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Market Exposure, Civic Values, and Rules

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Market Exposure, Civic Values, and Rules

Devesh Rustagi*

Abstract

Does market exposure shape civic values and rules that constrain opportunistic behavior and foster generalized cooperation? I investigate this question using a natural experiment on market location from Ethiopia, where exchange is prone to cooperation problems from asymmetric information and absence of third-party enforcement. I find a strong negative effect of market distance on civic values and rule formation. These results arise because groups develop different kinds of exchange structures to alleviate cooperation problems from market failure. In groups further away from markets, individuals rely on eponymous exchange and reputation in dense social network, which fosters parochial cooperation. In contrast, in groups near markets, impersonal and ephemeral exchange with strangers creates a demand for civic values and rules, which together with community sanctioning fosters generalized cooperation. Distance from markets without asymmetric information has no effect on civic values and rules.

JEL: C93, D8, N97, Z13

Keywords: Markets, civic values, rules, cooperation, market failure, asymmetric information, Ethiopia

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I. Introduction

Markets exchange goes beyond allocation of goods and services. It has the potential to shape institutions and values crucial for economic development. In a seminal study, Acemoglu, Johnson and Robinson (2005) found that market exchange induced security of property rights and constraints on executive. However, less attention has been devoted to a rigorous empirical understanding of whether and how market exchange could affect civic values and rules necessary for collective action.[1]

Progress in this area has been hampered by two challenges. First, market exchange is hypothesized to operate in conflicting ways (Hirschman, 1982). While the *doux commerce* hypothesis argues that market interactions foster civility and cooperation (Montesquieu, 1748; Smith, 1763), the destructive hypothesis argues that markets erode civic values and give rise to envy, coercion, and exclusion (Marx, 1872; Veblen, 1899). Identifying the direction of this effect is difficult, as this depends on market characteristics. Some characteristics like competition are likely to induce unethical behavior (Bowles, 1998; Platteau, 2000; Shleifer, 2004), but others like market failure from asymmetric information are likely to induce civic values and rules (Arrow, 1970; Bowles, 1998; Platteau, 2000). This means, there are no general answers to whether markets foster or deplete civic values and rules. Second, market exposure could be capturing pre-existing differences in values and institutions, resulting in reverse causality and omitted variables bias. Also, markets are usually located in urban areas, so their effect may be confounded with access to administration, schooling, and religious places.

In this paper, I use market places from Ethiopia to make three contributions. First, using a natural experiment on market emergence and location, I show a positive effect of market exposure on civic values and rules. Second, after ruling out prosperity, occupational structure, outside exposure, and other confounding opportunities, I show market failure is the mechanism underlying the positive effect of market exposure. Third, I find that this result arises because, depending on market proximity, individuals develop different kinds of exchange structures to mitigate cooperation problems from market failure. These structures affect whether individuals trade eponymously or anonymously, and thus their civic values and rules.

The study takes place in the homeland of Arsi Oromo, where markets attract thousands of individuals, who congregate weekly to trade in impersonal interactions with strangers. The trade occurs primarily in livestock, which is prone to asymmetric information.[2] Weak state capacity in Ethiopia means there are no impartial third parties

[1] Civic values are persistent and shared values that help groups overcome the free rider problem in the pursuit of socially valuable activities (Guiso, Sapienza and Zingales, 2011). Rules are formal written down constraints (regulations, laws) that structure human interactions (North, 1991). There is ample evidence that both civic values and rules matter for collective action (see Alesina and Giuliano, 2015).

[2] Livestock markets provide livelihood to over 30 percent of Africa's population and account for 35 percent of it's agricultural GDP (FAO 2020). Source: https://www.fao.org/faostat/en/#data/QV

to remedy this situation. These features lock buyers and sellers in a cooperation problem. The findings from this study are likely to be of general interest because asymmetric information and weak state capacity are common throughout Africa and affect besides livestock the exchange of many other goods and services (Fafchamps, 2003; Gennaioli and Rainer, 2007; Michalopoulos and Papaioannou, 2014). The local markets resemble those from pre-industrial societies and our evolutionary past, so they also contribute to our understanding of societal growth and development (Greif, 2006).

Market exposure is lower among individuals located further away from markets because of higher opportunity cost of market attendance. So, I use market distance as a proxy for market exposure. It is measured as the number of hours individuals from a group take to access a market on foot (mean 2.85 hours, s.d. 1.11). I compare individuals who are from the same clan and attend the same market, but vary in their market distance for reasons unrelated to pre-existing differences. This is made possible by a natural experiment on market emergence and location, which has several unique features.

First, until the 19^{th} century, the study area lacked markets, towns, and trading routes. Markets emerged from garrisons that emperor Menelik II built after defeating the Arsi in the 1890s. These garrisons housed hundreds of soldiers, creating opportunities for market exchange. When Menelik died in 1913, the garrisons lost their military character and transformed fully into market places. Menelik chose garrisons locations on the basis of geographical suitability to defence. This resulted in their placement in areas that were unpopulated, surrounded by mountains, and without any link to pre-existing routes for trade, slavery, and coffee (see Figure 3, p10). This means, the emergence of markets was accidental and their location had nothing to do with potential for trade or civic values. Second, prior to the emergence of markets, individuals were homogeneous with respect to culture and institutions from common patrilineal descent and exposure to common religious and political leadership (Gnamo, 2014). This mitigates the concern that initial differences drive changes in civic values and rules. Third, the garrisons did not induces changes in the location of pre-existing Arsi settlements through sorting. The Arsi formed clan-based settlements, whose locations were determined by clan leaders following a well-respected custom. This custom prevented inter-clan warfare and ensured that clan boundaries remained stable even after Menelik's invasion (Gnamo, 2014). Finally, due to the mountainous terrain, the clan-based settlements were fragmented into groups. Movement across the groups was rare because of the belief that the spirit of one's ancestors lives with them, allaying further concerns over sorting (Gnamo, 2014). Importantly, some of these groups happen to be closer but others further away from markets. This allows me to use clan fixed effects to absorb pre-existing clan specific differences. Individuals from different groups tend to attend different markets, so I use market fixed effects to absorb unobserved market specific differences.

I use three proxies of civic values and rules. I first measure propensity to cooperate if

others do the same (positive reciprocity) using a two-player public goods game in which individuals take two decisions on their contribution to the public good in a one-shot, anonymous interaction (Fischbacher, Gächter and Fehr, 2001; Fischbacher and Gächter, 2010). The first decision is simultaneous, so both civic values and beliefs about other players' contribution play a role. In the second decision, I shut down beliefs by eliciting contributions in response to each contribution level of the other player (strategy method). This allows me to capture civic values as the Spearman rank correlation between self and other players' contribution (mean 0.499).[3]

All groups are engaged in a program under which they manage their forest as a common property. This allows me to consider two additional proxies of civic values. I start with a survey measure of time individuals spent monitoring their group managed forest in a month. The program requires groups to maintain existing forest cover, which calls for monitoring, especially to prevent forest use by outsiders from neighboring groups. However, because monitoring is individually costly but generates benefits for the entire group, it proxies for civic values (mean 27.8 hours). The third proxy is based on the likelihood of having formal written down rules. I combine official records with surveys to collect data on whether a group has formal rules restricting livestock grazing inside the group managed forest. This is crucial to mitigate damage caused by livestock to young trees and promote natural forest regeneration (Amente, 2006) (mean 0.446).

I find that one standard deviation increase in market distance results in a decline in conditional cooperation by 0.16 points, time spent monitoring by 6 hours, and the likelihood of forming grazing rules by 22 percentage points. These results are robust to controlling for geography, forest condition, clan characteristics, Gini of cattle and land holding, education, and program duration. The results do not capture exposure to urbanization or short-lived garrisons; they hold when I control for distance from administration, schools, and religious places, population density, and trust in government.

I conduct vignette studies imitating local livestock exchange to shed light on plausible mechanisms underlying the negative effect of market distance on civic values and rules. I find that depending on market distance, groups developed different kinds of exchange structures to mitigate cooperation problems from asymmetric information (see Figure 6, p24). In groups further away from markets, the opportunity cost of market attendance is high, so individuals trade locally by entering into eponymous exchange with others from their social network, which fosters cooperation via reputation (Polanyi, 1944; Granovetter, 1985; North, 1991). From these situations, individuals learn to cooperate parochially, resulting in limited cooperation (Platteau, 2000). However, in groups near markets, the opportunity cost of attending markets is low, so it is possible to enter into exchange with

[3]Laboratory and field evidence highlight the importance of conditional cooperation for the provision of public goods (Fehr and Gächter, 2000), donations (Frey and Meier, 2004), and common property resources (Rustagi, Engel and Kosfeld, 2010; Kosfeld and Rustagi, 2015).

strangers. Since market exchange involves impersonal interactions, achieving cooperation calls for mechanisms beyond in-group trading. It is possible that efficiency gains from trade created a demand for civic values and rules, in the absence of which individuals would have to forego these gains (Arrow, 1970; Bowles, 1998). In a laboratory experiment, Kollock (1994) indeed found that higher trust emerges in situations where product quality is not verifiable. Fehr, Gächter and Kirchsteiger (1997) show that civic values help enforce incomplete contracts in experimental labor markets. From these situations, individuals learn to cooperate with strangers, resulting in generalized cooperation (Platteau, 2000).

Vignette studies further reveal that civic values are bolstered by sanctioning mechanisms that threaten dishonest traders with exclusion from future exchange. Targeting sanctions requires information on the identity of dishonest traders, but the impersonal nature of market exchange makes this difficult. The Oromo custom of announcing one's clan while meeting other Oromo people and use of ethnic markers while meeting non-Oromo people makes it possible to know a trader's clan and ethnic group. This information can foster cooperation through community responsibility, whereby the entire community of the defector is held responsible and faces punishment (see Greif, 2006; Deb, 2020).

The punishment mechanisms could have led to common knowledge that traders will be better off from being honest. Individuals seem to have internalized these values because they cooperate conditionally even in a one-shot, anonymous interaction without punishment. Evidence from the first decision of the public goods game also shows that individuals who live further away from markets contribute less to the public good and hold pessimistic beliefs about other players' contribution.

A falsification test shows that distance from markets that trade in products of verifiable quality (utensils, synthetic textiles) have no effect on civic values and rules. This result bolsters the importance of market failure in fostering civic values and rules.

There has been no infrastructural development since Menelik's time to reduce the opportunity cost of market attendance, so the exchange structures continue to shape civic values and rules. This means, the results reflect the cumulative effect of markets operating through directly exposure and through indirect exposure of ancestors, for instance, via cultural transmission. To this end, I find that market distance has a similar effect across the different age groups, despite stronger direct exposure among older individuals.

Related Literature. This paper contributes to the literature on the determinants of civic values, pro-social behaviors, and social norms. Previous studies focus on the role of slavery in eroding trust (Nunn and Wantchekon, 2011), trade in reducing religious riots (Jha, 2013), central institutions in crowding out honesty (Lowes et al., 2017), self-governance in fostering donations and norms of cooperation (Guiso, Sapienza and Zingales, 2016; Rustagi, 2022*a*), and election outcomes in increasing xenophobia (Bursztyn, Egorov and Fiorin, 2020). This paper highlights the role of economic exchange in shaping civic values and rules (Montesquieu, 1748; Smith, 1763; Hirschman, 1982; Bowles, 1998; Platteau,

2000). A closely related seminal paper is by Henrich et al. (2010), who find a positive link between calories purchased from markets and fairness in behavioral games. Enke (2022) also finds a positive link between market-related concepts in a society's folklore and folklore-based measures of morality.[4]

This paper distinguishes itself from previous studies in several ways. First, in addition to using a natural experiment on the emergence and location of markets to render a causal interpretation, the paper sheds light on the mechanism through which market exchange shapes civic values and rules. It shows that markets failure from asymmetric information is the reason underlying the positive effect of market exposure. These results help us understand the direction of the market effect. They also lend empirical support to the conjecture that market failure fosters civic values (Arrow, 1970; Bowles, 1998).

Second, the paper documents the emergence of different kinds of exchange structures to mitigate cooperation problems from market failure. This offers novel empirical evidence in support of many influential studies suggesting the importance of economic organization for cultural change (Polanyi, 1944; Granovetter, 1985; North, 1991; Greif, 2006), as well as studies on governance and contract enforcement under weak states (Ostrom, 1990; Greif, 2006; Dixit, 2009; Deb, 2020; Sanchez de la Sierra, 2021). Since the exchange structures affects who cooperates with whom, the paper also contributes to the literature on the origins of limited and generalized cooperation (Platteau, 2000).

Third, the paper highlights the importance of market exposure in shaping both cultural norms and formal written down rules. These findings are significant given the recent evidence on the interplay between culture and institutions in sustaining collective action (Bisin and Verdier, 2017; Acemoglu and Robinson, 2019; Rustagi, 2022*b*).

Finally, the paper builds on the research of Rustagi, Engel and Kosfeld (2010) and (Kosfeld and Rustagi, 2015), who exploit the variation in civic values to study its effect on commons management. This study goes a step deeper and asks what explains variation in civic values by examining the role of market exposure.

The paper is organized as follows. Section II discusses the natural experiment on market exposure, Section III the field setting, and Section IV the measures of civic values, rules, and market distance. Section V presents the empirical strategy, Section VI the main results, and Section VII the potential channels. Section VIII offers concluding remarks.

II. Historical Background

This section provides an overview of the natural experiment on the emergence and location of markets in the homeland of the Arsi, who make up the largest sub-branch of the Oromo

[4] A parallel literature uses lab experiments to examine how markets affect morals towards third parties, such as environment, child labor, and animals. Falk and Szech (2013) find that markets erode moral values, but Bartling, Fehr and Özdemir (2020) find that this is due to repeated play and not markets.

people. The natural experiment comprises four key features described in a chronological order below. It relies on an in-depth study of the Arsi Oromo by Gnamo (2014) and related studies on Oromo people (Perham, 1948; Haberland, 1963; Hassen, 1994).

II.A. Migration

In the pre-market period, individuals were homogeneous with respect to culture and institutions, which mitigaes the concern that pre-exsting differences correlated with market distance drive changes in civic values and rules. This is because of the way the Arsi migrated and settled in the study area. In the 16th century, the Oromo started migrating north from their ancestral homeland in response to increasing population pressure (see Figure 1). While migrating, they split into two confederations, of which the *Borana* moved to the west and *Barentu* to the east. Over time, these confederations split further into many divisions, each settling in a different part of Ethiopia by the 18th century. The Arsi trace their origin to the *Barentu* confederation. To reduce population pressure further, the Arsi split into two moieties. Those who descended patrilineally from the ancestor named *Siko* settled to the north of the river Wabe Shebele, whereas those who descended patrilineally from the ancestor named *Mando* settled to the south. The study area lies entirely to the south of the river Wabe Shebele and all individuals residing there descended from the common ancestor named *Mando*. This means, the pre-market population had similar cultural origins from common ancestry (Hassen 1994).

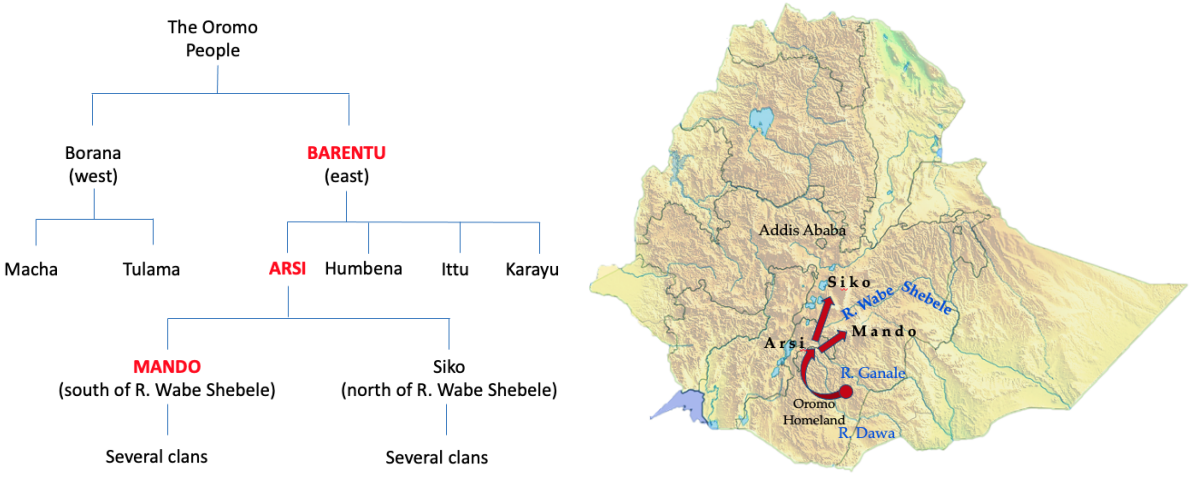

Figure 1: The Oromo Genealogy Tree and Migration

Notes. The left figure shows the genealogy tree of the Mando Arsi based on Gnamo (2014, p31). The right figure shows Oromo migration with focus on the Arsi sub-group and its splitting into two moieties that settled on the different sides of the River Wabe Shebele. The study area lies to the south of the river in the homeland of the Mando Arsi.

During migration, the religious (*Qallu*) and political (*Gada*) institutions forming the cornerstone of the Arsi society also split. These institutions involved decision-making in

a public assembly, but the large geographical distances separating the different moieties made it difficult to hold a common assembly. Consequently, the *Siko* and *Mando* developed their own religious and political institutions. This means, the pre-market population was exposed to common religious and political institutions.

II.B. Settlement Formation

The Mando Arsi formed settlements before the markets emerged on the basis of their clan (*gosa*). The settlements locations were determined by a custom called *Baala Buusa* (leaf laying ceremony) through which clan leaders (*Abba baala*) declared communal property rights to land on a first-come first-served basis by placing a leaf. These rights were inherited by the subsequent generations and were not disrupted when Menelik defeated the Arsi (Gnamo, 2014, p63). Since *Baala Buusa* was respected by all Arsi clans, it prevented conquering of each others' territories (Gnamo, 2014, p33). The Arsi clans also bonded over strong regional identity (*Arsooma*), friendship (*firooma*), marriage (*soddomaa*) and matrimonial alliances (*dhalooma*), which further prevented territorial take overs. As Gnamo (2014, p33) writes "*Gosa* [clan], however strong and powerful it might have been, did not have the right to conquer and occupy the land belonging to the descendants of *Abba baala*." This means, clan homelands have remained stable over time and their locations were not affected by markets, mitigating concerns over sorting.

II.C. Settlement Fragmentation

The Mando Arsi live in the Bale mountains, where due to the rugged terrain their settlements were fragmented into smaller units called 'groups' (Hodson, 1927, p92). Some of these groups happen to be closer to markets but others happen to be further away. This allows me to use variation in market distance within clans and introduce clan fixed effects to absorb any remaining unobserved pre-existing differences that are due to clans. Given the importance of clans in the organization of the Arsi society, this is a crucial step. Individuals from different groups may attend different markets, which allows me to introduce market fixed effects to absorb unobserved market specific differences.

Furthermore, individuals rarely moved across groups even within their clan homeland, as they preferred to reside in the area where their forefathers once lived, died, and were buried. This was because of the belief that the spirit of one's ancestors lives with them. As Gnamo (2014, P63) writes, "the residence rule is patrilocal among the Oromo, where men are expected to be born, grow up, live, bring their wives to their residence, and die." An in depth survey with the elderly in each group shows that only 1.5 percent of the households have out-migrated to cities in the past six decades. This alleviates further concern over sorting by market location.

II.D. Market Emergence and Location

The Arsi society was a paramount chiefdom (Murdock, 1967). It did not form any princely states (Gnamo, 2014, p68) or centers of trade and towns (Horvath, 1968). An Italian map from 1894 (before the garrisons emerged) confirms this (see Figure 2). On the map, the study area is labeled as "Monti degli Arussi". It stands out as an empty space without any towns. This is not due to omission by cartographers, as the maps do include nearby towns like Arbegoma and Chevena. These towns are over 80 km away from the study area and fall in the homeland of the Sidamo people, who are ethnically distinct from the Oromo people.

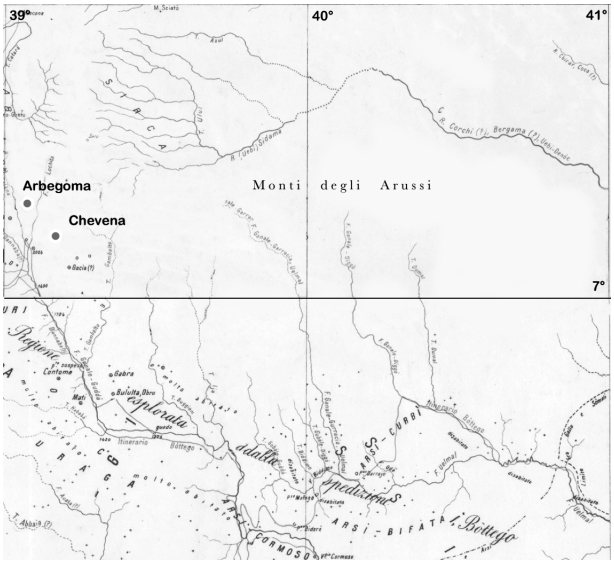

Figure 2: The Study Area Before the Conquest by Menelik

Notes: The map shows the study area as "Monti degli Arussi" and its surroundings in 1894 before the invasion by Menelik. Source: Corpo di stato maggiore, Ministero della guerra, Italy, 1894.

Market emergence.– In the late 19th century, Menelik, the king of Shoa (1865-1889) and the emperor of Ethiopia (1889-1913), began expanding the southern boundaries of his kingdom by waging wars against different ethnic groups including the Arsi Oromo. In the late 1890s, he subjugated the spear wielding Mando Arsi with little resistance (Pankhurst, 1998, p178-179) using superior European firearms (Perham, 1948, p293-294). To maintain his hold over the subjugated lands, Menelik built garrison camps called *ketemas*. Once a garrison was created, soldiers moved in with their families. This influx of people created opportunities for exchange, leading to the emergence of markets. After Menelik's death in 1913, the garrisons lost their military purpose and transformed fully into market places (Akalou, 1973). The Italian tourist guide to East Africa (1935-1941) described these garrisons as thriving market centers rather than as military establishments (Italiana et al., 1938, p464). Since it was not the intention of Menelik to build centers of trade, the emergence of markets was unintended.

Market location.– The garrison locations were determined by Menelik on the basis of geographical suitability to defense. The Mando Arsi played no role in this process. Figure 3 offers a 3-D view of the wider geographical context in which the study area is located (enclosed in a dashed red line). The garrisons (black circles) were placed on a plateau bounded to the west by the Rift Valley, to the east by the gorge of the river Wabe Shebele, to the south by the 4000m high Bale Mountains, and to the north by a saddle connecting the equally high Mt. Kaka and Mt. Enkolo. These geographical barriers offered protection to garrisons in the event of an attack.

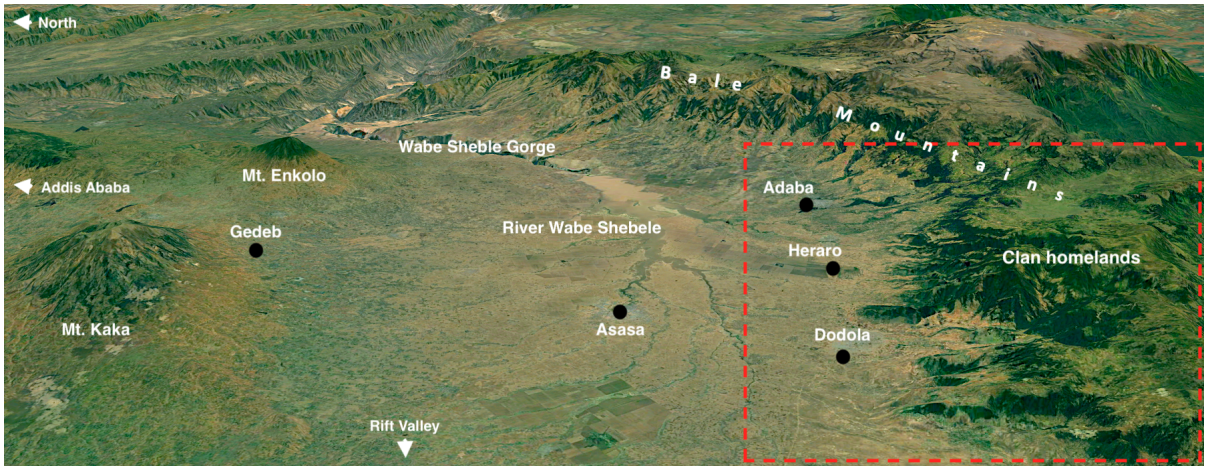

Figure 3: The Location of Garrisons in the Study Area

Notes: The figure shows the geographical context in which the garrisons were placed by Menelik. The study area is enclosed by a dashed red line and the garrisons are in black circles. Baseline map source: Google Earth 2023.

The study area is home to three garrisons: Dodola, Heraro, and Adaba. They were connected to Addis Ababa (Menelik's capital) via two other garrisons to the north of the river: Asasa and Gedeb. The garrisons were neither on pre-existing trade routes (see Zewde, 2002, p23) or on routes used for the Red Sea slave trade (see Shell, 2018, p66) or for coffee trade.[5] Most battles between Menelik's Army and the Arsi were fought over 100 km to the north of the study area (see Gnamo, 2014, p146). This makes it highly unlikely that clan characteristics like bravery influenced Menelik's decision to place these garrisons. Nevertheless, clan fixed effects allow me to account for such clan specific differences.

Because of limited resources, Menelik ruled the subjugated areas indirectly through local clan leaders (see Gnamo, 2014, p162). Since clan leaders resided locally, the indirect rule is likely to have affected the entire area and not just places that were relatively close to the garrisons. It is doubtful that different clans were affected differently, nonetheless having clan fixed effects allows me to absorb any such potential difference. Also, because

[5]The trade routes were far from the homeland of Mando Arsi. The Mando Arsi were involved in slave trade. The altitude of the area is not suitable for coffee cultivation or for coffee forest. While coffee does grow naturally to the south of the Bale mountains in the Harenna forest, it is on a steep escarpment with a fall of over 1000 meters.

Menelik died a few years after the garrison were built, the bite of this indirect is expected to be weaker.

III. The Field Setting

This section provides an overview of the groups in the study area, as well as the nature of market interactions. It is based on data from the forest management program office and discussions with group members.

III.A. Groups

There are 56 groups in the study area. All of them are located inside the Adaba-Dodola Forest Protection Area in the West Arsi administrative zone. Of these, 52 groups are in the sample; three groups in which a pilot study was conducted were excluded and data were not available for the fourth group. Figure 4 shows the location of these groups.

The groups cover an area of 4.5 km^2 on average. Their boundaries follow geographical features, such as mountain ridges, rivers, and valleys. The groups range in size from 16 to 30 households, which are often organized into hamlets. Some of these hamlets are from the homeland of the adjacent clan. As a consequence, group boundaries often intersect clan boundaries. The groups comprise of 1368 households. These households speak the Arsi dialect of Oromo language and follow Sunni Islam mixed with Oromo beliefs. All households practice subsistence agriculture and forest gathering, but the main occupation is small-scale herding which involves both buying and selling of livestock. 80 percent of the households are from ten clans: *Doda* (30%), *Adaba* (13%), and *Shedama* (9%), *Holbatana* (7%), *Abena* (6%), *Bidika* (4%), *Angiso* (3%), *Magda* (3%), *Doyo* (3%), and *Weqe* (2%). The first three clans alone account for over 50 percent of the households (see Figure 4). The level of socio-economic development is poor: except for primary schools and mosques, infrastructure like roads, electricity, mobile towers, tap water, dispensary, irrigation, and veterinary care are completely lacking.

All groups are engaged in a forest commons management program which was rolled out from 2000-2005. Under the program, each group was given property rights to manage the forest in its boundary. The group members are allowed to use their forest to graze livestock, harvest timber and non-timber forest products, and maintain existing homesteads and farms inside the forest. In return for these benefits, the groups are required to maintain existing forest cover, restrict further expansion of agriculture and settlement by members inside the forest, and prevent outsiders from accessing the forest.

All groups have the same organizational structure: an elected five-member executive committee headed by a leader. This committee is responsible for administering forest related decisions. All other administrative decisions are taken in consultation with the

village to which the groups belong. There are five villages and their administrative centers are located some distance away from the groups (see Figure 4).

As mentioned in Section II.C, migration across the groups is rare. Households are required to maintain residence inside their group to benefit from the commons management program. Out-migration for over three months comes with a penalty of expulsion from the program.

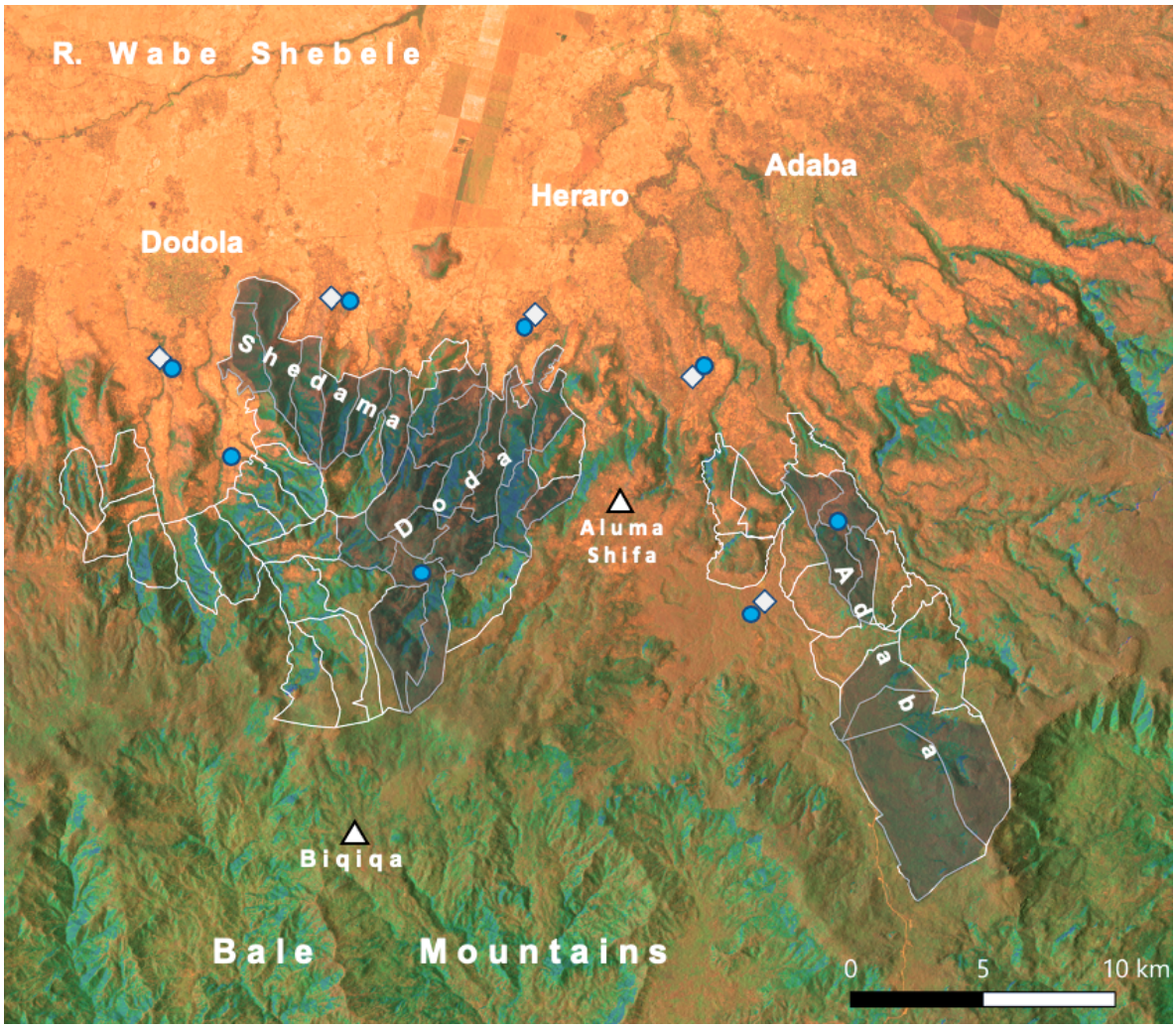

Figure 4: Location of Groups, Clans, Markets, Administration, and Schools

Notes: The figure shows the location of groups (white boundaries), homeland of three major clans: Doda, Adaba, and Shedama (shaded area embossed with clan's name), and three market towns: Dodola, Heraro, and Adaba. The locations of village administration offices are in solid white diamonds, primary schools in solid blue circles, and alternative markets in solid white triangles.

III.B. Market Interactions

The markets are held on two days in a week called 'market days', which brings together thousands of buyers and sellers who are not known to each other from adjoining areas. The markets are held on a large ground(s), which is over 12 times the size of a standard football field. Sellers do not have a fixed location from which they operate; rather locations are

taken on the basis of arrival. The first day of the market is reserved for livestock trade. The number of individuals attending the market on this day is also larger than on the second day. For instance, the market in Dodola attracts as many as 5,000 people on the first day. Livestock includes cattle, horses, donkey, pony, goat, and sheep. Other prominent items include butter, honey, fuel wood, charcoal, bamboo, rubber boots, synthetic textiles, candles, and utensils. Individuals from the study area attend markets to both buy and sell livestock, which typically comprises exchange of a single livestock.

Since livestock exchange forms the cornerstone of markets, several features are worth noting. First, market exchange occurs among strangers in the form of impersonal interactions that cease to exist once the exchange is over. Livestock is inspected on the spot and exchange takes place against instant payment in cash. There are no orders in advance and sellers do not offer credit. Second, livestock exchange is prone to asymmetric information, as the seller has more information about livestock quality than the buyer. This problem is further aggravated by the absence of quality guidelines, lack of veterinarian checks before purchase, and primitive patterns of production that produce highly uneven quality of livestock. While there are some cues that the buyers may use to adjudge livestock quality, these are far from perfect and the problem remains. Third, livestock exchange is riddled with informal agreements that cannot be verified and enforced by impartial third parties. As such, there are no impartial third parties in the form of courts or police. Even if such third parties did exist, the small size of transactions does not merit formal action, as this would make exchange costly and inefficient. Informal enforcement agencies like mafias or private armies are absent. Fourth, there are no middlemen in the markets and trade happens directly between buyers and sellers. Fifth, markets attract a large fluctuating population of buyers and sellers who could be Oromo people from different clans, as well as non-Oromo people (Amhara, Gurage, Sidamo).

These features imply that buyers and sellers are locked in a cooperation problem. If buyers do not trust sellers, they will not be willing to pay a high price. Knowing this, sellers have no incentive to produce high quality livestock. Under these circumstances, markets may end up trading only in poor quality livestock or may even fail to exist altogether (Akerlof, 1970). However, individuals have clearly managed to avoid this fate as markets not only exist but are also thriving. This is not because of personalized relationships based on long-term exchange, which the vignettes reveal to be rare. As I discuss in section VII, this is due to civic values reinforced by community sanctioning.

IV. Data

I use a group level survey to measure market distance and combine this with a behavioral experiment and household level survey to measure civic values and rules. Table A.1 reports summary statistics on these variables. I append this with data on group level

characteristics and naming patterns of individuals from the forest management program office. Finally, I use vignette studies imitating local livestock exchange to study mechanisms. The experimental instructions and procedures are described in Appendix B and vignette studies in Appendix C.

IV.A. Market Distance

The three livestock markets in the study area on average 12 km apart from each other. Since there are no roads connecting groups to markets, households tend to attend the market that is closest to their group on foot. I measure market distance as the number of hours households take on average to cover a one-way market trip on foot. Market distance ranges from less than 1 hour to 5 hours, the average being 2.85 hours (s.d. 1.11). Market distance is expected to affect the opportunity cost of market attendance. This is confirmed by household data on market trips, which decline steeply with market distance.

IV.B. Civic Values and Rules

I consider the following measures of civic values and rules: individual propensity to cooperate conditionally (positive reciprocity), time spent monitoring the group managed forest, and formation of rules regulating grazing inside the group managed forest.

Propensity for Conditional Cooperation

Conditional cooperation is defined as the individual willingness to cooperate provided others do the same, even when the payoff maximizing strategy is to defect on others' cooperation. Measuring conditional cooperation in the field is challenging due to confounding motivations operating at the same time. Individuals who appear cooperative might do so not because they have civic values but because of benefits from repeated interaction and reputation formation. Another concern is confounding of conditional cooperation with beliefs. Individuals with similar levels of conditional cooperation might behave differently because of differences in beliefs about others' cooperation. For instance, conditional cooperators with optimistic beliefs would cooperate, but those with pessimistic beliefs would defect. These concerns imply that observed cooperation behavior is a poor proxy for conditional cooperation. I overcome these concerns using a behavioral experiment described below.

The Experiment.– I use a one-shot anonymous public goods game in the strategy method (Fischbacher, Gächter and Fehr, 2001; Fischbacher and Gächter, 2010). This allows me to rule out repeated interaction, reputation formation, and beliefs from playing a role. During the game, two players were randomly assigned to an experimental group. Each player received an endowment of six bills of one Ethiopian Birr and had to decide on his contribution to the public good in the units of 1 Birr. Any amount in the public good

was multiplied by 1.5 and then distributed equally between the two players, regardless of their contribution. The payoff function of player i, where $i = (1, 2)$ is given by:

$$\pi_i = 6 - C_i + 0.75(C_i + C_i) \tag{1}$$

where C_i denotes the contribution of player i to the public good and $(C_1 + C_2)$ is the total value of the public good. Because the marginal per capita return from contributing one Birr to the public good was 1.5/2 or 0.75, it was in the self-interest of players to contribute nothing. Yet, if both players contributed their entire endowment, each player's earnings increased from 6 to 9 Birr; this created a cooperation dilemma.

Each player took two decisions: unconditional and conditional. In the unconditional decision, players contributed simultaneously and stated their beliefs about the other players' contribution. In the conditional decision, I used the strategy method to shut down beliefs: players reported their contribution in response to each possible contribution of the other player. To ensure incentive compatibility, both decisions were made payoff relevant. A die was rolled to determine for which player the unconditional decision is taken; this was matched with the other players' conditional decision to calculate payoffs.

The experiments were conducted in 2008. This was the first time ever that individuals took part in an experiment, so I ensured they understood the game (see Appendix B for procedures). On average, each player earned 7.5 Birr, which was slightly over one day's wage in Dodola, the largest town. 720 individuals took part in the experiment, representing 53 percent of the households. Given the importance of clan in the organization of the Arsi society, I test for sample representation by comparing clan proportions in the sample to those in the population. Figure A.1 in Appendix A shows the proportion of ten major clans in the sample is the same as in the population (p-value = 0.45).

Measuring conditional cooperation.– The conditional decision allows me to obtain a revealed measure of civic values: (i) *free riders* are expected to always contribute zero regardless of the other players' contribution; (ii) *altruists* are expected to always contribute their full endowment regardless of what the other player does; and (iii) *conditional cooperators* are expected to increase their contribution in the increasing contribution of the other player. I find that a large fraction of individuals behave either as free riders or as conditional cooperators, but only a handful behave as altruists. Accordingly, I use the Spearman correlation between self and other players' contribution in the conditional decision as a measure of an individuals' propensity for conditional cooperation. The higher the Spearman ρ the higher is the propensity to cooperate conditionally, whereas zero correlation implies a tendency for free riding.[6] The average propensity to cooperate conditionally turns out to be 0.499 (s.d. 0.518). While conducting robustness checks, I use

[6]The Spearman ρ is also zero for altruists and flat contributors (individuals who contribute the same amount that is different from zero and full endowment). Only 1.8 percent of the individuals behave as altruists and 2.3 percent as flat contributors.

an indicator for conditional cooperator – individuals for whom the Spearman ρ is positive and statistically significant at p-value <0.05. I find that 47 percent of the individuals behave as conditional cooperators and 11 percent as free riders.

Time Spent Monitoring

Maintaining the existing forest cover requires groups to restrict overuse by members and prevent outsiders from neighboring groups to access their forest. This calls for group members to engage in decentralized monitoring, whereby individuals patrol the forest in small teams. Monitoring is prone to a second order free rider problem: it is individually costly but generates group level benefits. Individuals are better off if others engage in monitoring while they can do something else in the meantime. If every individual thinks like that, there will be no monitoring, resulting in poor forest management. I use data from a household survey conducted in private with 508 individuals to elicit time spent monitoring in a month, which turns out to be 27.80 hours (s.d. 15.48) on average. As before, the frequency of different clans in this sample is similar to that in the population, underscoring the representativeness of the sample (p-value = 0.38, see Figure A.2).

Rules on Resource Use

Rules regulating resource use are considered critical for the management of public goods and commons. In my setting, the single biggest cause of deforestation is the disappearance of young trees from the forest due to browsing by livestock. To mitigate this deforestation, ecologists recommend rules regulating livestock grazing inside the forest (Amente, 2006). I use household surveys conducted privately to assess whether a group has rules restricting grazing inside the forest and on the same spot, as well as the duration of these restrictions. 511 households took part in this survey, of which 44.6 percent (s.d. 49.8) reported having grazing rules in their group. Grazing was restricted, on average, for 1.76 months in a year (s.d. 1.698). I confirm this using books maintained by groups. Rustagi (2022*b*) show that these rules matter for successful management of commons. As before, the proportion of different clans in this sample is the same as in the population (p-value = 0.44, see Figure A.3).

IV.C. Descriptive Results

Figure 5 present maps and binscatter plots to show the association of civic values and rules with market distance. It is evident from the figure that both civic values and rules decline steeply with market distance (p-value < 0.001).

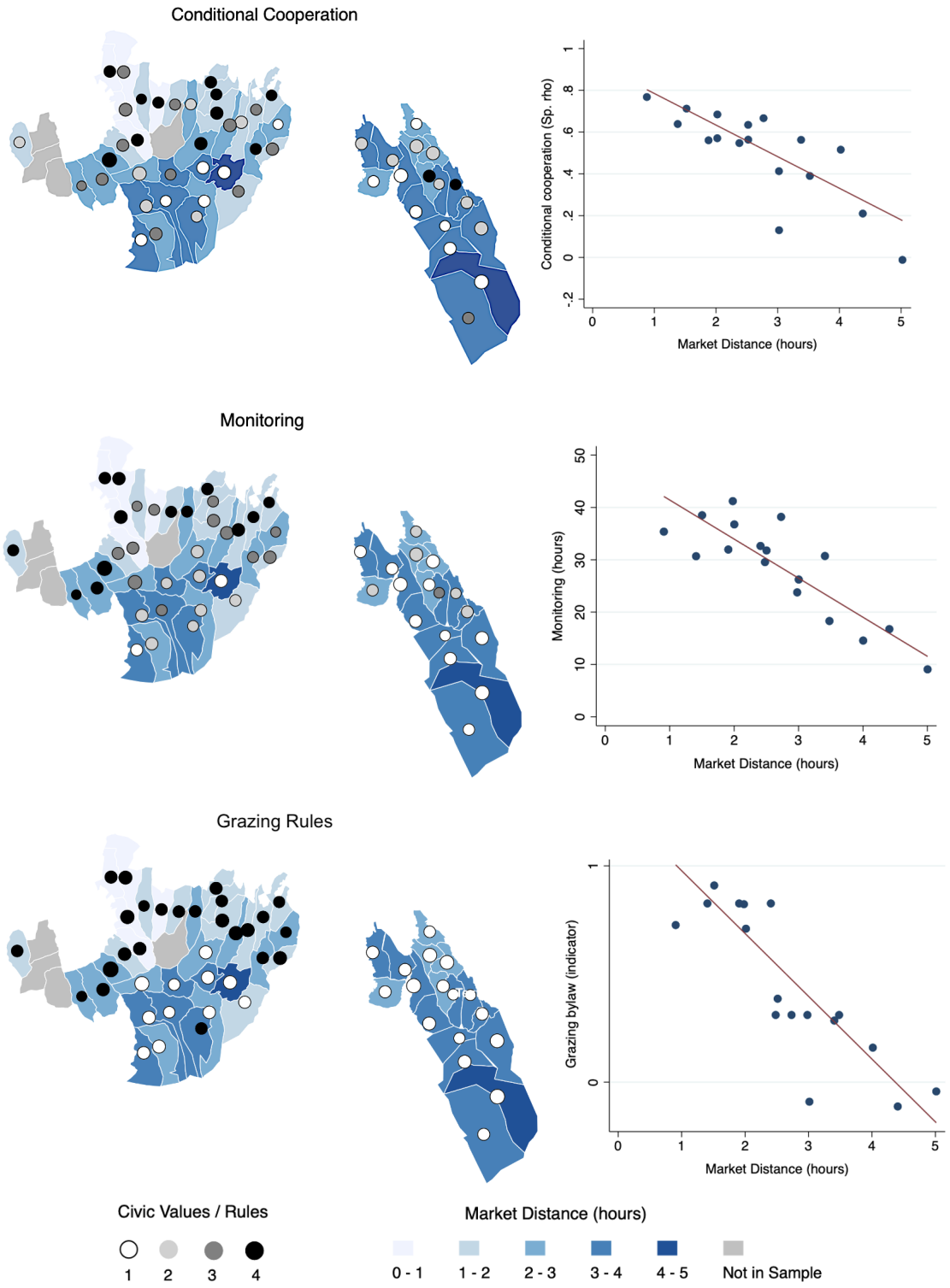

Figure 5: Civic Values and Grazing Rules by Market Distance

Notes: The maps show market distance (hours) in shades of blue, whereby a darker shade implies higher distance from market. Circles indicate civic value or rule in shades of grey, where a darker shade implies stronger civic value (quartile) or rule (indicator). The bin scatter plots show the corresponding association of civic values and rules with market distance after accounting for market fixed effects.

V. Empirical Specification and Strategy

I study the effect of market distance on civic values and rules using the following OLS specification:

$$y_{igcm} = \alpha_0 + \beta MD_g + \mathbf{X}_{gcm}\gamma + \mathbf{H}_{igcm}\delta + \theta_c + \eta_m + \epsilon_{igcm} \quad (2)$$

where y_{igcm} is the civic value or rule (conditional cooperation, monitoring, grazing bylaw) reported by individual i from group g, clan c, and attending market m. *MD* is one-way market distance measured in hours. $\mathbf{X}$ and $\mathbf{H}$ are a vector of household and group specific characteristics that are considered as key determinants of civic values and rule formation in the literature. In the main specification, these include altitude, group size, group fragmentation into hamlets, share of females in a group, Gini of cattle ownership, Gini of land ownership, years of education, and duration for which a group has been under the commons management program. Table A.1 reports the definition and summary statistics on these variables. θ_c is a fixed effect for the clan of an individual. In the main specification, I consider three clans that account for over 50 percent of the households in the study area: *Doda*, *Shedama*, and *Adaba*. η_m is a fixed effect for the market that the individual attends. I cluster standard errors at the group level, which is the treatment unit. The results hold when I cluster standard errors on the group and the market, the group and the village, the group and the clan, or when I use spatial cutoffs at 2-10 km distance.[7] The coefficient of interest is β, which captures the effect of market distance on civic values and rules.

While conducting robustness checks, I consider additional proxies of: a) *Forest condition*: in groups closer to markets, there could have been more pressure on forest, resulting in greater need for civic values and rules. While altitude already captures the variation in forest type, I additionally control for plantation forest type using data from the program office and initial forest condition at the start of the program using data on median tree cover in 2000 from (Hansen et al., 2013); b) *Geography*: in addition to altitude, I include latitude and longitude; and c) *Clan composition*: in addition to the fixed effects for the three clans, I consider clan fragmentation and fixed effects for seven others clans that account for additional 30 percent of the household population. Table A.2 reports the definition and summary statistics on these variables.

The natural experiment described in section II suggests that market distance is plausibly exogenous. A balance check in Table A.3 shows that, with the exception of latitude, market distance is uncorrelated with a variety of geographical, social, and economic variables. In Table A.4, I test for sorting by market distance by checking if groups closer to market are larger or denser. I find no association of market distance with group size, population size, population density, and migration.

[7] Moran's I turns out to be statistically insignificant for these cutoffs.

Market distance could be picking the effect of opportunities associated with urbanization, such as access to administration, schooling, and religious places. The field setting allows me to separate these effects. The administrative offices relevant to the households are located in the main settlement of the village (see Figure 4). Also, households rarely have more than 3 years of education, so access to primary school is of utmost importance. The primary schools are located either in the group or in the neighboring groups or in the main settlement of the village (see Figure 4). Individuals do not rely on market places for mosque attendance. Friday is the preferred day for attending mosques, but this does not coincide with market day(s). Instead, individuals attend local mosques dispersed throughout the study area. While reporting robustness checks, I control for distance to village administration, local primary school, and local mosque. To further ensure that market exposure is not capturing the effect of urbanization operating through density and short-lived garrisons, I control for population density per km^2 and trust in government. Table A.2 reports the definition and summary statistics on these variables.

VI. Results

VI.A. Main Results

Table 1 presents results on the effect of market distance on conditional cooperation in Panel A, time spent monitoring in panel B, and formation of grazing rules in Panel C. Table A.5 reports the coefficients on covariates. Column 1 is without any controls and shows that market distance has a strongly negative coefficient, which is statistically significant at the 1 percent level in all the three panels. Market distance explains large variation in civic values and grazing rules, which ranges from 12-51 percent.

In column 2, I introduce clan and market fixed effects. The coefficient on market distance changes little in magnitude and remains statistically significant throughout, suggesting that market distance is not capturing unobserved clan and market specific differences. The fixed effects are jointly statistically significant in panel B-C, where their inclusion leads to a jump in the R-squared by 6-7 percentage points.

In column 3, I introduce main control variables. Although the coefficient on market distance declines slightly in magnitude in panel A and loses over one-third of its magnitude in panels B-C, it remains statistically significant at the 1 percent level. The controls variables are jointly statistically significant in all the panels and their inclusion raises the R-squared by 4-5 percentage points. According to the estimates in column 3, a one standard deviation increase in market distance (1.11 hours) leads to a decline in conditional cooperation by 0.16 points, time spent monitoring by 6 hours, and the likelihood of forming grazing rules by 22 percentage points. These are large effects in relation to the mean of the dependent variables.

Table 1: Market Distance, Civic Values, and Rules

	No controls (1)	Fixed Effects (2)	Control variables (3)	Median split (4)	Tercile split (5)
	Panel A: Conditional Cooperation (Spearman *rho*)				
Market distance	-0.158	-0.159	-0.146		
	(0.022)	(0.024)	(0.027)		
Above median market distance				-0.271	
				(0.088)	
Second tercile of market distance					-0.178
					(0.088)
Third tercile of market distance					-0.552
					(0.087)
R^2	0.12	0.12	0.16	0.14	0.15
Observations	720	720	720	720	720
	Panel B: Time Spent Monitoring (hours)				
Market distance	-8.527	-7.437	-5.615		
	(1.091)	(1.026)	(1.047)		
Above median market distance				-11.419	
				(3.347)	
Second tercile of market distance					-8.985
					(3.958)
Third tercile of market distance					-19.594
					(2.201)
R^2	0.39	0.46	0.54	0.52	0.53
Observations	508	508	508	508	508
	Panel C: Grazing Rules (indicator)				
Market distance	-0.317	-0.280	-0.197		
	(0.029)	(0.031)	(0.051)		
Above median market distance				-0.425	
				(0.139)	
Second tercile of market distance					-0.365
					(0.127)
Third tercile of market distance					-0.628
					(0.234)
R^2	0.51	0.57	0.66	0.65	0.65
Observations	511	511	511	511	511
Controls	No	No	Yes	Yes	Yes
Fixed Effects	No	Yes	Yes	Yes	Yes

Notes: OLS estimates with robust standard errors clustered on the group in parentheses. Control variables include altitude, group size, group fragmentation, share of female members, Gini of livestock ownership, Gini of land holding, education, and program duration. Fixed effects are for clan and market.

VI.B. Robustness Checks

I carry out a number of robustness checks which include: a) alternative forms of clustering; b) alternative measures of market distance; c) alternative measures of civic values

and rules; d) introduction of additional controls for forest, geography, clans; and d) introduction of additional controls for other distances and urbanization.

Alternative forms of clustering.– I show in Table A.6 that the main results are robust to clustering at different levels including different spatial cutoffs.

Alternative measures of market distance.– The effect of market distance may not be linear. To alleviate this concern, I consider an indicator variable for above median market distance in column 4 of Table 1. It enters with a large negative and statistically significant coefficient. Similar results are obtained when I consider terciles of market distance in column 5. With respect to the first tercile as the benchmark category, civic values and rules decline in the second and more steeply in the third tercile. Together, these results imply that individuals more exposed to markets hold stronger civic values and rules.

Alternative measures of civic values and rules.– Table A.7 shows that the results hold when I consider an indicator for conditional cooperator (column 1) and number of months grazing is forbidden in the group managed forest (column 2). One standard deviation increase in market distance leads to a decline in the share of conditional cooperators by 10 percentage points and grazing ban by 0.74 months.

Additional control variables.– In Table 2, I introduce plantation forest and median tree cover in column 1, latitude and longitude in column 2, clan fragmentation in column 3, and fixed effects for seven other clans in column 4. This does not lead to any major changes in the magnitude of the coefficient on market distance, which remains statistically significant at the 1 percent level. The additional clan fixed effects are jointly statistically significant in panels A and C (p-value < 0.05), but are close to the 10-percent level of significance in panel B (p-value $= 0.11$). In contrast, the additional controls are jointly statistically insignificant in all the panels. Notice that the coefficient on latitude is always very small in magnitude and is never statistically significant. These results suggest that market distance is not capturing the effect of forest, geography, and clan specific factors.

Distance from administration, school, and mosque.– In Table 3, I control for distance to local administration in column 1, primary school in column 2, and local mosque in column 3. These variables have a jointly statistically significant effect in all the panels. Despite this, the coefficient on market distance retains it's magnitude and significance. Market distance could be confounded with population density and trust in government, which may have been shaped by proximity to urbanization or short lived garrisons. Accordingly, I control for these variables in columns 4-5 of Table 3. This does not lead to any major changes in either the magnitude or the significance of the coefficient on market distance. These results suggest that market distance is not capturing the effect of other services offered by urban areas or that of urbanization.

Table 2: Market Distance, Civic Values, and Rules: Robustness Checks

	Forest condition (1)	Latitude and longitude (2)	Clan fragmentation (3)	Add. Clan FE (4)
	Panel A: Conditional Cooperation (Spearman *rho*)			
Market distance	-0.150	-0.172	-0.171	-0.180
	(0.028)	(0.040)	(0.040)	(0.038)
Plantation forest	-0.031	-0.023	-0.024	0.049
	(0.046)	(0.051)	(0.054)	(0.054)
Median tree cover	-0.000	-0.002	-0.002	-0.000
	(0.003)	(0.003)	(0.003)	(0.003)
Latitude		-2.177	-2.143	-2.317
		(2.228)	(2.307)	(2.133)
Longitude		-0.463	-0.457	-0.498
		(1.038)	(1.038)	(1.033)
Clan fragmentation			-0.010	0.004
			(0.127)	(0.119)
R^2	0.16	0.16	0.16	0.18
	Panel B: Time Spent Monitoring (hours)			
Market distance	-5.923	-5.075	-5.422	-5.807
	(1.102)	(1.358)	(1.323)	(1.254)
Plantation forest	-3.227	-2.865	-1.661	0.941
	(1.557)	(1.543)	(1.709)	(2.931)
Median tree cover	-0.106	-0.161	-0.249	-0.212
	(0.146)	(0.132)	(0.128)	(0.126)
Latitude		-15.386	-52.313	-60.270
		(61.376)	(60.455)	(58.318)
Longitude		-76.802	-86.234	-71.078
		(33.884)	(32.819)	(34.210)
Clan fragmentation			10.182	9.573
			(4.067)	(4.172)
R^2	0.55	0.57	0.58	0.59
	Panel C: Grazing Rules (indicator)			
Market distance	-0.205	-0.180	-0.181	-0.167
	(0.044)	(0.048)	(0.048)	(0.052)
Plantation forest	-0.118	-0.120	-0.114	-0.181
	(0.065)	(0.071)	(0.076)	(0.090)
Median tree cover	-0.008	-0.007	-0.008	-0.009
	(0.006)	(0.006)	(0.006)	(0.006)
Latitude		1.515	1.326	2.062
		(1.952)	(1.946)	(1.718)
Longitude		-0.479	-0.527	-0.583
		(0.941)	(0.931)	(0.825)
Clan fragmentation			0.052	0.051
			(0.158)	(0.161)
R^2	0.68	0.68	0.68	0.70
Controls and FE	Yes	Yes	Yes	Yes

Notes: OLS estimates with robust standard errors clustered on the group in parentheses. Control variables include altitude, group size, group fragmentation, share of female members, Gini of livestock ownership, Gini of land holding, education, and program duration. Fixed effects (FE) are for clan and market. The number of observations is 720 in Panel A, 508 in Panel B, and 511 in Panel C.

Table 3: Market Distance, Civic Values, and Rules: Other Distances

	Village administration	Primary school	Local mosque	Population density	Trust in government
	(1)	(2)	(3)	(4)	(5)
	Panel A: Conditional Cooperation (Spearman)				
Market distance	-0.180	-0.185	-0.132	-0.160	-0.154
	(0.038)	(0.039)	(0.037)	(0.039)	(0.040)
Village distance	0.060	0.058	0.009	0.011	-0.004
	(0.052)	(0.053)	(0.047)	(0.047)	(0.054)
School distance		0.047	-0.011	-0.006	-0.037
		(0.081)	(0.074)	(0.068)	(0.072)
Mosque distance			-0.311	-0.299	-0.290
			(0.049)	(0.047)	(0.061)
Population density				-0.011	-0.010
				(0.004)	(0.004)
Trust in government					-0.069
					(0.043)
R^2	0.16	0.16	0.20	0.21	0.19
	Panel B: Monitoring (hours)				
Market distance	-8.468	-9.425	-9.467	-8.913	-8.899
	(1.423)	(1.196)	(1.301)	(1.400)	(1.306)
Village distance	4.955	4.701	4.738	4.708	5.256
	(1.442)	(1.439)	(1.530)	(1.515)	(1.444)
School distance		7.276	7.316	7.118	6.039
		(3.082)	(3.258)	(3.278)	(3.246)
Mosque distance			0.248	-0.063	0.069
			(2.563)	(2.563)	(2.476)
Population density				0.211	0.223
				(0.153)	(0.140)
Trust in government					4.614
					(1.573)
R^2	0.57	0.59	0.59	0.59	0.61
	Panel C: Grazing Rules (indicator)				
Market distance	-0.135	-0.190	-0.174	-0.140	-0.137
	(0.058)	(0.044)	(0.049)	(0.050)	(0.050)
Village distance	-0.107	-0.122	-0.136	-0.137	-0.130
	(0.044)	(0.044)	(0.044)	(0.043)	(0.042)
School distance		0.422	0.406	0.395	0.376
		(0.114)	(0.116)	(0.110)	(0.105)
Mosque distance			-0.092	-0.111	-0.107
			(0.101)	(0.097)	(0.097)
Population density				0.013	0.014
				(0.005)	(0.005)
Trust in government					0.079
					(0.043)
R^2	0.68	0.74	0.74	0.76	0.76
Controls and FE	Yes	Yes	Yes	Yes	Yes

Notes: OLS estimates with robust standard errors clustered on the group in parentheses. Control variables include altitude, group size, group fragmentation, share of female members, Gini of livestock ownership, Gini of land holding, education, and program duration. Fixed effects (FE) are for clan and market. In columns 1-4, the number of observations is 720 in Panel A, 508 in Panel B, and 511 in Panel C. In column 5, the no. of observations are 482 in Panel A, 500 in panel B, and 503 in panel C.

There is an issue of over controlling when introducing simultaneously both additional and distance related controls. Nonetheless, the results hold when I carry out such an exercise in Table A.8.

VII. Plausible channels

The above results raise questions over why does market exposure foster civic values and rules? To answer this question, I study the role of market failure from asymmetric information as the channel. I then rule out prosperity, occupational patterns, and outside exposure as potential channels.

VII.A. Market failure

Livestock exchange is prone to cooperation problem from asymmetric information and lack of third party verification. I use vignette studies imitating local livestock exchange to shed light on mechanisms that foster cooperation. Figure 6 provides an overview of the findings. In groups further away from markets, the opportunity cost of attending markets is high, so individuals enter into livestock exchange eponymously with other individuals from their social network. This makes it easier to acquire information on traders' identity and past transaction history. As a result, reputation within the network makes dishonest behavior costly for traders (Polanyi, 1944; North, 1991). As Granovetter (1985) writes, in these situations, individuals don't have to "rely on either generalized morality or institutional arrangements to guard against trouble". Consequently, individuals learn to cooperate parochially from such experiences, resulting in limited cooperation (Platteau, 2000).

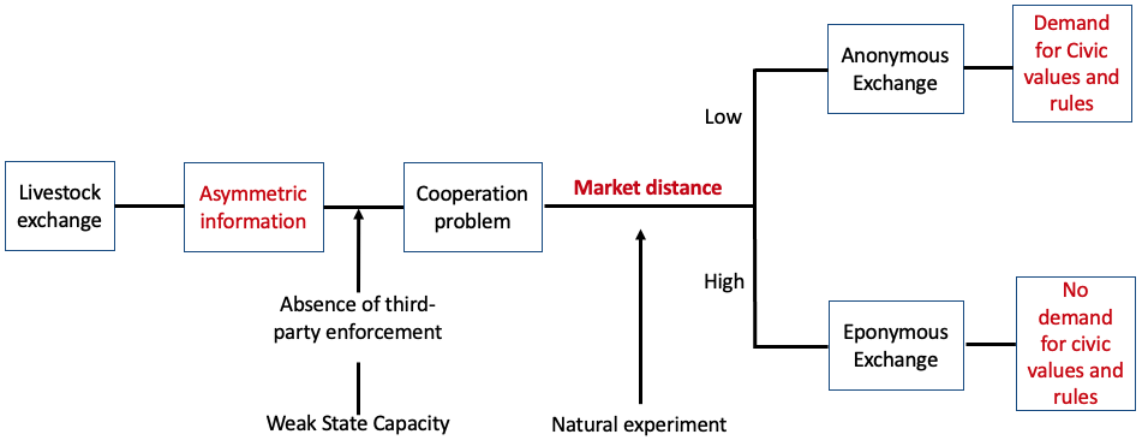

Figure 6: Plausible Channel – Market Failure and Civic Values

In groups near markets, the lower opportunity cost of market attendance makes it possible to trade with strangers who are not part of the social network. Since market

exchange involves a fluctuating population of strangers, enforcing cooperation calls for a new set of solutions that go beyond in-group trading. It is possible that the prospect of efficiency gains from trade creates a demand for civic values, in the absence of which trading parties would have to forego gains from cooperation. Arrow (1970) writes, "Norms of social behavior, including ethical and moral codes [may be].....reactions of society to compensate for market failure." Similarly, Bowles (1998) notes that "when contracts are incompletely specified and costly to enforce, the ex-post terms of exchange may depend on normative commitments of the parties to exchange." Studies based on laboratory experiments provide evidence in support of this hypothesis. In a seminal study, Kollock (1994) conducted a laboratory experiment in which individuals were randomly assigned to trade in products of certain or uncertain quality without any third party involvement. He found trust in strangers to be higher among those exposed to uncertain product quality. In another laboratory experiment, Fehr, Gächter and Kirchsteiger (1997) used a gift exchange game to show that civic values play an important role in the enforcement of contracts in labor markets with asymmetric information and absence of third party enforcement. From these situations, individuals learn to extend cooperation to strangers, resulting in generalized cooperation (Platteau, 2000).

Best cooperation outcomes are achieved when civic values are backed by some kind of punishment-based mechanism (Fehr and Schmidt, 1999; Fehr and Gächter, 2000). Vignette studies reveal that groups developed punishment based on multilateral reputation. This could have aided cooperation further by threatening dishonest traders with exclusion from future exchange (see Greif, 2006). Punishment requires information on identity and past transactions of traders, but the impersonal nature of market exchange makes this difficult. The Oromo custom of announcing one's clan while meeting other Oromo people and use of ethnic markers (languages, accents) while meeting non-Oromo people helps in mitigating this hurdle by generating information on trader's clan and ethnic group.[8] This information can play an important role in fostering cooperation through a credible threat in which the entire community of the defector is held responsible and faces punishment by the victim (see Greif, 2006; Deb, 2020).

However, monitoring of defectors is imperfect and there could be mistakes in declaring a trader dishonest (see Greif, 2006). To mitigate these shortcomings and also to rule out malicious intentions, vignette studies reveal that the communities intervene only when the scope of moral hazard on the part of the victim is unlikely. For instance, if a seller cheated a buyer by selling a poor quality cow that died soon after purchase, the community members were willing to exclude the seller's community from future exchange. Greif (2006) writes that in such situations "a credible threat of collective, multi-lateral punishment [could have] supported the beliefs that the short-run gain from cheating today was less than the

[8]While greeting other Oromo individuals, the Arsi always ask for clan name. If the other individual is from the same clan then the individuals kiss on the cheek or hand, otherwise not.

long-run benefit of being honest." It is plausible that these mechanisms generated further incentives for individuals to internalize the importance of civic values.

Additional evidence.– If beliefs and values are internalized then individuals from groups closer to markets are expected to display stronger trust in others and also cooperate more in impersonal interactions than individuals from groups further away from markets. One way to test this hypothesis is to conduct a field experiment in which individuals are invited to interact in a one-shot market exchange of products with asymmetric information, without third party enforcement. This approach, while appealing, allows researchers to study civic values in the same domain that engendered these values – market exchange. To the extent civic values acquired via market exchange become a generalized reason for behavior through a process called dissonance reduction, a stronger test lies in studying these values using a different domain than markets Festinger (1957).

Following Camerer and Fehr (2004), I argue that interaction in a one-shot, anonymous public goods game provides such a domain. Since player type in the game is not known and there is no third party to enforce cooperation, the game mirrors cooperation dilemma of market exchange.[9] Thus far, the evidence from the game suggests that individuals have indeed internalized these values because they cooperate conditionally even in a one-shot, anonymous interaction without punishment, where defection would have yielded a higher payoff. I now provide additional evidence in support of this result using data from the first decision of the public goods game, where the players decided simultaneously on their contribution to the public good in a one-shot, anonymous interaction. Since the game rules out repeated interaction, reputation formation, and punishment, cooperation in the game can be seen as reflecting internalized trust and values.

Table 4 reports the results. Columns 1-2 show that beliefs about other players' contribution decline with market distance. One standard deviation increase in market distance leads to a decline in beliefs about other players' contribution by about 0.42 Birr (column 2). This is a large effect given the mean belief is 2.67 Birr (s.d. 1.71). Columns 3-4 show that consistent with the decline in beliefs, own contribution to the public good also declines with market distance. According to the estimates in column 4, one standard deviation increase in market distance leads to a decline in contribution by 0.48 Birr. This is also a large effect in relation to the mean contribution of 2.05 Birr (s.d. 1.51). These results confirm that individuals closer to markets display stronger trust (belief) in impersonal interactions and also contribute more for the provision of public goods.

[9]The concern that experiments induce demand effect arises in situations where experiments are used to assign treatments and participants are aware of this. There is no treatment manipulation in the public goods game I used in this paper. All participants confronted the same decision situation regardless of their distance from market.

Table 4: Market Distance, Beliefs about Others' Contribution, and Own Contribution

	Beliefs about others' contribution		Own contribution	
	No Controls	Controls and fixed effects	No Controls	Controls and fixed effects
	(1)	(2)	(3)	(4)
Market distance	-0.419	-0.377	-0.451	-0.429
	(0.074)	(0.096)	(0.100)	(0.107)
R^2	0.07	0.11	0.10	0.18
Controls	No	Yes	No	Yes
Fixed Effects	No	Yes	No	Yes
Observations	704	704	704	704

Notes: OLS estimates with robust standard errors clustered on the group in parentheses. Control variables include altitude, group size, group fragmentation, share of female members, Gini of livestock ownership, Gini of land holding, education, and program duration. Fixed effects are for clan and market. Beliefs and own contribution are from the first decision of the public goods game. This data is missing for 16 observations from one group, so the number of observations is 704.

Falsification test.– Given the above findings, a natural question is to ask: what would happen to civic values and rules if markets are not prone to asymmetric information, that is, when product quality is verifiable? It is likely that there is no need for civic values in these situations, so distance from such markets is hypothesized to have no effect (Bowles, 1998). Manipulating market characteristics exogenously in the field is difficult, so I offer suggestive evidence in support of this hypothesis using distance from two additional periodic markets that the individuals attend (mean 2.23 hours, sd 1.22). These markets do not trade in livestock but in products of verifiable quality, such as synthetic textiles and utensils, and hence they are not prone to asymmetric information. To account for unobserved differences across markets without and with asymmetric information, I control for market fixed effects.[10]

Table 5 reports the results. Column 1 is without any controls and includes only distance to markets without asymmetric information (No AI). It enters with a positive sign, but is close to zero in magnitude and is never statistically significant in any of the three panels. When I additionally introduce distance to markets with asymmetric information (with AI) in column 2, the coefficient on market distance – No AI remain positive and statistically insignificant. In contrast, the coefficient on market distance – with AI enters with a negative sign and is statistically significant at the 1-percent level. When I introduce control variables and fixed effects in column 3, the coefficient on

[10]It is highly unlikely that the location of these markets was chosen by individuals. The groups are very small to wield any influence on the location of markets. Endogenous placement is possible only if groups coordinate with neighboring groups on providing a public good like market. In this case, distance from such markets should also have a negative coefficient. However, as the results below show, the coefficient turns out to be positive.

market distance – No AI rises in magnitude and is now marginally statistically significant in panel A and B. However, these gains mostly disappear when I include distance to village administration, school, and mosque in column 4. This is in contrast to the coefficient on market distance – with AI, which remains negative and statistically significant throughout. Together, these results suggest that only market with asymmetric information foster civic values and rules, whereas those without asymmetric information have no effect.

Table 5: Market Distance, Civic Values, and Rules:
Other Market Distance

	No controls	Market distance	Controls and FE	Other distances
	(1)	(2)	(3)	4
	Panel A: Conditional Cooperation (Spearman *rho*)			
Market distance - No AI	0.020	0.012	0.064	0.054
	(0.031)	(0.031)	(0.037)	(0.033)
Market distance- with AI		−0.164	−0.176	−0.163
		(0.023)	(0.028)	(0.041)
R^2	0.00	0.12	0.17	0.20
	Panel B: Monitoring (hours)			
Market distance - No AI	1.584	2.581	2.195	2.517
	(1.240)	(0.962)	(1.217)	(1.036)
Market distance- with AI		−8.831	−6.665	−11.097
		(1.105)	(1.008)	(1.274)
R^2	0.01	0.42	0.57	0.61
	Panel C: Grazing Rules (indicator)			
Market distance - No AI	0.009	0.046	0.044	0.001
	(0.059)	(0.037)	(0.028)	(0.025)
Market distance- with AI		−0.323	−0.214	−0.203
		(0.028)	(0.048)	(0.058)
R^2	0.00	0.53	0.67	0.75
Controls	No	No	Yes	Yes
Other market FE	No	No	Yes	Yes
Clan FE	No	No	Yes	Yes
Market FE	No	No	Yes	Yes

Notes: OLS estimates with robust standard errors clustered on the group in parentheses. Market distance - No AI is the distance to markets that do not trade in livestock but in products of verifiable quality and hence are not prone to asymmetric information. Market distance - with AI is the distance to markets that trade in livestock and are therefore prone to asymmetric information. Control variables include altitude, group size, group fragmentation, share of female members, Gini of livestock ownership, Gini of land holding, education, and program duration. Other market FE includes fixed effects for non-livestock markets, clan FE includes fixed effects for clans, and market FE includes fixed effects for livestock markets prone to asymmetric information. The number of observations is 720 in Panel A, 508 in Panel B, and 511 in Panel C.

Discussion.– Since Menelik's time, there has been no infrastructural development affecting the opportunity cost of market attendance for individuals in groups located further away from markets. Since there are still no roads in the study area, the exchange structures continue to shape civic values by affecting who trades with whom. This means, the

results reflect the cumulative effect of markets operating directly through exposure today and indirectly through exposure of ancestors in the past, for instance, through cultural transmission (Bisin and Verdier, 2001). If individuals acquire civic values culturally then the effect of market distance should be similar across individuals from different age groups, especially between younger and older individuals who differ in their length of exposure to markets. Figure 7 indeed shows a negative and significant effect of market distance on civic values and rules across individuals from all age groups. The coefficient on market distance is statistically indistinguishable across the different age groups.

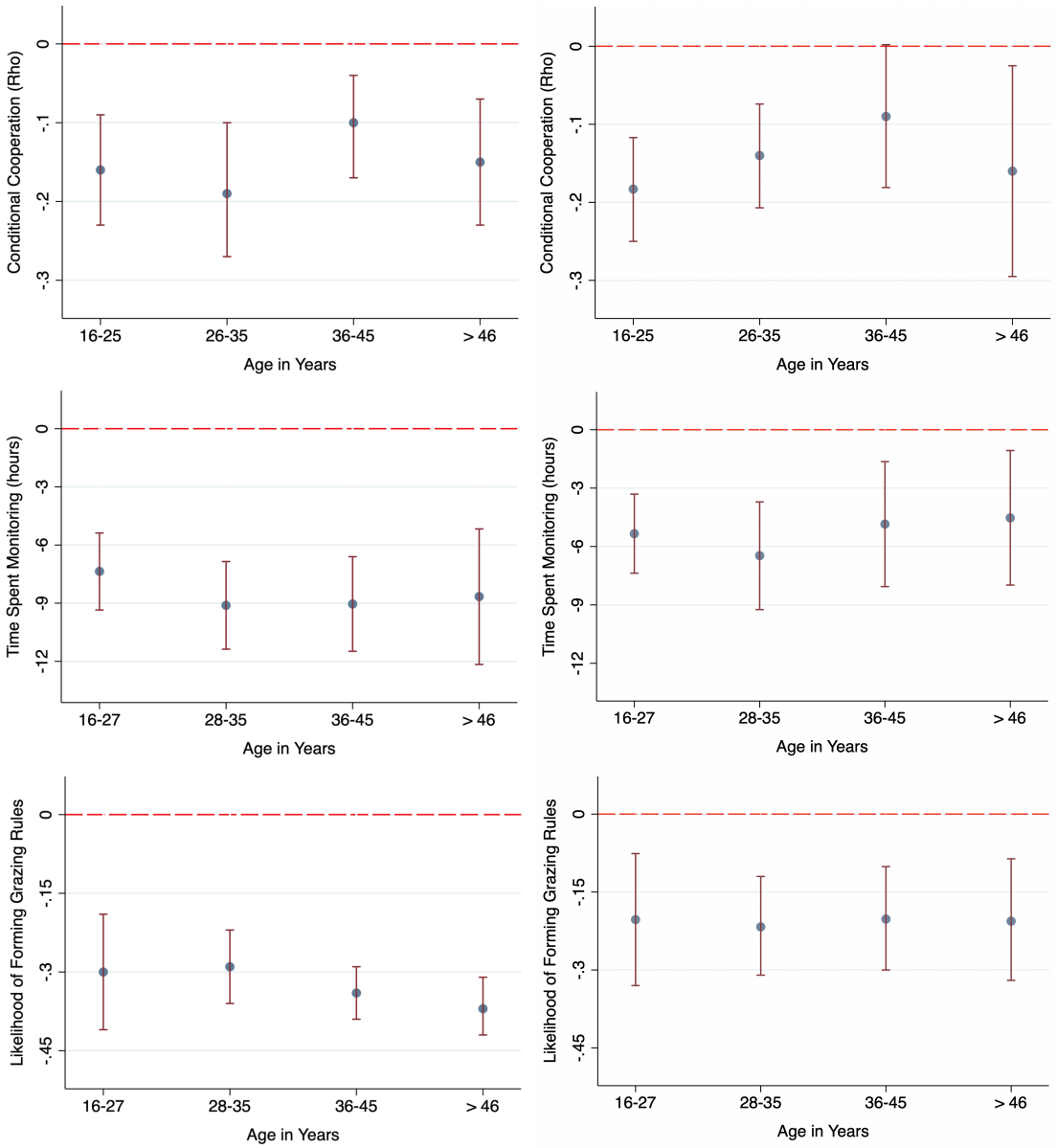

Figure 7: Effect of Market Distance on Civic Values and Rules by Age

Notes: The figure plots the coefficient on market distance by quartiles, without controls (left panel) and with the main controls (right panel). The dotted red line indicates zero difference. The capped bars indicate 96 percent confidence bands. The age-groups are slightly different in panels A and B-C because of a larger sample in panel A.

The results hold even when I introduce control variables or restrict the sample to individuals 60 years old and above (see Table A.9).

VII.B. Prosperity and occupational patterns

Prosperity.– It is plausible that market exposure makes individuals prosperous and this causes them to have higher civic values and form rules. Measuring prosperity in resource poor environments is very difficult, so I consider three different proxies in addition to Gini of cattle and land ownership that the main results already control for:

- Self-reported financial rating: poor, middle class, rich
- Livestock units with weights based on their market price: horse (1), cattle (0.8), donkey (0.7), sheep (0.2), goat (0.2)
- Land holding
- Others: family size, prevalence of polygamy, bride price

I start by testing whether these proxies are correlated with market distance. Figure A.4 plots coefficients from a regression of each of these proxies on market distance without and with controls. Individuals further away from markets rate themselves as poorer, have smaller land holding and smaller family size, pay lower bride price, but have higher prevalence of polygamy. However, with the exception of financial rating and land holding, the differences disappear once control variables are added. Even though financial rating is a self-reported measure, it serves as a good proxy for prosperity: richer individuals own more cattle, land, horses, donkeys, goats, sheep, and also have a larger family size. Given these patterns, I investigate if the effect of market distance on civic values and rules diminishes once I introduce the different proxies of prosperity as additional controls. Table 6 reports the results. Column 1 includes financial rating, column 2 livestock units, column 3 land holding, column 4 others, and column 5 all of them together. The coefficient on market distance retains its magnitude and significance in all the three panels.

Occupational patterns.– It is plausible that proximity to markets affected occupational patterns. I investigate this in Figure A.5 by looking at forest dependence (share of income from forest) and ownership of different kinds of livestock. Two features are worth noting. First, there is no association between market distance and forest dependence. Second, as market distance increases, the ownership of sheep and horses rises, but that of goat and donkey decline. I investigate if occupational patterns have a bearing on the effect of market distance on civic values and rules. Columns 6-8 of Table 6 report the results. In column 6, I control for forest dependence, in column 7 for livestock variables, and in column 8 for

both of them together. The coefficient on market distance remains mostly unchanged in both magnitude and significance throughout the different columns and panels.

Together, these results demonstrate that prosperity and occupational structure do not seem to be the channels underlying the effect of market distance on civic values and rules.

Table 6: Market Distance, Civic Values, and Rules:
Prosperity and Occupational Structure

	Prosperity					Occupational structure		
	Finan -cial rating	Live -stock units	Land hold -ing	Others proxies	All proxies	Forest depen -dence	Live -stock pattern	All proxies
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Panel A: Conditional Cooperation (Spearman *rho*)							
Market distance	-0.152 (0.025)	-0.151 (0.023)	-0.146 (0.027)	-0.149 (0.025)	-0.152 (0.026)	-0.140 (0.028)	-0.160 (0.025)	-0.161 (0.030)
p-value	0.642	0.717	0.851	0.088	0.396	0.475	0.804	0.380
R^2	0.145	0.152	0.156	0.159	0.155	0.133	0.155	0.146
	Panel B: Time Spent Monitoring (hours)							
Market distance	-5.492 (1.087)	-5.638 (1.046)	-5.683 (1.031)	-5.517 (1.062)	-5.397 (1.045)	-5.642 (1.045)	-5.223 (1.097)	-5.225 (1.090)
p-value	0.163	0.477	0.256	0.138	0.011	0.507	0.386	0.363
R^2	0.54	0.54	0.54	0.55	0.56	0.54	0.55	0.55
	Panel C: Grazing Rules (indicator)							
Market distance	-0.187 (0.051)	-0.196 (0.050)	-0.194 (0.050)	-0.193 (0.048)	-0.184 (0.049)	-0.195 (0.049)	-0.169 (0.050)	-0.170 (0.049)
p-value	0.147	0.158	0.049	0.047	0.167	0.010	0.158	0.108
R^2	0.66	0.66	0.67	0.67	0.67	0.67	0.68	0.69
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: OLS estimates with robust standard errors clustered on the group in parentheses. Control variables include altitude, group size, group fragmentation, share of female members, Gini of livestock ownership, Gini of land holding, education, and program duration. Fixed effects (FE) are for clan and market. Column 1 controls for financial rating, column 2 for livestock units, column 3 for land holding, column 4 for other proxies (family size, polygamy, bride price), and column 5 for all proxies of prosperity jointly. Column 6 controls for forest dependence, column 7 for ownership of cattle, horses, donkeys, sheep, and goats, and column 8 for all proxies of occupational structure jointly. p-value is for the variable listed in the column heading. In case, two or more variables are jointly introduced, the p-value is from a joint test of the null hypothesis.

VII.C. Exposure to the outside world

Markets could have also affected civic values and rules by exposing individuals to outsiders. As individuals get to learn more about outsiders, they update their beliefs, and eventually cooperate with them. To test the scope of this channel, I first examine whether market distance has a bearing on proxies of outside exposure that are commonly studied by anthropologists: ratio of age at which women marry relative to men, practice of clan endogamy in marriage, and clan preference in marriage (Ensminger and Knight, 1997).

Figure A.6 reports the coefficient from a regression of each of these variables on market distance. It turns out that market distance has a positive association with marriage ratio but negative association with clan endogamy. Although the prevalence of clan endogamy is still very low in the sample (17 percent), it could be that individuals living closer to markets have developed a preference for marrying into certain clans. However, note that the coefficient on clan preference in marriage is statistically insignificant. Give these patterns, I test in Table 7 if the effect of market distance on civic values and rules holds when different proxies of outside exposure are introduced as additional controls. Regardless of whether I introduce one proxy at a time in columns 1-3 or all of them together in column 4, the coefficient on market distance remains robust both in magnitude and significance in all three panels.

Table 7: Market Distance, Civic Values, and Grazing Rules: Role of Outside Exposure

	Marriage ratio	Clan endogamy	Clan preference	All proxies of exposure
	(1)	(2)	(3)	4
	Panel A: Conditional Cooperation (Spearman *rho*)			
Market distance	−0.139	−0.160	−0.147	−0.156
	(0.021)	(0.022)	(0.020)	(0.022)
p-value	0.208	0.10	0.081	0.030
R^2	0.16	0.16	0.16	0.17
	Panel B: Monitoring (hours)			
Market distance	−5.388	−5.023	−5.641	−4.853
	(0.577)	(0.527)	(0.517)	(0.578)
p-value	0.192	0.002	0.115	0.000
R^2	0.54	0.55	0.54	0.55
	Panel C: Grazing Rules (indicator)			
Market distance	−0.170	−0.168	−0.197	−0.145
	(0.018)	(0.019)	(0.018)	(0.019)
p-value	0.000	0.000	0.495	0.000
R^2	0.69	0.68	0.66	0.71
Controls	Yes	Yes	Yes	Yes
FE	Yes	Yes	Yes	Yes

Notes: OLS estimates with robust standard errors clustered on the group in parentheses. Control variables include altitude, group size, group fragmentation, share of female members, Gini of livestock ownership, Gini of land holding, education, and program duration. Fixed effects (FE) are for clan and market. Column 1 controls for the ratio of age at which women marry relative to men, column 2 for an indicator for clan endogamy, column 3 for an indicator for clan preference in marriage, and column 4 includes simultaneously all proxies of outside exposure. *p*-value is for the variables listed in the column heading. The number of observation is 720 in Panel A, 508 in Panel B, and 511 in Panel C

Another way of studying exposure to outsiders is to examine naming patterns of individuals (Algan et al., 2022). In the study area, individuals can take either Oromo

(Cushitic) or Arabic (Semitic) names.[11] I test if the proportion of individuals with Arabic names differs by market distance. Using a unique database on the name of each household (available for 27 groups), I show that there is no difference in the frequency of Arabic names by market distance. Table A.10 shows that the coefficient on market distance is very small and is also statistically insignificant (coef. 0.015, s.e. 0.002).[12] These results suggest that market distance is unlikely to affect civic values and rules through exposing individuals to outsiders.

VIII. Conclusions

I study a long standing question in economics on whether market exposure fosters or erodes civic values and rules. Major challenges in conducting this study lies in unbundling market characteristics to identify mechanisms and in establishing causality. I resolve these challenges using the context of livestock markets in rural Ethiopia that are prone to market failure from asymmetric information and absence of third party verification. I exploit a natural experiment on the emergence and location of markets, which mitigates concerns over pre-existing differences and sorting, and allows me to hold clan and market specific differences fixed.

Using market distance as a proxy for market exposure, I show a strong negative effect of market distance on experimental and survey measures of civic values and rules. The further the individuals are from markets, the lower is their propensity to cooperate conditionally in a public goods game, spend time monitoring their forest, and form rules regulating grazing inside their forest. These results are robust to controlling for a variety of geographical, economic, forest, and clan specific variables, as well as distance from local administration, schools, and religious places, population density, and trust in government.

The results arise because livestock exchange is prone to asymmetric information and lack of third party verification - a characteristic that is common across markets in sub-Saharan Africa and other developing economies. These features lock buyers and sellers in a cooperation problem. To mitigate this problem, groups developed different kinds of exchange structures depending on their distance from markets. In groups further away from markets, individuals trade in livestock eponymously within their social network, whereby reputation sustains cooperation. However, in groups located closer to markets, individuals have the option to trade with strangers in impersonal interactions. In these situations, the efficiency of exchange creates demands for civic values and rules which make it possible for individuals to extend cooperation to outsiders. These values are further bolstered by community punishment. I show that individuals from groups located close to

[11] Individuals rarely give their children Amharic or Tigray sounding names.

[12] I replicate the main results on the effect of market distance on civic values and rules in this subsample.

markets have internalized these values such that they display higher trust and cooperation even when repeated interaction, reputation, and punishment are absent. A placebo test shows that distance from markets that are not prone to asymmetric information has no effect on civic values and rules.

These results fill an important gap in the literature and highlight the importance of asymmetric information and market distance in the economic organization of societies which ultimately shape culture. Future studies can use randomized control trials to experimentally vary the opportunistic cost of market attendance through infrastructure development and then test how this affects civic values and rules. The findings could be useful in studying if infrastructure projects contribute to growth and development (see Donaldson, 2018) additionally through shaping civic values and rules.

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ONLINE APPENDIX

Market Exposure, Civic Values, and Rules

Devesh Rustagi

Appendix A

I. Data

Figures A.1 - A.3 test the representativeness of the experimental and survey samples. They show that the frequency of clans observed in the different samples is the same as the frequency of clans in the population.

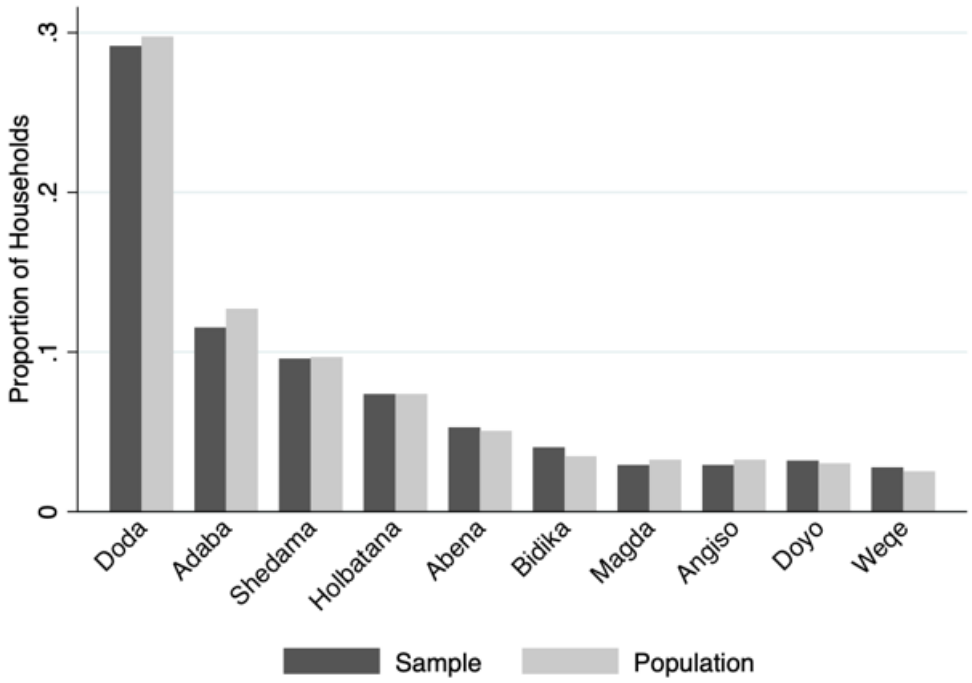

Figure A.1: Proportion of Households from Main Clans in the Experimental Sample and the Population

Notes: The bar graph shows the proportion of households from ten main clans in the experimental sample used to measure conditional cooperation and the population of interest.

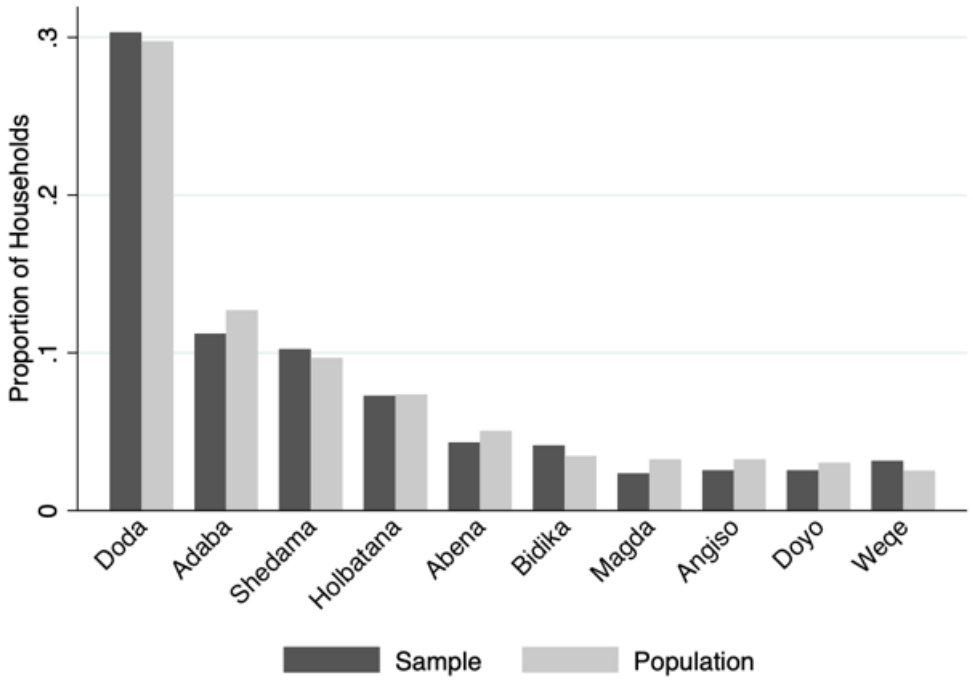

Figure A.2: Proportion of Households from Main Clans in the Monitoring Survey Sample and the Population

Notes: The bar graph shows the proportion of households from ten main clans in the sample used to measure monitoring and the population of interest.

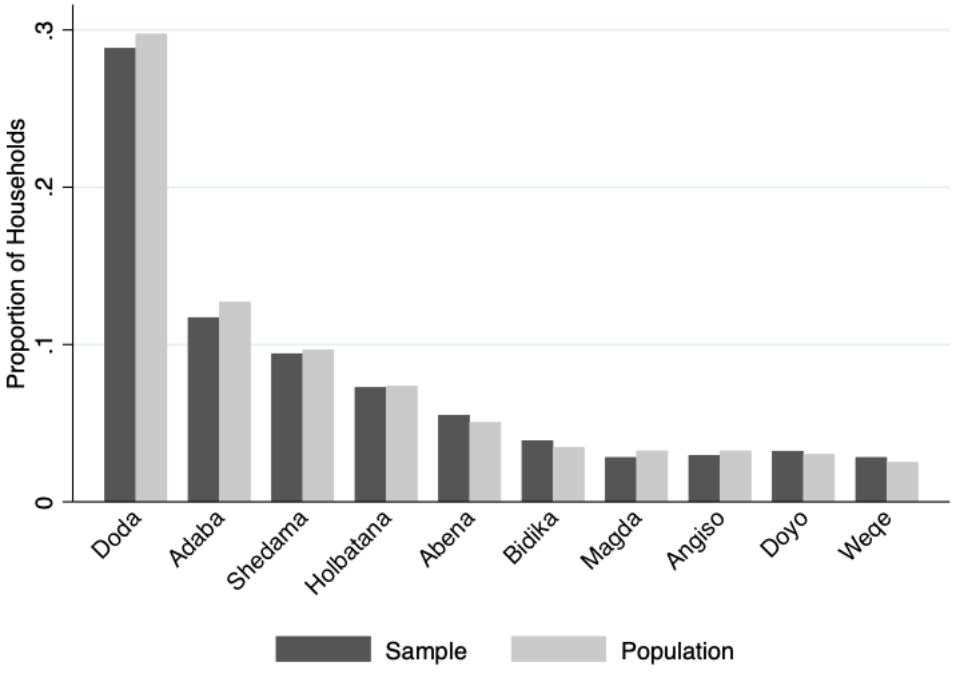

Figure A.3: Proportion of Households from Main Clans in the Grazing Rules Survey Sample and the Population

Notes: The bar graph shows the proportion of households from ten main clans in the sample used to measure grazing rules and the population of interest.

II. Summary Statistics

Table A.1 reports summary statistics of main control variables. Table A.2 reports summary statistics of control variables used for testing the robustness of the main results and also for testing the channels through which markets affect civic values and rules.

Table A.1: Summary Statistics

	Measurement unit	Obs.	Mean	Standard deviation
	A: Civic Values			
Main dependent variables				
Conditional cooperation (Spearman *rho*)	individual	720	0.499	0.518
Monitoring (hours per month)	individual	508	27.804	15.480
Grazing Rules (indicator)	individual	511	0.446	0.498
Alternative dependent variables				
Conditional cooperator (indicator)	individual	720	0.468	0.499
Grazing ban (months in a year)	individual	509	1.472	1.761
	B: Market Distance			
Market distance (hours)	group	52	2.851	1.111
	C: Main Covariates and Fixed Effects			
Altitude	group	52	0.231	0.425
Group size	group	52	26.308	4.625
Group fragmentation	group	52	0.489	0.246
Female share	group	52	0.202	0.113
Gini of Cattle ownership	group	52	0.334	0.083
Gini of Land ownership	group	52	0.298	0.077
Program duration (months)	group	52	23.000	19.623
Education (years)	individual	720	3.369	3.063
Doda	individual	720	0.292	0.455
Shedama	individual	720	0.100	0.295
Adaba	individual	720	0.120	0.320

Notes: Main dependent variables: Conditional cooperation is the Spearman *rho* between own and other players' contribution in the conditional decision of the public goods game. Monitoring is time spent in hours per month by individuals while managing their forest commons. Grazing rules is an indicator which equals 1 if a group has grazing rules, otherwise 0. *Alternative dependent variables*: conditional cooperator is an indicator for an individual who behaves as a conditional cooperator in the conditional decision of the public goods game, otherwise 0. Grazing ban is the number of months grazing is forbidden in the group managed forest. *Market distance* is one-way walking distance to market (hours on foot). *Main Covariates*: Altitude is an indicator for groups above 3100 meters, as it is beyond this altitude that forest type changes from a mix of broadleaf and coniferous to Erica heather. Group size is the number of households in a group. Group fragmentation is a Herfindahl index – the probability that two persons selected randomly from a group will not be from the same hamlet. Female share is the share of female household heads in a group. Gini of cattle and land are the Gini indices. Program duration is the number of months a group has been under the commons management program. Education is years of schooling. Doda, Shedama, and Adaba are indicators variables for three most widespread clans in the study area. Measurement unit indicates the level at which the data were collected.

Table A.2: Summary Statistics: Additional Control Variables

	Measurement unit	Obs.	Mean	Standard deviation
Forest				
Plantation forest	group	52	0.085	0.353
Median tree cover in 2000 (%)	group	52	39.701	9.788
Geography				
Latitude	group	52	6.896	0.033
Longitude	group	52	39.299	0.083
Other				
Clan fragmentation	group	52	.405	.240
Population density	group	52	13.988	8.738
Trust in Government	individual	503	.406	.491
Distances				
Village distance	group	52	1.644	1.094
School distance	group	52	0.827	0.384
Mosque distance	group	52	0.709	0.456
Prosperity				
Financial rating	individual	672	2.036	0.740
Livestock units	individual	697	14.135	10.535
Land ownership	individual	600	0.334	0.083
Family size	individual	671	8.548	4.176
Polygamy prevalence	group	52	0.452	0.191
Bride Price	group	52	1.031	0.359
Occupation structure				
Cow	individual	720	11.208	10.191
Horse	individual	708	2.576	2.037
Donkey	individual	697	0.700	1.013
Goat	individual	705	2.526	4.942
Sheep	individual	705	7.091	7.616
Forest dependence	individual	508	46.397	17.481
Outside exposure				
Marriage ratio	group	52	0.872	0.075
Clan endogamy	group	52	0.173	0.382
Clan preference	group	52	0.423	0.499

Notes: Forest: plantation forest is the ratio of area under plantation forest to area under natural forest. Median tree cover is the forest cover in in percentage in a group in 2000 from (Hansen et al., 2013). *Geography*: Latitude and longitude are measured in degrees. *Other*: clan fragmentation is a Herfindahl index – the probability that two persons selected randomly from a group will not be from the same clan. Population density is number of persons per km^2. Trust in government is a binary variable, where 1 implies the government is cooperative and 0 otherwise. It was collected using a household survey in which individuals were asked to rate the district government on a 5 point scale: very cooperative, cooperative, neutral, dominating, very dominating. Most respondents chose either cooperative or dominating. *Distances*: Administrative, school and mosque distance are local distances measured in hours. *Prosperity*: financial rating is the self-reporting rating by an individual as poor (1), middle class (2), or rich (3). Livestock unit is the total livestock weighted as 1 for horse, 0.8 for cow, 0.7 for donkey, and 0.1 each for goat and sheep. Land ownership is measured as land area held by an individual. Family size is the number of individuals in a family. Polygamy prevalence is the proportion of men with more than one wife. Bride price is the average price paid to the bride's family at the time of marriage/10000. *Occupation structure*: Cow, Horse, donkey, goat and sheep are the number of animals in the respective categories. Forest dependence is the self-reported share of income from forest. *Outside exposure*: Marriage ratio is the ratio of age at which women marry relative to men is a group. Clan endogamy is an indicator that equals 1 if a group practices clan endogamy in marriage. Clan preference is an indicator for groups that prefer certain clans in marriage. Measurement unit indicates the level at which the data were collected.

III. Empirical Strategy

Table A.3 reports balance check and Table A.4 tests for sorting by market distance.

Table A.3: Balance Check

	Coefficient on Market Distance
Geographical variables	
Altitude	-0.088
	(0.069)
Latitude	-0.010
	(0.002)
Longitude	0.011
	(0.009)
Forest condition	
Plantation forest	-0.090
	(0.079)
Median tree cover	-2.644
	(2.235)
Social and Economic heterogeneity	
Group size	0.378
	(1.146)
Group fragmentation	0.045
	(0.053)
Female share	-0.002
	(0.030)
Gini of Cattle ownership	0.011
	(0.022)
Gini of Land ownership	-0.003
	(0.017)
Education	-0.019
	(0.042)
Program duration	0.079
	(1.557)
Clan fragmentation	0.051
	(0.045)
Population density	-0.437
	(1.038)
Trust in government	-0.081
	(0.053)

Notes: OLS estimates with robust standard errors in parentheses. The estimates are obtained from a regression of each covariate on market distance after controlling for the other remaining covariates, clan and market fixed effects. The regressions are run at the group level. The number of observations is 52. The definition of these variables is in Tables A1-A2.

Table A.4: Sorting and Migration by Market Distance

	Group size	Population size	Population density	Migrant share
	(1)	(2)	(3)	4
Market distance	0.157	3.998	-1.468	-0.115
	(0.531)	(7.147)	(1.053)	(0.235)
Constant	25.860	169.795	18.174	1.802
	(1.648)	(18.375)	(2.938)	(0.790)
Obs.	52	52	52	52

Notes: OLS estimates with robust standard errors in parentheses. Group size is the number of households in a group. Population size is the number of individuals residing in a group. Population density is number of individuals per km^2. Migrant share is the percentage of households who have left the group in the past 55 years.

IV. Main Results

Table A.5 shows the coefficients on control variables. Table A.6 shows the coefficient on market distance is robust to using different kinds of clustering of standard errors. Table A.7 shows the results are robust to using alternative dependent variables. Table A.8 shows the coefficient on market distance is robust to simultaneously controlling for both additional controls and those related to distance and urbanization. Table A.9 shows the effect of market distance is similar by different age-groups.

Table A.5: Market Distance, Civic Values, and Bylaws: Coefficients on Control Variables

	Dependent variable:		
	Conditional cooperation	Monitoring	Grazing rules
	(1)	(2)	(3)
Market distance	-0.146	-5.615	-0.197
	(0.027)	(1.047)	(0.051)
Altitude	-0.108	-5.017	-0.076
	(0.083)	(2.656)	(0.140)
Group size	-0.005	-0.558	0.001
	(0.005)	(0.218)	(0.007)
Group fragmentation	0.246	5.398	-0.010
	(0.105)	(3.692)	(0.121)
Female share	-0.091	8.932	-0.151
	(0.246)	(10.214)	(0.243)
Gini of cattle ownership	0.548	0.119	-0.971
	(0.355)	(10.732)	(0.502)
Gini of land ownership	0.276	7.064	0.677
	(0.370)	(13.448)	(0.397)
Education	-0.005	0.330	0.005
	(0.007)	(0.167)	(0.004)
Program duration	0.000	0.247	0.014
	(0.004)	(0.082)	(0.004)
R^2	0.16	0.54	0.66
Market fixed effects	Yes	Yes	Yes
Clan fixed effects	Yes	Yes	Yes
Observations	720	508	511

Notes: OLS estimates with robust standard errors clustered on the group in parentheses.

Table A.6: Market Distance, Civic Values, and Rules: Clustering standard errors on markets, village, clans, and space

	Clustering on markets	Clustering on village	Clustering on clans	Clustering on space
	(1)	(2)	(3)	(4)
	Panel A: Conditional Cooperation			
Market distance	-0.146	-0.146	-0.146	-0.146
	(0.036)	(0.041)	(0.032)	(0.034)
	Panel B: Monitoring			
Market distance	-5.615	-5.615	-5.593	-5.615
	(2.072)	(2.172)	(1.154)	(1.488)
	Panel C: Grazing Rules			
Market distance	-0.197	-0.197	-0.196	-0.197
	(0.032)	(0.043)	(0.042)	(0.049)
Controls	Yes	Yes	Yes	Yes
Fixed effects	Yes	Yes	Yes	Yes

Notes: OLS estimates with robust standard errors in parentheses clustered on the group and market in column 1, the group and village in column 2, the group and clans in column 3, and on space using a cut-off of 2 km in panel A and 4 km in panels B-C of column 4. The results hold when other cutoffs are chosen. Control variables include altitude, population density, livestock ownership, land holding, share of female members, group fragmentation, education, and program duration. Fixed effects are for clan and market.

Table A.7: Market Distance, Civic Values, and Rules: Alternative Dependent Variables

	Share of conditional cooperators	Grazing ban (months)
	(1)	(2)
Market distance	−0.093	−0.667
	(0.031)	(0.158)
R^2	0.10	0.65
Mean	0.108	1.472
Controls	Yes	Yes
Fixed effects	Yes	Yes
Obs.	720	509

Notes: OLS estimates with robust standard errors clustered on the group in parentheses. The dependent variable in column 1 is an indicator for conditional cooperator and in column 2 the number of months grazing is banned inside the group managed forest. Control variables include altitude, group size, group fragmentation, share of female members, Gini of livestock ownership, Gini of land holding, education, and program duration. Fixed effects are for clan and market. Mean refers to the sample average of the dependent variable listed in the column heading.

Table A.8: Market Distance, Civic Values, and Rules: All Controls

	Dependent variable:		
	Conditional cooperation	Monitoring	Grazing rules
	(1)	(2)	(3)
Market distance	-0.195	-9.099	-0.112
	(0.056)	(1.556)	(0.054)
R^2	0.21	0.65	0.78
Additional controls	Yes	Yes	Yes
Distance controls	Yes	Yes	Yes
Market fixed effects	Yes	Yes	Yes
Clan fixed effects	Yes	Yes	Yes

Notes: OLS estimates with robust standard errors clustered on the group in parentheses. Additional controls include plantation forest, median tree cover in 2000, latitude, longitude, clan fragmentation, and fixed effects for seven other clans. Distance related controls include distance to village administration, primary school, and mosque, as well as population density and trust in government.

Table A.9: Market Distance, Civic Values, and Rules: Effects by Age Quartile

	First Quartile	Second Quartile	Third Quartile	Fourth Quartile	60 and above
	(1)	(2)	(3)	4	5
	Panel A: Conditional Cooperation (Spearman *rho*)				
Market distance	-0.183	-0.140	-0.090	-0.160	-0.124
	(0.033)	(0.033)	(0.045)	(0.067)	(0.065)
Obs.	177	188	170	154	82
	Panel B: Monitoring (hours)				
Market distance	-5.340	-6.470	-4.851	-4.526	-4.265
	(1.006)	(1.377)	(1.596)	(1.716)	(1.485)
Obs.	131	137	130	110	36
	Panel C: Grazing Rules (indicator)				
Market distance	-0.203	-0.217	-0.202	-0.206	-0.197
	(0.063)	(0.048)	(0.050)	(0.059)	(0.055)
Obs.	132	138	132	109	36
Controls and FE	Yes	Yes	Yes	Yes	Yes

Notes: OLS estimates with robust standard errors clustered on the group in parentheses. See Figure 7 for age-groups in different quartiles in different panels. Control variables include altitude, group size, group fragmentation, share of female members, Gini of livestock ownership, Gini of land holding, education, and program duration. Fixed effects (FE) are for clan and market.

V. Plausible Channels

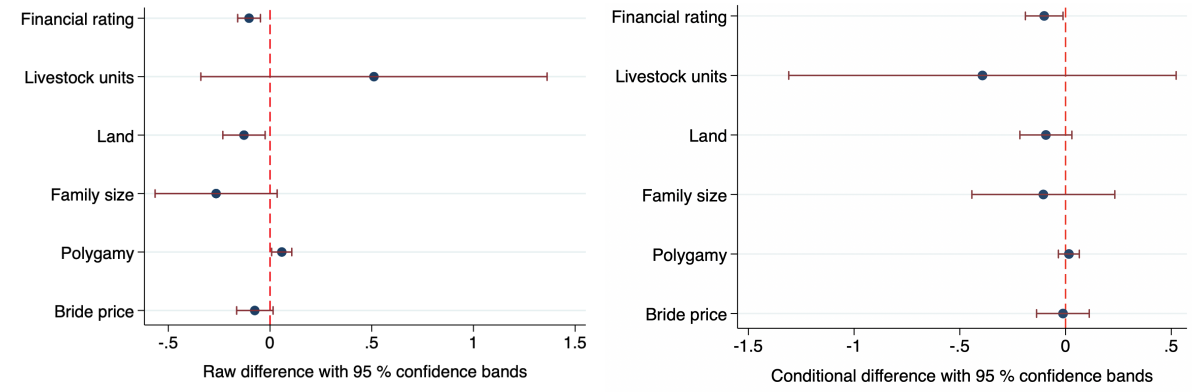

Figure A.4: Market Distance and Prosperity

Notes: The figure shows the association of market distance with different proxies of prosperity without any controls (left) and with controls (right). Capped lines indicate 95 percent confidence bands.

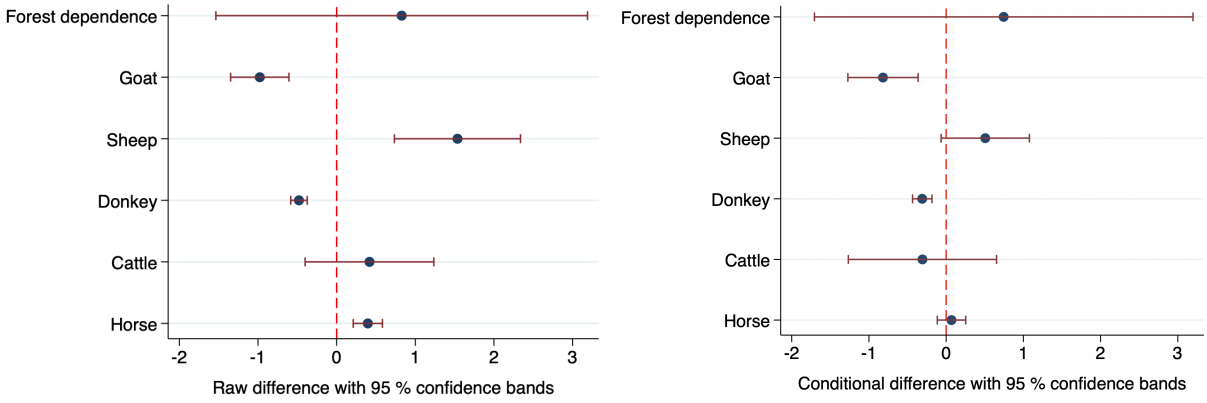

Figure A.5: Market Distance and Occupational Structure

Notes: The figure shows the association of market distance with different proxies of occupational structure without any controls (left) and with controls (right). Capped lines indicate 95 percent confidence bands.

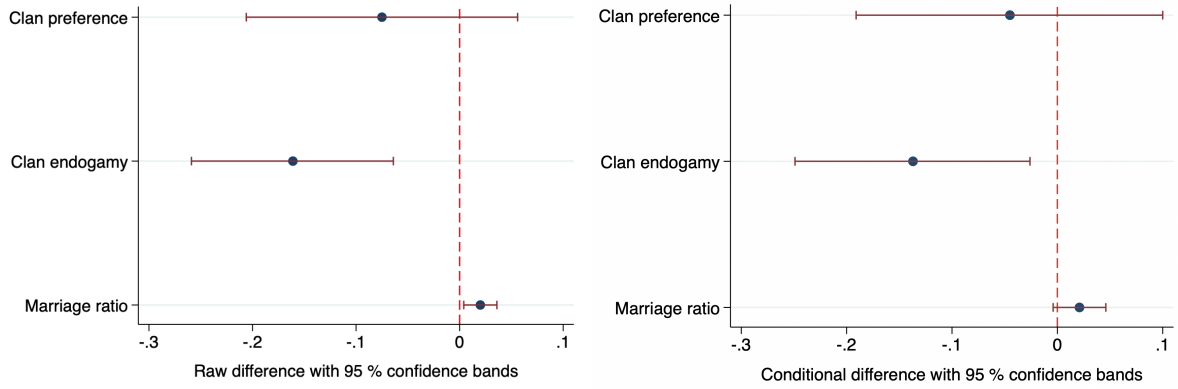

Figure A.6: Market Distance and Outside Exposure

Notes: The figure shows the effect of market distance on different proxies of outside exposure without any controls (left) and with controls (right). Capped lines indicate 95 percent confidence bands.

Table A.10: Market Distance and Exposure to the Outside World: Frequency of Arabic Names

	Dependent variable: Indicator for Arabic Name	
	(1)	(2)
Market distance	0.017	0.016
	(0.018)	(0.017)
R^2	0.001	0.004
Market FE	No	Yes
Obs.	735	735

Notes: OLS estimates with robust standard errors clustered on the group in parentheses. FE stands for fixed effects. Source: Adada-Dodola Forest Management Office.

Appendix B Experimental Procedures and Instructions

I. Experimental Procedures

I conducted three experiments, of which the paper uses data from the experiment that was conducted first. The household and community surveys were carried out after the experiments were conducted. I adopted several procedures to ensure that experimental measures are comparable across different groups and were not affected by contagion and contamination. Wherever possible, I followed the approach pioneered by Henrich et al. (see 2001, 2010) to conducting experiments in the field. This involved the following steps:

First, I used fixed written instructions, set of examples, and control test questions to conduct the experiments. This ensured uniformity in procedures and verbal explanations across groups. The written instructions were tested in a pilot study in the Yayu-Metu region of Ethiopia, which is linguistically similar but 400 km away from the study area. Based on the feedback, the instructions were fine-tuned and tested again in three groups that were excluded from the sample.

Second, the participants in experiments are familiar with money, especially small currency bills. I used actual bills of one Ethiopian Birr while delivering instructions, examples, testing, and for playing the actual game. This also made it easier for the participants to make simple calculations.

Third, the scope of contagion and contamination is larger if there is a wide gap separating the dates on which experiments are held in neighboring groups, as this leaves more time to discuss with future participants. To mitigate these concerns, whenever possible, I invited individuals from neighboring groups either at the same time or just the day after. The experiments were conducted right after the invitations were sent and were run each day, without a break, till all groups from a village had taken part. Once this was achieved, I moved to the next village and followed similar procedures there. Because the experiments lasted an entire day, individuals were left with less time to communicate with those yet to take part. Absence of electricity and mobile reception were of further help in achieving this. I find no difference in behavior when two groups were invited to take part in the experiment the same day or when one group was invited. The share of conditional cooperators or free riders is similar across these two situations.

Fourth, all experiments were run by me together with the main assistant. When two groups were invited at the same time, one group was guided through the experiment by me and the other group by the main assistant.I do not find any evidence of an experimenter effect on either the share of conditional cooperators (P-value > 0.7) or free riders (P-value > 0.6).

Fifth, participants were ensured that their decisions will be anonymous to each other as well as to the research assistants. Moreover, even though the main assistant is a native speaker, he is not from the study area and hence was not personally known to any of the participants.

Sixth, we employed community mobilizers, one from each village, to organize appointments with groups on our behalf. The community mobilizers knew nothing about the experiments or the surveys. They were informed: (a) to invite group members to arrive at an appointed date to play some games in which they could earn some money, (b) participation in the games was entirely voluntary, (c) the games could last an entire day. The mobilizers were given strict instructions to invite 15-25 households from each group. In addition, group leader, vice leader, and group committee members were highly encouraged to take part in the experiments. In some cases, household heads could not show up and sent a representative from their household. Representatives above 18 years old were allowed to take part in the experiments. Most experiments took place at administrative offices and camps. This did not affect any behavior in the experiment.

Seventh, once enough participants had arrived, we invited them to a room and requested them to sit according to their group affiliation. Participants were not allowed to enter the room if they were late by 15 or more minutes. Two local field assistants made sure that latecomers were sent back with a show up fee. After this, we requested the leaders or vice leader to check if: (i) all participants were from the invited group/s, (ii) did not belong to the same household, and (iii) were at least 18 years old. Participants who did not meet these criteria were sent back. In addition, nursing mothers with babies, sick participants, very old, and those with other health problems were also sent back with a show up fee.

Eight, before the experiments began, the main author and the main assistant introduced themselves in the local language, Afaan Oromo. After this, the main assistant took over the task of reading out the written instructions to the entire group. Because most of our subjects had limited literacy, we designed instructions didactically. During the instructions, the participants were given lots of opportunities to ask questions. Any unexpected question, for which we did not have a script, was answered first by the main author and then translated by the main assistant. This was followed by a fixed set of examples, which were illustrated by me. This had many advantages: (a) participants got used to me speaking in Afaan Oromo. I consider this important because when two groups were invited, I took over the responsibility of testing and engaging members from one of the two invited groups in the game; (ii) it gave some respite to the main assistant; and (iii) I gained participants' trust. The main assistant made sure that participants understood my accent; none of the participants complained about this. Moreover, the participants were very happy that I could speak their language.

ninth, before the actual game, the participants were tested one by one for their game

comprehension using a fixed set of control questions. These questions focused on testing a participant's basic understanding of the game, such as addition, multiplication, division, and other skills. While the main assistant tested this for households from one group, I did so simultaneously for households from another group. All participants rejected by me were tested again by the main assistant. Those who could not answer the questions correctly were given a show up fee and sent back. Further, two local assistants made sure that the rejected participants and uninvited persons had left the experimental venue.

tenth, depending on their group, the selected participants were given plastic identity cards bearing names of Swiss Cantons and German States. Before the actual game began, the selected participants were given another opportunity to ask further questions. During the actual game, participants were called one by one to a room / secluded area. Inside the room, subjects were given six bills of one Birr and then asked to make an unconditional decision to contribute to the public good. Once all participants had taken part in this decision, they were called one by one again to take the conditional decisions. In the meanwhile, the local assistants made sure that no one discussed the game. As in the experiments, anonymity was also ensured during the interviews. We were able to match a participant's behavior in the game with the interview through his/ her experimental identity (Swiss Cantons or German States).

II. Experimental Instructions

Introduction

Greetings and welcome to all of you. My name is Devesh Rustagi and I am a student from a university in Switzerland. I am here for a research concerning livelihood improvement through forest conservation. For my research, I would like to play a few games with you. Depending on the decisions made by you and other players in these games, you can win some money. The payment that you receive from these games is not from my own pocket, but sponsored by the German government. Before we proceed with the games, I would like to tell you some important things.

General instructions

1. In all games, your identity will be kept anonymous. This means that except for me and my assistant, no one will come to know of your identity. I am interested only in the decisions made by you in these games and not your identity. This is the reason that we will not ask your name in any of the games. We will identify your decision in the game with an identity card like this (show plastic cards). Please do not lose this card.

2. All games will be played for one round only. This means that after you have played the first game, we will begin with the second game. Likewise, after the second game is

over, we will begin with the third game. This means that after a game is over, there is no subsequent interaction.

3. We will play three games with you, but you will receive your money only in the end. We will keep a record of your earnings in all the games on a sheet like this (show payoff sheets for clarity) to make sure that you receive the correct amount.

4. We will give you separate instructions and examples on how to play each of these games. The instructions for each game will be given before we play the game. For instance, before we play the first game, we will give you the instructions on how to play the first game. Likewise, when we play the second game, we will give you the instructions for the second game, and so on. It is very important that you listen to these instructions carefully. In case you do not understand the game, please stop us and ask us. We will be happy to help you.

5. Before we play the actual game, we will check if you have understood the game or not. In case you do not understand the game, we will give the instructions again. However, if you are still not able to understand the game, we will have no choice but to request you to leave the venue. In this case, you will receive five Birr from us. Therefore, it is important that you listen to the instructions carefully.

6. We would like to keep the game anonymous, therefore, please do not discuss the game with each other. But you may discuss about politics, rainfall, market, cattle, WAJIBS, and other such things. In case we find that you are discussing the game with other players, we will exclude you immediately from the game. In this case, you will not receive any money.

7. We also request you to not to discuss the game with other WAJIB members as this will spoil my study.

8. (Read this only when two societies are invited) You will play the games only with the members of your own society.

9. I repeat again, please do not hesitate to ask any questions. We encourage you to ask as many questions concerning the games as possible. In case you have any questions at this stage, you may ask them now. Otherwise, we will begin with the instructions for the first game.

Experimental instructions

We will now give you instructions and examples for the first game. There are two parts in this game. We will now give you instructions for the first part. This is followed by a test in which we will check if you have understood the game or not. Once we are

sure that you have understood the game, we will begin playing the game.

In this game, we will divide you into groups of two players. You will not come to know to which group you belong. Likewise, you will not come to know the identity of the other (partner) player in your group. Similarly, the other player will not come to know your identity.

At the beginning of the game, each player will receive six Birr from us. Now you have to decide how many from the six Birr to put into your pocket and how many into a project. You may put any amount between 0 and 6 Birr into the project.

Now we will show you how this is done. Please note that since this is an example, we will tell the player how many Birr to put into the project. But when we play the actual game, you will have to decide this on your own, without any help from us. (Randomly select a player and give him six bills of one Birr each. Please make sure that each time YOU tell the person on how much he should put into the project. Do not allow the player to take a decision because this may influence the decision of other potential players). Suppose you are a player in this game. As mentioned before, you receive an endowment of six Birr from us. Now let us assume that out of six Birr, you put zero Birr into the project. Please put zero birr into the project. Ask the group: Can you tell me how many Birr there are in the project? How many Birr does the player have in his pocket? Have you understood this?

Now, let us assume that out of six, you put one Birr into the project. Please put one Birr. How many Birr are in the project? How many Birr does the player have in his pocket? (Carry on this procedure till 6 Ethiopian Birr). Have you understood this part? Do you need additional examples? (If yes, select another person and repeat the examples in the same order).

Any amount in the project will be increased by the same number of Shillingis as the number of Birr in the project. For example, if you put 0 Birr into the project, the project amount will be increased by 0 Shillingis. Now, the final amount of money in the project is 0 Birr. If you put 1 Birr into the project, the project amount will be increased by 1 Shillingi. Now, the final amount of money in the project is 1.5 Birr (Carry on till 6 Birr). I repeat, the project amount will be increased by the same number of Shillingis as the number of Birr in the project. Have you understood this? Do you need additional examples? (If yes, select another person and repeat the examples in the same order).

After the project money has increased, it will be divided equally between you and your partner player, irrespective of how much you have put into the project (Please repeat this again). For example, if the project contains 0 Birr, it will be increased by 0 Birr and then divided equally between you and your partner player. However, since zero does not

increase, both you and your partner will get zero Birr from the project. For example, if the project contains 1 Birr, it will be increased by 1 Shillingi. Now the total value of the project is 1.5 Birr, and both you and your partner player get 0.75 Birr each from the project (carry on till 6 Birr). Have you understood this part? Do you need additional examples? (If yes, select another person and repeat the examples in the same order).

Please remember that any money that you put into the project is first increased and then divided equally among the players in your group. Any amount that you put in your pocket remains the same. If you put 1 Birr in your pocket, it remains 1 Birr. It neither increases nor is it divided.

Your final earning from the game is the sum of the amount you have in your pocket and the amount you receive from the project.

We will now give you three examples. Please note that since now we are learning how to play this game, you can see the identity of each player as well as the decisions made by them. When we play the actual game, you will not come to know of this. Do you understand this? We will now select two people and tell them to take the following decisions in the game. You are player I and you are player II (look for participants with weak comprehension and always give them a chance to act as player I and II). We give you 6 Birr each at the start of the game.

Example 1: Now we will see what happens if both players put zero Birr into the project. Player I and II: Please put zero Birr into the project. Now, can you tell me how many Birr did player I put into the project? How many Birr does he have in his pocket? How many Birr did player II put into the project? How many Birr does he have in his pocket? How many Birr are in the project? We have zero Birr in the project. Since zero Birr does not increase and cannot be divided, each player gets zero Birr back from the project.

Player I has put zero Birr into the project, so he has six Birr in his pocket. He gets zero Birr from the project. Can you tell me, what is his income? Since player I has six Birr in his pocket and he gets zero Birr from the project, his final income is six Birr. (Please repeat the procedure to calculate the income of the second player.)

Example 2: Now we will show you the second example. You are player I and you are player II. You get six Birr from us at the beginning of the game. Now we will see what happens if both players put six Birr into the project. Player I and II please put six Birr into the project. Now, can you tell me how many Birr did player I put into the project? How many Birr does he have in his pocket? How many Birr did player II put into the project? How many Birr does he have in his pocket? How many Birr are in the project?

We have 12 Birr in the project. The project amount will now be increased by 12

Shillings. The final amount in the project is 12 Birr + 12 Shillings = 18 Birr. Now 18 Birr is divided equally among both the players. So, each player gets 9 Birr.

Now, can you tell me, how many Birr does player I have in his pocket? How many Birr does he get from the project? What is his final income? We repeat, since player I has zero Birr in his pocket and he gets nine Birr from the project, his final income is nine Birr. (Please repeat the procedure to calculate the income of the second player.)

Example 3: Now we will show you the third example. You are player I and you are player II. We will see what happens if player I puts zero Birr into the project and Player II puts six Birr into the project. Player I, please put zero Birr into the project and Player II, please put six Birr into the project. Now can you tell me how many Birr did player I put into the project? How many Birr does he have in his pocket? How many Birr did player II put into the project? How many Birr does he have in his pocket? How many Birr are in the project? We have six Birr in the project. The project amount will be increased by 6 Shillings. So the final amount in the project is 6 Birr + 6 Shillings = 9 Birr. Now 9 Birr is divided equally among both the players. So, each player gets 4.5 Birr. Now, how many Birr does player I have in his pocket? How many Birr does he get from the project? So, what is his final income? We repeat, since player I has 6 Birr in his pocket and he gets 4.5 Birr from the project, his final income is 10.5 Birr. How many Birr did player II put into the project? How many Birr does he get from the project? So, what is his final income? I repeat, since player II has zero Birr in his pocket and he gets 4.5 Birr from the project, his final income is 4.5 Birr.

We will now summarize the key results from these examples:

a) If both players put zero Birr into the project, they both earn 6 Birr.

b) If both players put 6 Birr into the project, they both earn 9 Birr.

c) If one player puts zero and the other player puts six Birr into the project, the player who puts zero Birr earns 10.5 Birr, while the player who puts 6 Birr, earns 4.5 Birr.

d) If you and your partner player put the same amount into the project, you both earn the same income.

e) If you put less than what your partner puts into the project, you earn a higher income.

f) If you put more into the project than your partner, you earn a lower income.

If you have any questions, you may ask them now. Otherwise, we will call you one by one and ask six questions to check if you have understood the game or not. Please note that if you answer these questions wrong, we will give you 5 Birr and request you to leave

the game venue. Therefore, please tell us if we need to repeat the examples or not (If yes, repeat the examples in the same order).

Control questions

1. How much money do you get at the start of the game? / What decision do you have to take in the game?

2. Suppose, you decide to put X Birr into the project, how much is left in your pocket?

3. What happens to the money in the project?

4. If you put X Birr into the project, by how much will this increase? What happens after the money is increased?

5. If you put X Birr into the project and your partner also puts X Birr into the project, who earns more?

6. If you put Y Birr into the project and your partner puts Z Birr into the project, who earns more?

(For those who answer 5-6 questions correctly, ask them to sit back in the room. Pay the remaining players 5 Birr and request them to leave. After this, repeat the control questions and let the selected players answer in a chorus. Ask again, if everyone understands. If yes, give them the identity cards).

Actual Game

We will now call you one by one to enter this room and play the game. Please remember that you will not come to know the identity of your partner player or the amount they put in the project.

We will also ask you a question: How many Birr do you believe your partner player will put into the project? This is an important question, so please think before you answer this question.

While you wait for your turn, two assistants will conduct interviews with some of you. They will also check if you discuss the game with each other or not. If they find you discussing the game, we will have to expel you from the game.

When entering the room, please keep your identity card ready.

Unconditional decision

Hello! Have a seat please. I hope you have understood the game. Your identity card, please? Here are your six Birr. Now you have to decide out of six Birr how much you

would like to put into the project. Please put the amount here on the table. How many Birr do you believe your partner player will put into the project? Thank you. Please do not discuss this with the other players.

Additional experimental instructions for the conditional decision

We will now give you instructions to play a slightly different version of the decision that you just played. In the first decision, you did not know the amount your partner player puts into the project. But in this game, we will tell you how many Birr your partner player puts into the project. After you have seen this, you can decide on how many Birr you would like to put into the project. There are seven decisions to be made in this game. Each decision is independent of the other. Please note that you will get a fresh endowment of six Birr at the start of each decision. We will now give you illustrations on how this game is played. Please listen carefully. While we give examples, no one is allowed to speak.

Decision 1: Your partner player in the game puts out of six - zero Birr into the project (put no money on the table). Now, out of six Birr, how much would you like to put into the project? After you have made your decision, the decision is over.

Decision 2: Your partner player in the game puts out of six - one Birr into the project (put one Birr on the table). Now, out of six Birr, how much would you like to put into the project? After you have made your decision, the decision is over. (Carry on till 6 Birr.)

Do you have any questions?

There are seven decisions to be taken in this game. Please watch our fingers for why there are seven decisions. Your partner player puts 0, how much would you like to put; Your partner player puts 1, how much would you like to put; Your partner player puts 2, how much would you like to put; Your partner player puts 3; how much would you like to put; Your partner player puts 4, how much would you like to put; Your partner player puts 5, how much would you like to put; Your partner player puts 6, how much would you like to put. Can you count our fingers now? How many decisions do you have to take in this game? At the beginning of each decision, you will get 6 Birr, just like in the examples you saw. Each decision is independent of the other. A very important point is that we will pick only one of these seven decisions to decide your earnings. So please take all the decisions seriously. Do you have any questions?

We will now call you one by one to play this game. As usual, please keep your identity

card ready.

Conditional decision

Hello! Please take a seat. I hope you have understood the game. Your identity card, please? Here are your six Birr. Now we will show you one by one how much your partner player puts into the project. After you have seen this, you can decide how many Birr you would like to put into the project. Please put the amount here on the table.

Decision 1: Your partner player in the game puts out of six - zero Birr into the project (put no money on the table). Now, out of six Birr, how much would you like into put in the project? Now this decision is over. Please return all the money you have in your hand to me.

Decision 2: Here are your six Birr. How many Birr do you have in your hand? Your partner player in the game puts out of six - one Birr into the project (put one Birr on the table). Now, out of six Birr, how much would you like to put into the project? Now this decision is over. Please return all the money you have in your hand to me.

(And so on till 6 Birr.)

Appendix C Vignette Study

Vignette A: Market Exchange 1

One day an Oromo man called Ibsaa decided to sell his cows to earn money. He went to a market where he met Barentu, another Oromo man. Barentu wanted to buy Ibsaa's cows. The cows looked healthy from outside, but they were actually sick. No one except for Ibsaa knew that. Ibsaa decided not to tell this to anyone. Barentu bought the cows. Some months later, the cows died. This was a big loss to Barentu.

1) In your opinion, what Ibsaa did to Barentu was right or wrong?

2) Are you pleased or displeased with Ibsaa?

3) Will you say anything to Ibsaa if you met him? What will you say?

4) What should Barentu do?

a) find Ibsaa and get his money back
b) go to the police
c) stop buying from Ibsaa in the future
d) tell everyone that Ibsaa cheated so that everybody is aware
e) contact the leader of the group to which Ibsaa belongs

f) contact the leader of the group to which Barentu belongs
g) Other

5) What will happen to Ibsaa? Will Ibsaa be punished?

6) What happens if Ibsaa says he did not know that his cows were sick? After all, there is no proof of this. Will you agree with him?

7) If you go to a market, will you buy cows from Ibsaa? Why / Why not?

8) Do you think other people will buy cows from Ibsaa?

9) Will you buy other products from Ibsaa?

10) If Barentu told everyone that Ibsaa cheated, will Ibsaa take revenge?

2B: Market Exchange 2

One day an Oromo man called Ibsaa decided to sell his cows to earn money. He went to a market where he met Barentu, another Oromo man. Barentu wanted to buy Ibsaa's cows. Barentu bought the cows. Some months later, the cows died of sickness. This was a big loss to Barentu. Barentu thinks that Ibsaa cheated him by selling him sick cows.

1) Do you think Ibsaa cheated Barentu or was Barentu just unlucky?

2) Whom are you going to support? Why?

3) Do you think Ibsaa knew his cows were sick and did not tell this to Barentu? After all, it is difficult to prove that Ibsaa knew it.

4) Does Barentu have any option to get justice? What should Barentu do?

5) After this incident, will other people buy cows from Ibsaa?

6) Will people buy other products from Ibsaa?

7) Would it have been possible to avoid this situation? How?

8) How easy is it for people to sell sick cows in the market?

9) Do you have a mechanism to detect people who cheat in the market? How does it work?

10) Do you think that people who buy livestock mostly buy from the same seller/s? Why?

11) Does market exchange (buying-selling) teaches you not to cheat? How?

12) Do you implement the social norm of not to cheat in others areas of your life, outside the market exchange. For example, in dealing with people from your group or people

from other group? How?