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Abstract

There is a long-standing debate on whether access to markets may change pro-social preferences and as a result undermine informal support structures prevalent in many developing country settings. This study presents empirical evidence on the relation between market integration and pro-social behaviour among rural households in Liberia. This is particularly relevant in light of recent emphasis on promoting agricultural development through connecting small-scale farmers to markets and value chains. We use data from two lab-in-the-field experiments to measure preferences for altruism and fairness towards fellow villagers and traders from a provincial market and combine the experiments with household survey data. We define market integration as the share of consumption bought at the market. The regression analysis is based on Tobit and 2SLS Tobit models using chief characteristics and predicted food consumption expenditures as instrumental variables. Our study finds that increased levels of market integration have no robust impact on altruistic behaviour, as represented by amounts send in the dictator game, but are associated with lower offers in the ultimatum game. Our findings support the idea that market integration makes people act more economically rational, especially

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when matched with traders. The study provides new evidence that contrary to popular belief, markets do not crowd out norms of generosity or fairness, or lead to some sort of negative externality by changing norms and preferences but rather strengthen strategic considerations and behaviour.

1.   Introduction

There is a long-standing debate on whether access to markets may change pro-social preferences and as a result undermine informal support structures prevalent in many developing country settings (Polanyi & MacIver, 1957; Scott, 1977). More generally, exposure to formal institutions like markets is likely to have implications for the functioning of informal institutions, and interactions between them may matter for economic outcomes (Boettke, Coyne, & Leeson, 2008; Williamson, 2009). The role of markets is one among many forms of institutional arrangements distinctly related to social preferences. On the one hand, it has been emphasised that social preferences are an essential pre-requisite for the development of markets. Montesquieu (1749), cited in Ensminger (2004), states that "wherever there is commerce manners are gentle". Engaging in trade with strangers requires trust and other-regarding preferences to overcome the issue of non-enforceable elements that always partially remain in market interactions. In an analysis of 15 small scale societies in different parts of the world, Henrich et al. (2001) indeed demonstrate an evolutionary co-evolvement of market integration and norms of fairness. On the other hand, market structures are sometimes believed to erode moral values (Sandel, 2012), which can lead to adverse external effects on third parties. Introducing prices may make social norms appear to be a marketable good that can be evaded by paying a price (Gneezy & Rustichini, 2000) or the replacement logic ("if I don't do it, someone else will")

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where market participants feel less pivotal for externalities related to markets with multiple actors (Falk & Szech, 2013). Exposure to markets could also make people more 'rational' and the expanding role of the market in people's life may increase awareness of efficiency gains, and new levels of economic rationality may influence the allocation of rents, affecting the distribution of wealth (List and Millimet (2008); Cecchi and Bulte (2013)). It is, however, unclear how it may affect individual motivations, and values, and social norms.[2] Bowles (1998) for example argues that the conventional approach to policy design falls short, as "it overlooks the possibility that economic incentives may diminish ethical or other reasons for complying with social norms and contributing to the common good. Where this is the case, the kinds of incentives stressed by economists may have counterproductive effects."

While cross-country evidence suggests that people appear more fair and trusting when more exposed to market transactions (Fischer, 2008; Henrich et al., 2010), evidence from within-country studies does not necessarily support this hypothesis. Lamba and Mace (2013) for example find no effect of market contact on fairness norms at all. Related, Siziba and Bulte (2012) find that market integration does not promote generalised trust in Zimbabwe while it has a negative effect in Mozambique and the pooled sample. The effect of market integration on pro-social behaviour thus remains contested and may differ depending on the specific context (Gagnon & Goyal, 2017). The role of market integration in shaping pro-social behaviour is thus an empirical question and the answer may differ across time and space. Our paper contributes to the evidence base on this issue and sheds light on whether exposure to formal institutions affects preferences for altruism and fairness, and whether impacts

[2] See also (Klitgaard, 1997; Swidler & Watkins, 2009)

differ for members of the same community vis-à-vis traders from a distant provincial town.

We use two lab-in-the-field experiments to study whether variation in household's market integration can causally explain differences in altruism and fairness. We also test whether villagers who are more market oriented behave differently towards peer villagers than towards traders from a provincial market—who are very much integrated into the market. Having a group of people that is unambiguously "integrated in the market" facilitates a comparison between behaviour towards this population and the sample of villagers that moves along an arguably more "noisy" proxy gradient of market integration. Our results suggest that increased levels of market integration have no robust impact on preferences for altruism, as represented by offers in the dictator game (DG), but are associated with lower offers in the ultimatum game (UG). In contrast to the DG, the UG involves a strategic element that may resemble bargaining processes in the market place. Hence, our findings support the idea that market integration simply makes people act more rational, especially when matched with traders. To account for reverse causality or omitted variable bias we also estimate 2SLS models, instrumenting market integration with chief characteristics and predicted food consumption expenditures at the village level. Results are weaker but point in the same direction; no effect on altruism and a negative impact of market integration on offers to traders. One could argue that traders from a distant town are also strangers, thereby confounding in- and out-group preferences with behaving more rational towards this group. However, we find our results hold when looking at the sub-sample of males only who are typically not involved in market activities. If in- versus outgroup preferences would be driving our results, we would expect men to allocate lower shares to traders than women on average, but market integration not to matter. We however do not observe such

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patterns in our data. Our results are important in light of recent debates about the interaction between formal and informal institutions and the increased emphasis on promoting (agricultural) development through connecting to markets and value chains that its possible implications beyond direct immediate economic outcomes.

The remainder of the paper is organised as follows: section 2 describes the Liberian context, experimental set-up and procedures. Section 3 provides descriptive statistics and section 4 describes the econometric models. Section 5 presents the results and various robustness checks and we end with concluding remarks in Section 6.

2.   Context, experimental design and procedure

Liberia is a small country on the West African coast, founded by freed slaves from the Americas in 1847. The history of the emergence and expansion of trade and market activities in Liberia shows three distinct features that are particularly relevant in the context of our research, which are further explained below. These are (i) the recent phenomenon of periodic markets in our study area; (ii) the role of the town chief in promoting market exchange and his linkages to the government in Monrovia; and (iii) the profession of trading in rural markets being a job that is exclusively held by women.

While international trade among the central Liberian coast has been dated back to the early 1200s, markets in the interior were rare before 1900, except for the northern part of the country (Handwerker, 1980). Also, with markets and trading routes emerging in the interior, they remained distinct from coastal trading activities, and people from the interior rarely made expeditions to the coast, but rather operated in small groups through interior trans-shipment points to buy and sell quantities of goods to be shared with their kinsmen. Exposure to markets and trading activities thus has been long confined to those individuals who actually took part in these expeditions.

During the early twentieth century, the Liberian government created an administrative hierarchy from the national government level down to the town chiefs and established and expanded periodic markets in the interior.[3] Sometimes this was at the request of town chiefs wishing to receive recognition from the central government. In other cases they did this to legitimise the Monrovia-based government, levy local taxes and provide for means of communication to and from the capital (Buell, 1928, cited in Handwerker, 1980). A chief's connection to Monrovia may thus be linked to the extent to which his village is involved in market exchange.

Trading activities in Liberia historically have been and continue to be a women's job. As Handwerker (1980) writes "An extensive trade in foodstuff and household articles, with its attendant social activity was the core of the market. As in the contemporary system, these commodities were in the hands of women: ..." And: "...the trade in foodstuffs is in the hands of the wives of the farmers, trade in palm oil, rice, smoked fish, and so forth collected in towns and surrounding regions can be expected to be in the hands of the wives of traders."[4]

Experimental design

We conducted two experiments: a dictator game (DG) and an ultimatum game (UG) in 36 randomly selected communities in Margibi and Montserrado provinces.[5]

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[3] Periodic markets in Liberia were weekly markets situated outside the walls of towns, or in open fields in a central location, catering for multiple towns (Handwerker, 1980).

[4] Also see (Bauer, 2009; Mazurana & Carlson, 2004) for arguments on trading business being job carried out predominantly by women in many African contexts.

[5] This study is part of a larger research project. In collaboration with "ZOA", a Dutch NGO, two of the authors were involved in a rigorous evaluation of an agricultural community development project that aimed to improve households' food security and strengthen community cohesion. Our sampling frame comprised all villages in the provinces of Margibi and Montserrado that were i) not targeted by ZOA before; (ii) had a minimal size of 30 households; (iii) had some farming potential. The experiments in this paper were conducted in 2010 as part of the baseline data collection for the larger project.

Behavioural experiments are now routinely used in developing country settings to measure individual preferences in an incentive-compatible manner (Cardenas & Carpenter, 2008). We obtained a sampling frame from the Liberian Institute of Statistics and Geo-Information Services (LISGIS) to select our villages using a two-stage stratified randomised design, with stratification based on the presence of a "main road" in the village.[6] Depending on the community size, in each community, 10-20 randomly selected household representatives (household head or spouse) were invited to participate in the experiments.

The DG is a one-shot game wherein senders allocate any amount between 0 and 100 LD[7] to a receiver, who is randomly matched with the sender, and keep the remainder. The experiment stakes were determined in consultation with the NGO and pay-out values are in accordance with other economic lab-in-the-field studies in the region (Beekman, Bulte, & Nillesen, 2014; Beekman, Gatto, & Nillesen, 2015; Fearon, Humphreys, & Weinstein, 2009). Receivers get nothing apart from the share the sender allocates to them.

As senders and receivers will never know the identity of their partner, an economic rational strategy for senders would be to maximise self-interest and to allocate nothing to the receiver, and keep the full 100 LD. Positive contributions to the receiver could be explained with fairness norms and altruism (Fehr & Fischbacher, 2003). Senders play the DG twice; once with an anonymous community member, and once with a professional trader from the province capital Kakata.

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[6] The condition of even main roads in the Liberian interior is however extremely poor.
[7] At the time of the research activities, 100 LD = 1.43 USD and about equal to a day's wage for rural unskilled labour.

The UG is also a one-shot game, wherein the proposer offers any amount between 0 and 100 LD to a responder, who is randomly matched with the proposer. Responders get nothing apart from the share the proposer offers them. In contrast to the DG, responders are now asked to accept or reject the amount passed by the proposer (in increments of 10 LD). If the responder accepts, she will receive the amount offered and the proposer will keep the remainder. If the responder rejects, both the proposer and the responder will receive 0 LD. The self-interest maximising strategy for responders is to accept any positive amount offered by the proposer, and anticipating this, the optimal strategy by the proposer is to allocate the lowest possible non-zero amount to the responder. The Nash equilibrium for a self-interested player is thus at 10 LD, which is the smallest possible positive offer to the responder. We use a slightly adapted version to the original UG by using the strategy method, where we ask respondents for each possible allocation whether they would reject or accept the offer (see Oosterbeek, Sloof, and Van De Kuilen (2004); and Bahry and Wilson, 2006 for a discussion of the strategy method).

Rejecting a non-zero offer can be regarded as a form of altruistic punishment commonly found in UG. It shows that many people are willing to punish others at a cost to themselves to prevent unfair outcomes or to sanction unfair behaviour (Fehr & Fischbacher, 2003). In the analysis we test for differences in UG behaviour when subjects were matched with a professional trader from the province capital (Kakata) as compared with an anonymous community member.

Procedure

Upon arriving in the community, participants were collected in the palava hut (the public meeting place) where they received an ID code to guarantee anonymity and were informed about the activities they would take part in. Participants were informed

that they would receive a sitting fee of 70 LD (about 1 USD at time of the research activities). Participants received a brief introduction to the activities. They were informed that the experimenter would explain the activities to them individually in greater detail after they completed a household questionnaire. Each participant was then invited to draw a lottery slip indicating 'S' or 'R' to determine their role during the game (sender or receiver; proposer or responder). Participants kept their role during both games.

Participants were presented a sheet with basic information on the pool of traders to make the matching with traders more realistic as traders were not physically presented during the experiments.[8] Yet, the specific matching always remained anonymous and participants never received specific information regarding the matched trader. Responders only played the experiment with villagers and not with the professional trader. In total, there were 298 proposers and 288 responders (in case of an odd number of participants in the community, one individual would be matched twice).

After completing the household questionnaire, participants were invited to join the experimenter. They first drew another lottery ticket indicating 'C' or 'T' from a bag to determine whether they would play with a community member or with an anonymous trader first, then received individual explanation of the games, and finally made their decisions (see supplementary article materials for detailed experiment scripts).

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[8] Basic information included age, ethnicity, place of birth, type of business, years in business and a photo. As participants could see other participants and had some basic knowledge about the pool of villagers, we decided to provide similar information regarding the pool of traders.

The UG was repeated with a small sample (n=10) of traders from the market at the province capital Kakata with the same monetary incentives. We matched each villager with one of these professional traders and used their decisions to determine experiment pay-outs. As we are mainly interested in the responses of villagers we only collected information of a small sample of traders, which does not form part of the econometric analysis.

3. Summary statistics

Figure 1 summarises the results of the DG and UG. A few patterns become clear. In the first place, both in the DG and in the UG, a smaller share of players is making 'economic rational' choices when matched with a fellow community member than when matched with a trader. In the DG, about 10% of the 298 participants kept their full endowment and shared nothing, maximising their self-interest in relation to fellow community members. This increased to 18% once matched with a professional trader. In the UG, 7% of respondents maximised their self-interest in relation to fellow community members and 12% in relation to professional traders by sharing the lowest possible non-zero amount (10 LD). In the DG, 69% of participants shared an amount between 0 and 50 LD with a community member, and 62% shared such an amount with a trader. In the UG, 65% of the respondents shared an amount between 10 and 50 LD with a community member, and 69% with a trader. Kolmogorov-Smirnov tests suggest that both DG and UG contributions decreased significantly once the game was played with a trader instead of a villager.

In the second place, as expected, average offers are significantly higher in the UG than in the DG: the median offer is 40 LD for community members and 30 LD for traders (on average 35 and 28 LD). Furthermore, a minority of the respondents share more than 50% of their endowment. In the DG, 2% of the respondents behave

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'extremely altruistic' towards fellow community members, and 11% towards traders (compared to 2 and 3% in the UG).

Finally, offering an equal split of the endowment (50-50 LD) in the UG was accepted by 97% of the community members and almost a third accepted the smallest positive offer of 10 LD. As we employed a strategy method, the UG responder choices can be analysed for the full range of UG offers irrespective of the actual offer of the matched proposer. Bahry and Wilson (2006) distinguish three UG responder profiles: first, monotonically-rational responders who hold consistent ordering in their rejections; second, hyper-fair subjects represented by an inverted u-shape in which very high and very low offers are rejected and intermediate offers are accepted; third, confused responders who switch back and forth between rejecting and accepting. In our sample, about 64% of the responders behave consistent with monotonically-rational preferences, while 5% can be classified as hyper-fair and 31% as confused.[9]

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[9] Confused subjects are defined as having more than one acceptance/rejection switching point that cannot be explained with hyper-fair preferences.
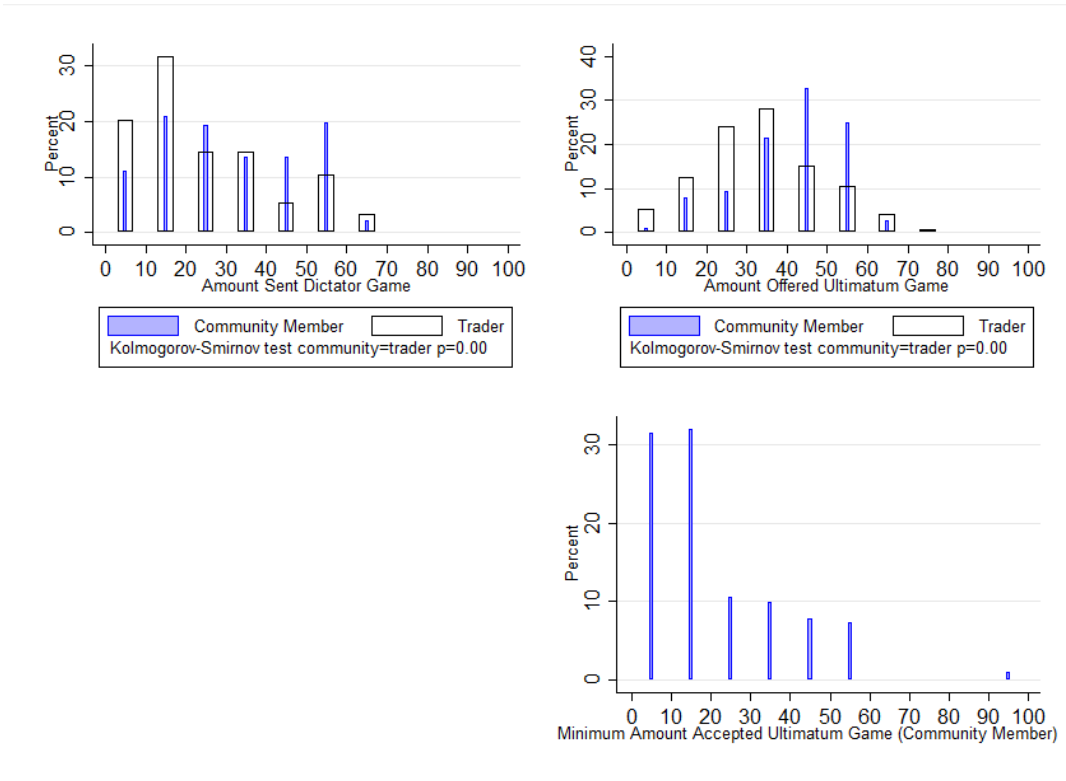
Figure 1 Summary statistics of the DG and UG

DG and UG evidence across the world

Based on a large number of results from ultimatum games from across the world,

Fehr and Schmidt (2006) observe three general patterns. First, in the UG, the majority

of senders offer 40% to 50% of their endowment. In our sample, this is true with

respect to fellow community members (the modal offer to community members is 40

LD), but offers to traders are lower (the modal offer is 30 LD).

Second, offers lower than 20% of the endowment, are rejected with probability 40%

to 60%. Our findings match this observation: 35% of the community members reject

an offer of 10 LD, and 67% reject a zero offer (average rejection rate of 51% for

offers lower than 20 LD). Compared with lab-in-the-field evidence from Russia

(Bahry & Wilson, 2006), the share of subject classified as hyper-fair is considerably

smaller, while the share of monotonically-rational and confused subjects is significantly larger in our sample.[10]

Third, the probability of rejection decreases as the size of the offer increases. We find the same, up to a 'fair' offer of 50% of the endowment. Beyond that point, rejection rates by fellow community members increase again.

With respect to the dictator game, Fehr and Schmidt (2006) note that typical senders assign on average between 10% and 25% of their endowment to receivers, with modal allocations at zero and 50%. The latter is not true for our sample: the modal allocation is 20%, both to peer villagers and to traders. Average allocations do match earlier experimental results, although allocations to community members are higher than expected (39% for community members and 29% for traders).

As highlighted by Fehr and Schmidt (2006), we observe that offers in the UG are generally higher than offers in the DG, due to fear for rejection. However, fairness norms do play a role as well, as in the DG, where the possibility of rejection is removed—the vast majority of the senders do allocate a non-zero amount to a receiver. In addition, fairness norms, irrespective of market integration, seem to play a larger role with respect to (anonymous) fellow community members, than with respect to (anonymous) professional traders.

Sample characteristics

Table 1 summarises the indicators for market integration and the control variables used in the econometric analysis. We define market integration as a household's share of calories bought on the market with respect to total calorie consumption. This is a

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[10] It should be noted that the share of hyper-fair subjects in Bahry and Wilson (2006) seems exceptionally large exceeding 40% of subjects in their sample.

similar approach as described in Henrich et al. (2001) and Henrich et al. (2010). Total consumption includes bought items, items produced or collected by the household, and gifts in the course of two weeks before the survey. Included consumption items are: rice, cassava, bulgur wheat, white flour, corn, beans, eggs, and oil.

As robustness check, we also define market integration as the share of bought consumption items with respect to total consumption in terms of monetary value. The definitions of market integration are different in two respects. First, in the calorie based definition, consumption items with a high nutritious value get a higher weight, whereas in the money based definition, consumption items with a high monetary value get a higher weight. Second (and related), the calorie definition includes only staple foods (and eggs), whereas the monetary definition also includes rather luxurious consumption goods (fish and chicken) and charcoal. These three items are widely consumed, but cannot be converted into nutritious value with our data.

The summary statistic shows that the average participant is part of a household that purchased 78% of its consumed calories on markets. However, there is a considerable amount of variation covering the full range of possible levels of market integration. The distribution is skewed toward the upper boundary: while 56% were fully market integrated (100% of calories bought), only 7% had a market integration below 10%. The monetary definition of market integration is similar to the calorie definition, yet, the level of market integration is slightly higher.

Table 1 Summary Statistics

Variable	Obs.	Mean	SD	Min	Max
Market Integration					
Market integration Kcal	564	0.79	0.31	0	1
(hh kcal bought as share of total consumption)					
Market integration USD	563	0.82	0.28	0	1
(hh USD spend on food as share of total consumption)					
Individual Characteristics					
Gender (male=0; female=1)	543	0.52	0.50	0	1
Age	568	42.46	14.19	17	86

Head literate (no=1; yes=2)	521	1.57	0.50	1	2
Household Characteristics	575	2.08	1.15	1	5
Household Assets (0-20)	579	7.66	3.02	0	17
HH size	574	3.72	1.91	1	15
Village Characteristics					
Village size (People in thousand)	548	0.28	0.28	0.04	1.57
Protestants in village (2: less than half – 6: everyone)	570	5.27	1.07	2	6
Distance (next major) town (2: ≤ 30 min – 6: ≥1 day)	582	3.21	0.97	2	6
Instrumental Variable					
Predicted share food expenditures (village average)	582	0.75	0.05	0.66	0.86
Village chief visits to Monrovia=0-7 days/year	452	0.70	0.46	0	1
Village chief visits to Monrovia=7-14 days/year	452	0.23	0.42	0	1
Village chief visits to Monrovia=14-21 days/year	452	0.03	0.18	0	1
Village chief visits to Monrovia >21 days/year	452	0.04	0.20	0	1

In the regression analysis we control for a set of individual, household, and village level variables. The sample of experiment participants is gender balanced and on average 42 years old, living in a household with four members and is headed by a literate head in 57%. Participants reside in relatively small rural villages ranging from 40 to 1570 habitants, who are predominantly Protestants. To account for wealth differences, we control for an asset indicator that comprises 20 items.[11]

4.   Methodology

To quantify the effect of market integration on experiment decisions, we regress the DG and UG outcomes on a measure of market integration and a vector of controls. However, a household's level of market integration is likely to be endogenous to social preferences: individuals with pro-social preferences (including higher levels of trust) are probably more likely to involve in market activities than others, and market participation may influence what is considered socially acceptable behaviour (Guiso, Sapienza, & Zingales, 2004; Tu & Bulte, 2010). Therefore we also report results using an instrumental variable approach. To probe a causal relation between market

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[11] Respondents were asked whether they or their household members own any of the following 20 assets: cooking pots, coal pot, bicycle, hoe, bed, generator, canoe, axe, table, radio/tape, fishing utensils, shovel, chairs, cell phone, tapping knife, spade, mattress, sewing machine, cutlass, mosquito net. The asset index represents the number of different assets owned in the household.

integration and fairness norms, we thus estimate the following two models in addition to standard models:

$$Y_{ij} = \alpha \ + \beta \ MI_j^* + \gamma X_{ij} + \partial_k + \varepsilon_{ij} \ , \qquad (1)$$

$$MI_j^* = a \ + b \ Z_j \ + c X_{ij} + \partial_k + e_{ij} \ , \qquad (2)$$

where Y_{ij} denotes the amount sent in the DG or UG; MI^* is our predicted measure of community level market integration; X_{ij} is a vector of controls, ∂_k are district fixed effects to capture unobserved factors that may vary at this level; Z_j is our vector of instruments; and ε_{ij} and e_{ij} are error terms, clustered at the village level. As DG and UG responses are restricted to a range from 0 LD to 100 LD, we estimate Tobit models to account for the censored data structure.

Selection of instrumental variables

There are two critical requirements for a valid instrumental variable (Angrist & Krueger, 2001). First, the instrument has to be correlated with the suspected endogenous variable (in our case market integration). Second, the instrument has to be uncorrelated with unobserved factors that affect household's DG and UG behaviour. Two instrumental variables for market integration are used in the analysis: the chief's number of visits to Monrovia in the past year and the predicted budget for food expenditures as share of household consumption.

As described above, town chiefs have historically played an important role in regulating market and trading activities of its village members for tax collection purposes and to strengthen their position as local governance authorities. We therefore hypothesise that a chief's travel to Monrovia correlates positively with average village level market integration. We also believe that chiefs' connection to

Monrovia has no influence on individual level preferences for fairness and altruism other than through the postulated channel of market integration.

The second instrument is based on the standard demand theory that higher incomes affect the demand for market goods dependent on expenditure elasticities. Thereby income changes are predicted to move households along the food expenditure Engel curves. However, a household's exact food expenditure elasticity depends on access to markets and individual preferences. For example food expenses of households with limited access to markets are expected to be less sensitive to incomes than households who are more integrated into markets. To eliminate household's specific preferences, we focus on predictions based on the regional food expenditure elasticity. That is, we predict how much a household in the region with a given expenditure level and socio-demographic characteristics would spend on food items as share of the total consumption. Thereafter we use the village level average as instrument for market integration in order to attenuate the potential effect of unobserved factors in the DG and UG on household's consumption. The predicted share of food expenditures on consumption is expected to be positively correlated with market integration–as food items are purchased on markets–but at the same time the predictions on the village level are not correlated with unobserved factors of household's social preferences.[12]

We estimate the expenditure budget allocation based on the full data set also including villages in the same region that were not selected for participation in the experiment (n=1036). Budget shares devoted to food and non-food groups are related

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[12] Furthermore, we focus on food expenditure as they are typically purchased on regional markets as opposed to non-food expenses (hired labour, social events, construction etc.), which are in many cases acquired within villages.

to total household expenditures and other household characteristics. The budget of household i allocated to food items (w_F) is specified based on a Working-Leser model given by

$$w_{Fi} = \alpha_F + \gamma_F \ln p_f + \beta_F \ln M_i + \delta X_i + \varepsilon_{Fi} \ , \qquad (3)$$

Where p_f refers to a (logged) food price indicator, M refers to household's (logged) total per capita expenditure and X refers to a set of household control variables including household size, the household composition, and province level fixed effects (following (Ecker & Qaim, 2011; Team, 2012)).[13] Based on the estimation (see Table A6 in the Annex), we predict the share of food expenditure on household's consumption (including own produce) and use the village level mean as instrumental variable for household's market integration.

Summary statistics of the instrumental variables are presented at the bottom of Table 1. The number of visits to Monrovia is measured as an ordinal variable and shows that the majority of chiefs does not visit Monrovia more often than 14 times a year, roughly once per month. The food budget predictions suggest that 66% to 86% of household's consumption pertain to purchased food items.

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[13] Using Equation (2), the marginal effect on the food budget share of a change in total household expenditure is given by β_F, while the total expenditure elasticity can be derived using the formula $E_i = 1 + \left[\frac{\beta_F}{w_F}\right]$ (Team, 2012).

5. Results

Regression Results

We first present the ordinary Tobit regression results, followed by the two stage least square (2SLS) estimations and additional robustness checks. Table 2 reports the Tobit regression results on the effects of market integration on the DG and UG outcomes. Columns (1) – (3) refer to the DG amounts sent to villagers (1), traders (2), and traders conditional on the amount sent to villagers (3). The same approach is used for UG outcomes, where we additionally consider the minimum amount accepted in the UG (column 7).

The amount sent to a villager in the DG is positively and highly significantly associated with DG contributions sent to traders. However, we find that market integration has no statistically significant effect on DG contributions in the estimations. In contrast to that, we find a negative effect of market integration on UG offers to villagers and traders in the estimations. The negative effect on subject's offers to traders holds after controlling for their offers to villagers, which seems to suggest that participants discriminate between traders and villagers. We find no effect of market integration on the minimum amount accepted by responders in the UG. The null result holds after confining the sample to monotonically-rational and hyper-fair subjects (results not reported, but available on request).

Table 2 Market integration and fairness norms – Tobit

	Dictator Game			Ultimatum Game			
	(1) Villager	(2) Trader	(3) Trader	(4) Offer Villager	(5) Offer Trader	(6) Offer Trader	(7) Min. Accepted
Market Integration	-5.49*	-4.05	-0.17	-8.64***	-9.34***	-3.30*	-1.91
	(3.22)	(3.83)	(3.35)	(2.25)	(2.58)	(1.96)	(6.30)
DG to villager			0.74***				
			(0.08)				
UG to villager						0.74***	
						(0.07)	
HH+village controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
District FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Adjusted R^2	0.004	0.013	0.077	0.014	0.012	0.076	0.008
Observations	238	238	238	238	238	238	218

Standard errors in parentheses (clustered at the village level). Included household controls: assets, sex respondent, age and literacy household head, household size, share of protestants in the community, distance next town, community size. $^*p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$

To account for potential endogeneity of household's market integration we estimate 2SLS Tobit models. The results are reported in Table 3 and follow the same structure as in the previous table except that we present the first stage estimates of the 2SLS model in the first column.

The instrumental variables have the expected effect on market integration (see column 1 of Table 3): the chief's visits to Monrovia are positively associated with village level measures of market integration as is the effect of the predicted share of food expenditures on consumption. We should note, however, that while significant, our instruments are not particularly strong with first-stage F-statistics ranging from about 8.5 to just over 18.7 depending on the dependent variable used.

In contrast to the ordinary Tobit estimates, higher levels of market integration do not systematically vary with DG offers in any of the 2SLS models. The 2SLS results for UG offers to traders are in line with the ordinary Tobit estimates. The result in column (7) suggests a negative impact of market integration on UG offers to traders after controlling for UG offers to villagers. This supports that more market integrated participants discriminate stronger between villagers and traders. As before, we find no effect of market integration on the minimum offer accepted in the UG.

The coefficients in the second stage are larger compared with the previous estimates. Based on the applied instrumental variables the exogeneity of market integration is not rejected by the Wald test of exogeneity suggesting that the ordinary Tobit approach is appropriate in these cases.

Table 3 Market integration and fairness norms – 2SLS Tobit

	1st Stage	Dictator Game	Ultimatum Game

	(1) Market Integration	(2) Villager	(3) Trader	(4) Trader	(5) Offer Villager	(6) Offer Trader	(7) Offer Trader	(8) Min. Accepted
Market Integration		-8.35	-27.88	-18.89	47.40	-8.67	-24.43*	-27.96
		(29.68)	(27.74)	(14.14)	(35.79)	(60.98)	(14.46)	(25.64)
DG villager				0.74***				
				(0.10)				
UG villager							0.74***	
							(0.11)	
Pred. budget	2.63***							
food expenses	(0.63)							
Chief visits	0.09							
Monrovia=7-14	(0.08)							
Chief visits	0.39***							
Monrovia=14-21	(0.08)							
Chief visits	0.31***							
Monrovia >21	(0.08)							
HH+village controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
District FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	187	187	187	187	187	187	187	158
First stage F- Stat.[1]		8.47	8.47	8.47	8.47	8.47	12.28	18.67
p-value Wald test [2]		0.92	0.39	0.20	0.10	0.99	0.10	0.30

Standard errors in parentheses (clustered at the village level). Included household controls: assets, sex respondent, age and literacy household head, household size, share of protestants in the community, community size. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

[1] Kleibergen-Paap Wald F-statistic.

[2] Wald test of exogeneity: test of non-significance of the residuals from the first-stage regression in the second stage

Sensitivity Analysis

Local markets are more than just shopping places; they are important meeting points in which people interact and communicate. These social interactions could influence preferences regardless of whether they take place on a local market or in any other context. This is important for the validity of our findings as it has been shown that more frequent social interactions can change social ties and ultimately behaviour (Bernhard, Fehr, & Fischbacher, 2006; Goette, Huffman, & Meier, 2012). Thus, what seems to be an effect of market integration may be the result of differences in social distance and differences in people's perceptions of in-group and out-group members. That is, traders are less likely to be strangers in terms of their behaviour, for more market integrated individuals.

Our data do not allow us to cleanly separate preferences for strangers (members of the out-group) from preferences for a specific type of strangers (market traders), but we explore a particularity of the research region to support our argument that it is market integration rather than adverse preferences for strangers that explain our results. Trade, mainly in the form of petty trade, lies in the responsibility of female household members and men do not engage in market trade nor as vendors or as buyers. The main estimation results indicate modest differences in the experiment behaviour of women as compared to men: women offered significantly less to traders in the DG than men, but the effect diminishes in the UG (results not presented, but available on request). We then confine the analysis to male experiment participants who have no direct contact with traders irrespective of their household level of market integration. The Tobit estimates are presented in Table 4. In spite of the reduced sample, the results of market integration hold, which indicates that the estimates are not driven by adverse preferences for strangers.[14]

Table 4 Market integration and fairness norms – Tobit males only

	Dictator Game			Ultimatum Game			
	(1) Villager	(2) Trader	(3) Trader	(4) Offer Villager	(5) Offer Trader	(6) Offer Trader	(7) Min. Accepted
Market Integration	-5.20	1.51	4.74	-4.93	-7.66**	-4.74*	-4.77
	(4.99)	(4.83)	(3.44)	(3.54)	(3.69)	(2.41)	(14.28)
DG to villager			0.73***				
			(0.10)				
UG to villager						0.65***	
						(0.08)	
HH + village controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
District FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes

[14] We do not present the 2SLS results here. However, the effect of market integration on UG offers to traders remains negative (the equivalent to column 6 of Table 4), yet only at *p=0.12*, which could be related to the reduced sample size due to missing observations (n=98) and hence insufficient statistical power.

Adjusted R^2	0.015	0.020	0.082	0.023	0.026	0.087	0.013
Observations	112	112	112	112	112	112	93

Standard errors in parentheses and clustered at the village level. Included household controls: assets, age and literacy household head, household size, share of protestants in the community, distance to next town, community size. $^*p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$

As additional robustness check, we test whether the results are sensitive to the way we measure market integration. Alternative indicators to the calorie based approach include the frequency of market visits and whether households sell market goods. However, these indicators say little about the depth and salience of market integration and are thus only very crude measures of market integration. Alternatively, the share of villagers working outside of the community, crops grown for the external market and food produced within the community have been used in the literature (Cárdenas et al., 2017), but are difficult to implement with the data at hand. For an alternative but still nuanced reflection of the level of market integration, we use household's market expenditures as share of the total consumption expenditures as indicator. The Tobit estimation results are presented in Table 5. The coefficients only change marginally and the negative effect of market integration particularly on UG offers remains. The results also hold using 2SLS models with the monetary definition of market integration. In the 2SLS model, the effect of market integration is negative and significant on the 5% level for UG offers to traders after controlling for UG offers to villagers (results not reported, but available on request).

The sensitivity analysis supports the main results suggesting a negative effect of market integration on UG offers particularly when directed to a professional trader. This does not seem to be driven by differences in preferences for "strangers" versus "community members" as the effects hold for male participants who are not engaging in market trade and the results hold after using monetary instead of caloric market integration.

Table 5 Market integration and fairness norms –share of expenditures on consumption (Tobit)

	Dictator Game			Ultimatum Game			
	(1) Villager	(2) Trader	(3) Trader	(4) Offer Villager	(5) Offer Trader	(6) Offer Trader	(7) Min. Accepted
Market Integration	-7.25** (3.12)	-2.84 (4.25)	2.61 (3.65)	-8.36*** (2.40)	-9.64*** (2.70)	-3.92** (1.94)	3.32 (6.92)
DG to villager			0.75*** (0.08)				
UG to villager						0.74*** (0.07)	
HH + village controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
District FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.004	0.013	0.078	0.012	0.011	0.074	0.008
Observations	237	237	237	237	237	237	217

Standard errors in parentheses (clustered at the village level). Included household controls: assets, sex respondent, age and literacy household head, household size, share of protestants in the community, distance to next town, community size. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

6.   Conclusion

This study presents empirical evidence on the relation between market integration and pro-social behaviour among rural households in Liberia. Our key contribution is that we provide new evidence that contrary to popular belief, markets do not crowd out norms of generosity or fairness, or lead to negative externalities of some sort by changing norms and preferences but rather strengthen strategic considerations and behaviour, at least when tested in an experimental set-up like ours.

Participants that are more integrated into the market discriminate stronger between peer villagers and traders in the UG, which could be interpreted as being more confident in staying close to the economic rational offer. That is, people who are more integrated into markets seem to realise that the receiving party's best response would be to act economically rational and to accept the lowest non-zero amount offered. Anticipating this, they offer particularly less to traders than those with less market experience. Yet while the results seem to suggest that market integration strengthens strategic considerations, it does not affect altruistic motives.

Why does the effect not hold for the DG? This is possibly due to the conceptual differences between both games. While DG is a game of generosity without

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uncertainty, the UG involves an additional strategic component in which proposers have to form expectations on the responder's behaviour. Thus the game appears more like a strategic choice where one tries to maximise earnings from the game, which may overlay altruistic motives (Charness & Gneezy, 2008). Market integrated participants are more familiar with such strategic choices and may thus be primed stronger towards economically rational behaviour, which could explain the differences in UG offers towards traders vis-à-vis fellow villagers. This does not seem to be the result of self-selection into markets, but rather supports the argument that economical rationality is a social, not an individual construct that can be stimulated by market experience (List & Millimet, 2008).

Yet one may argue that increased levels of market integration would also affect acceptance rates, which we do not find. One obvious explanation is that we have a relatively large proportion (31%) of "confused" responders, switching back and forth between accepting and rejecting offers as offers increase. While we also estimated models without these responses and used the consistency of responses as dependent variable, the null result remains, now possibly because of insufficient power to pick up effects. Also, it may be due to the fact that strategic considerations in the UG are here limited to the decision of the proposer. With the strategy method, responders do not need to anticipate senders' behaviour hence eliminating the strategic element for responders. While speculative, this would be consistent with the idea that market integration does not impact negatively on norms of fairness but rather increases strategic decision-making in a context deemed appropriate for this.

Yet, some potential limitations of the econometric analysis need to be borne in mind: First, the estimations are based on a relatively small sample, which limits the statistical power of our models. In order to address endogeneity concerns of market

integration, we estimated 2SLS models similar to previous empirical work on the effects of markets and trust (Siziba & Bulte, 2012). We use a set of plausible instruments, though not as strong as one would wish for, hence our findings in the 2SLS models are less robust and not precisely estimated. Second, our data does not allow us to perfectly separate in- and outgroup preferences from preferences towards traders. We exploit the traditional role of women as market actors in the region to mitigate concerns for these confounding factors and find no support for the idea that it is in-out group preferences that drive our results. This seems to suggest that it is not only the experience of market trade that induces more economically rational behaviour but the consistent finding of the effect of market integration on male participants may also point at their internal household bargaining power regarding budget allocation decisions, or due to spillover effects related to market experience of female household members. As traders are females, gender effects could confound the male-only results, however, we don't see reasons to believe that possible gender effects in the male-only sample are related with the level of market integration. Ideally, one would add a group of real strangers that are not traders to the sample to validate the findings.

To what extent are our results generalisable? While our overall findings from the behavioural games are broadly consistent with results from other settings, we have less to say about how these results are mediated by levels of market integration in environments (very) different from our Liberian context. At the same time, there are a number of market characteristics that pertain to many African countries, including the predominant role of women in market activities, and that true autarky is rare, hence it is not inconceivable that our findings have value beyond Liberia.

Finally, we believe our results will promote future work on examining the role of markets in changing pro-social preferences, for example in the context of evaluating the impact of (rural) market development programmes to test some of the postulated channels above and, in a second step, examine the ultimate consequences for development outcomes.

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Annex

Table A6 Working-Leser model on budget share for food expenditures

	Share Food Expenditures
Ln Expenditures	0.09^{***}
	(0.01)
Children <5	-0.00
	(0.01)
Children <12	-0.01^{*}
	(0.01)
Children <18	0.04^{**}
	(0.01)
Age HH head	-0.004^{***}
	(0.00)
Household Size	0.00
	(0.00)
Employed HH member	0.02
	(0.02)
Ln Price/kcal	0.01
	(0.02)
Province= Todee	-0.04
	(0.03)
Province= Kakata	-0.08^{**}
	(0.03)
Observations	1036
R^2	0.144

Standard errors in parentheses
$^{*} p < 0.1$, $^{**} p < 0.05$, $^{***} p < 0.001$

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