Trustworthiness and Social Capital in South Africa: Analysis of Actual Living Standards Data and Artefactual Field Experiments[*]

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Abstract

This paper measures trustworthiness using an experimental protocol designed to distinguish this social norm from purely altruistic preferences. Experimental participants were drawn from South African households surveyed by a longitudinal living standards survey. This procedure not only permits analysis of the impact of experimentally measured social norms on real world outcomes, it also provides a rich array of data that can be used to control for initial conditions and prior possibilities that might be spuriously correlated with norms. Interestingly, altruism has more robust effects on living standards than does trustworthiness. This finding motivates a deeper reconsideration on how trusts works, especially in societies like South Africa's where the boundaries of trust are likely to be tightly circumscribed by a history of social exclusion and segregation.

JEL Codes: C93, O12, Z13

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 norms that compel trustworthiness are essential to the operation of market economies.[1] Trustworthiness 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) in an early quantitative study find that a greater density of civic associations (which they interpret as an indicator of the social capital of trust) enhances the capacity of individual households to generate a livelihood in poor countries. Similar results are found for South Africa in the work by Maluccio, Haddad and May (2000) and Haddad and Maluccio (2003).

While provocative, this body of work faces the challenge that social norms are intrinsically difficult to measure. Young (2008) defines social norms as customary rules of behavior that coordinate interactions between people. He goes on to note that such norms have economic value and become a type of social capital if they create a "uniquely salient or focal solution to a coordination problem, thus reducing the risk of coordination failure." This paper employs experimental economic methods in an effort to directly measure a social norm of trustworthiness. While the well-known trust game would seem to be an ideal instrument for this purpose, play in the trust game may also reflect the operation of other norms, including those that prescribe sharing or altruistic behavior. Because sharing and trustworthiness norms may have quite different economic implications, the analysis here exploits an experimental protocol in which individuals reveal both altruism and trustworthiness, opening the door to the construction of a net-trustworthiness measure shorn of the potentially confounding influence of altruism.

A second key feature of this study is that individuals selected to participate in the experimental study belonged to a random sample of South African communities that are part of the KwaZulu-Natal Income Dynamics (or KIDS) longitudinal

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

living standards study. This design permits us to match artefactual experimental measures with actual household economic data so that we can explore the economic impacts of social capital at the concrete level of local social groups, as Sobel (2002) suggests. In addition, the three-rounds of the KIDS panel dataset offer analytical degrees of freedom that can be used to address econometric identification issues.[2]

In its effort to use measures derived from experimental games to explore real economic outcomes, this study builds on the pioneering work of Hans Binswanger who used experimentally derived risk preferences to explore individual farming decisions (see the summary in Binswanger and Sillers 1983). Similar to this work, Karlan (2005) uses economic experiments to measure norms and then explores the impact of these norms (understood as social capital) on the loan repayment decisions of low wealth, microcredit clients. Unlike Karlan's work, the analysis here does not analyze behavior in a particular transaction, but returns to the broader social capital literature and asks whether individuals living in communities characterized by greater degrees of trustworthiness are better able to advance economically.

As with the Karlan and the Binswanger and Sillers work, the analysis here is subject to the Levitt and List (2006) critique that economic experiments may provide an untrustworthy guide to individuals' behavior in real transactions. In the specific case of social norms, there may be a deeper concern that games may reveal individuals' preferences, but may tell us little about communities and the focal solutions to coordination problems that have emerged within them. While there is some evidence that participants in economic experiments do reflect the institutional environment where they live (Cardenas 2003), the proof is ultimately in the pudding. We do find that behavior within communities tends to be highly correlated, as would expected if the experimental results were reliably picking up local social norms.[3] In addition, the fact that this study (like those of Binswanger and Karlan) finds statistically reliable connections between experimental play and

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[2]Because norms may themselves endogenously evolve with the growth of material living standards (*e.g.*, see Francois and Zabojnik 2005), it is especially important to employ an adequate set of econometric controls. From this perspective, directly measured norms offer additional advantages over group membership indicators of social capital as group membership is obviously directly economically endogenous as it takes time and money to join and participate in social groups.

[3]As Manski's (1993) work on social effects makes clear, behavior within a community can be correlated for a variety of reasons, some of which reflect the operation of social norms, and others of which are purely spurious. Section 3 below discusses this issue further.

real world economic outcomes suggests that experiments are able to measure information that is otherwise unavailable to us as researchers, a point that is more thoroughly developed by Castillo and Carter (2007).

The remainder of this paper is organized as follows. Section 2 presents the intuition behind our strategy to measure trustworthiness using multiple economic experiments and uses a simple behavioral model to derive a measure of trustworthiness that is purged of the influence of altruism. Section 3 describes the experimental protocol and its implementation in South Africa, and shows that while altruism and trust game play are indeed tightly intertwined, the latter reveals the operation of social norms beyond what can be explained based on altruistic considerations alone. Using the experimentally derived norm measures, Section 4 then follows the social capital literature and estimates the impact of these norms on household living standards controlling for community effects and prior levels and rates of improvement in individual well-being. We find that social norms matter (boosting economic possibilities), though surprisingly altruism appears to matter more than trustworthiness. Our finding that social norms matter would seem to allay some of the fears expressed by Durlauf (1998) and others that the apparently positive economic effects of social capital simply reflects spurious correlations and unresolved identification problems. At the same time, the somewhat puzzling configuration of findings regarding altruism and trustworthiness suggests that we still have much to learn about how to measure and estimate the value of social norms and relationships, as discussed in the concluding section of the paper.

2. Using Experimental Games to Measure Trustworthiness in the Presence of Altruism

Empirical research on social capital has either relied on associational density measures (*e.g.*, the 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 group-based information conduits with the operation of norms that stabilize otherwise incentive incompatible inter-temporal exchanges (Fafchamps and Minten 2002). Associations are also expensive to establish and join, making them contemporaneously endogenous to economic outcomes. On the other hand, self-reported trust measures are susceptible to distortion and are difficult to interpret (Putnam 1995).

Experimental economic methods offer an alternative way to measure trustwor-

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thiness.[4] Experiments provide economic incentives to participants and resemble economic situations where norms might play a role in shaping behavior. Glaeser et al. (2000) have suggested using the trust game as a way to measure trust. However, as this section discusses, play in the trust game may reflect the operation of several distinctive norms of behavior, norms which would be expected to have quite different economic implications. A challenge is thus to devise procedures that permit the isolation of these different norms.

2.1. Trust Measurement and the Altruism Confound

In the trust game, an individual (the trustor) is given an endowment of money that he may either keep for himself or send to a recipient (the trustee). Any money sent to the trustee is multiplied (generating a positive return on money "invested" in the trustee). The trustee then has the choice to either keep all the multiplied money received for herself, or to return some to the trustor. Amounts sent by the trustor and those returned by the trustee present themselves as candidate measures for trust and trustworthiness.

However, there are two potential problems with these measures. The first is common to any experiment: Does the experiment evoke the same norms of behavior that individuals bring to their day-to-day economic lives. Indeed, work such as that by Montgomery (1989) suggests that people adopt different roles and employ different preference orderings, depending on circumstances. As explained in Section 3 below, the experiments employed here were framed as neutral "decisions" in order to avoid invoking particular social norms (see Camerer (1995) on early examples of framing effects in experimental economics).

A second problem with directly interpreting trust game results as indicators of trust and trustworthiness is that play in this game may be shaped by other considerations.[5] As developed more formally below, amounts invested and returned in trust games will not necessarily isolate trust and trustworthiness. Trustees can return money in the trust game because of altruistic preferences that compel them to share gains, or because of trustworthiness norms that would compel even non-altruistic individuals to return funds when entrusted with others' money. Similarly, trustors might send money away out of a sense of altruism or a norm

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[4]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.

[5]For example, Schechter (2007) argues that trustor behavior is shaped not only by trust, but also be risk aversion.

of sharing, as well as out of an expectation of return and selfish gain.[6] Distinguishing between these two motives is quite important if altruism norms have different economic implications from norms of trustworthiness. Platteau (2000), for example, argues that strong sharing norms may actively discourage innovation and growth in a community (since norms that compel unconditional sharing of gains act as a tax on income increases), whereas trustworthiness that secures legally unenforceable loan contracts may facilitate economic advance. Contrary to this argument, Becker (1981) suggests that altruistic preferences might serve as a device to discipline those who are selfish but who would also benefit from others' altruism.

In an effort to isolate and measure trustworthiness separately from altruism, the experiment employed here had individuals play multiple games, permitting the creation of a trustworthiness measure based on comparison of play across the trust and dictator games. In the latter game, an individual (the 'dictator') is given an endowment of money that she may either share with a passive recipient, or keep for herself (Forsythe et al. 1994). While the dictator's decision would appear to mimic that of the trustee, a key difference is that the funds available to the dictator were not previously held or allocated to her by her recipient. The dictator game thus opens a window into observing purely altruistic preferences shorn of any obligation to behave in a trustworthy fashion with the receiver's money. Under modest assumptions about the nature of preferences, the next section will show that observing an individual play both the dictator and trustee roles allows us to recover a measure of net trustworthiness–*i.e.*, returns beyond what the individual would send were she motivated solely by altruistic considerations.[7]

While this paper focusses on the possibility that altruistic considerations may confound the interpretation of trustee behavior as an indicator of trustworthiness, the more general point is that individuals operate under the influence of various

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[6]Forsythe, 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.

[7]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 inter-personal comparisons, he found that sender and receiver decisions are partially explained by unconditional kindness.

norms. For example, if trustees believe that trustors sent funds out of altruism rather than as an investment, then the interpretation of their behavior is further confounded by this fact.[8] Similarly, it could be argued that the decisions by both dictators and trustees is driven by a sense of fairness that stands apart from both altruism and trustworthiness. While this observation could certainly be true, Young (2008) suggests that stable social norms that coordinate behavior will tend to be fair in the sense that they result in an equal division of the gains to coordination. If this observation is correct, then norms of fairness and trustworthiness are not separate entities. Clearly there is much to learn about the different norms that shape behavior in situations when coordination of behavior and expectations are important.

2.2. Modeling and Measuring Trustworthiness in the Presence of Altruism

The trust game described above is particularly appropriate for the analysis of social capital because its structure matches the incentives of a loan contract in which there is no legal enforcement of repayment obligations. Denote as B^T the financial endowment given to the trustor in the trust game. The trustor divides this endowment between funds retained for himself and funds sent to an anonymous trustee (S). Funds sent to the trustee are implicitly invested in a project which yields a gross rate of return of $\pi > 1$ such that the trustee receives πS as her gross income. The trustee then chooses an amount R to return to the trustor. The trustee is free to return as much or as little of gross income to the trustor as she wishes, and faces no legal (or other external) sanctions should she return nothing to the trustor. For this reason of course, the amount returned by the trustee suggests itself as a measure of trustworthiness.[9]

In his review, Young (2008) notes that the enforcement of social norms in general can take place through a variety of mechanisms. Returning money in a trust game is clearly not a self-enforcing social convention as trustees have material incentives to retain the entire amount they receive. When implemented as a one-shot, anonymous exercise shorn of repetition and reputation effects (as we do here), trustee behavior is also not regulated by threats of external disapproval or sanctions. To the extent that these games adequately capture social norms, it

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[8]We thank an anonymous referee for this observation.

[9]Barr (2003), for example, uses information on the distribution of returns anticipated by trustors in the trust game to identify the strength of trustworthiness.

must therefore be capturing norms whose enforcement has been internalized by the trustee. That is, the one shot anonymous trust game should reveal information on what Platteau (2000) calls moral norms and Basu (2000) calls activity-limiting norms. These are norms that are sufficiently durable to shape behavior outside of any immediate punishment or incentive structure that might sustain them. In their theoretical analysis of trust and development, Francois and Zabojnik (2005) argue that it is precisely this durable sort of trust, which does not depend on immediate incentive structures for its maintenance, that is vital to the operation of market economies and economic development.[10] Barrett (1997) makes a similar point in his discussion about the importance of anonymous trust that permits the sphere of exchange to expand beyond those with whom one has direct social mechanisms of information and control.

While the simplicity of the trust game is compelling, using the gross amount of funds sent by the trustor as a measure of trustworthiness presumes that the trustor would in fact send nothing if he knew for sure that nothing would be repaid by the trustee. While this would be true for a purely selfish trustor, we know from a large body of experimental evidence that individuals will unconditionally share money even when the structure of the game prohibits repayment (as in the dictator game described above). Indeed, the trust game makes it relatively cheap for the trustor to altruistically share money with the trustee as each unit of money received by the trustee only costs the trustor $1/\pi$ units.[11]

Similarly, the gross amount of money returned by the trustee in the trust game is likely to be shaped by the same altruistic sharing norms that lead individuals to share money in the dictator game, as well as by any additional norms that compel individuals to return money specifically entrusted to them by the trustor. We will refer to this second kind of norm as a norm of trustworthiness.

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[10]Moral or activity-limiting norms are presumably initially created with some incentives. In the models of Francois and Zabojnik (2005) and Escriche *et al.* (2004), parents choose whether or not to socialize their children to a particular set of norms. While even rod-sparing parents create incentive structures for their children to conform to the desired norms, the presumption is that the norms eventually become internalized and persist in limiting behavior well past the point where these incentives are operative.

[11]We will refer to behavior such as that seen in the dictator game as altruistic. While altruism denotes the idea that individuals care about others and gain utility from helping them, it is of course possible that players in the dictator game are compelled by a steely sense of duty to share, and do not experience any direct increase in welfare from the act of sharing (Barrett 1999). Dana, Weber and Kuang (2007) suggest that giving in dictator games is the result of attempts to boots one's image of oneself rather than altruism. In our study, we maintain anonymity and protocol stability as a way to reduce this kind of "audience" effects.

To isolate trustworthiness shorn of altruistic influences, we would like to observe trustee behavior in the absence of trustworthiness considerations. Fortunately, the symmetry between the trustee's decision and that of the dictator in the dictator game suggests a way to create this counterfactual. As noted above, the dictator's decision resembles a counterfactual for the trustee decision in which trustworthiness norms are not operative. A straightforward measure of the strength of trustworthiness norms would then be the difference between the actual trustee share and the counterfactual share as revealed by the same individual's play in the dictator game:

$$\widetilde{\Delta}_j = \left(\frac{R_j}{\pi S_j} \right) - s_j^d, \tag{1}$$

where s_j^d is the share sent by individual j in the dictator game and πS_j is the amount received by j as trustee in the trust game. This simple inter-personal comparison measure thus says that the trustee's trustworthiness is signalled by any additional amount that she sends in her role as trustee over and above what she sends as a dictator.[12]

While (1) is intuitive and compelling in its simplicity, it overlooks one important difference between the trustee and dictator decisions that makes the latter suspect as a clean counterfactual for the former. In the trust game, the trustee knows that the trustor kept the portion of the budget $B^T - S \geq 0$ for himself. In the dictator game, no such endowment is given to, or has been retained by, the dictator's partner. Put differently, the proper counterfactual for the trustee's decision would be a a dictator game played when the dictator's partner was known to enjoy a prior endowment of $B^T - S$.

However, in the experimental data available for this study we do not observe trustees play a dictator game with appropriately structured pre-play endowments.[13] Unfortunately, ignoring the impact of endowments on trustee play could distort the measure of trustworthiness based on (1). Consider, for example, an individual whose altruistic preferences would lead her to a 50-50 division of the

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[12] In principal, play by the trustor could also be used to separately identify trust from altruistic preferences. However, in our particular empirical application, we can only separate the two under strong assumptions about the trustor's elasticity of substitution between his own well-being and that of the trustee.

[13] Note that implementing such a scenario would have required an experiment in which each trustee played an individually tailored dictator game based on the amounts retained by the trustee's trustor partner.

spoils in a standard dictator game. If this same individual, as trustee, received only a very modest share from her trustor (indicating that the trustor had already kept more than 50% of the available funds for himself), she would be inclined on purely altruistic grounds to return nothing to the trustor. However, perhaps trustworthiness norms compel her to return a 30% share to the trustor. In this case, trustworthiness measure (1) would be -20%, indicating no trustworthiness, when in fact it was exactly a norm of trustworthiness that compelled the trustee to return the 30% share.

By imposing structure on the nature of preferences, we can formalize this intuition and use it to derive a measure of trustworthiness based on a more satisfying counterfactual than that used in (1). In particular, assume that in the absence of trustworthiness norms, we can adequately represent a trustee j's preferences by the following CES utility function,

$$u(y_s, y_o) = \left((1 - \alpha_j) y_s^{(\sigma_j - 1)/\sigma_j} + \alpha_j y_o^{(\sigma_j - 1)/\sigma_j} \right)^{\sigma_j/(\sigma_j - 1)} \tag{2}$$

where y_s is the total payout received by the individual herself, y_o is the total payout received by her partner, α_j measures the strength of altruistic preferences and σ_j is the elasticity of substitution between payoffs to herself and to her partner. In the standard dictator game, the dictator must divide a budget of B^d between herself and her partner who received no prior endowment, so that $y_s = B^d - R^d$ and $y_o = R^d$, where R^d is the amount sent by the dictator to her partner. Choosing $R^d \geq 0$ to maximize utility of the form (2) will result in the dictator sending her partner $R^d = \widetilde{\alpha}_j B^d$, where the optimal budget share $\widetilde{\alpha}_j = \frac{(\alpha_j)^{\sigma_j}}{(\alpha_j)^{\sigma_j} + (1 - \alpha_j)^{\sigma_j}}$.

However, if the individual knows that her partner received a prior endowment, she will in general send a lower share than $\widetilde{\alpha}_j$.[14] In the trust game, the trustee receives a budget of πS, and knows that her trustee partner has retained an endowment of $B^T - S$, so that the final payouts become $y_s = \pi S - R$ and $y_o = (B^T - S) + R$. In this case, if the trustee behaved like an individual in the dictator game and chose R based solely on altruistic considerations in order to maximize (2), she would optimally choose:

$$\widehat{R}_j = \max[\widetilde{\alpha}_j \pi S - (1 - \widetilde{\alpha}_j)(B^t - S), 0]. \tag{3}$$

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[14]However, if trustees care only about the "act of giving," the money endowment kept by the trustor will not influence the trustee's decision. Re-specifying our analysis here in terms of impure altruism of this sort (to use the langauge of Andreoni 1989) would imply uniformly smaller estimates of the degree of trustworthiness (as trustees who ignore trustor endowments should altruistically give no less than they would taking those endowments into consideration).

Note that in the trust game, the trustee's choice is censored from below at zero (*i.e.*, the game structure does not permit a trustee to take further funds away from a trustor who retained most of the endowment for himself). Also, as can be seen from examination of the interior solution, a purely altruistic individual discounts the amount sent to her partner based on the amount of endowment already enjoyed by the partner as $\widehat{R}_j$ declines with the amount of funds retained by the trustor $((B^t - S))$.

Figure 1 graphs $\widehat{R}_j$ for different values of πS.[15] The solid line reflects the censored relationship, whereas the dotted line, which extends below zero, shows what uncensored choices would look like. As can be seen, a purely altruistic trustee will return nothing to a trustor who kept most of the budget for himself, and absent censoring would like to take an additional amount away from the trustor when πS is too low and $B^t - S$ is too high for her preferences.[16]

[insert Figure 1 here]

Expression (3) now opens the door to a more satisfying counterfactual measure of how the individual would have played her role as trustee in the absence of trustworthiness norms. In particular, knowledge of $\widetilde{\alpha}_j$ and of the amount received by the trustee in the trust game would permit us to use (3) to create a measure of how the trustee would behave if her choice was guided solely by altruistic considerations, shorn of any additional compulsion induced by norms of trustworthiness. We can thus modify the naive trustworthiness measure (1) as follows:

$$\widehat{\Delta}_j = \left(\frac{R_j - \widehat{R}_j}{\pi S_j} \right) \tag{4}$$

Note that this measure of excess trustor returns is simply the difference between actual trustee play and the estimated counterfactual play of the trustee if she operated solely under the influence of altruistic norms.

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[15]Other parameter values are set at those typical of the actual experiments reported below: $\pi = 3$, $B^t = 10$, and $\widetilde{\alpha}_j = 0.38$, where the latter figure is based on median play in the dictator game.

[16]As can be seen from (3), the intercept is strictly negative $(-(1 - \widetilde{\alpha}_j)B^t)$, indicating that purely altruistic trustees will not return anything to trustors who retained most of their budget for themselves. The slope, indicating the amount marginally returned per unit received ($\widetilde{\alpha}_j + (1 - \widetilde{\alpha}_j)\frac{1}{\pi}$), is strictly greater than $\frac{1}{\pi}$ (for $\pi > 1$), indicating that altruistic trustees ($\alpha_j > 0$) always *marginally* share some of the gains and repay more than the amount that the trustee sent to the trustor. As the strength of altruism declines, the slope and intercept drop and the non-altruistic trustee ($\widetilde{\alpha}_j \approx 0$) will return nothing.

Figure 1 illustrates this measure for the hypothetical case of a trustee j with the median level of altruism who receives 20 Rand from her trustor ($\pi S = 20$). If trustee j returned R_j to her trustor, then $\widehat{\Delta}_j$ would be proportional to the indicated distance between R_j and the predicted predicted pure altruism counterfactual given by $\widehat{R}_j$.[17] Given the information available from the paired dictator and trust experiments, we can calculate measure (4) for each trustee participant.

3. The KwaZulu-Natal Economic Experiment

As described in the introduction, we carried out field experiments in fourteen South African communities that were part of an on-going longitudinal living standards study. Seven of the communities were urban, while the other seven were rural. All were located in the South African province of KwaZulu-Natal. KwaZulu-Natal saw some of the most severe politically-motivated violence in South Africa in the time leading up to the 1994 election of Nelson Mandela. Hundreds were killed, and a legacy of mistrust between supporters of the Africa National Congress and the Inkatha Freedom Party continues to shape life in the province. Study communities include tight-knit rural areas operating under chieftaincy structures, as well as politically and ethnically heterogenous urban townships. These communities thus promise substantial variation in levels of both trust and altruism. After describing the experimental procedures employed to identify the key parameters needed for the trustworthiness measures discussed above, this section takes a first look at the statistics that describe the experimental results.

3.1. The KIDS Living Standards Data

The fourteen communities used in this study were randomly selected as part of a 1993 South African national living standards survey called the Project for Statis-

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[17]The difference represented by measure (4) can be transformed into a scaled measure of trustworthiness if we impose further structure on the nature of preferences. We can redefine y_o, the term which gives the trustee altruistic utility, as $y_o = B^t - S + R - \tau_j B^t$, where the new parameter τ_j measures the strength of norms that compel trustworthy behavior. If $\tau_j = 0$, then y_o reduces to $R - S + B^t$ as in the pure altruism case and the trustee would optimally set $R = \widehat{R}_j$. If $\tau_j = 1$, y_o reduces to $R - S$ such that this utility function is similar to a Stone-Geary specification in which the trustee only receives altruistic gratification after returning more to the trustor than the amount S that originally belonged to the trustor. After some manipulation, we can show that we can measure trustworthiness as $\tau_j = \frac{R_j^* - \widehat{R}_j}{(1 - \widetilde{\alpha}_j) B^T}$. Empirical results using this scaled measure are qualitatively similar to those reported below for $\widehat{\Delta}_j$.

tics on Living Standards and Development or PSLSD. The PSLSD was the first nationally representative household survey in South Africa to investigate poverty, inequality and socio-economic dynamics. The design of the study was similar to that of the Living Standards Measurement Surveys that have been undertaken in more than 100 developing countries. The main instrument was a comprehensive household survey that collected an array of information on the socio-economic circumstances of households. The 1993 sample was selected using a two-stage self-weighting proportional-to-population design using a sample frame based on the 1985 Census (PSLSD 1994).

Households visited by the PSLSD in KwaZulu-Natal province were re-surveyed in 1998 to form the study known as the KwaZulu-Natal Income Dynamics Study (or KIDS). The 1993 PSLSD data included 1558 households of all races located in 73 enumerator clusters or communities in KwaZulu-Natal. For KIDS in 1998, the white and colored households were excluded from the sampling frame due to likely sampling biases. Eventually, the matched 1993 and 1998 waves of KIDS contained data on 1171 African and Indian households of the 1354 eligible households interviewed in 1993.

As May *et al.* (2007) detail, a third wave of the KIDS study was completed in 2004. As in 1998, "core members" of the original 1993 households were identified for resurvey. Households where cores had spilt up were tracked and interviewed whenever feasible. The 2004 survey refreshed the panel by interviewing adult children of core household members and has data for 74 per cent of the households contacted in 1998 and for 62 per cent of the households interviewed in 1993. Attrition levels in the KIDS data are typical for panel data in low income countries. Detailed analysis of attrition in the first two rounds of KIDS fails to reveal any systematic biases (Alderman *et al.* 2001).

3.2. Experimental Procedures

Forty percent of the subjects for the KwaZulu-Natal economic experiments were recruited from respondents to the KIDS 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.

In keeping with standard practice, the experimental protocol was framed in neutral language.[18] All experimental subjects played two games and assumed three roles, dictator, trustor and trustee. Individuals were told that they had several decisions to make with money we would give them and that their decisions would affect their earnings and the earnings of others with whom they would be randomly paired. The intent of this neutral framing is to avoid invoking any particular social role (and norms that might accompany it) that might tilt the analysis in one direction or another.[19] Somewhat at variance with standard procedure, we had each subject play sender and receiver roles in both the dictator and trust games. This design permits us to form the inter-personal comparison measures (1) and (3) for all experimental participants. As we will see in the next section, play in both games is broadly in-line with what has been observed in other field experiments, suggesting that this procedure did not lead people to horde all funds for themselves. Ultimately, this outcome may speak to the strength of altruistic and trustworthiness norms that apparently compelled normal and locally appropriate behavior.[20]

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. 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 subjects did not want to share any money, they were told to leave the blue envelope empty.

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[18] The experiments were conducted in Zulu except in the Indian community of Chatsworth where the experiments were conducted in English.

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

[20] While it might seem reasonable to hypothesize that no one would share funds in the dictator game given that everyone else was also playing the same game, this behavior would not be obvious in a community characterized by strong sharing norms. If individuals considered it likely that others would share, then an altruistic sharing norm would continue to compel them to share lest they receive but not send any money. Our results in fact show sharing levels consistent with expectations in other field experiments, giving us confidence that this configuration of the dictator game revealed reliable information on sharing norms.

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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 made their decision, envelopes were collected,[21] 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.[22] 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 their decisions. 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 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.

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

[22]Envelopes 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.

3.3. Experimental Data

Table 1 displays descriptive data from the trust and dictator games played in the 14 South African communities, listed in the ascending order of the average budget shares returned by trustees in the community. On average across the whole sample, trustees returned 39% of the funds they received, while trustors sent away 52% of their budgets and dictators sent away 42%.

While interesting as indicators of individual behavior and preferences, a key question is whether play in these games reflects social norms understood as focal points for a coordination problem. Consistent with the notion that game play reflects social norms, the median community share sent by trustors correlates strongly with the median budget share returned by trustees as the correlation coefficient is 67%. The correlation between community average shares is 47%.

[insert Table 1 here]

Table 1 also shows that income levels and income growth vary greatly across communities.[23] The data suggest a relationship between behavior in experiments and changes in per-capita household expenditures. Expenditures are measured in Rand per-person per-month. To contextualize these figures, the most commonly used poverty line in South Africa is Rand 322. Half of the communities with above average levels of trustworthiness almost or more than doubled their expenditures between 1998 and 2004. The corresponding proportion for communities below the average level of trustworthiness is one in three. The relationship between behavior in experiments and expenditure is clearer when comparing communities according to their level of sharing. Five out of eight communities above the mean level of sharing almost or more than doubled their expenditure between 1998 and 2004. Only one in six of communities below the mean level of sharing did so.

It is of course possible that these correlations are spurious. As can be seen from Table 1, the gender and educational composition of the participant groups varies substantially across communities. Four out of the five most trustworthy communities are also rural. However, supporting the notion that play in the game reflects community focal point norms is the evidence that an individual's level of trustworthiness and altruism can be predicted by the behavior of others in their community. Regressing dictator and trustee shares on average community shares (and other covariates) reveals that that a ten percentage point increase in the

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[23]The growth figures are relatively high, in part because the South African economy stagnated at best during the mid-1990s.

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share sent by others in a community increases the individual's share by about eight percentage points, even when the community share has been instrumented with a set of pre-determined instruments (full results are available from the authors). While there are a number of factors that could explain these relationships,[24] they support the notion that the experimental games capture social norms operative at the community level. The next section of this paper will further test this idea by exploring whether or not the community norms revealed by these games have real life economic effects on the wellbeing of individuals.

As can be seen in Table 1, both 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). As discussed above, the altruistic norms that underlie such relatively high levels of giving in the dictator game would be expected to spillover and influence play in the trust game.

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%.[25] 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 relatively trustworthy behavior of individuals playing the trustee role in the KwaZulu-Natal economic experiments is quite remarkable given that trustees had no material incentive to return any money, nor did they face any threat of

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[24]In the language of the literature on social effects, this correlated behavior could reflect true endogenous social effects (individuals mimic the behavior of those around them) as well as the operation of common exogenous factors that lead to common behavior (exogenous social effects) as well as the operation of correlated unobserved factors (like minded individuals tend to live in the same community).

[25]Prior to playing their role as trustor, individuals played the dictator game. In subsequent research in Honduras, we found that individuals who first played the dictator game sent significantly less (6 percentage points) in the trust game, compared to individuals who played the trust game first. While we do not have an explanation for this finding, it sends a cautionary note that perhaps the order of play made trustors send less money than they otherwise might have. Since this order treatment was uniform across all players, it should not introduce any systematic bias to the analysis.

social sanctions or disapproval given the anonymity of the experimental design. Amounts returned by trustees are larger than that typically observed in trust experiments with student populations, but in keeping with the general tenor of field experiments in developing countries (see the review by Carpenter and Cardenas 2008). However, 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.

[insert Table 2 here]

A more precise decomposition of the trustee behavior into altruistic and trustworthiness components is possible using the prediction from the model of trustee behavior developed in Section 3. Overall, 71% of subjects returned more as trustees than the pure altruism counterfactual trustee decision predicts.[26] The mean (median) value for the net trustworthiness measure $\widehat{\Delta}$ is 11% (32%). The significance of trustworthiness norms can be more firmly established by an econometric test of the implications of a purely altruistic model of trustee behavior. From (4), the observed budget share (censored by the non-negativity restriction) will be given by:

$$r_j = \begin{cases} r_j^* = \widetilde{\alpha}_j - (1 - \widetilde{\alpha}_j)\left[\frac{B^t}{\pi S} - \frac{1}{\pi}\right] \\ 0, \; otherwise \end{cases} \tag{5}$$

If there were no norms of trustworthiness operative, then the Tobit regression of budget share on $\widetilde{\alpha}_j$ and $(1 - \widetilde{\alpha}_j)(\frac{B_T}{\pi S} - \frac{1}{\pi})$ should yield coefficient estimates of 1 and -1 respectively (while the intercept term should be zero). Table 2 presents these Tobit estimates. As can be seen, the estimated coefficients are quite different from what would be expected in the case in which purely altruistic considerations determined trustee play in the trust game.[27]

Figure 2 projects the data points from our experiments onto Figure 1 and gives a visual feel for this result. The solid line in that figure is again the amount that

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

[27]The coefficients are also statistically different than those that would be predicted if forgetful trustees ignored game endowments held by trustors (see note 9 above). Forgetfulness implies that regression (5) would have an intercept of 1/3, a coefficient on $\widetilde{\alpha}_j$ of 2/3, and a zero coefficient on the term $(1 - \widetilde{\alpha}_j)(\frac{B_T}{\pi S_o} - \frac{1}{\pi})$.

a 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. The purely altruistic model predicts that 23% of trustees would have returned zero given their level of altruism and the endowment retained by their trustors. In fact only 3.5% of trustees returned nothing to their trustors.[28]

[insert Figure 2 here]

4. The Economic Value of Trustworthiness

Several prior studies have used micro data to explore the impact of social capital 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. 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 measure of lcoal social capital. 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.[29]

Using the first two rounds of the living standards data available for this study (the KwaZulu-Natal Income Dynamics study, or KIDS), Maluccio *et al.* (2000) construct both household-specific and community-level individual social capital indices conceptually similar to that employed by Narayan and Pritchett. They find that while the community social capital index has little explanatory power for 1993 livelihood outcomes, it does have a large and statistically significant effect in 1998. The individual level variable is significant in both periods, though larger

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[28] The trustworthiness norm measure discussed in footnote 14 above, τ_j, has a mean value of 0.19 and a median of 0.52. This value 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 τ_j within communities ranges from 0.20 to 0.66.

[29] Worried 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.

in 1998. They interpret these results as evidence that the post-apartheid period offered new opportunities for upward mobility, opportunities that could be more effectively exploited by individuals with larger endowments of social capital and residing in communities with higher levels of social capital. Following up on the Maluccio *et al.* (2000) study, Haddad and Maluccio (2003) use the 1993 and 1998 rounds of the KIDS data to explore the interactions between group membership and self-reported trust measures.[30] They find positive interactions between group membership and self-reported trust, as well as positive impacts of both trust and group membership on the well-being of households.[31] The employ household fixed effects to lessen concerns that the endogeneity of group membership to household well-being biases estimates of the impact of social capital. However, even setting aside these endogeneity concerns, their social capital variables are at best indirect measures of social norms. These indirect measures are also unable to distinguish the effects of trustworthiness from altruism or sharing norms.

4.1. Regression Model and Estimation Strategies

The measures derived from the KwaZulu-Natal economic experiments permit us to more directly explore the impact of trustworthiness and altruism on the capacity of households to generate a livelihood. The proxy measures of trustworthiness used in many other studies, based on group membership and participation, are arguably not only less precise, they are also economically endogenous in a most immediate way. If membership in groups and clubs is a normal economic good, we would expect higher well-being to lead to increased participation. While even directly measured community norms may be endogenous to economic phenomenon, we can exploit the panel structure of the available KIDS data and write the regression function for the 2004 level of per-capita expenditures of household i in community g as:

$$y_{ig}^{04} = \delta_0 y_{ig}^{93} + \delta_1 \Delta_{ig}^{y} + \beta_N N_g + \beta_z z_{ig} + [c_g + \varepsilon_{ig}^{y}], \qquad (6)$$

where household well-being is measured as 2004 per-capita expenditures, y_{ig}^{93} is the household's per-capita expenditures during the initial round of the KIDS survey in

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[30] The KIDS surveys asked respondents to use a five point scale to rate the degree to which they trusted local leaders, the media, etc.

[31] The Haddad and Maluccio study treats trust and group membership as endogenous variables, using prior period trust to identify group membership, and prior period membership to identify trust. The Maluccio *et al.* study employs fixed effects to control for time-invariant characteristics that may be correlated with the group-membership based social capital index.

1993, Δ_{ig}^y is the in change in the household per-capita expenditures between 1993 and the second survey round in 1998, the vector N_g includes measures of average community norms from the 2001 KwaZulu-Natal economic experiments,[32] and the z_{ig} are the economic and social factors that condition achievable well-being of household i. The unobserved factors, enclosed in square brackets, are partitioned into a community effect (c_g) and an idiosyncratic error term (ε_{ig}^y).

Regression equation (6) exploits the temporal structure of the available information in several ways. First, the KwaZulu economic experiments were carried out *three* years in advance of the 2004 round of the KIDS data which we use to construct the measure of household expenditures. Short term phenomenon that may have boosted livelihoods in a community thus cannot have also influenced the pre-determined trustworthiness measure. In addition, the data from the two earlier rounds of the KIDS data (1993 and 1998) can control for prior levels and trends in household expenditures that may be spuriously correlated with observed norms. While we believe that this data structure provides a strong identification strategy, we further control for a community fixed effect, c_g. Following Hausman and Taylor (1981), we instrument for the community fixed effect using the community means for all the observed right-hand side variables that vary within communities (including community average initial living standards and prior average growth in living standards). While there is always some chance that some shock randomly perturbed both community norms and living standards in the post-1998 period, it is hard to imagine what such a shock might be,[33] especially since the social norms revealed by the KwaZulu economic experiments would be expected to evolve slowly over time. From this perspective, it is important that we rely on direct norm measures rather than associational density measures, as the latter could be easily moved by short-term income shocks.

4.2. Regression Results

Table 3 presents the results of this estimation strategy. In addition to 1993 per-capita expenditure level and 1993 to 1998 expenditure growth, the other individual control variables in the regression include the age, education and sex of the household head. Across all of the regressions, initial expenditures and prior expenditure growth are strong and significant predictors of 2004 well-being levels.

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[32] For individual i, the measure N_g is the mean of all individuals in the community except i.

[33] Severe natural crises might be one candidate for such a shock. However, no such events took place in the study area over the relevant time period.

The included standard human capital variables are not significant, presumably because they change little over time and their influence has already been subsumed by the variables measuring initial conditions. Mean community initial conditions (which control for community effects) are also significant as would be expected.

[insert Table 3 here]

The first column of Table 3 includes only a single norm measure, the gross share returned by the average trustee in the community.[34] As can be seen, the coefficient on this gross trustworthiness measure is economically large and statistically significant. A shift from the 25th percentile value of this community average trustworthiness share (36%) to the value at the 75th percentile (42%) is estimated to increase the per-capita expenditures of the median KIDS household by about 42 Rand per-person per-month (or about $US 6). Given that the median household has a per-capita standard of living approximately equal to the national poverty line of 322 Rand per-person per-month, this increase implies a living standards increase of just over 10%.

While this trustworthiness effect implies a rather substantial increase in living standards, the amount returned by trustor likely reflects the operation of both norms of trustworthiness as well as those of altruism. If Platteau's (2000) intuition is correct, then we might expect to see larger returns to trustworthiness once we strip away or control for the effect of altruism. To explore this idea, models 2 and 3 in Table 3 include measures of both altruism and trustworthiness. Model 2 includes the average community altruism share, $\overline{s}^d$. Including this variable reduces the magnitude of the coefficient of the trustworthiness variable by about 35% and reduces its statistical significance. Model 3 employs the net measure of trustworthiness given by measure (4) and also controls for altruism. Both measures are significant, but the coefficient on the altruism measure is substantially larger.

At a first level, these results suggest that strong, altruistic sharing norms may play a more important role in promoting economic advance than suspected. Such norms may operate by stabilizing consumption and enabling individuals to undertake riskier, but more remunerative activities. This result is consistent with Becker's idea that altruistic preferences can help internalize incentive problems in families and groupings. Indeed, recent experimental work by Gürerk, Irlenbusch,

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[34]This measure was calculated on an observation specific basis so that the average excluded the share sent by the household (for those cases in which a household member participated in the economic experiments).

and Rockenbach (2006) shows that if groups can form endogenously, altruistic preferences can promote cooperation across society since selfish people can be excluded from its benefits.

At a second level, these results encourage a deeper consideration of how social capital might work in order to facilitate economic advance. Conceptual work such as that by Barrett (1997) and Francois and Zabojnik (2005) suggests that it is not trust *per se* that matters, but rather the boundaries of trust. Our experiments were rooted within single communities. While our experiments should have elicited a durable, action limiting, moral norm of trustworthiness, trustworthiness amongst members of those single communities may not signal the sort of generalized, anonymous trust which these authors suggest is key to development.

In addition to these conceptual points, the empirical analysis of social capital would seem to require a more careful structural approach than one that pools data on all households and asks if household per-capita expenditures increase on average with trust. While trustworthiness may enhance the capacity of households to informally access capital, insurance or jobs when markets are weak, not all households in a community will be constrained in their access to these goods.[35] Pooling all households into a single regression may thus disguise the impact of trust on those who need it.[36]

Finally, the capacity of people to assist those whom they trust clearly depends on the resources that they have available to them. Theoretical analysis by Mogues and Carter (2005) shows that in a polarized society like South Africa, we might expect endogenously created social capital to offer little in the way of upward economic mobility for poor households. Without control for the resources of the trusting group, little could again be inferred from pooled regressions of the sort displayed in Table 3, even when norms are appropriately measured and endogeneity issues handled credibly. Unfortunately, the data available for this study contains scant information on the resources and capacity of local social networks to bridge and connect people to economic opportunity.[37]

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[35] In addition, the variance of trust may be just as important as its average level if social capital works by making agents willing to issue the informal loans that permit economic advance.

[36] An 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).

[37] In a variation of the regressions reported in Table 3, the trust variable was interacted with measures of average community assets and education levels, with the expectation that these measures might signal the reach and connectedness of local networks. While the estimated coefficients of there terms were positive, they lacked statistical significance.

5. Discussion and Conclusions

This study set out to assess the claim that trustworthiness affects economic outcomes, especially in low-income economies where markets and other formal institutions tend to fail. In an attempt to alleviate the measurement problems associated with this assessment, this study employed variations on trust and dictator games to separately isolate and measure both trustworthiness norms and the strength of altruistic preferences. 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 norms that guide their real world decisionmaking. In addition, the experiments were structured to reveal internalized or moral norms of behavior that some authors have argued are key to anonymous exchange and effective market institutions.

Combining these experimental norm measures with data on real economic outcomes allows us to re-approach the type of regressions found in the microeconometric social capital literature. Our directly measured norms, as well as the suite of control variables available from our three round panel study, make our analysis less susceptible to the endogeneity problems that have plagued other social capital studies (Durlauf 2002). We find that that experimentally measured norms account for variation in economic well-being beyond what can be accounted for by conventional variables. That is, these experiments do reveal novel information on the socioeconomic environment, lending further encouragement to studies that combine results from field experiments with real economic data.

Finally, our estimates indicate that sharing norms or altruism may have a stronger and more robust effect than does trustworthiness. While this result merits further investigation in its own right, it also suggests that we need to work harder in order to properly understand at the micro level how trust works. 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.

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Table 1. Summary Statistics

Community (*=Urban)	Exp. Obs	Experimental Session Characteristics						KIDS Survey		
		Average [Median] Share, %			Years of Age	Male (%)	Years Education	Per-Capita Expend.		
		Dictator	Trustor	Trustee				1998	2004	Growth (%)
Madadeni*	21	43 [38]	48 [40]	32 [33]	39.3	67	7.0	429	836	95
Buxeden	25	44 [38]	50 [40]	33 [33]	42.1	42	6.7	252	352	21
Emkindini	25	40 [38]	59 [60]	33 [33]	40.8	36	6.1	244	464	77
Kwamashu*	19	38 [38]	57 [60]	36 [33]	42.7	42	8.5	564	916	64
Imbali*	18	33 [38]	49 [40]	36 [33]	48.1	35	6.5	437	875	98
Umlazi-Z*	19	29 [25]	51 [40]	37 [33]	30.2	22	9.0	292	453	27
Umzumbe	10	38 [38]	42 [40]	39 [33]	33.0	40	7.6	428	647	41
Chatsworth*	20	53 [50]	56 [60]	39 [39]	49.9	30	5.1	913	1990	118
Mpumalanga*	15	32 [25]	41 [40]	40 [33]	36.5	69	8.8	696	764	33
Okhlahlamba	23	45 [50]	49 [40]	40 [33]	42.4	35	4.1	203	433	113
Mkandla	25	48 [50]	59 [60]	42 [42]	48.0	28	3.9	248	395	60
Mpakama	21	44 [38]	57 [60]	43 [42]	42.6	38	2.5	142	166	36
Dundee*	25	53 [50]	58 [60]	44 [42]	56.7	40	4.8	344	640	89
Kwabrush	17	46 [38]	65 [60]	51 [50]	42.9	29	2.9	140	381	175
ALL	283	42 [38]	53 [60]	39 [33]	42.8	39	5.8	380	666	77

Table 2: Test of Pure Altruism Counterfactual

	Trustee Share *Regression* (r_j)
$\widetilde{\alpha}_j$	0.27 (0.06)
$(1-\widetilde{\alpha}_j)(\frac{B_T}{\pi S_o}-\frac{1}{\pi})$	0.07 (0.02)
Constant	0.20 (0.04)

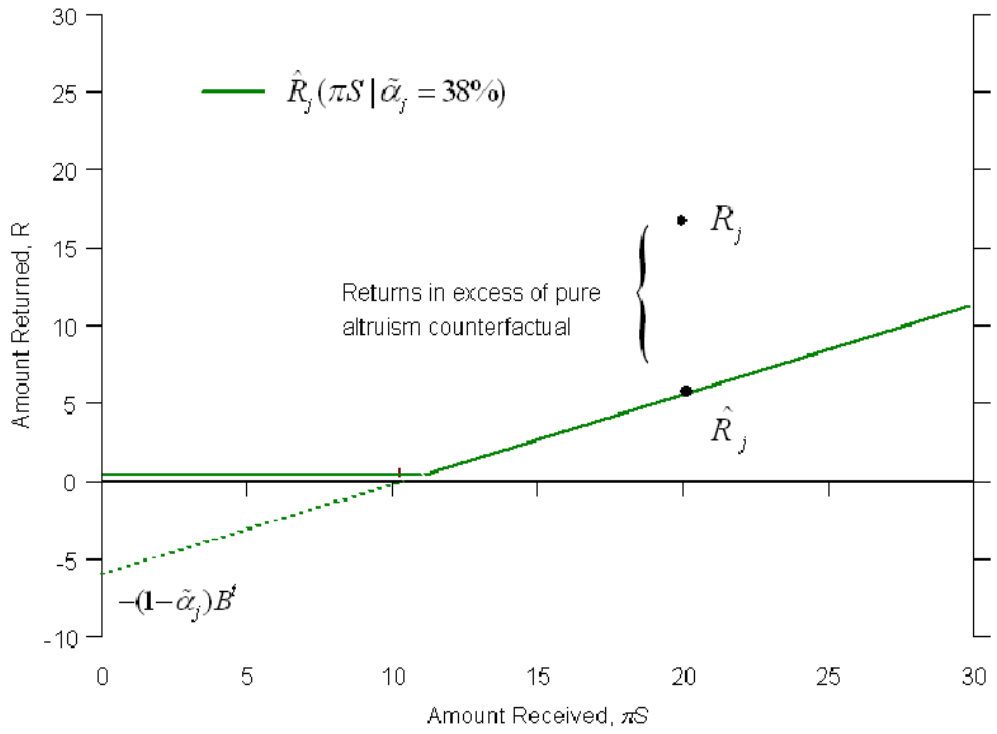| Table 3. *2004 Household Per-Capita Expenditures (log)*			
	Model 1	*Model 2*	*Model 3*
Average Community Norms			
Share Returned by Trustee, $\frac{R}{\pi S}$	2.04 (0.01)	1.44 (0.07)	
Net Trustworthiness, $\widehat{\Delta}$			0.27 (0.02)
Altruism, $\overline{s}^d$		1.16 (0.18)	2.15 (0.01)
Economic Characteristics			
1993 Expenditures (*log*)	0.45 (0.00)	0.44 (0.00)	0.43 (0.00)
1993-1998 Change in Expenditures	0.36 (0.01)	0.35 (0.01)	0.34 (0.02)
Education of Household Head	0.01 (0.52)	0.02 (0.41)	0.02 (0.35)
Demographic Characteristics			
Household Size (log)	0.02 (0.88)	0.02 (0.88)	0.02 (0.91)
Sex of Household Head (male=1)	-0.03 (0.79)	-0.03 (0.79)	-0.03 (0.80)
Age of Household Head (log)	0.004 (0.37)	0.004 (0.40)	0.004 (0.38)
Community Characteristics			
Location (urban =1)	0.23 (0.10)	0.27 (0.01)	0.40 (0.00)
Constant	-0.73 (0.52)	-0.80 (0.40)	-0.26 (0.69)
Instruments for Community Effects			
Mean 1993 Expenditures	0.59 (0.00)	0.57 (0.00)	0.48 (0.00)
Mean 1993 Expenditure Growth	0.27 (0.22)	0.23 (0.16)	0.15 (0.25)
R^2	0.49	0.50	0.50
n=209			

p-values in parentheses

Figure 1. Trustworthiness as Returns in Excess of Pure Altruism Counterfactual
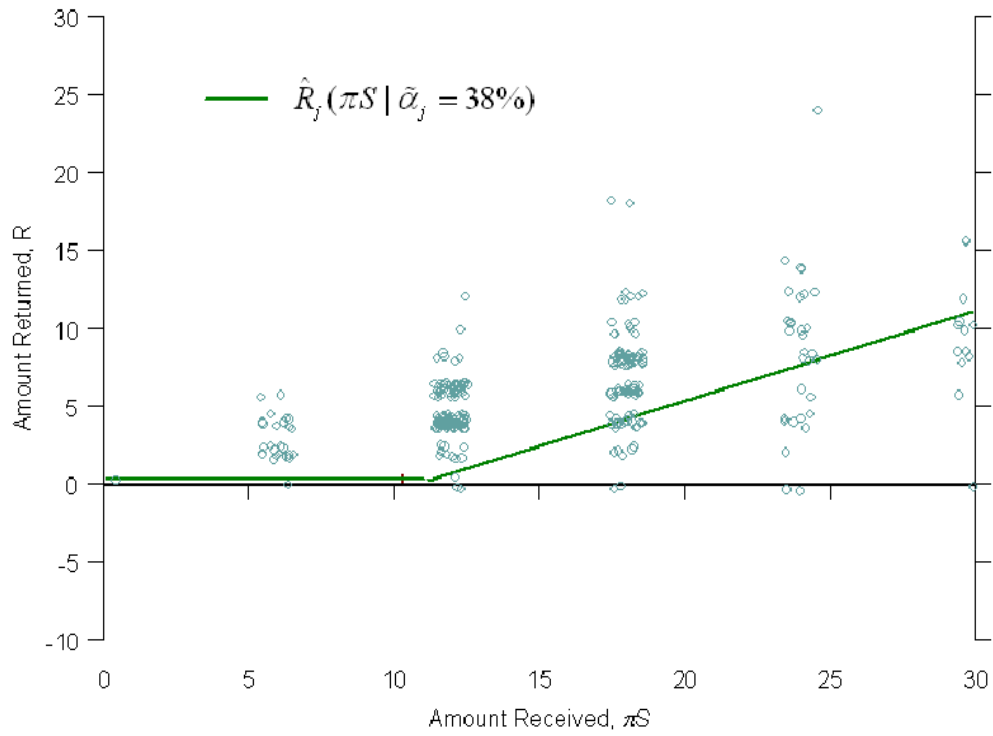
Figure 2. Trustee Data Showing Returns in Excess of Pure Altruism
Counterfactual