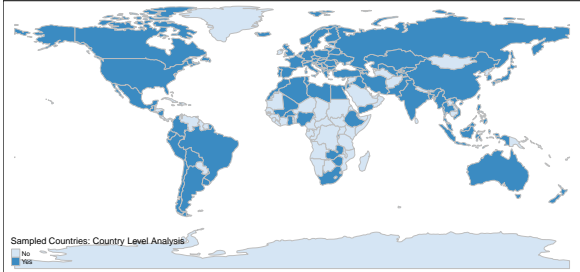
Table B8: Trust in a Generic Stranger

	Dependent Variable: Trust in a Generic Stranger				
	(1)	(2)	(3)	(4)	(5)
Country: Transhumant Pastoralism [std.]	-0.175 (0.183)				
Ethnic: Transhumant Pastoralism [std.]		-0.001 (0.022)			
Mother Origin Country: Transhumant Pastoralism [std.]			-0.074 (0.046)		
Father Origin Country: Transhumant Pastoralism [std.]				0.045 (0.054)	-0.013 (0.057)
Mean Dep. Var.	1.03	1.12	0.34	0.34	0.33
Observations	109	64828	9271	9243	6782
Baseline Controls	Yes	Yes	Yes	Yes	Yes
Geographic Controls	Yes	Yes	Yes	Yes	Yes
Ethnographic Controls	Yes	Yes	Yes	Yes	Yes
Continent FE	Yes	No	No	Yes	Yes
Country FE	No	Yes	Yes	Yes	Yes
R^2	0.447	0.073	0.128	0.126	0.116

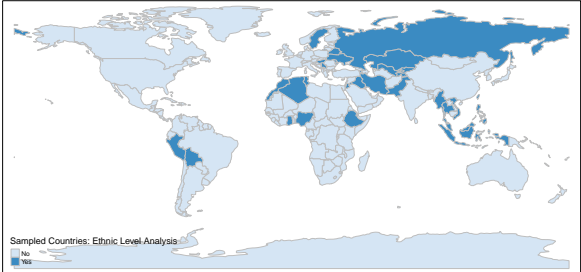
Notes: Across all specifications, the dependent variable of interest is: trust in a generic stranger. The original variable is a dummy variable equals to one if a respondent reports that *most people can be trusted*, and zero, if the respondent answers *you never be too careful in dealing with others*. In column (1), the unit of observation is a country in the WVS and EVS, the dependent variable is collapsed by country across all respondents, and transhumant pastoralism is measured at the country level. In column (2), the unit of observation is a respondent in the WVS, standard errors in () are clustered at the ethnic group level, and transhumant pastoralism is measured at the ethnicity level. In columns (3) to (5), the unit of observation is a respondent in the WVS who is a second generation migrant, standard errors in () are clustered at the mother or father country or origin level. Baseline controls include a country's historical reliance on animal husbandry, and log number of years since a country's ethnic groups were observed in the E.A. Geographic controls are ancestry-adjusted and include: latitude, suitability for agriculture, caloric suitability, share of land in arid climate, elevation, and ruggedness. Ethnographic controls are ancestry-adjusted and include: political complexity, domestic organization around nuclear family, and past irrigation. Columns (2) to (5) control for age, age squared, and gender. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

B.5. Sampled Countries

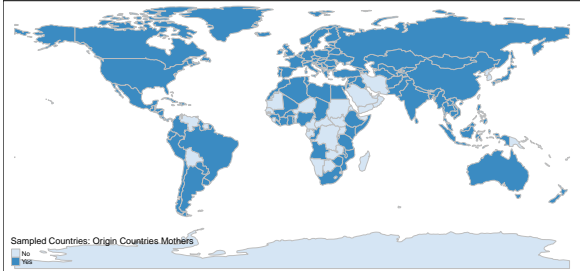
Figure B3: Sampled Countries: WVS/EVS



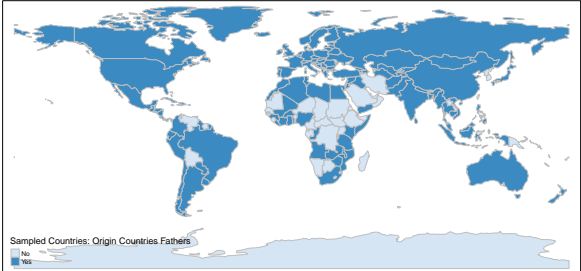
(a) Sampled Countries: Cross-Country Analysis



(b) Sampled Countries: Ethnic Level Analysis



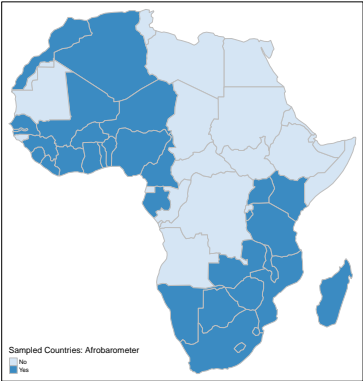
(c) Origin Countries of the Mother



(d) Origin Countries of the Father

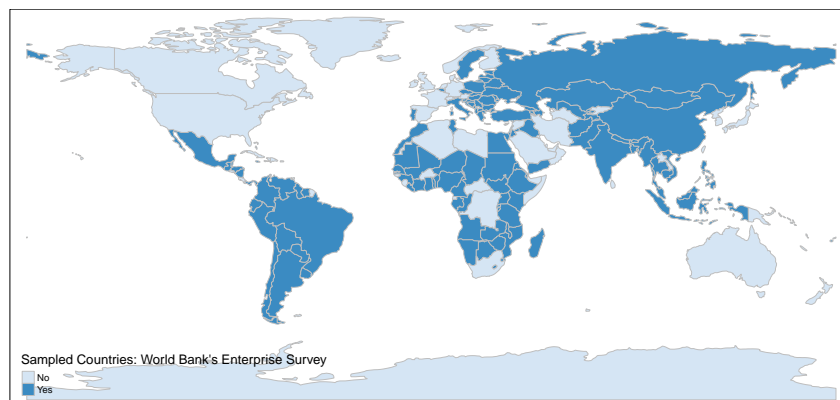
Notes: These maps display the sampled countries (shaded blue) of the coss-country analysis panel (a), the within country analysis based on a respondent’s ethnic group panel (b), and the within country analysis based on a respondent’s mother’s (c) and father’s (d) country of birth.

Figure B4: Sampled Countries: Afrobarometer



(a) Afrobarometer Sample

Figure B5: Sampled Countries: World Bank's Enterprise Survey



(a) World Bank's Enterprise Survey

B.6. Summary Statistics

Table B9: Summary Statistics: Ethnic Group Level

	count	mean	sd	min	max
Ethnographic Features					
Transhumant Pastoralism	1186	0.045	0.165	0	1
Animal Husbandry	1289	0.156	0.179	0	1
Political Complexity	1154	0.942	1.105	0	4
Nuclear Family	1290	0.295	0.456	0	1
Irrigation	1187	0.105	0.307	0	1
ln(Years since Obs.)	1282	7.547	0.097	5	8
Geographic Features					
Latitude [std.]	1290	15.355	22.695	-55	78
Ruggedness	1290	106.102	129.427	0	884
Agriculture Suitability	1184	0.361	0.284	0	1
Caloric Suitability	1285	1210.013	662.292	0	3173
Elevation	1290	651.624	662.277	-15	4677
Arid Climate	1290	0.190	0.363	0	1

Table B10: Summary Statistics: Individual Level WVS

	count	mean	sd	min	max
Baseline Controls					
Age	48157	39.783	15.647	15	103
Sex	48163	1.525	0.499	1	2
Endogenous Controls					
Education {low, middle, high}	44948	1.963	0.717	1	3
Religious person	46490	1.301	0.524	1	3
Social class (subjective)	45146	3.323	0.991	1	5
Employment status	48001	3.341	2.117	1	8
Scale of incomes	46975	4.979	2.097	1	10

Table B11: Summary Statistics: Individual Lever Afrobarometer

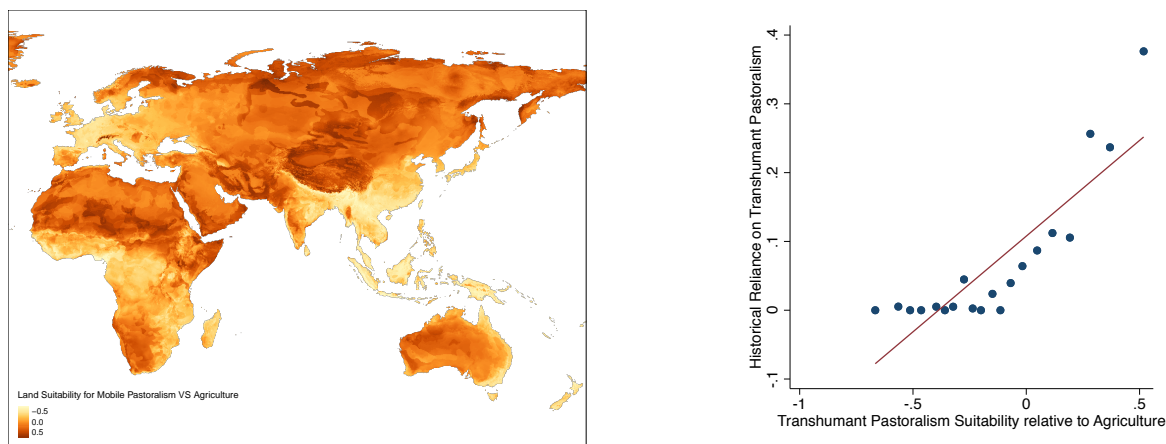
	count	mean	sd	min	max
Respondent Controls					
Respondent Age	140404	36.794	14.597	18	130
Respondent Gender	141356	1.501	0.500	1	2
Respondent Urban Status	141257	1.635	0.504	1	3
Respondent Education	141027	3.180	2.121	0	9
Interviewer Controls					
Interviewer Age	3923	29.473	7.105	18	68
Interviewer Gender	3923	1.471	0.499	1	2
Interviewer Urban Status	3923	1.743	0.442	1	3
Interviewer Education	3923	7.048	1.235	3	9
Number of Surveys	141362	53.891	35.389	1	271

B.7. Instrumental Variable Approach

This section provides with details on the instrumental variable approach this paper relies on. The IV strategy is based on (Becker, 2019) who instruments for the historical reliance on pastoralism of groups in the E.A. using an ethnic group’s homeland suitability for the maximum between transhumant pastoralism and animal husbandry, relative to agriculture as measured by (Beck and Sieber, 2010). To better fit our framework we compute for each ethnic group’s homeland the relative suitability of transhumant pastoralism to agriculture using the same data.

The left panel of Figure B6 displays the distribution of the our suitability index for the old world. Only the Old World is displayed in this map as the data from (Beck and Sieber, 2010) is not available for North and South America. The right panel in Figure B6 presents the bin scatter plot between the extent to which an ethnic group in the E.A. historically relied on transhumant pastoralism and an ethnic group’s homeland suitability for transhumant pastoralism. Reassuringly groups who originate from locations where the suitability for agriculture is higher than the transhumant pastoralism one score around zero in our index historical reliance on transhumant pastoralism constructed from variables v_4 , v_{40} , and v_{30} in the E.A. Conversely, groups from areas where conditions favor transhumant pastoralism relative to agriculture score higher in our index of transhumant pastoralism.

Figure B6: Land Suitability for Transhumant Pastoralism



Notes: The left panel displays the suitability index of transhumant pastoralism relative to agriculture. The original data is from (Beck and Sieber, 2010). More suitable areas are depicted with a darker color. The right panel displays the bin scatter plot between the extent to which an ethnic group in the E.A. historically relied on transhumant pastoralism and an ethnic group’s homeland suitability for transhumant pastoralism relative to agriculture.

Table B12: Transhumant Pastoralism and Trust: Instrumental Variable Estimates

	Dependent Variable: $\Delta(\text{Trust}^{In} - \text{Trust}^{Out})$							
	Cross-Country Estimates				Within-Country Estimates			
	OLS (1)	IV (2)	OLS (3)	IV (4)	OLS (5)	IV (6)	OLS (7)	IV (8)
Transhumant Pastoralism [std.]	0.390*** (0.084)	0.448** (0.202)	0.450*** (0.156)	1.059 (2.233)	0.072*** (0.020)	0.092* (0.049)	0.063** (0.031)	0.122 (0.123)
Mean Dep. Var.	1.07	1.07	1.07	1.07	1.12	1.12	1.12	1.12
Num. of Clusters					111	111	101	101
Observations	81	81	81	81	44589	44589	42540	42540
Individual Controls	No	No	No	No	Yes	Yes	Yes	Yes
Baseline Controls	No	No	Yes	Yes	No	No	Yes	Yes
Geographic Controls	No	No	Yes	Yes	No	No	Yes	Yes
Ethnographic Controls	No	No	Yes	Yes	No	No	Yes	Yes
Continent FE	No	No	Yes	Yes	No	No	No	No
Country FE	No	No	No	No	Yes	Yes	Yes	Yes
Survey-Wave FE	No	No	No	No	Yes	Yes	Yes	Yes
First Stage F-Stat		12.08		.22		5.53		2.65
R^2	0.226	0.221	0.613	0.530	0.102	0.102	0.101	0.100

Notes: OLS and IV estimates with robust standard errors clustered at the ethnic group level in parentheses. In columns (1) to (4), the unit of observation is a country from the old world and data is from the WVS and EVS. In columns (5) to (8) the unit of observation is a respondent in the WVS. In columns (1) to (4), *Transhumant Pastoralism* is an index [0;1] measuring a country’s historical reliance on transhumant pastoralism. In columns (5) to (8) *Transhumant Pastoralism* is measured at the ethnic group level. In even columns *Transhumant Pastoralism* is instrumented by the ethnic group homeland’s suitability for pastoralism. Dependent variable in all columns is the difference between average in-group trust (family, neighbors, people known) and average trust in out-group (people first met, people of another religion, foreigners). Baseline controls include an ethnic group’s historical reliance on animal husbandry, and the log number of years since a given ethnic groups was observed in the E.A. Geographic controls include: latitude, suitability for agriculture, caloric suitability, share of land in arid climate, elevation, and ruggedness. Ethnographic controls include: political complexity, domestic organization around nuclear family, and past irrigation. Survey-round fixed effects are included in every specification. Specifications presented in columns (4) to (8) control for the respondent’s age, age squared, and gender. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

B.8. Discussion of the Results

Table B13: Second Generation Migrants: Transhumant Pastoralism and In-Group Trust Bias

	Dependent Variable: Δ (Trust ^{In} - Trust ^{Out})					
	Mother's Country		Father's Country		Same Country	
	(1)	(2)	(3)	(4)	(5)	(6)
Transhumant Pastoralism [std.]	0.064* (0.034)	0.064* (0.034)	0.039 (0.032)	0.039 (0.031)	0.055 (0.038)	0.055 (0.037)
Mean Dep. Var.						
Observations						
Num. of Clusters						
Geographic Controls	Yes	Yes	Yes	Yes	Yes	Yes
Ethnographic Controls	Yes	Yes	Yes	Yes	Yes	Yes
Lasso-Selected Controls	No	Yes	No	Yes	No	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Survey-Wave FE	Yes	Yes	Yes	Yes	Yes	Yes
R ²	0.102		0.104		0.105	

Notes: OLS estimates with robust standard errors clustered at the mother or father country level in parentheses. The unit of observation is a respondent in the WVS who is a second generation migrant. Transhumant Pastoralism is an index [0;1] measuring a country's population historical reliance on transhumant pastoralism. Dependent variable in all columns is the difference between average in-group trust (family, neighbors, people known) and average trust in out-group (people first met, people of another religion, foreigners). Each specification controls for the respondent's age, age squared, and gender. Control variables are measured at the mother or father country of origin level. Baseline controls include a country's historical reliance on animal husbandry, and log number of years since a country's ethnic groups were observed in the E.A. Geographic controls are ancestry-adjusted and include: latitude, suitability for agriculture, caloric suitability, share of land in arid climate, elevation, and ruggedness. Ethnographic controls are ancestry-adjusted and include: political complexity, domestic organization around nuclear family, and past irrigation.

Figure B7: Transhumant Pastoralism and Firm Size, Decile Analysis

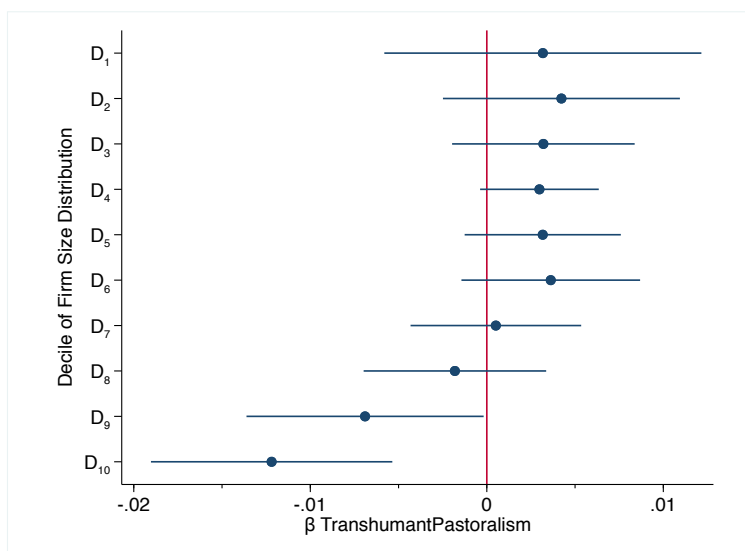
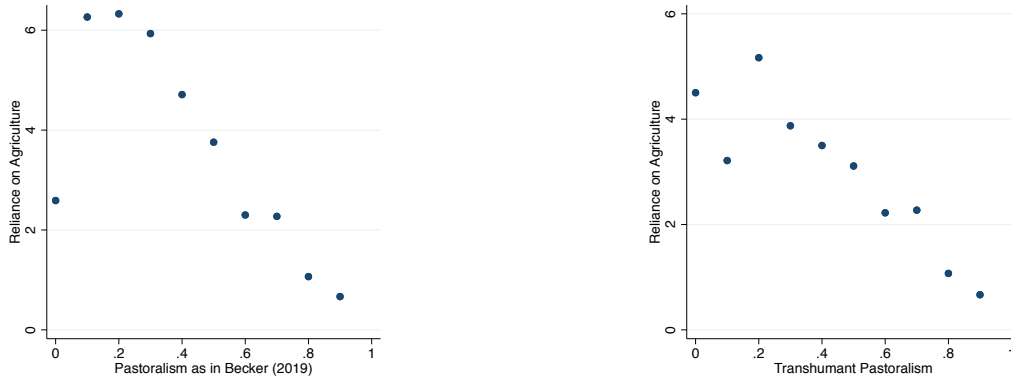


Figure B8: Binscatter Plot: Pastoralism, Transhumant Pastoralism, and Reliance on Agriculture



(a) Pastoralism as in (Becker, 2019)

(b) Transhumant Pastoralism as in this paper

Notes: Anke Becker’s measure classifies groups that rely on agriculture for more than 60% of their calorie intake as pastoralists. Our measure performs better in filtering out these groups.

Table B14: Individual Level Estimates: Transhumant Pastoralism and In-Group Trust Bias (Region FEs)

	Dependent Variable: $\Delta(\text{Trust}^{In} - \text{Trust}^{Out})$				
	(1)	(2)	(3)	(4)	(5)
Transhumant Pastoralism [std.]	0.074*** (0.010)	0.069*** (0.022)	0.088*** (0.028)	0.074*** (0.021)	0.090*** (0.026)
Mean Dep. Var.	1.12	1.13	1.12	1.12	1.12
Num. of Clusters	112	106	104	101	101
Observations	39817	38807	37488	37382	37398
Individual Controls	Yes	Yes	Yes	Yes	Yes
Baseline Controls	No	Yes	Yes	Yes	Yes
Geographic Controls	No	Yes	No	Yes	Yes
Ethnographic Controls	No	No	Yes	Yes	Yes
Lasso-Selected Controls	No	No	No	No	Yes
Region (ISO 3166-2) FE	Yes	Yes	Yes	Yes	Yes
Survey-Wave FE	Yes	Yes	Yes	Yes	Yes
R^2	0.175	0.171	0.169	0.170	

Notes: OLS estimates with robust standard errors clustered at the ethnic group level in parentheses. The unit of observation is a respondent in the WVS. *Transhumant Pastoralism* is an index [0;1] measuring an ethnic group historical reliance on transhumant pastoralism. Dependent variable in all columns is the difference between average in-group trust (family, neighbors, people known) and average trust in out-group (people first met, people of another religion, foreigners). Each specification controls for the respondent’s age, age squared, and gender. Baseline controls include an ethnic group’s historical reliance on animal husbandry, and the log number of years since a given ethnic groups was observed in the E.A. Geographic controls include: latitude, suitability for agriculture, caloric suitability, share of land in arid climate, elevation, and ruggedness. Ethnographic controls include: political complexity, domestic organization around nuclear family, and past irrigation. Survey-round fixed effects are included in every specification. * p < 0.1; ** p < 0.05; *** p < 0.01