

Market Integration and the Evolution of Trust: Evidence from West Africa*

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Abstract

We examine the impact of increased market integration on various measures of trust, including personalized trust and trust in complete strangers. Theory suggests trust fosters economic development via reduced transaction costs and increased specialisation. A virtuous cycle materializes if increased specialisation, via increased market integration, also fosters trust. Using a comprehensive survey of households in West Africa in the early stages of market integration, the Kano-Katsina-Maradi region in Northern Nigeria and Niger, we identify a negative and causal relationship between market integration and trust. We explore whether and how the relationship depends on the quality of formal institutions in the region, and we find that increased market integration only decreases trust if local institutional quality is low. These results suggest trust and formal institutions are complements in early stages of development—not substitutes.

Keywords: trust, market integration, poverty trap.

JEL Codes: D02, O17, Z13

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1. Introduction

Economic analyses have revealed a positive correlation between trust levels and economic performance (e.g. Knack and Keefer 1997). Trust lowers transaction costs, which facilitates trade and invites static and dynamic efficiency gains. “Virtually every commercial transaction has within itself an element of trust, certainly any transaction conducted over a period of time. It can be plausibly argued that much of the economic backwardness in the world can be explained by the lack of mutual confidence” (Arrow, 1972: 357). For trade to flourish and extend beyond “flea market” barter or cash-and-carry modes of exchange, moral obligations of fairness and reciprocity should extend to anonymous others. While fairness and reciprocity norms extending to kith and kin may regulate exchange in traditional societies based on self-provision, generalized morality and trust should develop and spread for broader (and more beneficial) patterns of trade to take off (Platteau 1994, Fafchamps 2011, Tu and Bulte 2011). In light of this observation it is no surprise that searching for the determinants of trust has emerged as an important research topic in the social sciences.

The role of market integration as a determinant (rather than a result) of trust, fairness and reciprocity has received some attention in recent years (e.g., Tabellini 2008, Henrich et al. 2010, Siziba and Bulte 2012). The breadth and intensity of market exchange varies across societies, and has varied over time within societies. The transition from subsistence farming and local, personalised exchange to specialisation and long-distance, impersonal exchange is widely regarded as an essential component of overall economic development (e.g. Fafchamps

2011). This process of market integration implies important differences in the social structure of societies. For example, Kumar and Matsusaka (2009) emphasize the difference between “village social capital” and “market social capital.” Village social capital typifies rural economies in poor countries, and takes the form of kinship ties, patron-client relations, and repeated personalised exchange. In contrast, market social capital involves access to and knowledge about third-party punishment, including courts, auditors, credit ratings, and so on. To reap the potential benefits from specialisation and trade, communities should adjust the composition of their (structural) social capital stocks—divesting in village capital and investing in market capital.¹

However, the implications of broader and deeper integration into markets may be more fundamental than this, and extend to the *cognitive* domain of social capital as well – affecting levels of trust and trustworthiness in society. Using an RCT design, Al-Ubaydli et al. (2013) find that ‘priming’ experiment participants for market participation positively affects expectations about the trustworthiness of others, and increases amounts sent in a trust game. This is consistent with evidence from ‘the field.’ Based on an extensive study that involved the collection of experimental data across various societies, Henrich et al. (2010) propose that “market norms may have evolved as part of an overall process of societal evolution to sustain mutually beneficial exchanges in contexts where established social relations (for example, kin, reciprocity, status) were insufficient” (p.1480). Hence, market integration “involved the selective spread of those norms and institutions that best facilitated successful exchange...” (p.1484). If so, market integration speaks to the puzzle of the origins of human prosociality. Behavioral evidence and observational data suggest most people display fair, trusting and cooperative behaviour – even with strangers and in one-shot

¹ Theoretical models have probed such investment trajectories and emphasized that the desired transformation may not occur in the presence of strategic complementarities (e.g., Kranton 1996, Kumar and Matsusaka 2009). If so, a poverty trap might eventuate.

encounters. Such behavior is arguably supported by norms of fairness and trust, sustained by internalization, punishment, or signalling and reputation effects—begging the question about the origins and evolution of such norms. If market integration fosters trust through spreading these norms and if trust, in turn, promotes market integration, then trade and trust are *complements* in development. Supporting this important thesis, Henrich et al. (2004, 2010) document a strong and robust positive correlation between experimental measures of trust and fairness on the one hand, and an objective measure of market integration on the other hand.

The final word about the complex inter-relationship between trust and trade, however, remains to be written. The evidence provided by Henrich et al. (2004, 2010) is based on cross-sectional data collected in 15 societies. The sample of societies included in this study is (intentionally) diverse, implying that the risk of omitted variables looms large. Correlation between trust and market integration thus need not imply any *causal* relationship between these variables. Cross-section studies may also gloss over potentially considerable within-country heterogeneity of various relevant variables, which renders interpretation difficult and may produce biased estimation results (Imbens and Angrist 1994).

For these reasons it seems prudent to complement the above analyses by probing the relation between market integration and trust using data from a large and culturally relatively homogenous sample of households in Northern Nigeria and Niger (see below). We seek to extend the pioneering work of Henrich et al. (2004, 2010) by moving beyond correlations to establish the causal effect of market integration on trust. We identify *exogenous variation* in market integration, and use a system's approach to statistically analyse how trade affects trust. Insight in this particular causal effect allows us to evaluate the thesis that market integration and trust are complements—mutually reinforcing each other in a co-evolutionary process of (economic) development. From a normative (or policy) perspective, this is

relevant information. If trade and trust are complements in development, a short-term exogenous “shock” or policy intervention could place autarchic societies on a self-propelling trajectory of increasing trust and market integration. From a positive perspective, this raises the question why not all communities are characterized by high trust and high market integration.

The objective of this paper is to analyse the causal effect of market integration on various survey-based measures of trust in a society at an early level of economic development and characterized by relatively low levels of trade. We distinguish between trust in fellow villagers (*personalized* trust) and trust in strangers (*generalized* trust), and are especially interested in assessing whether market integration fosters trust in strangers. Our main result is that trade does *not* invite such trust—the opposite appears true for our sample of African villagers. We typically find that, if anything, higher levels of market integration reduce the various types of trust, although this causal effect is only statistically significant in communities with below-average quality institutions. Hence, increased market integration does not necessarily put villages on a path to economic prosperity—formal institutions play an important mediating role. We speculate this may explain the persistence of low levels of market integration and trust in large pockets of the developing world.

This paper is organized as follows. In section 2 we introduce our data and outline our identification strategy. Section 3 contains our results – extensive series of OLS, probit, and 2SLS estimates. We also present some preliminary and tentative results sketching the mechanism linking market integration to trust. In section 4 we discuss our main findings, placing them into the wider context of trade and trust, and draw some conclusions.

2. Data

We use data collected in Northern Nigeria and Niger (the “Kano-Katsina-Maradi region”) as part of the so-called Sub-Saharan African Challenge Program (see FARA 2009 for details).² Ten households per village were sampled in 180 villages. Survey data were collected during two waves: a first wave in 2008, which included detailed data about expenditures (allowing us to construct household-level proxies of market integration), and a second wave in 2010, which included several questions about personalized and generalized trust. There are no trust data for 2008, and no detailed expenditure data for 2010, so there is no scope for a full-fledged panel analysis. Instead, we will merge the 2008 and 2010 waves to construct one cross-section dataset, and analyze the complex interrelationships between market integration and trust via an instrumental variables strategy (see below).

<< *Insert Table 1 about here* >>

The most important data are summarized in Table 1. From the original data set of 1800 observations we omitted those households which we do not observe in both waves, and we also omitted those with total expenditures in the 99th expenditures percentile because we suspect some of these are plagued by either measurement error or wrong data entry. As a result, the largest sample available for our analysis includes 1633 households—but we still have many missing observations for some of the variables of interest. The summary statistics of this data set are presented under Sample 1 in Table 1.

Panel A of Table 1 contains 3 complementary trust measures, based on variations of the conventional survey questions as used in the World Value Survey. One question asked was the following: “Generally speaking would you say that most people can be trusted, yes or no?” This first question seeks to measure somebody’s overall or general trust attitude, capturing a combination of “personalized and generalized trust.” Next, respondents were

² Of the three study regions included in this Challenge Programme, detailed household expenditure data are available only for the Kano-Katsina-Maradi region, and hence we could not use data for the other two regions.

asked to state, from a range from 1 (very poor) to 5 (very good), how they would describe their trust in people from the same village, and also their trust in complete strangers. Our second trust measure thus focuses on (within-village) personalized and repeated exchange and serves as our proxy of “personalized trust”, and our third trust measure captures “generalized trust” as it is most closely related to the type of trust that fosters anonymous market exchange. Since the first trust variable was collected as a binary variable (“trust or no trust in most people”), we also converted the other two (categorical) trust variables (regarding other people in the same village, and regarding complete strangers) into binary ones. A trust score of 4 or 5 on the 5-point scale is transformed into a score of 1, and a categorical score of 1, 2 or 3 is coded as zero. In our sample trust in complete strangers is lower than trust in people from the same village whereas level of general trust is in between these two.

Panel B in Table 1 contains our market integration proxies. We consider three variables: total expenditures, food expenditures and non-food expenditures (including expenditures on repairs, education, health and clothing). To guarantee that these variables indeed capture market integration, and not wealth or income, we control in our regressions for wealth, total (food) consumption in the regression models (and income in robustness checks). We also control for household size, so our expenditure data do not pick up that some households are larger than others. Since our expenditure data are skewed, we take their natural logarithm in what follows.³

These, and other, control variables are summarized in Panel C of Table 1. FCS measures total food consumption within a certain time period (a week), capturing both subsistence production and food purchased on the market. The “durable good” variable is intended to pick up ownership of assets, and hence is a proxy of wealth. The other variables

³ Because some households are subsistence farmers with zero expenditures, we construct the expenditure variables by taking the natural logarithm of 1 + “expenditures in 1000s of international dollars” rather than by taking the logarithm of “expenditures in 1000s of international dollars” directly.

are included in some of the analyses below to control for factors known to be correlated with trust, and should shrink the confidence intervals associated with our coefficients of interest. These controls include the age, gender and religious group membership status of the household head, and whether or not a mobile phone network and/or an agricultural extension policy⁴ are in place in the village.

Panel D of Table 1 summarizes the instruments we use to identify exogenous variation in potentially endogenous regressors of interest—market integration. The instruments are the number of markets within a 50 km radius, and the number of (local) markets in the village in which the household resides. We speculate the presence of (local) markets lowers transaction costs and encourages market exchange, but does not affect extant trust levels other than via market integration. Below we provide the results of specific tests to support these assumptions. We also believe it is reasonable to assume that the presence of markets is exogenous to trust attitudes of individual households.

As Table 1 documents, there are missing observations for quite a few variables of interest among the 1633 households in Sample 1. These variables include trust measures, expenditure proxies and control variables. To be able to compare our estimates for different trust measures, market integration proxies and regression models within the same sample, we report main estimation results using a subsample of 1177 households. The summary statistics of these households are presented under Sample 2 in Table 1. According to the relevant tests, robustness checks and instrumental variable regression results (see robustness related discussion below)⁵, our estimates do not change when using 1633 or 1177 households.

⁴ Agricultural extension policies include introduction of improved variety crops, education for the application of chemical fertilizers and pesticide application and soil and water conservation techniques via extension agents who works for government officials or NGOs active in the region or in cooperation with them.

⁵ We have tested whether there are systematic differences between complete and incomplete questionnaires in terms of trust measures. We regress a dummy variable (equal to 1 if at least one of the trust measures is missing for a household) on the total expenditure and control variables by using probit estimation technique and robust

3. Does market integration foster trust?

Does increased market integration affect the likelihood of trusting others? We estimate the following model:

$$(1) \quad Y_{iv} = \gamma_0 + \gamma_1 E_{iv} + X'_{iv} \beta + \varepsilon_{iv},$$

where i and v denote household i and village v , ε_{iv} denotes an error term, X_{iv} refers to a vector of household controls, and E_{iv} measures the extent to which the household is integrated in markets. Y_{iv} measures trust (personalized or generalized trust), and since this variable is a dummy we commence by estimating (1) using a probit specification. In all models we cluster standard errors at the village level. The thesis that market integration fosters trust is supported if $\gamma_1 > 0$.

As stated above, we have three different trust measures (a general trust measure, a measure capturing personalized trust, and a measure reflecting trust in complete strangers), and we have three different indicators of market integration (total expenditures, and expenditures of food and on non-food items). This gives rise to 9 different regression models, and the results are presented in Table 2. To facilitate interpretation, note that we converted the coefficients of the Probit analyses into marginal effects.

<<Insert Table 2 about here>>

Before turning to the coefficients on the key variables of interest, our three different measures of market integration, note that all other covariates perform similarly across all nine specifications. Importantly, household size, total assets and food consumption score (FCS)

standard errors clustered at village level. We find that membership to religious group (-) and one of the province fixed effects enters significantly. Among the estimations religiosity is positively correlated only with general trust (See Table-2). We also tested whether that estimation result change according to religiosity of the households and find that there is no significant difference. For this reason we believe that attrition due to missing trust measures does not bias our results. Additionally, our main instrument is missing for only one village and if there is any selection bias due to attrition of households in OLS and Probit estimates, this will be corrected in 2SLS procedure assuming it is exogenous.

are included to control for the amount of expenditures (on food and/or on non-food items) that are associated with the number of mouths to be fed, food intake, and wealth – leaving the expenditure variables to capture the impact of market integration on trust. FCS is positive and significant in all 9 regression models, while household size is never significantly different from zero. The performance of the assets variable is more unequal; it is significant (at the 5 or 10% level) in explaining general trust, but it is not significantly correlated to personalized trust or generalized trust. Most importantly, regarding the correlation between our measures of market integration and the three types of trust, the results are very robust – we invariably find that households that are better integrated in the local economy, tend to place less trust in both people from the same village and in complete strangers. The same negative correlation results when using general trust as our dependent variable – we find $\gamma_1 < 0$ in all nine models.

The results in Table 2 are obtained using standard probit regression analysis, which pick up correlations, but not necessarily causal relations. To circumvent the quite stringent assumptions underlying IVprobit (especially regarding joint normality of the error terms⁶; Wooldridge 2002), we proceed as follows. We first re-estimate the nine models presented in Table 2 using OLS, and check whether the coefficients obtained are qualitatively similar to the ones obtained using Probit. Next, we run 2SLS models for all nine specifications to allow for causal interpretations of the coefficients obtained. The 2SLS model we employ is specified as follows. We “predict” E_{iv} using the following equation:

$$(2) \quad E_{iv} = \alpha_0 + \alpha_1 M_{iv} + X'_{iv} \alpha_2 + \mu_{iv},$$

where μ_{iv} denotes the error term and M is a vector of excluded instruments consisting of the number of markets in village, and also of the number of markets within a 50 km radius. As the number of markets within village is not a strong predictor of one of our measures of

⁶ In IVprobit, our first stage error term might violate the normality assumption because both the dependent and instrumental variables are censored at zero as we use $\log(1+x)$ of both (see above).

market integration, food expenditure, we report our main estimates from the estimations where we use number of markets within 50km as the only instrument. In robustness checks, we estimate same models with both instruments and report consistency of our estimates. Using (2) we calculate predicted values of E_{iv} , which we subsequently use in (1).

We thus re-ran the same 9 specifications that were used in the Probit regressions (as already presented in Table 2) and also use OLS and 2SLS. We present the key results of all 27 regressions in Table 3. To economize on space we do not report the full outcomes of all these regression models – instead, Table 3 only presents the 27 estimates of γ_1 , the coefficient on the relevant measure of market integration. The full regression results of the 2SLS models are presented in Table A1 in the Appendix, while the exact regression results of the OLS models are available upon request.⁷ Our main result is that, in contrast to the theoretical prediction that $\gamma_1 > 0$ and despite the fact that we are controlling for key factors like income, wealth and household size, we find that all 27 estimates are *negative* and significant. While the OLS and Probit coefficients are of roughly equal size (recall that we converted the Probit coefficients into marginal effects), the 2SLS coefficients are considerably larger. This may reflect that measurement errors in market integration indicators are large, or that the Probit and OLS correlations pick up a significant opposite effect (i.e., trust promoting trade).⁸ The estimation results of the first stage of our 2SLS models, including various test statistics, support our instrumentation strategy. Specifically, the F-values of the excluded instrument exceed 10 in all regressions (see Table A1 for details).

<< *Insert Table 3 about here* >>

⁷ The coefficients of the OLS regressions on all the covariates other than γ_1 , are very similar to the coefficients obtained in the second stage of the 2SLS models. Including these here would thus not provide any useful new insights.

⁸ Unfortunately, the data do not permit us to usefully explore this reverse relationship. As stated in section 2, the expenditure data were collected in the first wave of data collection in 2008, while the trust data were elicited in the second wave, in 2010. While the timing of data collection strengthens our beliefs that the relationship uncovered in the 2SLS regressions are indeed causal, a similar analysis of the reverse relationship would only be reliable if trust would be time-invariant.

When comparing the results for people from the same village and strangers, we observe that the eroding effect of market integration on trust is more pronounced for strangers than for fellow villagers. Both the correlations and the 2SLS causal estimates are about twice as large for the generalized trust model as for the personalized trust model. While this is intuitive, as trade may intensify interaction with strangers and enlarge the probability of being cheated or disappointed by the behavior of trading partners, it is surprising to note that market integration also reduces personalized trust. Perhaps this reflects the gradual substitution of informal institutions and sharing arrangements for formal, market-mediated ones (cf. Ahlerup et al. 2009 for a theoretical analysis), setting in motion a process of erosion of village social capital.

We thus find that market integration (proxied by expenditures, controlling for income and food consumption) is associated with *lower* levels of general trust, personalized trust, and generalized trust. The negative coefficients in Table 3 are consistent with results by Siziba and Bulte (2012),⁹ but opposite to those found by Henrich et al. (2010). The latter may be caused by the fact that Henrich et al. derive their trust variable from (incentive-compatible) experiments, rather than survey questions. However, while this methodological difference will undoubtedly affect point estimates (estimated “levels of trust”) it is hard to see how it would reverse the comparative statics with respect to market integration. Next, while it may be easy to reconcile our 2SLS results with their OLS estimates – their correlations may pick up other dimensions of the complex interrelationship between trade and trust – it is puzzling that market integration enters negatively in our Probit and OLS models. Perhaps the sign reversal is due to differences in the way we operationalize market integration? Henrich et al. (2010) base their study on the percentage of calories consumed that is purchased on the

⁹ Siziba and Bulte (2012) use an RCT design to document a negative relation between market integration and stated trust among a sample of farmers in Mozambique. In a related vein (albeit not focusing on trust directly), Jakiela (2011) uses effort games in Kenya, and finds that proximity to markets decrease the level of offers in dictator games.

market. Arguably our measure of food expenditures is comparable to this variable. However, controlling for the overall level of food consumption (the variable Food Consumption Score, based on the nutritional value of various food items consumed over a period of time – regardless of whether they are home-produced or purchased), the food expenditures variable also consistently enters with a negative sign. The same is true for non-food expenditures, so we do not believe our results are driven by specific features of food as a consumption item.

We followed several routes to probe the robustness of these findings. For example, we have estimated “parsimonious models” without controls, and also gradually added different combinations of control variables (gradually reducing sample size). Our main results, in particular those for general and generalized trust, go through for such more parsimonious specifications and larger sample sizes.¹⁰ We also estimated ordered Probit models, treating generalized and personalized trust as categorical variables rather than binary ones. This generally does not affect the qualitative nature of our results.¹¹ Similarly, we find that our results are robust to including alternative specifications of income. While monetary income measures are available for only a rather small sub-sample of our respondents, all results go through when focusing on this subsample and controlling for income. We have also re-estimated the various 2SLS models with both excluded instruments (rather than one), and the p-values of Hansen’s J test consistently exceed 0.10 so we cannot reject the exogeneity of our instruments. Additionally, we have estimated all models using the LIML estimation technique (producing consistent outcomes when instruments are “weak”) and estimates are still robust with former estimates. We then also estimated a series of 2SLS

¹⁰ As an extra robustness test we also estimated a general model and replaced all missing values of the explanatory variables by zeros, combined with inserting dummies for these missing observations. This does not affect our results.

¹¹ In ordered probit estimations we find statistically significant and negative estimates for total expenditure and non-food expenditure variables. When measuring market integration with food expenditures, we find that the associated coefficient is again negative, but fails to be statistically significant at the 10% or better.

models at the village level and IV Probit models to test the robustness of the 2SLS outcomes. We found, again, that all results summarized in Tables 2 and 3 are robust to such extensions. Details of all results are available upon request.

We find no support for a “virtuous cycle” between market integration and trust, as market integration decreases trust for the average household. This analysis is based on the assumption that the relationship between market integration and trust is orthogonal to local institutional quality – which may not be the case in practice. To explore the role of instrumental quality as a mediating factor, we hypothesize that increased market integration reduces trust because not all market transactions are completed truthfully and faithfully. We test this by analysing whether high-quality local institutions attenuate the negative causal effect of market integration on trust. If households can resort to arbitration by formal institutions in case of trade conflicts, they are less likely to be exploited in the trade relationship. If so, faith in trading partners may not erode as fast as in regions where households cannot resort to formal institutions. We obtain a proxy for institutional quality by calculating, for every household, the average level of trust of co-villagers in the local government (another survey question). While one’s own trust in local government may be correlated with trust attitudes to fellow villagers or strangers, the average trust level of co-villagers is arguably exogenous to own trust. We construct an institutional quality variable that takes on a value between 1 and 5, and subsequently turn this into a binary variable by assuming that institutional quality is high (low) if average trust of co-villagers is 3 or higher (smaller than 3).¹² The 2SLS results, for each of the two subgroups, are presented in Table 4, where we again instrument for market integration by the number of markets within a 50km distance.

¹² For the definition and descriptive statistics of the institutional quality variable, see Panel E in Table 1. We exclude the villages where trust in local government officials reported by less than 4 households, since such small numbers of villagers likely produces a very noisy measure of the quality of institutions. This explains why these models are based on a slightly smaller sample.

<<Insert Table 4 about here>>

The results are robust and interesting. While the coefficient on the predicted level of market integration continues to be negative and significant in villages with low (perceived) institutional quality, the relationship vanishes in villages with high institutional quality. We thus find support for a poverty trap mediated by formal institutions: villages are locked into a low trust, low market integration situation, unless the quality of local institutions is sufficiently good.

4. Discussion and conclusions

We used data on 1633 households in Niger and Northern Nigeria to test whether market integration fosters trust. If trade and trust are complements in development, policy interventions that increase either trust or market integration would put autarchic societies on a “virtuous” trajectory of increasing prosperity and trust. We seek to extend ground-breaking work by Henrich et al. (2010) by focusing on within-country variation in market integration and trust, and by identifying exogenous variation in market integration (via an instrumental variables approach). Using three measures of market integration (expenditures on food, expenditures on non-food items and expenditures on both) and controlling for wealth and food intake, we find that increased market integration reduces trust.

Closer inspection reveals this effect is entirely driven by villages with low-quality local institutions. In other words, the trust-eroding effect of market integration is mediated by the quality of local institutions, and virtuous cycles between trade and trust may exist—but only if the quality of institutions is sufficient high. We believe this has important implications for policy makers. Specifically, in a context of “low institutional quality” it will be difficult to kick-start processes of increasing trade and trust. Improving the quality of

local governance and institutions, or building local confidence therein, seems a pre-condition for virtuous cycles to emerge.

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Tables:

Table 1: Variable definitions and descriptive statistics

Variables	Definitions	Sample 1				Sample 2			
		count	mean	min	max	count	mean	min	max
<i>A. Trust Variables</i>									
Trust	equals 1 if someone generally trusts others, 0 otherwise	1415	0.60	0	1	1177	0.62	0	1
Trust in people from same village	equals 1 if someone rates his or her trust in people from same village above 3 in categorical question (1-no trust, 5-complete trust), 0 otherwise	1531	0.82	0	1	1159	0.83	0	1
Trust in complete strangers	equals 1 if someone rates his or her trust in complete strangers above 3 in categorical question (1-no trust, 5-complete trust)	1427	0.32	0	1	1081	0.34	0	1
<i>B. Expenditure variables</i>									
Total expenditure	Log (1+sum of food expenditure and non-food expenditure [1000 international dollars])	1521	2.27	0	5.38	1177	2.22	0.064	5.38
Food expenditure	Log (1+ annual food expenditure of household [1000 international dollars])	1521	0.826	0	4.20	1177	0.80	0	4.20
Non-food expenditure	Log (1+ total of annual cloth, education, repairs, health, expenditure of household, [1000 international dollar])	1549	2.10	0	5.25	1177	2.05	0	5.25
<i>C. Control variables</i>									
FCS	Food consumption score, weekly.	1567	62.38	2.92	108.50	1177	62.9	2.92	108.5
Income*	log (annual income of household, 2010, in current US dollars)	1091	8.07	-3.37	12.22	793	8.07	-3.28	12.11
Durable Goods	Number of different types of durable assets owned by household	1567	4.14	0	10	1177	4.13	0	10
Male	equals 1 if household head is male, 0 otherwise	1631	0.96	0	1	1177	0.95	0	1
Household size	number of members of the household	1618	13.17	1	110	1177	12.74	1	102
Age	age of household head	1626	49.60	18	100	1177	49.5	20	100
Education	equals 1 if household head has graduated from primary school, 0 otherwise	1589	0.20	0	1	1177	0.19	0	1
Religious group	equals 1 if a member of household is a member of a religious group or cultural group, 0 otherwise	1487	0.43	0	1	1177	0.43	0	1
Extension policy	equals 1 if household lives in a village where extension policies have been applied before 2008, 0 otherwise	1633	0.33	0	1	1177	0.32	0	1
Mobile network	equals 1 if there is mobile network coverage in the village household lives in, 0 otherwise	1633	0.92	0	1	1177	0.92	0	1
<i>D. Instruments</i>									
Markets within 50km radius	log(1+Number of output markets within 50km radius of the village)	1623	1.77	0	4.39	1177	1.71	0	4.39
Markets within village	log(1+ Number of output markets within the village)	1604	0.22	0	1.79	1162	0.20	0	1.79
<i>E. Institutional Quality</i>									
Others trust in local government	equals to 1 for a household if average trust in local government officials of other people living in the same village is higher than 3, 0 otherwise	1357	0.55	0	1	1112	0.59	0	1

* Income variable was given in current U.S dollars for some of the households in the survey therefore stated income levels in local currency also turned into current U.S dollar not into international dollars.)

Table 2: Market integration and trust-Full specifications for Probit estimations

VARIABLES	General Trust	General Trust	General Trust	Trust in people from same village	Trust in people from same village	Trust in people from same village	Trust in complete strangers	Trust in complete strangers	Trust in complete strangers
Total Expenditure	-0.0652*** (0.0167)			-0.0353*** (0.0122)			-0.0567*** (0.0171)		
Food Expenditure		-0.0576*** (0.0203)			-0.0267* (0.0152)			-0.0370* (0.0195)	
Non-food expenditure			-0.0633*** (0.0164)			-0.0342*** (0.0121)			-0.0535*** (0.0166)
FCS	0.00182** (0.0009)	0.00195** (0.0009)	0.00179** (0.0009)	0.00236*** (0.0005)	0.00241*** (0.0005)	0.00234*** (0.0005)	0.00253*** (0.0009)	0.00267*** (0.0009)	0.00251*** (0.0009)
Assets	0.0203** (0.0085)	0.0160* (0.0085)	0.0207** (0.0085)	0.00628 (0.0075)	0.00384 (0.0074)	0.00652 (0.0075)	-0.000398 (0.0085)	-0.00471 (0.0081)	-0.000139 (0.0085)
Gender	0.161** (0.0642)	0.145** (0.0634)	0.160** (0.0638)	0.0326 (0.0436)	0.0235 (0.0439)	0.0312 (0.0434)	-0.0330 (0.0720)	-0.0515 (0.0734)	-0.0367 (0.0720)
Age	0.000436 (0.0012)	0.000185 (0.0012)	0.000400 (0.0012)	-0.000847 (0.0008)	-0.000954 (0.0009)	-0.000879 (0.0008)	1.09e-05 (0.0012)	-0.000280 (0.0012)	-1.94e-05 (0.0012)
Education	0.0230 (0.0372)	0.0195 (0.0374)	0.0213 (0.0370)	-0.0355 (0.0316)	-0.0365 (0.0325)	-0.0371 (0.0317)	0.0111 (0.0430)	0.00487 (0.0426)	0.0100 (0.0432)
Household Size	0.00213 (0.0017)	0.00238 (0.0017)	0.00198 (0.0017)	0.00130 (0.0014)	0.00128 (0.0014)	0.00122 (0.0014)	0.00138 (0.0017)	0.00165 (0.0018)	0.00127 (0.0017)
Religious group membership	0.0771** (0.0315)	0.0782** (0.0313)	0.0793** (0.0316)	0.00780 (0.0248)	0.0101 (0.0251)	0.00870 (0.0247)	0.0255 (0.0327)	0.0297 (0.0327)	0.0279 (0.0328)
Extension policy	-0.0768** (0.0364)	-0.0735** (0.0367)	-0.0786** (0.0364)	-0.0400 (0.0257)	-0.0384 (0.0259)	-0.0408 (0.0257)	-0.00931 (0.0349)	-0.00695 (0.0357)	-0.0106 (0.0349)
Mobile Network	0.0198 (0.0613)	0.00141 (0.0632)	0.0183 (0.0613)	0.0294 (0.0441)	0.0146 (0.0444)	0.0293 (0.0440)	-0.0667 (0.0489)	-0.0880 (0.0539)	-0.0691 (0.0493)
Observations	1177	1177	1177	1159	1159	1159	1081	1081	1081
Method	Probit	Probit	Probit	Probit	Probit	Probit	Probit	Probit	Probit

Robust standard errors clustered at village level are in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Coefficients reflect marginal effects at the variable's mean. Province fixed effects are added to the model but not reported in the table.

Table 3: The coefficients of Market Integration in 27 regression models explaining Trust

Market integration indicators	General Trust			Trust in people from same village			Trust in complete strangers		
	Probit	OLS	2SLS	Probit	OLS	2SLS	Probit	OLS	2SLS
Total Expenditure	-0.0652*** (0.0167) [1177]	-0.0656*** (0.0172) [1177]	-0.408*** (0.122) [1177]	-0.0353*** (0.0122) [1159]	-0.0331** (0.0132) [1159]	-0.122* (0.0656) [1159]	-0.0567*** (0.0161) [1081]	-0.0558*** (0.0162) [1081]	-0.206*** (0.0776) [1081]
Food Expenditure	-0.0576*** (0.0203) [1177]	-0.0570*** (0.0209) [1177]	-0.581*** (0.164) [1177]	-0.0267* (0.0152) [1159]	-0.0261* (0.0144) [1159]	-0.172* (0.0975) [1159]	-0.0370* (0.0195) [1081]	-0.0354* (0.0184) [1081]	-0.287** (0.115) [1081]
Non-food Expenditure	-0.0633*** (0.0164) [1177]	-0.0636*** (0.0167) [1177]	-0.432*** (0.133) [1177]	-0.0342*** (0.0121) [1159]	-0.0317** (0.0130) [1159]	-0.130* (0.0699) [1159]	-0.0535*** (0.0166) [1081]	-0.0524*** (0.0158) [1081]	-0.221*** (0.0834) [1081]

Robust standard errors clustered at village level are in parentheses. *** p<0.01, ** p<0.05, * p<0.1. For probit estimations, estimates of marginal effects at mean levels are shown. We control for household heads' education, age and gender; food consumption score of the household; membership to religious or cultural group; household size; number of durable assets in the household; whether agricultural extension policies have been applied in the village; existence of mobile network in the village; province fixed effects in the estimations. In IV regressions number of markets within 50km radius of the village household resides in is used as instrument.

Table 4: Market integration and Trust: Heterogeneity with respect to institutional trust in local government

Dependent var:	(1) General Trust		(3) Trust in people from same village		(5) Trust in complete strangers	
	Others' trust in loc. gov.=0	Others' trust in loc. gov.=1	Others' trust in loc. gov.=0	Others' trust in cent. loc.=1	Others' trust in loc. gov.=0	Others' trust in loc. gov.=1
Total Expenditure	-0.430*** (0.1395)	-0.490 (0.3697)	-0.193*** (0.0671)	-0.0477 (0.1636)	-0.227*** (0.0695)	-0.104 (0.2971)
FCS	0.00206 (0.0016)	0.000539 (0.0013)	0.00154 (0.0010)	0.00219*** (0.0007)	0.00195* (0.0011)	0.00167 (0.0014)
Assets	0.0425* (0.0228)	0.0443** (0.0174)	0.0335** (0.0135)	-0.00183 (0.0097)	0.0325** (0.0133)	-0.00804 (0.0164)
Gender	0.349*** (0.1164)	0.345** (0.1669)	0.142 (0.1274)	0.0428 (0.1117)	0.165** (0.0663)	-0.102 (0.1369)
Age	0.00429 (0.0027)	0.00240 (0.0030)	0.000923 (0.0018)	-0.00192 (0.0016)	0.00106 (0.0017)	0.000321 (0.0025)
Education	0.0515 (0.0884)	0.0889 (0.0733)	-0.0410 (0.0520)	-0.0146 (0.0380)	-0.0242 (0.0512)	0.0837 (0.0760)
Household size	0.000783 (0.0031)	0.00171 (0.0025)	-0.000559 (0.0026)	0.00287** (0.0012)	-0.00208 (0.0020)	0.00493* (0.0026)
Religious group mem.	-0.0350 (0.0580)	0.0594 (0.0608)	-0.0315 (0.0414)	0.0150 (0.0334)	0.0325 (0.0495)	-0.0220 (0.0497)
Extension policy	-0.0171 (0.0764)	-0.138** (0.0585)	-0.0334 (0.0467)	-0.0532* (0.0319)	-0.000734 (0.0413)	-0.0225 (0.0513)
Mobile network	0.122 (0.0982)	0.294 (0.1812)	0.167* (0.0896)	-0.0124 (0.1061)	0.0393 (0.0600)	-0.0540 (0.1544)
Constant	0.287* (0.1542)	0.481** (0.2404)	0.583*** (0.1721)	0.725*** (0.1268)	0.0817 (0.1083)	0.513** (0.2074)
Observations	460	652	457	652	442	612
Method	2SLS	2SLS	2SLS	2SLS	2SLS	2SLS
Root mean sq. error	0.561	0.568	0.392	0.325	0.417	0.481
F-stat (Instrument)	22.17	4.763	22.15	4.763	22.39	3.896

Robust standard errors clustered at village level are in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Number of markets within 50km radius households resides in used as instrument for total expenditure. Province fixed effects are added to the model but not reported in the table.

Appendix 1: Full results of the 2SLS regressions

Table A1: The second stage regression results

VARIABLES	(1) General trust	(2) General trust	(3) General trust	(4) Trust in people from the same village	(5) Trust in people from the same village	(6) Trust in people from the same village	(7) Trust in complete strangers	(8) Trust in complete strangers	(9) Trust in complete strangers
Total Expenditure	-0.408*** (0.1220)			-0.122* (0.0656)			-0.206*** (0.0776)		
Food Expenditure		-0.581*** (0.1633)			-0.172* (0.0975)			-0.287** (0.1152)	
Nonfood Expenditure			-0.432*** (0.1333)			-0.130* (0.0699)			-0.221*** (0.0834)
FCS	0.00131 (0.0010)	0.00223* (0.0012)	0.00101 (0.0010)	0.00238*** (0.0006)	0.00267*** (0.0006)	0.00228*** (0.0006)	0.00230** (0.0010)	0.00279*** (0.0010)	0.00214*** (0.0010)
Assets	0.0414*** (0.0128)	0.0120 (0.0115)	0.0471*** (0.0142)	0.0107 (0.0082)	0.00157 (0.0076)	0.0125 (0.0088)	0.00908 (0.0104)	-0.00650 (0.0087)	0.0121 (0.0113)
Gender	0.304*** (0.0920)	0.245*** (0.0863)	0.307*** (0.0924)	0.0953 (0.0733)	0.0743 (0.0709)	0.0958 (0.0728)	0.0372 (0.0736)	0.00153 (0.0730)	0.0358 (0.0731)
Age	0.00268* (0.0016)	0.00184 (0.0016)	0.00264 (0.0016)	-0.000456 (0.0011)	-0.000719 (0.0010)	-0.000455 (0.0010)	0.000957 (0.0013)	0.000471 (0.0013)	0.000957 (0.0013)
Education	0.0711 (0.0515)	0.0740 (0.0582)	0.0644 (0.0514)	-0.0170 (0.0301)	-0.0158 (0.0320)	-0.0190 (0.0302)	0.0321 (0.0476)	0.0316 (0.0489)	0.0300 (0.0487)
Household size	0.00176 (0.0019)	0.00475** (0.0023)	0.000776 (0.0020)	0.000985 (0.0012)	0.00183 (0.0013)	0.000698 (0.0012)	0.00153 (0.0016)	0.00315 (0.0020)	0.00102 (0.0016)
Religious group mem.	0.0225 (0.0388)	-0.00181 (0.0436)	0.0320 (0.0389)	-0.00697 (0.0262)	-0.0133 (0.0281)	-0.00436 (0.0258)	0.00303 (0.0358)	-0.0102 (0.0400)	0.00760 (0.0357)
Extension policy	-0.0703 (0.0434)	-0.0318 (0.0471)	-0.0817* (0.0446)	-0.0440 (0.0281)	-0.0322 (0.0285)	-0.0471* (0.0283)	-0.00734 (0.0336)	0.0116 (0.0372)	-0.0129 (0.0334)
Mobile network	0.166** (0.0827)	0.0821 (0.0771)	0.172** (0.0849)	0.0768 (0.0577)	0.0520 (0.0493)	0.0787 (0.0585)	-0.00516 (0.0624)	-0.0539 (0.0626)	0.000460 (0.0634)
Constant	0.447*** (0.1375)	0.262** (0.1321)	0.423*** (0.1362)	0.616*** (0.0974)	0.562*** (0.1001)	0.610*** (0.0970)	0.359*** (0.1222)	0.272** (0.1210)	0.351*** (0.1208)
Observations	1,177	1,177	1,177	1,159	1,159	1,159	1,081	1,081	1,081
Method	2SLS	2SLS	2SLS	2SLS	2SLS	2SLS	2SLS	2SLS	2SLS
F stat. (Instrument)	21.45	19.27	20.25	20.44	19.87	19.05	22.34	22.01	20.18
RMSE	0.550	0.599	0.566	0.364	0.371	0.366	0.466	0.485	0.471

Robust standard errors clustered at village level are in parentheses, *** p<0.01, ** p<0.05, * p<0.1. Province fixed effects are added to the model but not reported in the table.

Table A1 -- continued
First stage regression results

VARIABLES	(1) Total Expenditure	(2) Food Expenditure	(3) Non-food Expenditure	(4) Total Expenditure	(5) Food Expenditure	(6) Non-food Expenditure	(7) Total Expenditure	(8) Food Expenditure	(9) Non-food Expenditure
Markets within 50km radius	0.292*** (0.0630)	0.205*** (0.0466)	0.275*** (0.0612)	0.291*** (0.0644)	0.206*** (0.0463)	0.273*** (0.0625)	0.307*** (0.0650)	0.221*** (0.0470)	0.287*** (0.0639)
FCS	-0.000337 (0.0012)	0.00134 (0.0010)	-0.00102 (0.0013)	-0.000562 (0.0012)	0.00129 (0.0010)	-0.00128 (0.0013)	-0.000755 (0.0013)	0.00114 (0.0011)	-0.00143 (0.0014)
Assets	0.0568*** (0.0178)	-0.0108 (0.0156)	0.0669*** (0.0175)	0.0592*** (0.0179)	-0.0109 (0.0156)	0.0694*** (0.0176)	0.0618*** (0.0184)	-0.00991 (0.0160)	0.0715*** (0.0182)
Gender	0.323*** (0.1057)	0.124 (0.0811)	0.313*** (0.1007)	0.388*** (0.1025)	0.153* (0.0789)	0.368*** (0.0982)	0.398*** (0.1224)	0.161* (0.0913)	0.365*** (0.1159)
Age	0.00552** (0.0022)	0.00244 (0.0018)	0.00513** (0.0023)	0.00561** (0.0022)	0.00245 (0.0018)	0.00527** (0.0023)	0.00548** (0.0023)	0.00224 (0.0019)	0.00511** (0.0024)
Education	0.145* (0.0851)	0.107 (0.0794)	0.122 (0.0840)	0.143 (0.0870)	0.108 (0.0814)	0.119 (0.0861)	0.154* (0.0882)	0.109 (0.0828)	0.134 (0.0872)
Household Size	0.000193 (0.0039)	0.00527* (0.0029)	-0.00210 (0.0039)	0.000543 (0.0039)	0.00529* (0.0029)	-0.00169 (0.0040)	-0.000243 (0.0039)	0.00547* (0.0030)	-0.00255 (0.0040)
Religious group membership	-0.103** (0.0517)	-0.114*** (0.0434)	-0.0750 (0.0531)	-0.110** (0.0516)	-0.115*** (0.0439)	-0.0832 (0.0531)	-0.101* (0.0542)	-0.118** (0.0463)	-0.0737 (0.0557)
Extension policy in place	0.0232 (0.0713)	0.0824 (0.0531)	-0.00447 (0.0718)	0.0116 (0.0717)	0.0765 (0.0536)	-0.0133 (0.0718)	0.0154 (0.0731)	0.0769 (0.0550)	-0.0106 (0.0734)
Mobile Network	0.332** (0.1433)	0.0890 (0.0911)	0.328** (0.1416)	0.334** (0.1456)	0.0929 (0.0917)	0.328** (0.1441)	0.381** (0.1532)	0.103 (0.0944)	0.381** (0.1516)
Constant	-0.0544 (0.2233)	-0.358** (0.1620)	-0.108 (0.2248)	-0.112 (0.2238)	-0.391** (0.1622)	-0.151 (0.2246)	-0.177 (0.2393)	-0.428** (0.1715)	-0.201 (0.2424)
Observations	1,177	1,177	1,177	1,159	1,159	1,159	1,081	1,081	1,081
R-squared	0.360	0.202	0.334	0.363	0.204	0.335	0.345	0.200	0.315
2nd stage dep. var.	General Trust	General Trust	General Trust	Trust in people from same village	Trust in people from same village	Trust in people from same village	Trust in complete strangers	Trust in people from outside village	Trust in complete strangers
Method	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS

Robust standard errors clustered at village level are in parentheses, *** p<0.01, ** p<0.05, * p<0.1. Province fixed effects are added to the model but not reported in the table.