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An Experimental Approach to Social Capital in South Africa

By

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An Experimental Approach to Social Capital in South Africa

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Abstract

This paper measures the social capital of trust and trustworthiness in South Africa using an experimental protocol designed to distinguish these norms from altruism. Experimental participants played multiple roles, making it possible to construct theoretically-grounded norm measures based on an individual's play across roles. Two-stage estimates of a social interaction model of norms identifies the presence of endogenous social effects, indicating that communities can be meaningfully typified as having and maintaining distinct normative environments. However, in contrast to studies that rely on less direct social capital measures, we do not find that trust boosts mean household living standards when controlling for the endogeneity of norms.

JEL Codes: C93, O12, Z13

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1. Introduction

In the *Theory of Moral Sentiments*, Adam Smith stressed that social norms, which control the “self-regarding passions” and lead individuals to behave in a trustworthy manner, are a vital underpinning of human society. Similarly, the more recent literature on social capital claims that trust and norms that compel trustworthiness are essential to the operation of market economies.¹ Trust, for example, makes cooperation possible while avoiding the cost associated with the enforcement of legal contracts (Putnam, 1995; Fukuyama, 1999). In less developed economies where the cost of legality is high, and where financial markets are thin or missing, relations based on trust or informal enforcement mechanisms may provide the only avenues of access to credit and insurance. Consistent with this hypothesis, Narayan and Pritchett (1998) and others have found that a greater density of civic associations (which they interpret as an indicator of social capital and trust) enhances the capacity of individual households to generate a livelihood in poor countries.

While provocative, this body of work on trust faces two major challenges. First, trust and social norms are intrinsically difficult to measure. Second, even if precisely measured, it is difficult to identify the effect of norms on behaviors and economic outcomes because norms themselves are endogenous and subject to complex social interactions (Manski, 1993; Durlauf, 2002). In an effort to address these issues, this paper employs experimental economic methods to measure trust and altruism. Individuals selected to participate in the study belonged to a random sample of South African communities where participant and other households had been surveyed by a longitudinal living standards study. This design allows analysis of the impact of experimentally measured norms on real household economic outcomes, while giving access to detailed panel data that can be used to address econometric identification issues.²

This study offers three specific contributions. First, it measures and establishes the behavioral relevance of distinct norms of trust, trustworthiness and altruism. For this study, each experimental participant played multiple games and roles, allowing the measurement of separate individual level norms. While indi-

¹ See Putnam, Leonardi and Nanetti (1993), La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1996), Guiso, Sapienza, and Zingales (2000), and Knack and Keefer (1997) among others.

²As an analysis of behavior and outcomes within local communities, this study answers Sobel’s (2002) challenge to study social capital at the level of small group interactions rather than with national level data.

viduals' altruism explains part of what might appear as trusting and trustworthy behavior, econometric analysis establishes the relevance of trust and trustworthiness norm by rejecting restrictions implied by a pure altruism model of behavior in the experimental games.

Second, this study shows that individual experimental measures effectively capture communities' distinctive normative environments and levels of trust. A community's normative environment would in principle be revealed by the presence of endogenous social effects in which individuals' trust, trustworthiness and altruism are mutually reinforcing. Instrumental variable estimates of a social interactions model (in which individual 'norm shocks' are used as identifying instruments) confirms the presence of these endogenous social effects.

This study's third, and perhaps most provocative, contribution is its inability to duplicate the sort of social capital results found in the literature that has followed Narayan and Pritchett (1998) and examined the impact of social capital on expected per-capita household expenditures. Because the analysis here relies on directly measured norms, which have in turn been instrumented with idiosyncratic norm shocks, this study's dissonant results appear to confirm Durlauf's (2000) contention that the analysis of social capital has been plagued by unresolved identification problems. Further reflection on these results points the way toward a more careful, structural analysis of the economic impacts of social capital at the individual level.

The remainder of this paper is organized as follows. Section 2 briefly reviews experimental approaches to trust and altruism. Section 3 theoretically models the choices presented to experimental participants and derives measures of trust and trustworthiness that are purged of the influence of altruism. Section 4 describes the experimental protocol and its implementation in the KwaZulu-Natal province of South Africa. Section 5 shows that individual choices in the experimental games are driven by more than purely altruistic considerations. Section 6 develops an identification strategy for a social interaction model of norms and finds that an individual's norms are significantly shaped by predominant community norms. Section 7 estimates a reduced form model of the economic impacts of trust and altruism on households' economic well-being. Section 8 concludes the paper.

2. Using Experiments to Measure Social Norms

Empirical research on trust has either relied on associational density measures (*e.g.*, number and strength of civic associations), or on direct survey questions

which ask respondents to self-report trust and trustworthiness. Neither approach is entirely satisfactory. Associational density measures may conflate incentive compatible associations with the operation of norms that stabilize otherwise incentive incompatible, time-sensitive exchanges. Self-reported trust measures are susceptible to distortion and are, in general, difficult to interpret (Putnam, 1995). In addition, neither empirical approach offers any prospect of separating out the effects of different norms (*e.g.*, altruistic sharing norms versus norms of trustworthiness), despite the fact that these different norms may have different economic impacts.³

Experimental economic methods offer a potentially appealing way to separately measure norms such as trust and altruism.⁴ Experiments provides economic incentives to participants and resemble economic situations where norms might play a role in shaping behavior. In this paper, we will use the dictator game (Forsythe, Horowitz, Savin, and Sefton, 1994) to measure the strength of other-regarding, or altruistic norms. In the dictator game, an individual is given an endowment of money that he may either share with a passive recipient, or keep for himself. We will also employ the trust game (Berg, Dickhaut, and McCabe, 1995). In the trust game, an individual (the trustor) is also given an endowment of money that she may either keep for herself or send to a recipient (the trustee). However, in the trust game, any money sent to the trustee is multiplied by a factor of three, and the trustee has the choice to either keep all money received for himself, or to return some to the sender.

Glaeser, Laibson, Scheinkman and Soutter (2000) have suggested using the trust game as a way of measuring trust. However, amounts invested in trust games would not seem to necessarily isolate trust. Trust games reveal only how much *selfish* trustors trust—*i.e.*, measuring trust with this game assumes that no other motives explain acts of giving by trustors. But assuming that people are purely selfish as trustors, and yet that they act in a trustworthy fashion as trustees, is asymmetric. Trustees can return money in the trust game out of norms of altruism, fairness or trustworthiness. In the same manner, trustors might send

³Bernheim, Shleifer, and Summers (1985) and Cox (1987) have shown the failure of the Ricardian equivalence in the presence of reciprocity, and Andreoni (1989) has shown it in the presence of impure altruism. Fehr and Gächter (2000) discuss the importance of reciprocity when contracts are incomplete.

⁴In recent papers, Camerer and Fehr (2001) advocate the use of economic experiments to measure the relative importance of social norms, while Carpenter (2001) proposes the use economic experiments to measure social capital and trust.

money away out of a sense of altruism, as well as out of trust.⁵

In order to isolate and measure trust separately from altruism, this paper will have individuals play multiple games and create trust and trustworthiness measures based on intra-personal comparisons of play across games. This approach of using multiple games to assess motives is not new. Forsythe *et al.* (1994) employed a dictator game to see if fair offers in the ultimatum game reflected the fear of rejection or an underlying altruistic norm. More recently, Gneezy, Guth and Verboven (2000) used a sequence of trust games to see if trustors would send more money as the games relaxed constraints on trustees' ability to send money back. Closer to our approach, Cox (2000) implemented several dictator games designed to duplicate elements of both trustor and trustee decisions. While the Cox study is based on across individual comparison, he found that sender and receiver decisions are partially explained by unconditional kindness.

The next section develops a framework to analyze decisions made in the dictator and trust games when altruism is present. This model yields individual level measures of trust and trustworthiness. It also provides a straightforward test of whether behavior in the trust game is explicable only in terms of distributional or altruistic considerations.

3. Modeling Trust and Trustworthiness in the Presence of Altruism

Denote as 'purely selfish' the following representation of the trustor's decision in a one-shot, anonymous trust game:

$$\begin{aligned} \underset{x_s, x_o}{Max} \quad & E[u(x_s + rx_o)] \\ & \text{subject to} \\ & x_s + px_o \leq B^t \end{aligned} \tag{3.1}$$

The trustor maximizes expected utility by allocating available funds between herself and her trustee partner. Here x_s is the amount of money retained by the trustor, and x_o is the amount of money that the trustee receives from the trustor. The cost of keeping a unit of money is one, and the cost of sending one unit of

⁵Forsythe, Horowitz, Savin and Sefton (1994), Eckel and Grossman (1996), and Andreoni and Miller (2002) are among those who have shown that individuals will send money to others in similar experimental situations out of respect for these norms.

money to the trustee is p . There is no enforceable contract nor punishment that guarantees that any of the money passed to the trustee will be returned to the trustor. Expectations in (3.1) are taken over, r , the uncertain ratio of funds returned by the trustee to the trustor. We assume that trustor has a probability distribution that describes her beliefs about the return ratio, r . As discussed by Barr (2003), the moments of this probability distribution capture the essence of trust.

This same information can be captured by defining a certainty equivalent rate of return, \hat{r} , defined as the value of r which, if known with certainty, would lead to the same allocation as (3.1).⁶ Using \hat{r} , and further defining $\hat{p} = (p - \hat{r})$ as the trustor's certainty equivalent net cost of sending money to the trustee, the purely selfish trustor's problem (3.1) can be rewritten as:

$$\text{Max}_{x_o} u(B^t - \hat{p}x_o). \quad (3.2)$$

For such a selfish trustor “ i ”, a measure of trust—understood as a high first and low second moment for the distribution of r —is the share of the budget that she sends to the other person, σ_i^t , defined as

$$\sigma_i^t \equiv px_o/B^t. \quad (3.3)$$

Setting aside or controlling for differences in risk aversion, inter-personal comparisons of σ^t would reveal information on differences in trust.

However, σ^t would not be a clean measure of trust if the trustor is not purely selfish. More precisely, σ^t will reflect more than information on trust and risk aversion if trustors care directly about trustees. To permit the possibility of altruism, we modify problem (3.1) by allowing trustor utility to depend on her own payoff as well as on that of the trustee:

$$\max_{x_o} u(B^t - \hat{p}x_o, x_o(1 - \hat{r}); \alpha), \quad (3.4)$$

where $u(\cdot)$ is a monotone function on own and other's payoff.⁷ Under this representation, an altruistic trustor might select $x_o > 0$ even if she was certain that there would be no return from the trustee ($\hat{p} = p$). In this case, inter-personal comparisons of trust measure (3.3) would confound trust with altruism.

⁶This certainty equivalent return ratio will of course also depend on the trustor's risk aversion.

⁷As written, (3.4) ignores the pre-game endowments of participants. For purposes of this theoretical exposition, we will ignore these endowments for all games and decisions, effectively assuming that endowment differences affect all decisions symmetrically.

3.1. Trust and Altruism

One way to isolate trust from altruism would be to observe trustor behavior when the trustor cannot return money, *i.e.*, when the trustor knows that $\hat{r} = 0$. Denote the budget share that trustor i would send, conditional on the knowledge that $\hat{r} = 0$, as $\tilde{\sigma}_i^t$. A possible measure of trust that accounts for altruism would be:

$$\delta_i^t = \sigma_i^t - \tilde{\sigma}_i^t \tag{3.5}$$

Measure (3.5) requires that the trust game be played under the counterfactual expectation of zero-return so that $\tilde{\sigma}_i^t$ can be measured. The dictator game approximates the situation in which trustors can expect no return from the trustee.⁸ As discussed in Section 2, the dictator game is a simple allocation exercise that abstracts from the strategic considerations of the trust game. The dictator game consists of two players, a dictator and a receiver. The dictator is endowed with an initial endowment that she can either keep for herself, or allocate to the receiver at a price of giving, p . The receiver has to accept any decision made by the dictator.⁹

Inferring the conditional trust share $\tilde{\sigma}_i^t$ from the dictator game is especially straightforward when the altruistic preferences in (3.4) exhibit a unitary elasticity of substitution utility between payoffs to oneself and payoffs to others.¹⁰ In

⁸Some studies dispute whether amounts sent in dictator games capture altruism at all, or whether they reflect of the lack of experimental controls. Hoffman, McCabe, Sachat, and Smith (1996) show that an increase anonymity produces a sharp decline in the amount shared by dictators. Eckel and Grossman (1996) show that a likely reason for a decline in contribution is that double-blind treatments eliminate any social context that could justify sharing, not the lack of a desire to share. Research also shows that dictator games are very sensitive to the subject population. Carpenter, Burks, Vergoohen, Carpenter (2001) find that a group of workers shared on average half of their endowment, in contrast with the one-third share typically found in studies of university students.

⁹Since the maximum amount of money that the receiver can return is always zero, the dictator game is equivalent to a trust game in which no reciprocity is expected. However, trustors could evaluate decisions based not only on trustee's choices but also on trustee's available choices (Sen, 1996; Rabin, 1993; Rabin and Charness, 2002). In this case, trustors may send more money to trustees who are unable to reciprocate than they might to trustees with the choice to reciprocate. If correct, this observation would suggest that a trust measure such as (3.5) will be biased downwards.

¹⁰In principal, the elasticity of substitution can be inferred from a more complex experimental design, as Andreoni and Miller (2002) show. Unfortunately, the exigencies of carrying out experiments under field conditions would have made an even more complex design difficult. While Andreoni and Miller (2002) show that there is a great deal of diversity in the shape of subject's utility functions, the behavior of their subjects bears little resemblance to the behavior

this case, the conditional trust share $\tilde{\sigma}_i^t$ will be constant and independent of game endowments and the price of giving such that $\tilde{\sigma}_i^t = \sigma_i^d$, where σ_i^d is the budget share sent in the dictator game. Further assuming Cobb-Douglas preferences, writing the utility function as $(1 - \alpha) \ln(B^T - \hat{p}x_o, x_o(1 - \hat{r}))$, yields the following straightforward expression for the implicit certainty equivalent net price of giving:¹¹

$$\hat{p}_i = \left(\frac{\alpha_i P}{\sigma_i^t}\right). \quad (3.6)$$

Note that \hat{p}_i decreases in σ_i^t and increases in α_i . In contrast to (3.5), price measure (3.6) has a direct economic interpretation and subsequent analysis will rely on it as an (inverse) trust measure.¹²

3.2. Trustworthiness and Altruism

This section models the trustee's return decision under the assumption that two norms regulate the decision: altruism and trustworthiness. Specifically, the model posits that the trustee chooses to return R to the trustor in order to:

$$\max_R u(x_o - R, R + B^t - px_o - \beta B^t), \quad (3.7)$$

where β measures the strength of norms that compel trustworthy behavior. Note that if $\beta = 1$, this utility function mimics a Stone-Geary specification in which the trustee must return px_o before gaining any positive utility. This is akin to saying that the trustee intrinsically respects the trustor's property rights over the amount sent (px_o). With $\beta > 1$, then trustee would feel compelled to return more to the trustor than was originally sent, meaning that he felt compelled to share the gains, essentially repaying principal plus interest to the trustor. If $\beta = 0$, the utility function in (3.7) reduces to $u(x_o - R, R + B^t - px_o)$ and the trustee would face a dictator problem where his partner (the trustor) is known to enjoy an endowment of $B^t - px_o$.¹³

of our participants. We therefore cannot, *a priori*, assess the direction of any bias introduced by an assumption of unitary elasticity of substitution.

¹¹This expression only holds for interior solutions, $\sigma_i^t < 1$, which occur if $\hat{r} < \hat{r}^*$.

¹²This is true as long as $\hat{r} < \hat{r}^*$, where \hat{r}^* is the certainty equivalent return rate that will lead the trustor to send the full amount of her budget to the trustee. In the case where $\hat{r} > \hat{r}^*$, $\delta_i^t = 1 - \alpha$ —i.e., the trustor sends the full additional budget to the trustee over and beyond what she would have sent in the dictator game.

¹³This model allows for spiteful behavior if $\beta < 0$.

The budget share returned by trustee “ j ” to the trustor,

$$r_j \equiv R/x_o, \quad (3.8)$$

will in general be influenced by both norms. When preferences can be represented by a Cobb-Douglas utility function ($u_j = (x_o - R)^{1-\alpha_j}(B^t - px_o + R - \beta B^t)^{\alpha_j}$), the solution to problem (3.7) will take the specific form:

$$R_j^* = \max[0, [\alpha_j + (1 - \alpha_j)p]x_o + (1 - \alpha_j)(\beta_j - 1)B^t]. \quad (3.9)$$

An altruistic trustee might return money whether or not he feels obligated to return the money entrusted to him (i.e., when $\beta = 0$). Analogous to the prior section’s analysis of trust, it is useful to define a purely altruistic counterfactual budget share, \tilde{r}_j , that denotes the amount that the trustee would return if $\beta = 0$. Using this share, a candidate measure of j ’s trustworthiness devoid of altruism would be:

$$\delta_j^r = r_j - \tilde{r}_j. \quad (3.10)$$

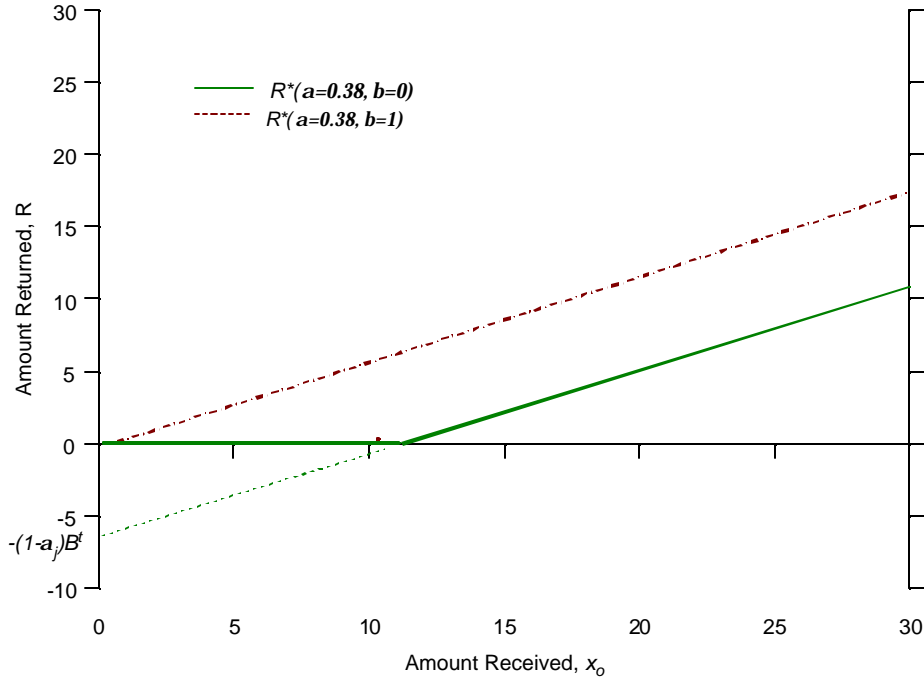
Like trust measure (3.5), (3.10) is also an individual level, intra-personal comparison measure.

While the prior section showed that a dictator game share could be used to proxy trustor behavior when shorn of norms and expectations other than altruism, the dictator share will overstate \tilde{r}_j because it fails to take into account that trustees know that trustors have retained an endowment of $B^T - px_o$.¹⁴ Figure 3.1 provides some intuition about the model in (3.7). The solid line segments in Figure 3.1 graphs (3.9) assuming that $p = 0.33$, $B^t = 10$, $\beta = 0$ and $\alpha_j = 0.38$.¹⁵ First, as indicated by the intercept term $-(1 - \alpha_j)B^t$, altruistic trustees will feel less compelled to redistribute to trustors the more selfish was the trustor. The purely altruistic trustee will return nothing to a trustor who retained most of the funds. Second, the slope $(\alpha_j + (1 - \alpha_j)p)$ is strictly greater than p (for $p < 1$), indicating that regardless of the trustee’s altruism, he will always *marginally* repay more than the amount that the trustee sent to the trustor (px_o). As is clear from the graph, a norm of trustworthiness simply increases the intercept of the return function.

¹⁴However, if trustees care only about the “act of giving,” the money endowment kept by the trustor will not influence the trustee’s decision and the dictator share would be a valid estimate of \tilde{r}_j .

¹⁵The first two numbers are the parameters from the experimental design described below, while the third reflects the median value of α implied by the behavior of South African experimental participants.

Figure 3.1: Trustee Decision under Pure Altruism Counterfactual



When $\beta = 1$, the return function has an intercept of zero. A purely selfish trustee ($\alpha_j = 0$) who is bound by trustworthiness ($\beta = 1$) will always return what was sent to him ($R^* = px_o$).

Manipulating (3.10) for different values of β permits us to define an individual level measure of trustworthiness:

$$\delta_j^r = r_j - r_{j\beta=0} = (1 - \alpha_j)\beta_j. \quad (3.11)$$

Solving this expression for β_j gives us a measure of the strength of moral norms that compel trustworthy behavior for individual j :

$$\beta_j = \frac{\delta_j^r}{(1 - \alpha_j)}. \quad (3.12)$$

Subsequent analysis will rely on (3.12) as a measure of the strength of trustworthiness norms.

4. Experimental Procedures

All experimental subjects played two games and assumed three roles, dictator, trustor and trustee. The experiments were implemented in 7 urban and 7 rural communities in the South African province of KwaZulu-Natal. The experiments were conducted in Zulu except in the Indian community of Chatsworth where they were conducted in English. The communities vary widely in terms of basic socio-economic characteristics. Some are quite isolated, mono-ethnic rural areas that operate under a traditional chieftaincy structure. Others are urban townships of much greater diversity. KwaZulu-Natal has suffered some of the most fractious politics in South Africa, with extreme levels of political violence, especially in the period leading up to the 1994 election of Nelson Mandela.

All 14 of the communities used in this study were originally randomly selected as part of the 1993 South African national living standards survey (PSLSD 1994 details the survey methodology). For the living standards study, approximately 20 households in each community were randomly selected for an in-depth interview. In the KwaZulu-Natal province, these same households were re-interviewed in 1998 for the KwaZulu-Natal Income Dynamics Study. Forty percent of our experimental subjects were recruited from the respondents to the living standard surveys, while the other sixty percent were selected from other families in the same communities. Not more than one participant per household was allowed. All the participants were at least 18 years old, and they were not told about experimental payments at the time of recruitment. The average age of participants was 43 years old, with 2 out of 5 being male. Twenty five percent of the sample was at least 57 years of age and 25% was at most 28 years of age. Participants had on average 6 years of education, with 25% of them having at most 2 years of schooling and 25% of them having at least 10 years of schooling. On average, there were 20 subjects per session. Two sessions were smaller (10 and 15 participants), and three sessions were larger (25 participants). The average participant knew 30% of the people in the room by name. The average payment to a participant in the experiment was 37 Rand (R37, or around \$5), which amounts to two-days wage in rural areas.

To play the dictator game, subjects were given 2 envelopes, one red and one blue. The red envelope contained R16 in R2 coins, and the blue envelope was

empty.¹⁶ To pass some of the R16 to another person in the room, subjects were instructed to put money from the red envelope into the blue envelope. If a subject did not want to share any money, they were told to leave the blue envelope empty. To protect the privacy of subjects' decisions, they were given a 'privacy box,' a cardboard box that prevented other people from seeing their manipulation of envelopes. This 'privacy box' was used in all decisions thereafter. Before any decision was made, a flip chart was used to explain all the choices available to dictators. After everyone had a chance to make a decision, envelopes were collected,¹⁷ shuffled in front of everyone and assigned to new subjects. The envelopes were not opened until the end of the session. Subjects did not know their payoff from previous decisions prior to making the next.

To play the trust game, subjects were given 3 envelopes, one red, one blue and one green. The red envelope contained R10 in R2 coins, and the blue and green envelope were empty and stapled together. To send some of the R10 to some other person in the room, subjects were instructed to pass it from the red envelope to the blue envelope. Subjects were told that any money put in the blue envelope was going to be tripled before being given to another subject. If the receiver wanted to return any of the tripled money in the blue envelope, they were instructed to use the green envelope to do so.¹⁸ If a subject wanted to pass no money they were instructed to leave the blue envelope empty.

Before any decision was made, a flip chart was used to explain the choices available to trustors. Subjects were asked to fill out an empty chart expressing how much money they thought would be returned to them had they chosen to send each of the possible options shown there. After this exercise was completed, subjects were asked to make a decision. Envelopes were collected, money in them tripled and shuffled in front of everyone before being assigned to new subjects. But before the blue and green envelopes were delivered, new flip charts were used to explain the possibilities available to trustees. In addition, an empty chart was given to everyone to be filled with the amount of money they thought they would have returned had they received any of the amounts listed there. After the charts were completed, subjects were given the blue and green envelopes with

¹⁶An appendix available from the authors reports the instructions read to participants and reproduces the various charts used to explain the game.

¹⁷Envelopes were collected in trays in order to minimize the contact that experimenters could have with them, and so minimize influencing subjects' decisions.

¹⁸Envelopes were coded to keep track of the origin and destination of an envelope. The coding was such that nobody knew which code was associated to the envelope sent or received.

Table 5.1: Altruism, Trust and Trustworthiness Measures

	<i>Budget Shares Sent as:</i>			<i>Intra-personal Comparison Measures</i>	
	<i>Dictator</i>	<i>Trustor</i>	<i>Trustee</i>	<i>Trust</i>	<i>Trustworthiness</i>
	σ^d	σ^t	σ^r	\tilde{p}	β
Mean	42%	53%	38%	0.29	0.18
Median	38%	60%	33%	0.28	0.52
<i>Budget Share Regressions</i>					
		<i>Trustor (σ_j^t)</i>	<i>Trustee (σ_j^r)</i>		
σ_j^d	-	0.40 (0.06)	0.27 (0.06)	-	-
$(1 - \sigma_j^d)(\frac{Br}{x_o} - p)$	-	-	0.07 (0.02)	-	-
Constant		0.36 (0.03)	0.20 (0.04)		
<i>Correlation between Norm Measures</i>					
<i>Norms</i>	<i>Individual</i>	<i>Community</i>			
σ^d, σ^t	0.38	0.56			
σ^d, σ^r	0.18	0.39			
σ^t, σ^r	0.25	0.47			
\hat{p}, β	-0.43	-0.39			

the tripled money. They were told to place in the green envelope any money they wanted to return to the sender. Finally, decisions were recorded and the green envelopes returned to the senders. A post-experiment questionnaire was administered immediately after play.

5. Experimental Results and Norm Measures

The top portion of Table 5.1 displays basic descriptive data from the trust and dictator games played in the 14 South African communities. Mean and median budget shares sent in the dictator game were around 40% for the sample as a whole. These results are consistent with previous works with non-student populations and above the mean sent by student populations (see Camerer and Fehr (2002) for a survey). At the community level the median budget sent in the dictator ranged from 25% to 50%. As discussed above, the altruistic norms that underlie such relatively high levels of giving in the dictator game would be expected to spillover and result in high levels of giving in the trust game even if trust itself was relatively

low. The remainder of this section uses the theoretical ideas developed in the prior sections to purge trust games results of the influence of altruism and explicitly tests whether play in the trust game is explicable solely in terms of altruism, or whether other norms are operative.

5.1. Trust and Altruism

As reported in Table 5.1, mean (median) budget share sent by trustors in the trust game was 53% (60%). Over 70% of the subjects sent between 40% and 60% of their budget to their trustees. The average amount sent by trustors varied across the 14 communities where the experiments were conducted, with the median budget shares sent ranging from 40% to 60%.

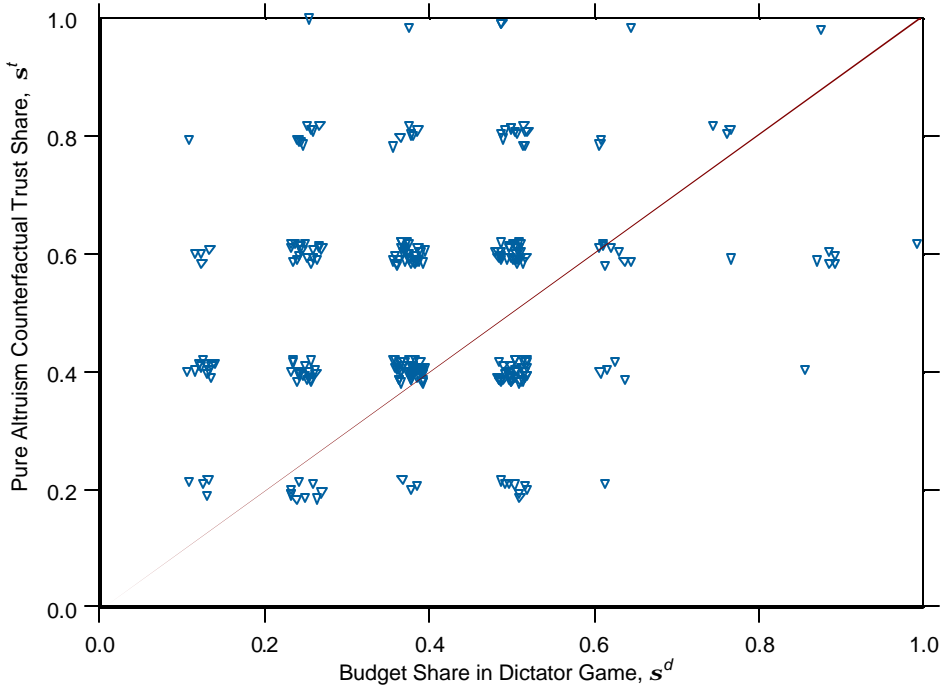
To what extent do these relatively robust trust game shares simply reflect the operation of altruistic norms? Figure 5.1, which plots the budget shares sent in the trust game against those sent in the dictator game, gives a first answer to this question.¹⁹ As can be seen, most experimental participants sent larger shares in the Trust game than in the Dictator game. Under the assumption that trustors have a unitary elasticity of substitution between money for themselves and money for trustees, the 45-degree line plots the predicted purely altruistic trust share ($\tilde{\sigma}^t$), and the vertical distance between any observation and the 45-degree line measures δ^t , the additional money the trustor sent in expectation of money being returned. Fully 70% of the subjects sent away a larger share in the trust game than in the dictator game.²⁰ The average difference between the shares sent in both games is 11% and we cannot reject the hypothesis that this measure is greater than zero.

The expression for the certainty equivalent net price of giving, \hat{p} , derived above in section 3.1 above, gives an alternative indicator of the degree of trust that controls for the individual's level of altruism. Lower values of \hat{p} indicate greater trust. A value of zero would indicate complete certainty that all funds sent to the trustor would be returned, while a value of one third (the gross price of giving in the trust game) would indicate certainty that no funds would be

¹⁹Since choices in both games are discrete, the graph shows “jittered” data, i.e., a random component has been added in order to show graphically where the population is concentrated.

²⁰Trustors had a more limited number of choices available than dictators (R10 versus R16). However, while 36% of subjects passed 20 percentage points of their endowments more as trustor than as dictators, only 8% of subjects sent 20 percentage points of their endowments more as dictators than as trustors. Therefore, the increase in the share sent in the trust games cannot be explained solely by the experimental design.

Figure 5.1: Behavior in Dictator and Trust Games



returned. As shown in Table 5.1, the mean and median for this measure are about 0.28. Community averages range from 0.21 to 0.33. While interpretation of this measure is difficult given the absence of comparative data, this modest difference between the gross and net price of giving, coupled with a mean δ^t of 11% suggests that much of the high trust share is rooted in altruism.

These observations raise the question as to whether other norms beyond altruism are operative. Under the assumption that the trustor has a unitary elasticity of substitution between his and others' payoffs, we should expect that for trustor j , the intercept of the regression of the trust share on the dictator share should be zero and that the coefficient on the term σ_j^d should be one. The middle panel of Table 5.1 displays the results of this regression. We can see that the intercept

is significantly different from zero, and that the point estimate for the slope of the equation with respect to the decision as trustor is significantly different from 1. At the level of individuals, while altruism and trust are clearly related, the estimated coefficient of 0.4 suggests that other considerations are shaping trustor's decision. Section 6 will return to examine a more complete econometric model of trust.

5.2. Trustworthiness and Altruism

The mean (median) share returned by trustees was 38% (33%). Fully 42% of the trustees returned more than a one third budget share, while another 38% of subjects returned exactly one third. From a financial perspective, most trustors broke even, or better, on money sent to trustees. This result is quite remarkable noting that trustees had no (purely selfish) incentive to return any money given the anonymity of the experimental design. While most trustees proved trustworthy, it is not clear whether their behavior resulted from the already noted high levels of altruism, or whether it reflected trustworthiness norms. Consistent with the notion that norms other than altruism are operative is the modest 0.18 correlation between dictator (altruism) shares and trustor shares shown in Table 5.1.

A more precise decomposition of the trustee behavior into altruistic and reciprocity components is possible using the prediction from the model of trustee behavior developed in section 3.2. Overall, 71% of subjects returned more as trustees than the purely altruistic model ($\beta = 0$) of the trustee decision predicts.²¹ Figure 5.2, which projects the data points from our experiments onto Figure 3.2 gives a visual feel for this result. The solid line in that figure is the amount that trustee with a median level of altruism but no norms of trustworthiness would have returned as a function of the amount received from the trustor. Such a trustee would have returned nothing to the trustor anytime he received less than about 11 Rand. In fact, the purely altruistic model predicts that 23% of trustees would have returned zero given their level of altruism, whereas in fact only 3.5% of trustees returned nothing to their trustors. The measure of reciprocity net of altruism measure, δ^r , has median and mean values of 13% (see Table 5.1). Our measure of the strength of trustworthiness norms, β , has a mean value of 0.18 and

²¹Forty six percent of the subjects returned, as trustees, a budget share that was at least 20 percentage points more than the altruistic model would have predicted. Only 10% of subjects returned, as trustees, a budget share that was at least 20 percentage points less than the altruistic model would have predicted.

a median of 0.52. Recall that β takes on a value of zero when trustworthiness norms are inoperative and a value of one when they compel complete respect for the trustor's rights over money she sent. The data once again exhibit substantial variation across the 14 different communities as the median value of β within communities ranges from 0.20 to 0.66.

Table 5.1 presents a regression analysis of the amounts sent by trustees designed to test whether individuals' altruism can account for their trustee behavior. As can be seen from expression (3.10), when there are no norms of trustworthiness operative, the coefficients of σ_j^d and $(1 - \sigma_j^d)(\frac{Bx}{x_o} - p)$ should be 1 and -1 respectively, while the intercept term should be zero. However, these coefficients are estimated to be quite different from these predicted values. Similar to the trustor behavior, the play of trustees is consistent with norms other than altruism shaping behavior in the Trust game. We turn now to more fully model the determination of these norms.

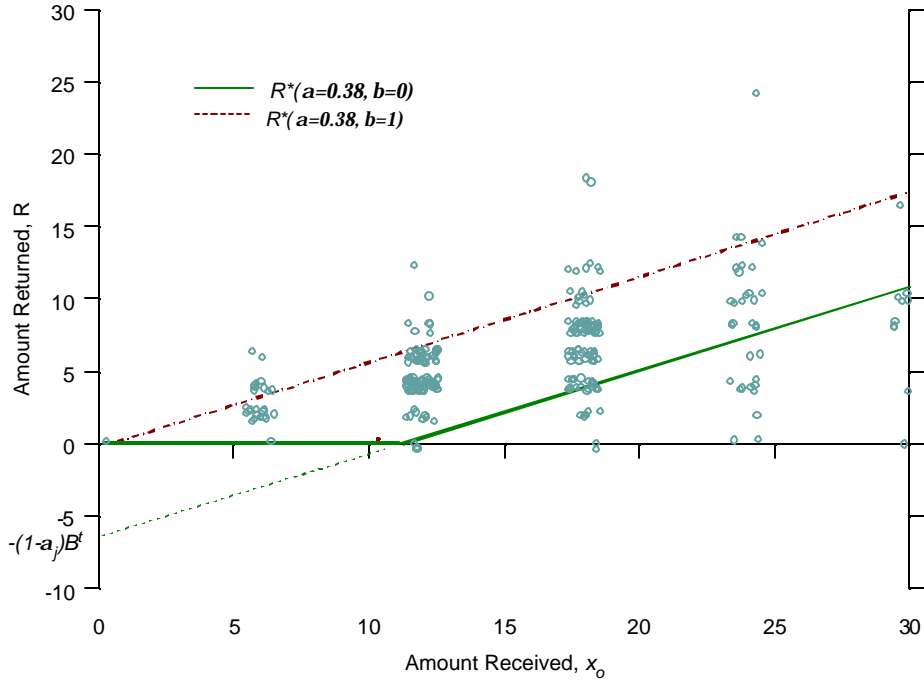
6. Norms and Social Interactions

Unlike economic experiments carried out with random groupings of college students, the games described in the prior sections were played with groups of individuals drawn from permanent communities where they live, work and, in many cases, grew up. This section uses the experimental data to test for evidence that these communities have and maintain distinctive normative environments so that it can be meaningfully said that some communities are systematically more trusting, enjoying greater social capital, than others. To carry out this task, this section specifies a social interactions model designed to identify the impact of community norms on the norms of individuals within the community.

6.1. The Reflection Problem

Manski's (1993) work on the identification of social interactions provides a framework for evaluating whether or not communities can be appropriately described as having distinct normative equilibria. If communities evolve and sustain distinctive norms of behavior, then we would expect that an individual's norms will be influenced by the norms of their community reference group. In using results from the experiments to investigate this issue, we are not proposing that the play of others in the experimental game directly influences an individual's play in the same game. Game play was strictly private information in the KwaZulu-Natal

Figure 5.2: Trustee Decision



experiments. Instead, we are interpreting play in the games as reflecting durable norms that were formed prior to the game.²² It is the nature of social effects on these durable social norms that we investigate.

Consider the following model of the strength of trustworthiness norms that shape individual j 's behavior as a trustee:²³

$$\beta_j = [z_j b_1 + \varepsilon_j b_2] + \bar{\beta}_{g(j)} c + \bar{z}'_{g(j)} d + u_j, \quad (6.1)$$

²²As one-shot, anonymous exercises shorn of repetition and reputation effects, the KwaZulu-Natal experiments should reveal information on what Platteau (2000) calls moral norms, or at least on norms that are sufficiently durable that they shape behavior outside the specific social context which created them.

²³A similar expression could of course also be given for the other norm measures, σ_j^d and \tilde{p} .

where the $g(j)$ subscript denotes the social reference group or community of individual j . First, and of greatest interest to this study, the model posits that j 's norms depend on $\bar{\beta}_{g(j)}$, the average or typical level of trustworthiness exhibited by members of j 's community group.²⁴ The two vectors in brackets capture individual characteristics and experiences that shape j 's trustworthiness. We have partitioned these factors into two components which we assume are orthogonal. The first component, denoted, z_j , are factors that affect j 's trustworthiness and also *directly* affect the trustworthiness of other community members because they influence the other's expected gains from being trustworthy.²⁵ Note that individual j 's trustworthiness will symmetrically directly depend on $\bar{z}_{g(j)}$, the average characteristics of the members of j 's group.

The second component in the square brackets, ε_j , includes private, idiosyncratic shocks that effect j 's trustworthiness, but do not directly affect others' trustworthiness. Examples of ε_j include acts of domestic betrayal or violence that sour j 's view of the world, but do not directly affect others. Significantly for our identification strategy, β_j does not depend *directly* on the private, idiosyncratic norm shocks experienced by other members of j 's social group (nor does ε_j directly affect the other members of j 's group) . Finally, the residual, u_j , captures unmeasured factors that affect j 's norms.

In Manski's language, the parameter c measures the magnitude of endogenous social effects. The parameter d measures contextual, or exogenous social effects. Evidence that $c > 0$ would imply the existence of a social equilibrium in which individuals are more trustworthy when, other things equal, their neighbors exhibit greater trustworthiness. However, as Manski and others have stressed, the OLS regression of β_j on $\bar{\beta}_{g(j)}$ will not in general identify the endogenous social effects parameter c . For if the behavior of all individuals within the group is shaped by the same factors (the $\bar{z}_{g(j)}$), then individual behavior will apparently mimic group behavior even in the absence of endogenous social effects.

The available data present several challenges to the estimation of (6.1). We have substantial data on the 40% of experimental participants recruited from households surveyed as part of the KwaZulu-Natal Income Dynamics Study (KIDS), as described in Section 4. We have much less information on the other exper-

²⁴The term $\bar{\beta}_{g(j)}$ could be replaced by some more general function of the trustworthiness of the members of j 's community group.

²⁵An example of such a factor might be the extent of i 's economic connectedness (e.g., ability to secure employment for others). Such connectedness may increase i 's altruism as well as the incentives for others to be recognized as good, contributing altruistic community members.

imental participants. Our estimation strategy is to replace $\bar{\beta}_{g(j)}$ in (6.1) with an instrumented version of it using data available on KIDS participants. In particular, we will use data on individual norm shocks, the $\varepsilon_{g(j)}$, as instruments that do not directly influence others and are less susceptible to reflect correlated unobservables.

The logic and limitation of this approach can be appreciated by rewriting (6.1) after accounting for equilibrium social norms:²⁶

$$\beta_j = [z_j b_1 + \varepsilon_j b_2] + \frac{d + c b_1}{1 - c} \bar{z}_{g(j)} + \frac{c b_2}{1 - c} \bar{\varepsilon}_{g(j)} + [u_j + \frac{c}{1 - c} \bar{u}_{g(j)}]. \quad (6.2)$$

Note that idiosyncratic norm shocks received by the other members of the group, $\bar{\varepsilon}_{g(j)}$ will only influence j 's norms if endogenous social effects exist—i.e., if $c > 0$. In order for our estimation procedure to yield consistent estimates which permit us to test for endogenous social effects, two things must be true. First, community average norm shocks ($\bar{\varepsilon}_{g(j)}$) must be orthogonal to observed ($\bar{z}_{g(j)}$) and unobserved ($\bar{u}_{g(j)}$) structural factors that also influence norms. The second assumption, required because we lack data on ε_j for all experimental participants, is that the instrumented group norm from the first stage regression is orthogonal to the variables omitted in the second stage regression. We will return to discuss the reasonableness of these assumptions when discussing the specific variables in the next section.

6.2. Instrumental Variables Estimation

Table 6.1 shows the first stage instrumental variable results for the norms of interest, altruism (measured by the share of funds sent in the Dictator game, σ^d), trust (measured by the certainty-equivalent net cost of sending funds in the trust game, \hat{p}), and trustworthiness (measured by the norm measure, β). The selection of instruments was guided by two considerations. First the instruments should be unrelated to contextual variables, especially the overall level of community economic well-being.²⁷ Second, given our interest in distinguishing trust and

²⁶Following Manski (1993), note that if the norm for every individual in the reference group $g(j)$ is determined by the analogue to (6.1), then the expected or equilibrium group norm can be written as:

$$\bar{\beta}_{g(j)} = \frac{b_1 + d}{1 - c} \bar{z}_{g(j)} + \frac{b_2}{1 - c} \bar{\varepsilon}_{g(j)} + \frac{\bar{u}_{g(j)}}{1 - c}.$$

Substitution of this expression into (6.1) yields the expression in the text.

²⁷For social capital regressions which relate expected income to social capital measures, it is especially important that the instruments be independent of income.

Table 6.1: Instrumental Regression for Community Norms

	<i>Altruism</i> (σ^d)	<i>Trust</i> (\tilde{p})	<i>Trustworthiness</i> (β)
Constant	0.095 (0.12)	0.23 (0.03) **	0.61 (0.10) **
Number of Family and Friends	0.023 (0.01) *	-	-
Trust in Extended Family	0.06 (0.03) *	-	-
Robberies in 1993	-	0.36 (0.15) *	0.04 (0.45)
Religious Diversity	-	0.09 (0.07)	-0.41 (0.20) *
<i>Adj-R</i> ²	0.4191	0.2286	0.2469
<i>n=14</i>			

Standard errors in parentheses, ** = p-value < 0.05, * = p-value < 0.10

trustworthiness from altruism, the instruments for the former were selected on the grounds of being less likely to be related to the latter.

Because the first stage regressions are at the community level, we have relatively few degrees of freedom to work, forcing parsimony in the choice of instruments. Altruism was instrumented by the average of individual's trust in their extended families as well as by the number of family members and close acquaintances who live in the community. Both variables were measured using household level data collected in 1998 as part of the KwaZulu-Natal household income and expenditure survey. Trust and trustworthiness were instrumented using two variables. The first was the average number of robberies experienced by members of each community in 1993. The second was a measure of religious diversity in the community as measured using 1998 information.²⁸ Our assumption is that each of these measures privately influence the norms of individuals within communities, but unlike contextual factors such as income and education, these measures do not directly influence the incentives for other individuals to act in a more trustworthy or altruistic fashion. Evidence that traumatic experiences affect trust has also been found elsewhere by Alesina and La Ferrara (2000). Crimes might be associated with income in general. However, the high and widespread levels of social disruption and crime experienced in South Africa at the end of apartheid makes this measure less suspect.²⁹ Finally, the inclusion of a measure of religious

²⁸If p_i is the percentage of people in religion i , the index of religious diversity is $1 - \sum_i p_i^2$.

²⁹All the results in this section hold even when controlling for 1993's income.

diversity implicitly assumes that subjects enjoyed giving more or reciprocating to a person belonging to their same religion.

Results in Table 6.1 are sensible. The extent and quality of local familial relations boost community altruism. Religious diversity does not significantly affect trust, but robberies experience by households diminishes trust as shown by the positive effect of the robberies variable on certainty-equivalent net price of giving in the trust game. Robberies do not, however, significantly influence trustworthiness, while religious diversity is estimated to significantly diminish the strength of trustworthiness norms.

Table 6.2 displays the results for the second stage, social interactions regressions for each norm. The key variables are the instrumented community norms. In addition, individual characteristics that might be expected to influence norms (age, gender, economic status and market integration) are included as is a variable from the post-experiment questionnaire designed to measure how well individuals understood the games they were playing.

The Table 6.2 estimates follow the discussion on identification above. We obtain evidence of significant endogenous social effects for all three decisions. These results support the idea that communities have normative equilibria which tend to maintain themselves through endogenous social interactions. In this sense, it is meaningful to say that communities enjoy distinct levels of the social capital of trust.³⁰

Somewhat surprisingly, the point estimates for the endogenous social effects for trust and trustworthiness are above one, contrary to the one for altruism. There are alternative explanations for this. As mentioned above, the regressions in Table 6.2 omit individual shocks³¹ that are used as instruments of community level norms. This might introduce an upward bias on the estimates. Second, we assume a linear relationship between community norms and individual behavior. Finally, our identification strategy ignores the fact that the trust game is a proposal-response game, and therefore, decisions as trustors and trustee might be reinforcing even in the absence of social interactions. Since the first two criticisms apply to the dictator regression also but we do not observe large social interaction parameters in this regression, we suspect that equilibrium considerations are the plausible cause of this upward bias.

The variation in session-level demographics permits us to observe two addi-

³⁰The results in this section hold true when alternative individual measures of norms, different instruments, or controls for income are utilized.

³¹Only 40% of our sample were also interviewed in 1993 and 1998.

Table 6.2: Social Interactions Regression

	<i>Money Sent as Dictator</i> ($\hat{\sigma}_i$)	<i>Individual Measures of Trust</i> (\hat{p}_i)	<i>Trustworthiness</i> ($\hat{\beta}_i$)
<i>Endogenous Social Effects</i>			
Altruism, $\sigma_{g(i)}^d$	0.56 (0.28) **		
Trust, $\hat{p}_{g(i)}$		1.40 (0.47) **	
Trustworthiness, $\beta_{g(i)}$			1.20 (0.40) **
<i>Individual Characteristics (z_i)</i>			
Age	9.2e-4 (7.4e-4)	6.0e-4 (6.6e-4)	3.6e-4 (0.003)
1=Male, 0=Female	-0.07 (0.02) ***	-0.041 (0.02) *	0.208 (0.11) *
% of Acquaintances	0.009 (0.05)	0.031 (0.04)	-0.209 (0.22)
Food self-sufficiency	-0.005 (0.01)	0.016 (0.01)	0.058 (0.06)
1=Urban, 0=Rural	0.036 (0.04)	0.010 (0.04)	0.096 (0.20)
Constant	-0.015 (0.20)	-0.310 (0.22)	1.384 (0.90)
<i>Exogenous Social Effects ($z_{g(i)}$)</i>			
Average Age	0.007 (0.002) ***	0.006 (0.002) ***	-0.014 (0.01)
% Men	0.134 (0.11)	0.144 (0.10)	-0.579 (0.51)
Average % Acquaintances	0.049 (0.11)	-0.021 (0.10)	0.383 (0.48)
Average Food Self-sufficiency	-0.041 (0.04)	-0.044 (0.04)	-0.138 (0.20)
<i>Experimental Understanding & Quality</i>			
Individual Error	0.009 (0.01)	-1.3e-4 (0.005)	0.029 (0.03)
Average Group Error	-0.016 (0.03)	-0.001 (0.03)	-0.191 (0.13)
<i>Adjusted - R²</i>	0.1353	0.0674	0.0495
<i>n=261</i>			

Standard errors in parentheses. * = p-value < .1; ** = p-value < .05; *** = p-value < .01

tional results. In South Africa, gender affects decisions at the individual level but age affects decisions at the session level. When controlling for the gender composition of the room, women tend to give more in the dictator game and trust and reciprocate more. Controlling for the age of the participant, sessions with older people are associated with more altruistic giving but less trust.

7. The Economic Value of Social Capital

Several prior studies have used micro data to explore the impact of the social capital of trust on the expected material well-being of households. The Narayan and Pritchett (1998) study of Tanzanian households was one of the first to explore this hypothesis with data on small, local groupings. In their study, Narayan and Pritchett regress household per-capita expenditures (as a measure of material well-being) on a set of basic control variables (household size, location and human capital) and on a social capital variable. They measure the latter with an index meant to capture the quantity and quality of associational life (the number of social groups and how well they function). They find that a community social capital measure has a strong positive effect on a household's realized level of per-capita expenditures.³² Using the same living standards data available for this study, Maluccio *et al.* (2000) and Haddad and Maluccio (forthcoming) ratify Narayan and Pritchett's findings, showing that social capital significantly enhance households' ability to generate livelihood in KwaZulu-Natal, South Africa.³³

The methods utilized in this study permit us to revisit the sort of social capital regression pioneered by Narayan and Pritchett. However, in contrast to previous studies, we have direct, experimental measures of the social capital of trust and altruism rather than econometrically troubled associational density measures. In addition, our econometric approach that explicitly models norms as an endogenous social process and instruments them with private, idiosyncratic norm

³²Worried about simultaneity bias (*i.e.*, higher expenditures may explain greater participation in groups and association, rather than vice versa), Narayan and Pritchett employ a two-stage regression procedure in which they instrument for their associational density social capital measure using self-reported trust measures. They argue that these instruments are econometrically exogenous to any individual household's level of well-being.

³³The first of these studies measures social capital with an association index akin to that used by Narayan and Pritchett, while the latter study uses a self-reported trust measure. Both studies use fixed effects, panel data methods in an effort to resolve simultaneity issues between social capital and income.

shocks. These instruments are directly unrelated to community income.³⁴ Table 7.1 displays the social capital regression results that our measures and methods yield. Similar to other studies in this area, the dependent variable is per-capita household expenditures, as a measure of household economic well-being. The regression features conventional, pre-determined control variables, including the age, education and sex of the household. Taking advantage of the panel nature of the KwaZulu-Natal data, the regression also includes the productive assets (land, machinery, small business equipment, *etc.*) held by the household five years prior to the survey date. Given these control variables, the regression asks if community norms (as estimated by the instrumental variable regressions in table 6.1) boost expected well-being above what would be predicted given household's initial conditions.

Table 7.1 shows three separate expenditure regressions. The first shows that the community level of altruism (measured by predicted dictator game giving, $\hat{\sigma}_{g(i)}^d$) is associated with higher expected levels of well-being.³⁵ The second regression shows that the impact of the instrumented trustworthiness norm measure, $\hat{\beta}_{g(i)}$, is, significantly negative. Finally, the third regression shows that when both altruism and trustworthiness are included in the regression, the former loses significance while the latter continues to show a significant and negative effect on expected well-being.³⁶

These results clearly signal that experiments are able to capture features of the economic environment that are not captured by traditional living standard measures. At first glance, the results are rather puzzling, at least from the perspective of Platteau (2000) who suggests that pure sharing norms may depress investment and incomes, while trust that collateralizes inter-temporal transactions may enhance it.

At a deeper level, these results may signal that efforts to uncover the economic impact of social capital need to structure a more careful approach than one which simply pools data on all households and asks if expected expenditures are increasing in social capital. While trust (or other norms) may enhance the capacity of households to informally access capital, insurance or jobs when markets are

³⁴These results are available from the authors.

³⁵This results hold with different specification of instruments or controlling for past income levels.

³⁶Because the same instruments were used for trust and trustworthiness, we cannot include both measures in the linear regression. Results with the trust measure, $\hat{p}_{g(i)}$, duplicate the reported findings with the trustworthiness measures.

Table 7.1: OLS Estimates of the Impact of Economic Norms

	<i>Household Per Capita Expenditures</i> (<i>logarithm</i>)		
<i>Community Norms</i>			
Altruism, $\sigma_{g(i)}^d$	1.527*		-0.213
Trustworthiness, $\beta_{g(i)}$		-0.987**	-1.036**
<i>Economic Assets</i>			
Education of Household Head	0.081**	0.080**	0.080**
Productive Assets 1993 (log)	0.023*	0.016	0.016
<i>Demographic Characteristics</i>			
Household Size (log)	-0.699**	-0.702**	-0.702**
Gender of Household Head (male=1)	0.145*	0.183*	0.185**
Age of Household Head (log)	0.013**	0.012**	0.014**
<i>Community Characteristics</i>			
Location (urban =1)	0.509*	0.471**	
Constant	4.785**	4.216**	4.243**
<i>Adjusted R</i> ²	0.5513	0.5689	0.567
<i>n=261</i>			

* Significant at the 10% level, ** Significant at the 5% level

weak, not all households in a community will be constrained in their access to these goods. Pooling all households into a single regression may thus disguise the impact of trust on those who need it.³⁷ Moreover, if trust permits households to mutually insure each other, such insurance need not have a positive effect on mean expenditures. Indeed, trust could even reduce expected expenditures if maintaining trust requires the investment of time into directly non-remunerative work activities. The estimates in Table 7.1 showing a negative impact of trustworthiness are consistent with this latter interpretation. Finally, the capacity of people to assist those whom they trust clearly depends on the resources that they have available to them. Without control for the resources of the trusting group, little could again be inferred from pooled regressions of the sort displayed in Table

³⁷An alternative approach to the study of social capital is to bypass some of the problems associated with the analysis of reduced form expenditure equations and focus on the impact of norms on a specific outcome, such as access to capital, as in Karlan (2002).

7.1, even when norms are appropriately measured and endogeneity issues handled credibly.

8. Discussion and Conclusions

This study set out to assess the claim that social norms affect economic outcomes, especially in low-income economies where markets and other formal institutions tend to fail. In an attempt to alleviate the norm measurement problems associated with this assessment, this study employed variations on trust and dictator games to isolate and measure norms of altruism, trust and trustworthiness. As opposed to self-reported measures of trust and trustworthiness, economic experiments such as these have the advantage of giving incentives to responders to reveal the behavioral norms that guide their real world decisionmaking. However, this novel way of measuring economically relevant norms does not exempt the study from the identification problems associated with the analysis of economic behavior in the presence of social interactions. This study has deployed an instrumental variables methodology to diminish these problems.

The overall results of this analysis are encouraging in their demonstration that economic experiments are a useful tool for capturing social norms that affect characterize communities and shape real economic outcomes. First, this study has shown that while amounts sent and returned in the trust game overstate levels of trust and trustworthiness when unconditional or altruistic sharing norms are high (as they are in South Africa), by having experimental subjects play multiple experimental roles, it is possible to develop measures that isolate trust and trustworthiness from altruism. Second, econometric analysis of the experimental data (supplemented with data from a household living standards panel survey) suggests that norms vary across communities and that these cross-community differences are reinforced by endogenous social interactions as individuals mimic the predominant norms around them. The community social capital of trust can thus be meaningfully identified from individual norm measures. Third, estimates of the type of livelihood regression found in the microeconomic social capital literature (*e.g.*, Narayan and Pritchett, 1998) show that experimentally measured norms account for variation in economic well-being beyond what can be accounted for by human and physical capital. That is, experiments do provide new information on socioeconomic environments. This finding is remarkable, since this study's estimation approach uses idiosyncratic norm shocks to instrument for community norms and is thus less susceptible to endogeneity problems

that has plagued other social capital studies, as Durlauf (2002) remarks. At the same time, the estimated impacts of social capital are quite different from those found elsewhere in the literature, and ultimately they suggest problems with the standard, reduced form approach that simply pools together all households in an effort to identify a mean effect of social capital on expected expenditures.

In closing, moving forward the social capital research agenda will require not only more careful measurement and modeling of norms (as we have tried to do here). It will also require a more structural approach to the effects of social capital on incomes and livelihoods and greater attention to the capacity of the trusting group to broker opportunities for those who need them.

References

- Andreoni, J., "Giving with Impure Altruism: Applications to Charity and Ricardian Equivalence," *Journal of Political Economy*, 97(6), 1447-1458, 1989.
- Andreoni, J. and A. Miller, "Giving According to GARP: An Experimental Test of the Consistency of Preferences for Altruism," *Econometrica*, 70, 737-753, 2002.
- Alesina, A. and E. La Ferrara, "Who Trusts Others?" Discussion Paper No. 2646, Centre for Economic Policy Research, London, UK, December 2000.
- Barr, A. "Trust and expected trustworthiness: an experimental investigation," *Economic Journal* 113, 614-630, 2003.
- Berg, J., J. Dickhaut, and K. McCabe, "Trust, Reciprocity, and Social History," *Games and Economic Behavior*, 10, 122-142, 1995.
- Bernheim, D., A. Shleifer, and L. Summers, "The Strategic Bequest Motive," *Journal of Political Economy*, 97, 1045-76, 1985.
- Camerer, Colin, and Ernst Fehr, "Measuring social norms and preferences using experimental games: a guide for social scientist." forthcoming in: J. Henrich, R. Boyd, S. Bowles, H. Gintis, E. Fehr, R. McElreath, eds., *Cooperation and Punishment in Simple Societies*.
- Carpenter, Jeffrey P. "Measuring social capital: adding field experimental methods to the analytical toolbox," forthcoming in Sunder Ramaswamy, Johnatan Isham, and Thomas Kelly, eds, *Social Capital, Economic Development and the Environment* (Edward Elgar).
- Carpenter, J., S. Burks, E. Vergoohen, G. Carpenter, "High Stakes Bargaining with Non-students," mimeo, 2001.
- Charness, G., and M. Rabin, "Understanding Social Preference with Simple Tests," *Quarterly Journal of Economics*, 117(3), 817-69, 2002.
- Cox, D. "Motives for Private Income Transfers," *Journal of Political Economy*, 95, 508-46, 1987.
- Cox, James, "Trust and Reciprocity: Implications of Game Triads and Social Contexts" University of Arizona, mimeo, 2000.
- Durlauf, S. "On the Empirics of Social Capital," *Economic Journal*, November 2002..
- Eckel, C. and P. Grossman, "Altruism in Anonymous Dictator Games," *Games and Economic Behavior*, 16, 181-191, 1996.
- Fehr, E., and S. Gächter, "Fairness and Retaliation: The Economics of Reciprocity," *Journal of Economic Perspectives*, 14, 159-81, 2000.

- Forsythe, R., J. Horowitz, N. Savin, and M. Sefton, "Fairness in Simple Bargaining Games," *Games and Economic Behavior*, 6, 347-69, 1994.
- Fukuyama, F. "Social Capital and Civil Society," IMF Conference on Second Generation Reforms, October 1, 1999, 1-13.
- Glaeser, E.L., D.I. Laibson, J.A. Scheinkman and C.L. Soutter, "Measuring Trust," *Quarterly Journal of Economics*, 105, 811-846, 2000.
- Gneezy, Uri, Werner Guth and Frank Verboven, "Presents or Investments? An Experimental Analysis," *Journal of Economic Psychology*, 21, 481-93, 2000.
- Guiso, L., P. Sapienza, L. Zingales, "The Role of Social Capital in Financial Development," National Bureau of Economic Research Working Paper No 7563, 2000.
- Haddad, L. and J. Maluccio, "Trust, membership in groups and household welfare: evidence from KwaZulu-Natal, South Africa," *Economic Development and Cultural Change*, forthcoming.
- Hoffman, E., K. McCabe, J. Sachat, V. Smith, "Social Distance and Other-regarding behavior in Dictator games," *American Economic Review*, 86, 653-660, 1996.
- Karlan, Dean, "Using Experimental Economics to Measure Social Capital and Predict Financial Decisions," Working Paper, Princeton University, 2002.
- Knack, S. and P. Keefer, "Does Social Capital Have an Economic Payoff? A Cross-Country Investigation," *Quarterly Journal of Economics*, 102, 1251-1288, 1997.
- La Porta, R., F. Lopez-de-Silanes, A. Shleifer, and R. Vishny. *Trust in Large Organizations*. NBER Working Paper No. W5864, 1996.
- Maluccio, John, Lawrence Haddad and Julian May. "Social Capital and Household Welfare in South Africa, 1993-98," *Journal of Development Studies*, 36(6) 54-81, 2000.
- Manski, C. "Identification of Social Effects: The Reflection Problem," *Review of Economics Studies*, 60(3), 531-542, 1993.
- Narayan, D. and L. Pritchett, "Cents and Sociability: Household Income and Social Capital in Rural Tanzania," *Economic Development and Cultural Change*, 47, 871-97, 1999.
- Platteau, J.-P. *Institutions, Social Norms, and Economic Development*. Gordon & Breach Publishing Group, September 2000.
- PSLSD. 1994. Project for Statistics on Living Standards and Development: South Africans Rich and Poor: Baseline Household Statistics. South African Labour

- and Development Research Unit, University of Cape Town, South Africa.
- Putnam, R. D., "Bowling Alone: America's Declining Social Capital," *Journal of Democracy*, 6, 65-78, 1995.
- Putnam, R.D., R. Leonardi, and R. Nanetti, *Making democracy work : civic traditions in modern Italy*. Princeton, N.J. Princeton University Press, 1993.
- Rabin, M., "Incorporating Fairness into Game Theory and Economics," *American Economic Review*, 83, 1281-1302, 1993.
- Sen, Amartya, "Maximization and the Act of Choice," *Econometrica*, 65, 745-779, 1996.
- Sobel, J., "Can We Trust Social Capital?," *Journal of Economic Literature*, 40(1), pp. 139-155, 2002.