Trust, Reciprocity, and Contract Enforcement: Experiments on Satisfaction Guaranteed

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Abstract

Theorists and policy analysts have convincingly argued that greater trust makes a more efficient society by reducing the need for costly contracts. At the same time, some experiments have suggested that reciprocity is a potent substitute for law when compliance with contracts is imperfectly enforced. This paper examines these issues within the context of a common trust-building contract device: satisfaction guaranteed. We find that this mechanism does indeed build trust and improve efficiency, but only if it is externally enforced. Paradoxically, only one side of the transaction needs the assurance of external enforcement. Offering a satisfaction guarantee always increases trustworthiness of sellers, even when honoring it is fully voluntary, but only elicits the trust of buyers when it is legally enforced.

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1. Introduction

It is widely agreed that trust between buyers and sellers can be a great catalyst to efficiency and economic growth. By reducing the need for expensive contracting, enforcement, or litigation, trust can ensure more exchanges, better quality of goods, and lower costs of government. Economists know little, however, about how trust is engendered and encouraged, and to what extent government oversight can help or hinder the process of trust-building. As such, economic experiments—both in the lab and in the field—have been seen as a fruitful way to explore the interactions of trust, fairness, reciprocity, voluntary association and voluntary compliance with contracts.

There are two experimental games that are often used to represent important natural features of markets. First is the gift-exchange or trust game. A buyer makes an offer for a good of unknown quality and, after receiving the offer, the seller decides how much of the costly quality to supply. In the subgame perfect equilibrium the lowest possible quality is provided. As a result many efficient trades are not made. Second is the ultimatum game. A seller posts a price which the buyer can take or leave. In the subgame perfect equilibrium the seller offers the "break even" price to the buyer. Thus, all efficient trades are made while the full surplus (or nearly so) accrues to the seller.

Data from both games show that behavior is not as predicted. In gift-exchange games, people do in fact place trust in the sellers and this trust is (sometimes) rewarded with high quality. In the ultimatum game, sellers who grab too much of the surplus are likely to have offers rejected. In both games concerns for equity are believed to be interacting with the natural market forces to increase efficiency in the trust game and to reduce efficiency in the ultimatum game.

This paper begins by first looking to the real world and asking what sorts of institutions or mechanisms are employed to build trust. One immediate answer is the policy of *satisfaction guaranteed*: if a buyer isn't satisfied with the quality of a good, it can be returned for a full refund. In US markets, satisfaction-guaranteed predominates. According to one survey, 95% of retailers have some sort of return policy, where products in "like new" conditions are returnable.[1] Since these goods can be resold, it restores both parties to their pre-transaction utilities (less

[1] Che (1996) summarizes a survey of Illinois retailers that report 78% give cash refunds with a receipt, 32% give cash refunds even without a receipt. Twenty-three percent limit the return period, and others limit returns to merchandise credit. However, fewer than 5% say all sales are final. In addition to "like new" refunds, many retailers also accept used goods, or allow a "trial period."

transaction costs). In the US, using the term "satisfaction guaranteed" can have legal consequences for sellers, and firms can be sued if they fail to honor it.[2] But suing over small transactions is clearly too costly for many consumers. This, in effect, makes satisfaction guaranteed nonbinding for many sellers.

Examining the "satisfaction guaranteed game" strategically, one immediately sees that it is simply a gift exchange game with an ultimatum game added to the end. The subgame perfect equilibrium is that the seller provides the quality that makes the buyer "break even." As a result, there is an equilibrium in which all efficient trades are made, no items are returned for a refund and, again, the seller claims all of the surplus. In this equilibrium sellers are better off and buyers are no worse off. Sellers, therefore, should always prefer to offer satisfaction guaranteed.

Despite this equilibrium, experience from the ultimatum game leads us to expect again that things will be more complicated. Buyers who care about equity may balk at sellers who don't share enough of the surplus and even reject some efficient trades. If this is so, then the guarantee cedes some of the seller's bargaining power to fair-minded buyers. This then leaves the net effect on suppliers unclear. Satisfying the equity concerns of buyers could possibly cost them more than they gain from the extra surplus that the guarantee generates. Depending on the distribution of fairness-preferences, sellers may or may not wish to offer a guarantee.

This paper will report on experiments that focus on the satisfaction guaranteed game where returned items restore the pre-transaction payoffs. We find that a satisfaction guarantee that is perfectly enforced will greatly increase economic efficiency. However, sellers that share too little of the surplus are often rejected, thus undoing many efficient trades. The net effect is that buyers make significantly more under satisfaction-guaranteed, but sellers make the same in both institutions, even after experience.

We also allow sellers the choice of providing their good with or without a satisfaction guarantee. We find they overwhelmingly will do so, and those that do not are not trusted by buyers. When given the choice, therefore, sellers are far better off providing a satisfaction guarantee.

Finally, we allow fulfilling guarantees to be voluntary and non-binding. That is, sellers who offer satisfaction guaranteed can renege if a refund is requested. This

[2] This is distinct from the legally binding "implied warranty of merchantability." This means that goods traded must perform for the purpose for which they are sold. This implied warranty binds unless it is eliminated with language such as "with all defects" or "sold as is." A satisfaction guarantee, by contrast, is an explicit promise to refund the price to the buyer.

is our most realistic and most interesting treatment. We find, as expected, that nonbinding guarantees greatly reduce the trust put in sellers. This lack of trust is partly justified—of those who seek refunds, only 17% are honored. However, we also found that buyers in this condition trusted too little. Despite being strategically equivalent to the case where guarantees are not allowed, sellers in this condition were significantly more generous. In fact, they on average returned quality that was just as good as those in the condition where the guarantee is perfectly enforced. In other words, promising a guarantee—even one they don't intend to honor—made our subjects behave just as generously as if the guarantee were binding. Hence, this study ends with an interesting paradox. A satisfaction guarantee that is not enforced greatly improves the trustworthiness of sellers, but does not increase the trust put in them by buyers.

What does this study teach us about trust, reciprocity and contract enforcement? First we see that simple and natural institutions, such as refund policies, are highly effective in generating trust. Second, such institutions without legal constraints may nonetheless come with moral constraints that make them efficient. Without some enforcement, however, even the moral constraints on sellers may not be enough to improve the efficiency in these markets. Some oversight, either from governments, courts, or market reputations may be needed to guarantee the success of "satisfaction guaranteed."

The next section will provide a brief review of the US. laws on satisfaction guaranteed, and will review the relevant literatures from ultimatum and gift exchange games. Section 3 presents the experimental design, and Section 4 presents the basic results. Section 5 will discuss what these results imply for contract design and enforcement. Section 6 is a conclusion.

2. Background

Here we review the econometric and experimental evidence on trust, discuss how guarantees are enforced in the US, and briefly summarize the theoretical literature on guarantees.

2.1. Economic Benefits of Trust

It has long been recognized that greater trust can enhance the efficiency of market exchange, and over the past decade economists and other social scientists have turned to measuring these effects. Most notably, Knack and Keefer (1997) find

that countries whose residents, when surveyed, are more likely to agree that "most people can be trusted" tend to have significantly higher growth rates. Several other authors have explored similar constructs of "social capital" and made similar conclusions.

Durlauf (2002) surveys this literature and convincingly argues that inferences offered by Knack and Keefer and others may not be as evident as they suggest. He states social capital might be more productively studied with controlled experiments. Examples include the study by the anthropologist Jean Ensminger (2004) that shows a connection between trust in ultimatum games and market integration of small African villages. Barr and Serneels (2004) find positive correlations between the trust game and wages earned by workers in Ghana. Carpenter, Burks and Verhoogen (2004) look at "efficiency wage" effects in US trucking firms and find that workers' efforts rise with wages and the perceived fairness of their treatment. These studies indicate a valuable role for trust in the economy.

2.2. Trust and Reciprocity in the Laboratory

Fehr, Kirksteiger and Reidl (1993) present a non-linear gift-exchange game in which "workers" have increasing marginal costs of effort and "firms" can encourage effort with efficiency wages. Positive correlations between wages and effort were observed. Berg, Dickhaut and McCabe (1995), and Van Huyck, Battalio and Walters (1995) presented very similar models which have colloquially become known as the trust game. In this linear game the proposer can pass some of his endowment to the responder, which is tripled along the way, and the responder can pass money back to the proposer at a one-for-one rate. Evidence from these games is that many people trust and many people repay that trust. However, on average trust doesn't pay—proposers earn back about 90% of what they passed.

What motivates people in these games? Those who repay trust must do so out of some concern for altruism and efficiency (Andreoni and Miller, 2002), some aversion to inequality (Fehr and Schmidt 1999, Bolton and Ockenfels 2000, Levine 1998, Charness and Rabin 2002), or an intrinsic taste for reciprocity (Rabin, 1993, Fehr, Gächter, and Kirchsteiger, 1997).[3] Those who exhibit trust could have two motives. First, they could care about the equity and efficiency of outcomes or,

[3]Sobel (2004) provides an excellent summary of the literature on trust and reciprocity. He distinguishes between two notions of reciprocity that are both central to our discussion. First is *instrumental* reciprocity, where reciprocity is intended to generate real returns in the future. This need not have any moral basis. The other notion is *intrinsic* reciprocity. This is behavior that is chosen for its own reward—reciprocating may be seen as the right or moral thing to do.

second, they could opportunistically take advantage of a fair or altruistic opponent (Andreoni and Samuelson, 2005).

Fehr, Gächter, and Kirchsteiger (1997), and Fehr, Kirchler, Weichbold and Gächter (1998) make a strong and compelling case that responders care about behaving reciprocally. Using the gift-exchange formats and proportional punishment and reward schemes they show that players respond as predicted to the behaviors of other subjects. Engelman and Ortmann (2002) replicate and expand upon these studies and find, however, that the existence of postitive reciprocity found by Fehr and coauthors is quite sensitive to the parameters and methods chosen. They suggest that their findings may not be generalizable.

Andreoni, Harbaugh and Vesterlund (2003) find related but somewhat different results in a simple linear carrot-stick environment. They find that neither punishment of selfish behavior nor rewarding of selfless behavior are strong enough tools to improve cooperation, but that the two tools in combination are quite effective. This is true despite the fact that only one tool can be used at a time.[4]

Charness and Haruvy (2002) explore preferences more closely in a gift-exchange model and, by varying the degree of intentionality involved in offers and efforts, are able to identify that altruism, distributional concerns and reciprocity all have significant contributions to the final outcomes in these games. Cox (2004) takes a similar approach with the games of Berg, Dickhaut and McCabe (1995). He builds from dictator to trust games in three steps and again finds significant roles for altruism, equity and reciprocity. Gneezy, Güth, and Veboven (2000) find that subjects show more trust when the potential returns are higher, indicating calculated faith in the recipricity of others.

In all of these games, the context and costs of the reciprocal opportunities have been shown to be important. For instance, Andreoni, Brown and Vesterlund (2002) compared two sequential games with similar equilibria, but which differed in the cost of equity. They found that people tolerate inequality more when equality comes at the expense of efficiency.[5] A different context effect is found by List (2004). He conducts a chain of studies that incrementally moves the gift-

[4]The contrast with the work of, e.g., Fehr, et al. (1997) is perhaps surprising. One possibility is that Fehr, et al. use proportional punishment and reward schemes, making punishing and rewarding more inexpensive the greater the cheating or cooperating. This is an interesting question for future research.

[5]This finding is evident in many studies, that is, people will prefer more for both subjects to less, even when relative allocations are uneven. Andreoni and Miller (2002) and Andreoni, Castillo and Petrie (2003, 2004) find significant minorities,however, are willing to "shrink" lopsided allocations toward zero for both.

exchange game from the lab to the field. With each increment he finds behavior closer to the prediction of selfish behavior, with lower degrees or reciprocity.

Engle-Warnick and Slonim (2004) explore trust games that are repeated over time with the same partner. They find an erosion of trust when end periods are known, but less erosion when end periods are not know. Their study speaks to the importance of both reciprocity and reputations, and also to the fragile and temporal nature of trust.

Some of the most intriguing studies of trust and context relate to how external enforcement of contracts can erode natural amounts of trust. Bohnet, Frey and Huck (2001), for instance, argue that both low and high enforcement of contracts achieve the greatest efficiency. Trust, they argue, is crowded out by institutions that imperfectly enforce agreements. Gneezy (2003) finds similar effects in a carrot-stick environment.[6] However, in a Prisoner's Dilemma, Neugebauer (2004) finds voluntary compliance with contracts is far inferior to enforcement. These disparate findings are part of the motivation in this paper.

2.3. The U.S. Laws on Satisfaction Guaranteed

The Magnuson-Moss Warrantee Act of 1975 gives the US Federal Trade Commission (FTC) the authority to enforce promises of satisfaction guaranteed. It states[7], "A seller or manufacturer should use the terms 'Satisfaction Guarantee,' 'Money Back Guarantee,' 'Free Trial Offer,' or similar representations in advertising only if the seller or manufacturer, as the case may be, refunds the full purchase price of the advertised product." Moreover, the Act makes it easier for consumers to pursue a remedy for breach of warranty in the courts, and creates a framework for resolving disputes inexpensively and informally, without litigation.[8]

Finding examples of successful consumer action is easy. A recent example is Gateway 2000, whose advertisements stated "30-Day Money-back Guarantee. If you're unhappy with your Gateway 2000 purchase, for any reason, you can return the system within 30 days for a full refund." Gateway was found to deduct the cost of shipping from the refund, at an average cost of $62 per customer, for which

[6] Gneezy and Rustichini (2000) find a related result in a field study, although here the enforcement (a fine) reduces compliance by making clear the price of non-compliance, rather than displacing trust.

[7] Magnuson-Moss Warrantee Act, Title 16, Chapter 1, Subchapter B, Part 239.3, "'Satisfaction Guarantees' and Similar Representations in Advertising."

[8] For more description of the act, go to "A Businessperson's Guide to Federal Warranty Law" at the FTC website, http://www.ftc.gov/bcp/conline/pubs/buspubs/warranty.htm.

the FTC fined Gateway $290,000. Numerous other complaints are available from the FTC website, or other consumer protection websites.[9]

Along a similar vein, many states in the US have enacted "lemon laws" to regulate the sale of automobiles, both new and used. These vary from state to state, but a typical law stipulates what is meant by "reasonable repair attempts," for instance that a new vehicle under warrantee must be completely repaired or replaced within 18 months of being purchased.[10] Again, these laws are intended to strengthen the commitments made by sellers to ensure the quality of their products.

2.4. Economics Literature on Guarantees

There is a long history of papers written on guarantees, beginning with Heal (1977) who viewed guarantees as risk sharing arrangements.[11] Che (1996) wrote the first theoretical paper explicitly on consumer return policies.[12] He did not consider the moral hazard problem on the part of sellers, but assumed that consumers are uncertain about their preferences. He then explored money-back guarantees as a screening method for monopoly sellers. Buyers are risk averse *ex ante* and vary in their willingness to pay *ex post*. The guarantee neurtralizes risk aversion, promotes sales, and thus allows a monopolist to identify the high demand consumers *ex post*. The guarantees are profitable when risk aversion is high or the cost of the good is high. Che shows that guarantees always improve the welfare of buyers, but monopolists offer too few of them.

Kessler and Lülfesmann (2004) consider the alternating offers bargaining model of Rubinstein (1982) with the option to return the good after purchase. In this model there is unknown quality prior to purchase and the option for multiple rounds of bargaining. Without guarantees there will be inferior quality, but equal

[9] The complaint against Gateway can be found at http://www.ftc.gov/os/1999/01/9323275cmp.htm. For an example of a consumer advocate website see ConsumerAffairs.com.

[10] See autopedia.com for information about lemon laws across states.

[11] A related literature on warrantees also exists. See Cooper and Ross (1985) for the genesis of this literature. They view warrantees as insurance policies and consider issues of double moral hazard.

In addition to game theoretic models, there is an extensive literature on money back guarantees in the marketing literature. See, for instance, Heiman, McWilliams, Zhao and Zilberman (2002). These papers analyze and compare the costs of various forms of refund or partial refund policies to the costs of other marketing tools, such as samples and demonstrations.

[12] Papers by Mann and Wessink (1989, 1990) considered a non-strategic model of money-back guarantees, comparing them to product replacements.

division of the surplus. With guarantees, the moral hazard problem of the seller is solved and quality improves. However, the guarantee erodes the bargaining power of buyers and allows sellers to negotiate higher prices. Moreover, guarantees can lead to multiple equilibria and inefficient delays in agreement. The net effect is that sellers are always better off with guarantees, but buyers are only probably better off, depending on parameters of the game.

3. Theory and Experimental Design

Consider a game with two players, player 1 acts as the buyer and player 2 the seller. Each player is endowed with 100 cents. We examine four conditions.

CONDITION 1: TRUST. In stage 1 player 1 passes $x \in [0, 100]$ to player 2. Player 2 receives an amount $3x$. In stage 2 player 2 observes x and can return any amount $y \in [0, 3x]$ to player 1. Final earnings for player 1 are $\pi_1 = 100 - x + y$, and for player 2 are $\pi_2 = 100 + 3x - y$.

While the most efficient outcome is $x = 100$, the subgame perfect choice is always $y = 0$, hence the best choice for player 1 is $x = 0$.

CONDITION 2: SATISFACTION GUARANTEED. After the basic game of Trust, we now add a third "guarantee stage." In this stage, player 1 has the option of choosing "default payoffs" rather than those earned from choices of x and y as calculated in the Trust game above. In this case the default payoffs would return *both* players to their original endowment, that is, $(\pi_1^D, \pi_2^D) = (100, 100)$.

The guarantee now alters the subgame perfect equilibrium. In the guarantee stage, player 2 would clearly choose the default if $y < x$. Hence, in stage 2 a money-maximizing player 2 chooses $y = x$, or $x + \varepsilon$. Going back to stage 1, any choice of x will yield the same payoff for player 1, that is $\pi_1 = 100$ or $100 + \varepsilon$. Hence, any amount $x \in [0, 100]$ is a subgame perfect equilibrium.[13] Note that with money-maximizing preferences, this multiplicity of equilibria means that a satisfaction guarantee will not assure efficiency.

[13] Note this is also a perfect equilibrium as long as the "trembles" by Player 2 are independent of the amount passed by Player 1. If they are increasing in the amount passed, however, then $x = 100$ could be the unique perfect equilibrium.

What if there are equity concerns? Suppose, for instance, player 1 would prefer the default of 100 to any amount returned by player 2 that is less than $x(1+\alpha)$, for some $\alpha > 0$. As long as $\alpha < 2$, then player 2 would most prefer to return $y = x(1+\alpha)$ and as a result player 1's best strategy is to send $x = 100$. For any $0 < \alpha < 2$, even if α is very small, this remains the unique subgame perfect prediction. This means that even a little bit of equity combined with a satisfaction guarantee will yield a unique equilibrium that is completely efficiency.

The Trust and Satisfaction Guaranteed games are illustrated in Figure 1. One can easily identify the equilibria in this figure. The figure also makes salient two possible competing versions of equity. First is "equal-payoffs" in which final payoffs of the two players are the same. This should encourage player 2 to choose $y = 2x$ and encourage players to strive for the (200,200) payoff. However, one could also justify a "split-the-surplus" notion of equity. By passing x, player 1 is creating a surplus of $3x$ for player 2, which shared evenly means $y = 1.5x$. When $x = 100$, this means a payoff of (150, 250). As we will see, both notions of equity are evident in the data.

CONDITION 3: OPTIONAL GUARANTEE. Start with Condition 2 and add a preliminary contract stage. In this stage player 2 decides whether he will provide a satisfaction guarantee. If he does, the game follows that of Condtion 2 above, and if not it follows as in Condition 1. The guarantee, if chosen, is perfectly enforced.

The Optional Guarantee condition is now, potentially, a four stage game, with the first stage being player 2's decision to offer a guarantee and the forth stage being player 1's decision to ask for a refund. Recall that a trustworthy seller has nothing to lose by offering a satisfaction guarantee. By contrast, an opportunistic seller may (or may not) find himself worse off in a situation with guarantees. As a result, those not offering a satisfaction guarantee will surely be mistrusted by buyers. In order to avoid revealing oneself as an opportunist, therefore, we expect all sellers to offer a satisfaction-guaranteed contract.

CONDITION 4: NONBINDING GUARANTEE. This condition adds a fifth and final stage to condition 3. In this final stage, those who offer guarantees do not have to honor them. In particular, if player 1 asks for a refund, player 2 can honor the guarantee, returning players to the (100,100) endowment, or renege on the promise and keep the payoffs as they stand.

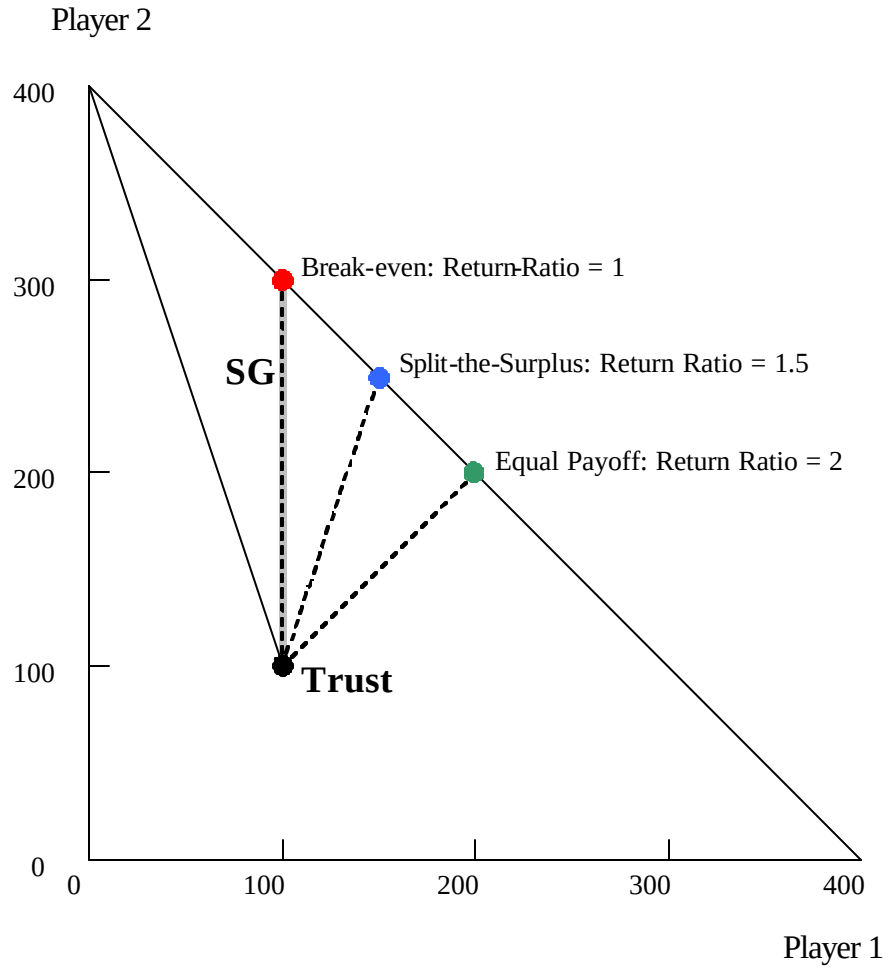

Figure 1: Subgame Perfect Equilibriua in Trust and Satisfaction Guaranteed (SG) Games

This last condition is the most interesting condition and, for many markets, the most realistic.[14] If there is no law to enforce guarantees, or if the cost of pursuing a claim for breech is sufficiently high, the promise of a guarantee may not be worth the paper it's written on. However, as is well-known from many social science experiments, people don't like to lie (Gneezy, 2005). If, as just discussed, market

[14]The design most similar to this that we know of is the "promise condition" of Glaeser, et al. (2000). Here they gave subjects the chance to make a nonbinding promise to pass back at least what they received, that is, to promise a return ratio of 1. They found the promise had little effect, and did not improve the amount returned by player 2s.

forces compel them to offer a satisfaction guarantee, then moral forces may compel them to honor it, in which case they should also tend to return amounts that will keep them honest and prevent a request for a refund. That is, even nonbinding guarantees may increase efficiency.

3.1. The Experiment

For each session of the experiment we recruited 20 subjects. All subjects were volunteers from undergraduate economics courses at the University of Wisconsin. There were two sessions for each of the four condition. Hence, each condition has 40 subjects, 20 in each role. The experiment as a whole involved 160 subjects.

Subjects interacted over a computer network. They were first presented complete directions for their game, and answered quiz questions to check their ability to calculate payoffs for both players' roles. They were then told their own role, which they kept throughout the experiment, and began making decisions. Each session thus has 10 player 1's and 10 player 2's (called player Red and Blue in the experiment). They played 10 iterations of the game, each time with a different partner. They were told, truthfully, that they would never play the same person twice. Each subject participated in only one of the conditions above. Subject's instructions can be obtained from the author.[15]

Each session generally lasted less than one hour. Subjects earned an average of \$15 (s.d. 4.80), ranging from \$5.13 to \$28. Subjects' identities were never recorded, and all subjects were paid anonymously and confidentially in cash at the end of the study.

4. Results

This sections considers the results in light of three questions: 1) Does the satisfaction guarantee improve efficiency? 2) Will sellers voluntarily commit to a satisfaction guarantee? 3) If compliance is voluntary, will altruism, fairness, honesty and trust be enough to sustain the efficiency properties of satisfaction guaranteed?

4.1. Does Satisfaction Guaranteed Improve Efficiency?

Table 1 shows the average amount passed by player 1 in all rounds, and in the final five rounds. Looking first at Trust, we see that subjects, as in earlier studies,

[15] Go to http://www.ssc.wisc.edu/~andreoni/ to download instructions.

passed significant amounts to player 2, but far less than the full 100. Looking to Satisfaction Guaranteed, however, the amount passed rises dramatically from 45 to 72, an increase of 60%. This difference grows to 80% by the last 5 rounds. Moreover, the number of times player 1 offers zero declines from 31 in Trust to 1 in Satisfaction Guaranteed, while the incidence of offering 100 rises from 39 to 85 times.[16] This indicates that a satisfaction guarantee greatly increases the trust displayed by buyers.

Table 1
Amounts Passed by Player 1

	Average Passed			Frequency of Passed Amounts				
Condition	All	w/Guar.	w/o	0	1-25	26-50	51-99	100
Rounds 1–10:								
Trust	45			31	50	46	34	39
Satisfaction	72			1	16	57	41	85
Optional	64	82	15	32	19	30	23	96
Nonbinding	50	56	27	42	31	30	51	46
Rounds 6–10:								
Trust	44			23	20	20	13	24
Satisfaction	80			0	5	19	24	52
Optional	76	88	5	12	3	13	8	64
Nonbinding	51	57	18	27	11	9	27	26

What about player 2, the sellers? The first column of Table 2 shows the average amount returned, and the second column shows the average *return ratio*. The return ratio is defined only when player 1 passes more than zero to player 2. It reports the amount returned divided by the amount passed, that is, y/x given that $x > 0$. A return ratio of 1 means player 1 breaks even, and greater than 1 yields a profit. Again, we see the difference between Trust and Satisfaction Guaranteed is extreme. Player 2 returns more than twice as much in Satisfaction, and the return ratio rises from 0.80 to 1.52. Organizing the data by subject, 14 of 20 player 2s in Trust had average return ratios *below* 1, while all 20 player 2s in

[16] To conduct this test, we organize data by subject. We average choices by subject over all 10 (or last 5) rounds. We find the mean and standard deviation of this average across subjects. Comparing mean amount passed this way the difference between the 20 subjects in Trust and the 20 in Satisfaction Guaranteed, the test is normally distributed. Here we find a significant difference, with $z = -3.20$.

Satisfaction Guaranteed have average return ratios *above* 1. As a result, seller's make a profit on their transactions in Satisfaction Guaranteed, on average, while their counterparts lose money in Trust.[17]

Table 2
Average Amounts Returned and Average Return Ratio* by Player 2,
Given Player 1 Passed more than Zero.

	All		With Guarantee		Without	
Condition	Average Returned	Return Ratio	Average Returned	Return Ratio	Average Returned	Return Ratio
Rounds 1–10:						
Trust	49	0.80				
Satisfaction	113	1.52				
Optional	98	1.20	110	1.34	4	0.14
Nonbinding	79	1.16	87	1.27	25	0.53
Rounds 6–10:						
Trust	56	0.81				
Satisfaction	130	1.59				
Optional	117	1.33	121	1.37	11	0.31
Nonbinding	83	1.10	90	1.20	4	0.06

∗Return ratio is (Passed back)/(Passed). A return ratio of 1 means player 1 breaks even.

Table 3 reports the average earnings for the two players. As expected, player 1 is far better off under Satisfaction Guaranteed. Earnings increase from 96 to 138 per round, a rise of 44%. Over the last five rounds the difference is 48%.[18] By contrast, player 2 is actually worse off over all 10 rounds, and significantly so.[19] However, for just the last 5 rounds, average earnings by player 2 in Trust and Satisfaction are nearly identical, 189 versus 188. Total earnings in Satisfaction are higher, rising from 290 to 314 overall, and from 288 to 335 for the final 5 rounds. This is an increase of 8 to 16%.When expressed as a gains-from-trade rather than earnings (i.e. subtracting 200 from the base), this is an increase in the surplus of 26 to 53%.

[17] Again, these differences are significant. The z-score for amount passed is $z = -8.50$, and for return ratio is $z = -5.44$. Differences are also significant for rounds 6–10.

[18] This is significant, with $z = -9.47$ for all rounds and -6.45 for rounds 6–10.

[19] $z = 1.95$.

Table 3
Average Earnings For all Rounds, For Player 1 and Player 2,
Overall and with and without satisfaction Guaranteed.

	All			With Guarantee				W/out Guarantee			
Condition	Pl. 1	Pl. 2	Tot.	Pl.1	Pl. 2	Tot.	No.	Pl. 1	Pl. 2	Tot.	No.
Rounds 1–10:											
Trust	96	194	290								
Satisfaction	138	176	314								
Optional	119	174	293	131	184	315	148	86	144	231	52
Nonbinding	112	186	298	118	191	308	162	88	166	253	38
Rounds 6–10:											
Trust	99	189	288								
Satisfaction	147	188	335								
Optional	130	182	312	135	194	329	85	97	112	210	15
Nonbinding	110	189	299	115	196	311	84	83	154	237	16

The differences between Trust and Satisfaction Guaranteed can be seen in Figures 2 and 3 below. These show the frequencies of outcomes over the final five rounds. Each circle is centered on a point in the data, and the larger the circle the more observations at that point. Figure 2 shows significant misplaced trust in the Trust condition, and many instances of disappointed player 1s. Figure 3 shows the clear improvement from satisfaction guaranteed. In none of the observations is player 1 worse off than at the endowment point, and large numbers of interactions resulted in equitable outcomes of equal-payoffs $(200, 200)$ and split-the-surplus $(150, 250)$.

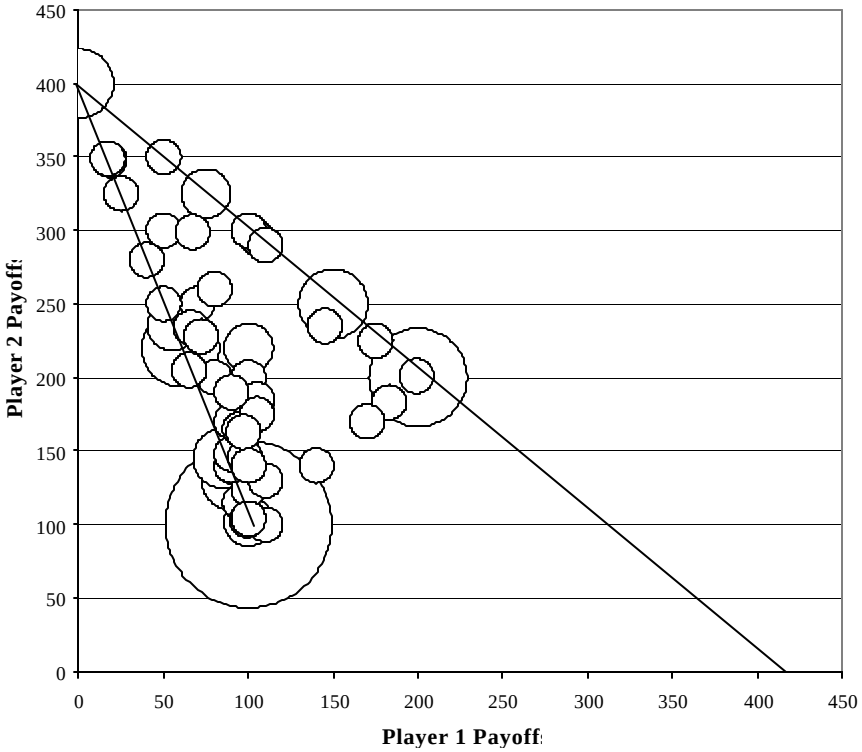

Figure 2: Trust, Last Five Rounds

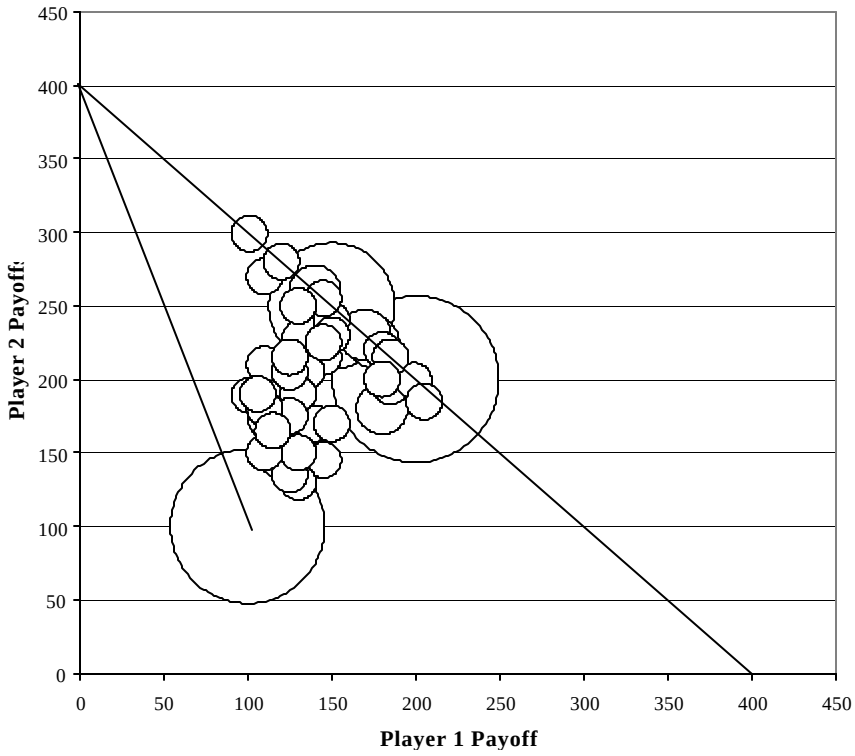

Figure 3: Satisfaction Guaranteed, Last Five Rounds

What does this say about the institution of satisfaction guaranteed? Focussing on the final 5 rounds, this indicates a big gain for player 1, the buyers, no net impact on player 2, the seller, and a modest 53% increase in gains from trade.

4.2. Do Sellers Voluntarily Commit to Satisfaction Guaranteed?

What happens when we allow subjects themselves to determine whether they will offer a contract with a satisfaction guarantee? We predict, in light of the results above, that all subjects should offer the guarantee. Table 4 shows that over all rounds, subjects in Optional offer guarantees 74% of the time, rising to 85% by the final 5 periods. Nineteen subjects offer guarantees at least 5 of the 10 rounds. Although only 4 of the 20 player 2s offered the guarantee all 10 rounds, 11 subjects offered them in all of the last 5 rounds. In the final round 18 of 20 subjects gave the guarantee.

Table 4
Percent of Player 2s Offering Satisfaction Guaranteed.

Condition	Percent Who Offered Guarantee	Percent of Guaranteed to Request Refund	Percent of Refund Requests Honored
Rounds 1-10			
Satisfaction	100%*	23%	100%*
Optional	74%	28%	100%*
Nonbinding	81%	25%	17%
Rounds 6-10			
Satisfaction	100%*	18%	100%*
Optional	85%	26%	100%*
Nonbinding	84%	26%	14%

* 100% is by experimental design.

This is evidence that subjects are learning they are better off offering a guarantee than not. Returning to Table 1, we see further evidence of this. Player 1 in Optional passes 82 on average to those offering guarantees, but only 15 to those who don't. By the last five rounds, these figures stand at 88 and 5. But does the offer of a guarantee really matter to the returns? Table 2 shows that those offering guarantees average a return ratio of 1.34, while those that don't average only 0.14. Those offering guarantees are both treated better by buyers, and respond more generously as sellers. Table 3 shows that sellers (player 2s) who offer guarantees make almost 30% more than those who don't. Over the last 5 rounds the gap is almost 75%. Both of these differences are significant.[20]

It is interesting to compare the Optional condition to the Satisfaction Guaranteed condition. Return to Table 3 and compare the earnings for Satisfaction under "All" to the earnings for Optional under "With Guarantee." These numbers are nearly identical for both players 1 and 2. This is a curious juxtaposition with the finding discussed in the prior paragraph. The fact that not all people are offering guarantees might suggest that the "cheats" are revealing themselves, leaving a population of more trustworthy people among those who offer guarantees. This appears not to be the case—whether guarantees were optional or required, sellers and buyers behaved the same on average. Perhaps this is because virtually all subjects experimented with providing or not providing the guarantee, and by the

[20] For all rounds $z = 9.51$, and for the last 5 rounds $z = 9.19$.

end of game were behaving virtually the same.

The similarities between Satisfaction and Optional conditions can be seen by comparing Figure 4 below with Figure 3 above. These both show the last five rounds of play. The similarity in the patterns is striking.[21] This will be a difference with the next game.

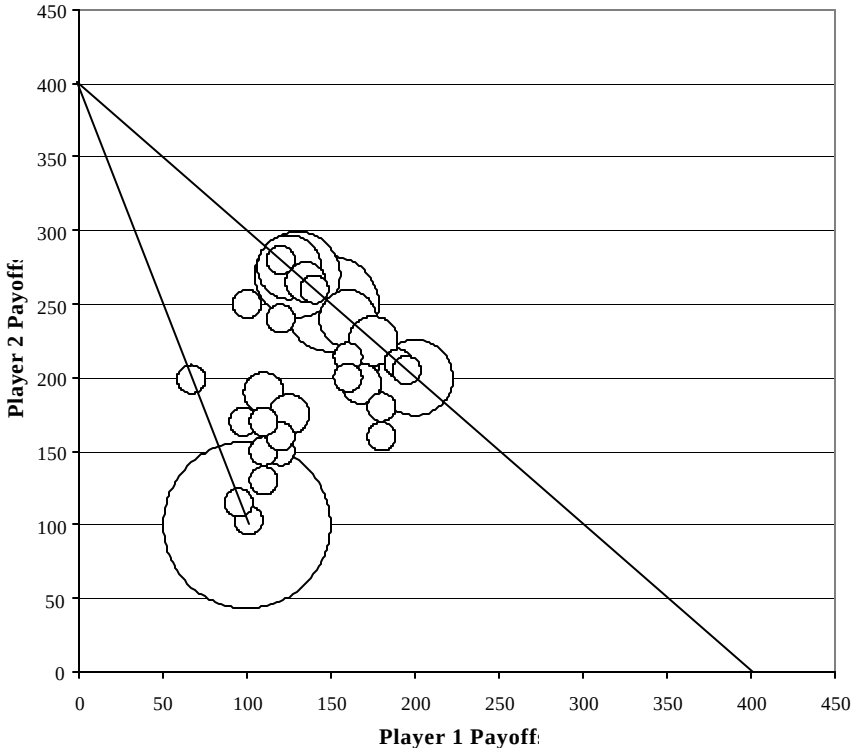

Figure 4: Optional Guarantee, Last Five Rounds

4.3. Caveat Emptor: Will Nonbinding Guarantees Still Improve Efficiency?

We now consider the most complex and realistic version of the satisfaction guaranteed game. Here player 2 first decides whether to offer a non-binding guarantee. Next the two play the basic trust game, after which player 1 can ask for a refund.

[21] Both the amounts passed and the return ratios can be shown to be not significantly different between these two. However, joint tests find significant differences at standard ($p \leq 0.05$) significant levels.

In the final stage player 2 decides whether to honor the request or to renege on the guarantee. The question of interest is whether making the promise of a guarantee, even though it is nonbinding, is enough to increase efficiency in this market.

Begin with the preliminary contract stage. As with Optional, most players offer the guarantee, with two main differences. First, when the default is not binding, sellers offer it much more freely. Nine of 20 subjects offered the default all 10 rounds—more than twice the rate for Optional—and 16 offered it 8 rounds or more. A second difference is on the opposite extreme. Two of the subjects chose *never* to offer the default. We asked subjects in the post-experiment questionnaire to explain their actions, but neither subject gave any insight into this decision.[22] When we look ahead to how these two behaved when they were passed positive amounts, we get a clue. Between the two of them they were offered positive amounts 11 times (an average positive offer of 54), but only returned a positive amount 1 time (returned 20 when passed 30 in round 3). It seems, therefore, that neither had intentions of returning anything if passed. Hence, it is possible that these two did not want to tell a lie by offering a guarantee that they wouldn't keep. That is, the cost of lying may have exceeded the possible gain of extra cash.

Next look at the actions of player 1. In Table 1 we see a steep drop in the amount passed. The amount passed in the Nonbinding condition is significantly lower than in the Optional condition, but not significantly different from the Trust condition.[23] This is true even if we condition on situations when the default was offered.[24] Hence, player 1's actions in Nonbinding is not significantly different from player 1's actions in Trust—player 1s place no extra trust in a nonbinding guarantee.

Turning to player 2, we ask whether player 1s should have placed more trust in player 2s. Here there is evidence that they should have. Looking at Table 2 the actions of player 2s appear to be between those in Trust and Satisfaction. In fact, average return ratios for the Nonbinding condition are above 1, indicating a profit

[22] One subject said nothing, and the other said simply, "Never gave the default option," which was our language for the satisfaction guarantee. It is doubtful that these two subjects did not understand the instructions. Quizzes given before each session required subjects to correctly calculate payoffs in three examples before moving on to the game. We are left, therefore, to spectate about their motives.

[23] Comparing Optional and Nonbinding for all rounds $z = 1.67$, which is not significant, but for the last five rounds $z = 2.57$, which is significant beyond $\alpha = .001$. Comparing Trust to Nonbinding, $z = -0.71$ for all rounds and -0.88 for the last five rounds.

[24] Comparing Trust to Nonbinding with guarantees, $z = -1.23$, and comparing Optional to Nonbinding, both with guarantees, $z = 2.93$.

opportunity for player 1s. Focussing on return ratios, those in the Nonbinding condition return significantly more than those in Trust, but significantly less than those in Satisfaction. Overall, the return ratios are not significantly different from those of the Optional treatment.[25] Again, even when we restrict ourselves to cases where player 2s offered the guarantee, we still get a difference that is significant.[26]

The actions of player 2s now contrast strikingly with those of player 1s. Player 2s are much more trustworthy than their counterparts in the Trust condition. Even though they are not as trustworthy as those in the Satisfaction condition, they are trustworthy enough that profitable exchanges are possible on average. Hence, the promise of a satisfaction guarantee seems to have the effect of binding sellers to behave more equitably. Unfortunately for player 1s, they didn't take advantage of this honestly.[27]

While the average return ratio suggests lost opportunities by player 1, perhaps they offered less because of a fear of variance, that is, risk aversion.[28] Table 4 shows the fraction of player 2s who offer guarantees, the fraction of those offers that generate a refund request, and the percent of those requests that are honored. The first column shows that Optional and Nonbinding conditions are fairly similar, and the second column shows the frequency of refund requests is also quite similar across Satisfaction, Optional, and Nonbinding. However, the third column shows a huge difference. Of the 40 requests for refunds in Nonbinding, only 7 were honored. For the last 10 rounds, only 3 of 21 requests actually received a refund. Looking within subjects, the only subjects who seemed unambiguously honest in their offers of guarantees were the two subjects who never offered them. Subjects who got more than one request for a refund all denied at least one of them.[29]

What is the net effect on earnings? Table 3 shows that player 1s, the buyers, do far worse in the Nonbinding condition than in either Satisfaction or Optional.

[25] For Trust vs. Nonbinding, $z = -2.26$, and for Satisfaction vs. Nonbinding, $z = 2.61$. For the last 5 rounds, these are -1.37 and 3.00, respectively.

[26] Comparing Trust and Nonbinding with guarantees, we get $z = -3.217$ for all rounds and $z = -2.270$ for the last five rounds. Of course, it may be that return ratios are non-linear in offers. If, for instance, player 2s have a return ratio that declines in the amount passed, it may be that the marginal return ratio (that is, the amount returned of the next cent passed) could be one.

[27] This conclusion rests, obviously, on the assumption that the return ratios on the amounts passed would not fall appreciably if larger amounts were passed.

[28] Eckel and Wilson (2004) demonstrate that there is a weak inverse relationship between trust and risk aversion.

[29] Only one subject honored all requests, but it's a trivial case. This subject got a single request. The amount passed was 3 and returned was 4, so only 5 cents was lost by player 2.

This is even true when conditioning on the presence of a guarantee. By the last 5 rounds the difference in earnings between the Trust and Nonbinding conditions is insignificant for player 1s. Looking at player 2s, the sellers, their payoff is nearly exactly the same on average, regardless of the condition. Whether guarantees are impossible, required, optional or nonbinding, player 2 seems to earn about the same. In sum, the introduction of nonbinding guarantees does little to improve efficiency—overall the improvement is not statistically significant.

The result can again been seen graphically. Figure 5 shows the pattern of outcomes for the final five rounds of the Nonbinding condition. While containing some of the shades seen in Figure 3 from Satisfaction, it most resembles the outcomes from Trust seen in Figure 2. Note the contrast of this with the surprising results of Bohnet, Frey and Huck (2001) and Gneezy (2003) who show that zero enforcement can be more efficient than imperfect enforcement. Here, contracts with no enforcement provide no improvement in efficiency over no contracts at all.

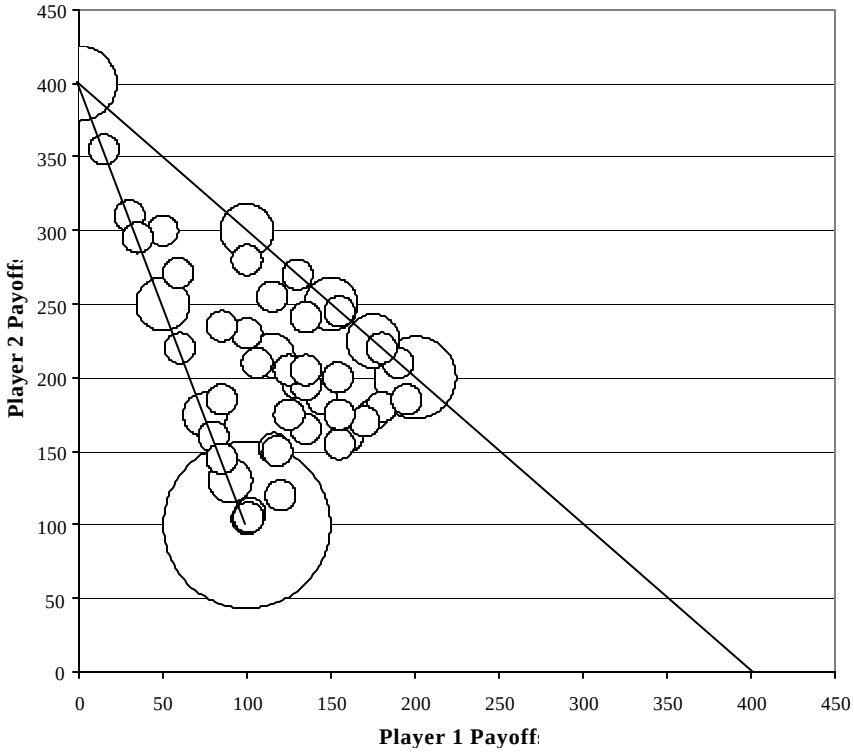

Figure 5: Nonbinding Guarantee, Last Five Rounds

5. Trust, Reciprocity and Contract Enforcement

In this section we address two issues about the interactions of trust and reciprocity in contract enforcement. First we consider how much fairness and reciprocity are driving the efficiency of the satisfaction guarantee. These notions have figured prominently in the work of Fehr, Gächter, and Kirchsteiger (1997), Fehr, Klein, and Schmidt (2004), and Brown, Falk and Fehr (2004) for instance, who state that fairness and reciprocity are potent contract enforcement devices.

Second we step back and look at all four institutions above at once and get a more complete picture of how satisfaction guarantees are altering the behavior and expectations of both the buyers and sellers. How much is each player's behavior influenced by the presence of a guarantee, and how does it change if guarantees are voluntarily offered or voluntarily honored?

5.1. Fairness and Reciprocity in Satisfaction Guarantee

In Section 3 we made the theoretical point that a satisfaction guarantee will assure efficiency if buyers will reject trades that, while profitable, do not give a sufficiently fair return. Figure 6 (left axis) shows the probability of requesting a refund in Satisfaction Guarantee treatment, conditional on the return ratio. Letting r be the return ratio, then we see, as expected, all unprofitable return ratios, $r < 1$, result in refunds, as do all "break even" return ratios, $r = 1$. However, many profitable return ratios, $r > 1$, also result in a refund. A seller who chooses a return ratio of 1.2, for instance, will have a greater than 50% chance of having to refund their earning. If the buyer passed all 100 to the seller, such a refund means forfeiting net gains of 180 for the seller and 20 for the buyer. The probability of a refund stays positive until return ratios exceed 2.

If we think of fairness of buyers as a constraint on sellers, then we can ask, what return ratio should a money-maximizing seller adopt? As shown in Figure 6 (right axis), the most profitable return ratio is about 1.45, just shy of the split-the-surplus ratio of 1.5. Even so, these sellers should expect about 10% of customers at this return ratio to seek a refund. Notice that a supplier who is choosing the profit maximizing r will average earnings of about 240. This far exceeds the average earnings in the Trust condition of 194. Given the choice, therefore, adopting a binding institution of Satisfaction Guarantees seems far superior for sellers than not.

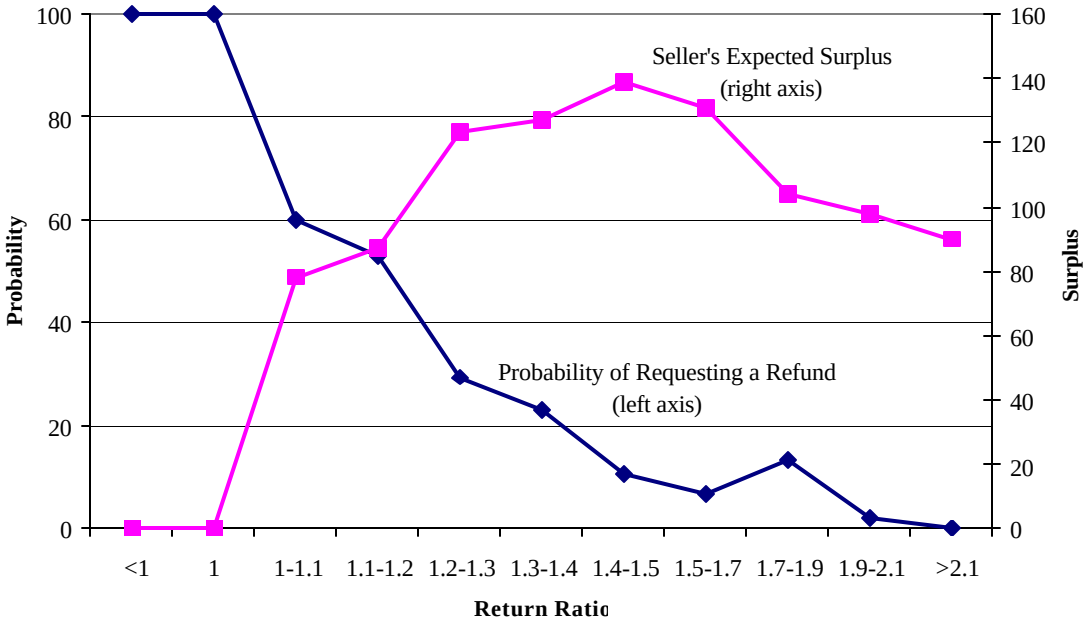

Figure 6: Probability of Reqesting a Refund, and Seller's Expected Surplus, Conditional on Return Ratios in the Satisfaction Guarantee Condition.

As with previous researchers, this confirms that fairness is indeed driving efficiency in a market where some retribution is possible. Here a simple refund policy, combined with fairness, pushes the economy to be both more efficient and more equitable.

5.2. Voluntary Contracts and Voluntary Compliance

Notice that our four treatments can be paired into two groups that are almost strategically equivalent. First, given that providing the guarantee should be profitable, as we have just established, then Satisfaction Guarantee and the Optional Guarantee should generate virtually the same behavior. Second, since in the subgame no seller in the Nonbinding treatment has an incentive to honor the guarantee, the promise should be meaningless, which makes Nonbinding and Trust conditions strategically identical.

We can explore these ideas by first looking at the amounts passed. Figure 7 shows the distribution of the amount passed, given that guarantees were offered in the Optional and Nonbinding treatments. Here we see our prediction is borne

out. The first two bars over each category compare the Satisfaction Guarantee with the Optional Guarantee. These two are quite similar. If anything those in the Optional condition are more generous than those in which the guarantee is required. Depending on the test used, the difference between these two conditions is either not significant or marginally significant.[30]

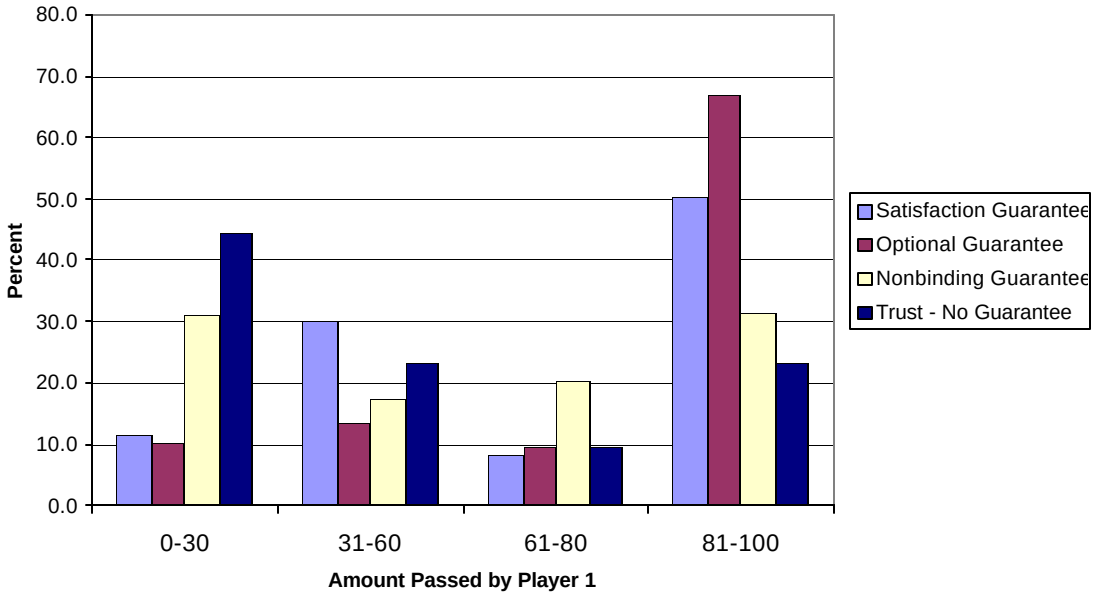

Figure 7: Distribution of Amount Passed by Player 1, Conditional on Guarantees Offered in Optional and Nonbinding Treatments.

The final two bars over each category in Figure 7 compare Nonbinding Guarantee and Trust. Again we see the predicted similarity—the two are not significantly different by any of the tests used.[31] This is true even though the Trust

[30] We test this in two ways, which we use in all the footnotes to follow in this section. First, we organize the data by subject, finding the average amount passed for each. We then compare the distributions of subjects' average choices using Mann-Whitney tests ($z = 1.89$), and a Kolmogorov-Smirnov tests (p-value 0.06).

[31] Organizing the data by subject, as in the previous footnote, and using Mann-Whitney tests ($z = 0.87$) or Kolmogorov-Smirnov tests (p-value 0.135) we see that in each case the difference in distributions is not significant.

and Nonbinding treatments are different from both Satisfaction and Optional treatments.[32] We can infer, therefore, that player 1 is treating the nonbinding guarantees as meaningless.

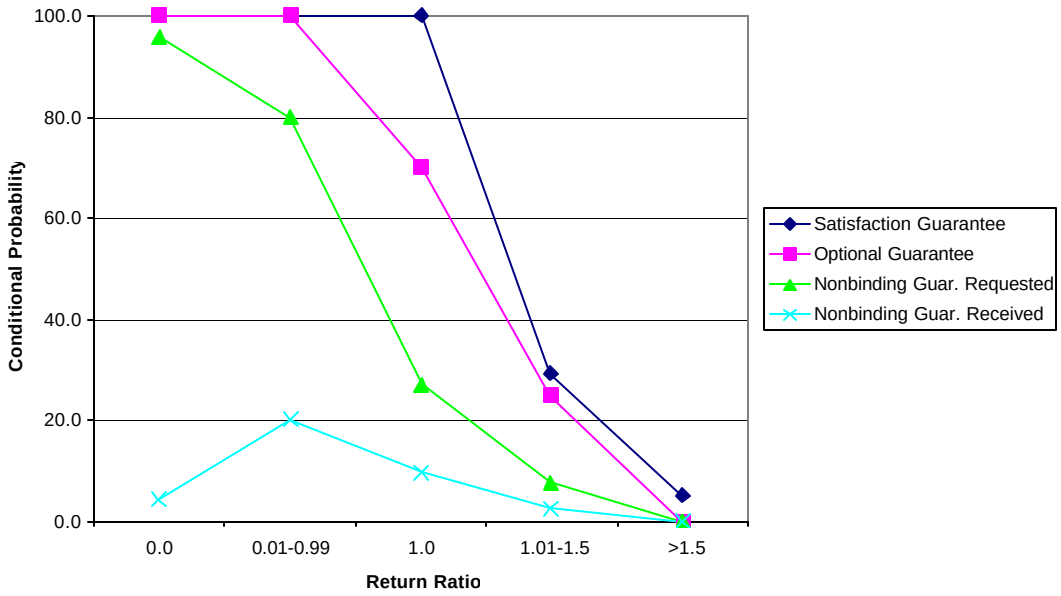

Figure 8: Conditional Probability of Requesting a Refund

Are the refunds offered in Nonbinding actually meaningless? Figure 8 shows the probability of requesting a refund conditional on the return ratio offered. We see again that Satisfaction and Optional Guarantee are very similar. The difference between them is not significant. The Nonbinding condition is, by contrast, well below the other two. A return ratio of 1, for instance, is certain to get a refund request in Satisfaction, but only faces a 28% chance of a request in Nonbinding. Surprisingly, even unprofitable return ratios have only an 80%

[32] For Trust versus Satisfaction, Kolmogorov-Smirnov (KS: p-value 0.023) and Mann-Whitney (MW: $z = 2.88$) both indicate significance. For Trust versus Optional the differences are significant as well (KS: p-value 0.003, MW: $z = 3.6$). For Nonbinding versus Optional the difference is significant (KM: p-value 0.008, and MW: $z = 2.89$), but for Nonbinding versus Satisfaction, the difference is insignificant or marginally significant (KM: p-value 0.275, MW: $z = 1.72$).

chance of generating a refund request in Nonbinding. Perhaps the last line in Figure 8 can indicate why. This shows the conditional probability that a refund request will be honored. This line validates the idea that the guarantees are nearly worthless. Perhaps, knowing the futility, buyers don't even bother to request.

The conclusion that the guarantees are worthless, however, is too strong even if the guarantees are not honored. The reason is that the act of promising a refund has a significant effect on behavior of sellers.[33] This can be seen in Figure 9 where we look at the distribution of return ratios across treatments, again under the condition that guarantees are offered in Optional and Nonbinding treatments. As above, we should expect Satisfaction and Optional to be similar, and one can clearly see that they are.[34] Comparing Nonbinding and Trust, however, the comparison is not as expected. The two are not similar, and the difference is highly significant.[35] By contrast, the statistical tests comparing the Nonbinding to the Optional treatments—which are predicted to be different—show the two are nearly indistinguishable.[36] This means that the sellers in the Nonbinding treatment are behaving nearly identically to sellers in the Optional treatment for whom the guarantee is binding. It appears that the act of offering a guarantee makes people behave more generously. This is true even when we know that they have very little intention of honoring the guarantee that they have offered. One hypothesis for this is that, having made the promise, sellers do not want to face their own deceit and thus make offers that are unlikely to generate a request for refund.[37] Whatever the reason, we see that offering a nonbinding guarantee seems to constrain sellers, perhaps morally, to make more generous offers.

Hence, we end with a paradox. Promising a guarantee that one isn't required to honor, and which one expects they won't always honor, nonetheless causes people to behave identically to those for whom the promise is binding. Even so,

[33] This contrasts with the "promise condition" of Glaeser, et al. (2000). Sellers only promised to send back at least what they received, and no refunds were possible. This promise, however, did not generate extra generosity.

[34] While they appear similar in the figure, the difference is marginally significant by a Kolmogorov-Smirnov test (p-value .059) and significant in a Mann-Whitney test ($z = 2.07$).

[35] A Kolmogorov-Smirnov test (p-value 0.017) and Mann-Whitney test ($z = 2.24$) both indicate a significant difference.

[36] Kolmogorov-Smirnov (p-value 0.56) and Mann-Whitney ($z = 0.22$) test indicate only minor differences between the two.

[37] In principle this hypothesis can be tested by including a condition in which it is mandatory to offer a satisfaction guarantee, but optional to honor it. This would presumably remove the moral constraint of having told a lie. Exploring this and other aspects of guarantees is left to future work.

buyers have little faith in the moral constraints put on sellers by this promise. As a result, a satisfaction guarantee without any binding enforcement fails to increase efficiency.

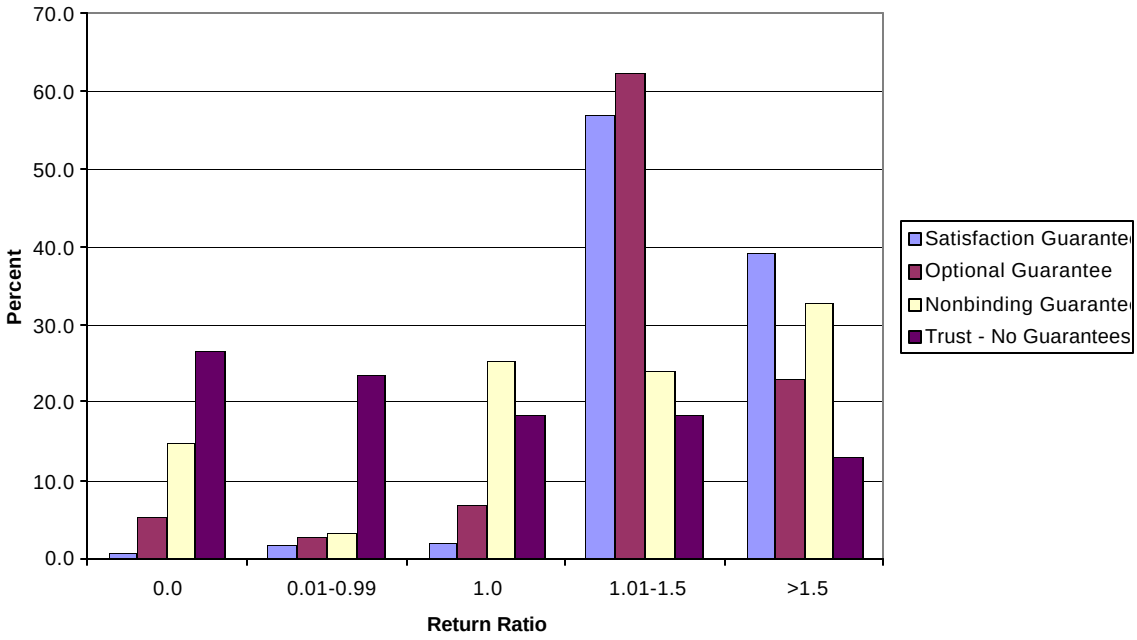

Figure 9: Distribution of Return Ratios Across Conditions

6. Conclusion

This paper was designed to look at a realistic market innovation to promote trust, trade, and efficiency. While satisfaction guarantees can be enforced by law in the United States, for many consumers the costs of seeking redress may outweigh the benefits. As such, a satisfaction guarantee may often be effectively nonbinding on the sellers. We ask whether and how a satisfaction guarantee can improve economic efficiency.

The experiment explores satisfaction guarantees in three stages. First, they are mandatory and enforced—all sellers must offer and honor them. Second, they

are optional, but fully enforced. Third, they are optional but unenforced, a *caveat emptor*.

We find four key results. First, when satisfaction guarantees are made and enforced, they cause dramatic and significant increases in efficiency. On average, sellers are no worse off by offering the guarantees, but buyers benefit greatly. Imprtantly, this is exactly the opposite of the predition of money-maximizing agents—buyers should be no better off and sellers much better off with guarantees. This suggests that the guarantee is interacting with preferences for fairness and equity in significant ways.

Second, when guarantees are optional sellers that don't offer them are not trusted nearly as much as sellers that do. However, the choice of offering a guarantee was also revealing in our data; those not offering guarantees were much less trustworthy.

Third, a promise of a satisfaction guarantee, even if it is nonbinding, improves the generosity of sellers. In a control condition in which no guarantees are present, buyers lose money on average. Even when nonbinding guarantees are offered, buyers make money on average. Hence, it seems that the distaste of breaking one's word pushes at least some sellers to offer greater quality to buyers.

Fourth, when the guarantee is not binding, buyers don't trust sellers even though on average they would be wise to do so. The data also reveals, however, only 17% of all requests for a refund were actually honored. Perhaps it was this unwillingness to be fleeced—either from risk aversion or moral repugnance—that kept buyers' offers so low. The net effect is that buyers in the nonbinding guarantee condition earn only marginally and insignificantly more than their counterparts in the control condition without guarantees.

What have we learned from this? Within the context of our data, we must conclude that individual morality is an insufficient commitment device, and external enforcement of guarantees is necessary to gain efficiency.

There are several observations that may temper this result and give more strength to voluntary compliance with satisfaction guarantees. First and foremost are reputations and selection. Businesses that routinely flaunt their guarantees may, at the very least, lose repeat business. Likewise, firms known for honoring guarantees may attract customers. However, if guarantees can be enforced by reputations, then it suggests that quality can be enforced this way as well. This in turn makes guarantees redundant. Hence, what may make guarantees useful and interesting is that they are an efficient substitute for reputations. If one only seldomly visits a vendor, or the business frequently changes owners, sales staff, or

managers, then reputaions may be harder to form or more difficult for buyers to learn. A game without reputations, as was studied here, may therefore be the most realistic and informative setting for studying satisfaction guarantees.

A second observation is that our experiment considered only perfect enforcement or no enforcement. Since the two regimes resulted in identical payoffs for sellers, it would naturally follow that even imperfect or random enforcement by the government could tip sellers to honoring their pledges.

A third observation is that, while satisfaction guarantees predominate US markets, they are far less common in other countries. This raises the prospect of possible multiple equilibria. One could ask what constellations of preferences for equity or tolerance for opportunism could generate this situation.

This paper also raises the prospect of considering the broader panoply of satisfaction guarantees. For instance, many firms sell goods with a "free trial offer." These goods are no longer "like new" and cannot be resold. How would a this affect the bargain between buyer and seller, and why would firms offer a "free trial"? Similar questions can be asked of even more generous offers like "double your money back." Moreover, these type of guarantees make the firm vulnerable to opportunistic buyers, which further complicates the bargain. This suggests interesting questions for future research.

In sum, this paper illustrates that the simple market innovation of satisfaction guaranteed can, with enforcement, greatly improve economic efficiency. By turning the trust or gift-exchange game into an ultimatum game, and by taking advantage of natural preferences for fairness, both buyers and sellers are better off.

References

Andreoni, James, Paul Brown and Lise Vesterlund. "What Makes an Allocation Fair? Some Experimental Evidence." *Games and Economic Behavior*, July 2002, 40,1-24.

Andreoni, James, Marco Castillo, and Ragan Petrie. "What do Bargainers' Preferences Look Like? Exploring a Convex Ultimatum Game." *American Economic Review*, June 2003, 93(3), 672-685.

Andreoni, James, Marco Castillo, and Ragan Petrie. "Taking Preferences Seriously in Ultimatum Games: Parametric and Nonparametric Estimates of Utility." working paper, April 2004.

Andreoni, James, William H. Harbaugh and Lise Vesterlund, "The Carrot or the Stick: Rewards, Punishments and Cooperation." *American Economic Review*, June 2003, 93(3), 893-902.

Andreoni, James and John H. Miller. "Giving According to GARP: An Experimental Test of the Consistency of Preferences for Altruism," *Econometrica*, 2002, 70, 737-753.

Andreoni, James and Larry Samuelson. "Building Rational Cooperation." *Journal of Economic Theory*, forthcoming, 2005.

Barr, Abigail and Pieter Serneels. "Wages and Reciprocity in the Workplace." working paper 2004.

Brown, Martin, Armin Falk, and Ernst Fehr, "Relational Contracts and the Nature of Market Interactions." *Econometrica,* 2004, 72, 747–781.

Berg, Joyce, John Dickhaut, and Kevin McCabe. "Trust, Reciprocity, and Social Norms," *Games and Economic Behavior*, 1995, 10, 122-142.

Bolton, Gary E., and Axel Ockenfels. "ERC, A Theory of Equity, Reciprocity and Competition," *American Economic Review*, 2000, 90(1), 166-193.

Bohnet,Iris, Bruno S. Frey, and Steffen Huck, "More Order with Less Law: On Contract Enforcement, Trust, and Crowding," *American Political Science Review,* March 2001, 95(1), 131–144.

Carpenter, Jeffrey, Stephen Burks and Eric Verhoogen. "Fairness and Freight-Handlers: A Test of Fair-Wage Theory in a Trucking Firm," working paper, 2004.

Che, Yeon-Koo. "Consumer Return Polices for Experience Goods." *Journal of Industrial Economics*, March 1996, 44 (1), 17–24.

Charness, Gary and Ernan Haruvy. "Altruism, Equity, and Reciprocity in a Gift-Exchange Experiment: An Encompassing Approach." *Games and Economic Behavior*, 40, 2002, 203–231.

Charness, Gary and Matthew Rabin, "Understanding Social Preferences with Simple Tests." *Quarterly Journal of Economics,* August 2002, 817–869.

Cooper, Russell and Thomas W. Ross, "Product Warranties and Double Moral Hazard." *RAND Journal of Economics*, vol. 16, no. 1, Spring 1985, 103-13

Cox, James C. "How to Identify Trust and Reciprocity." *Games and Economic Behavior*, 2004, 46, 260–281.

Durlauf, Steven N., "On the Empirics of Social Capital." *Economic Journal*, 2002, 112, 459–479.

Eckel, Catherine C. and Rick K. Wilson, "Is Trust a Risky Decision?" *Journal of Economic Behavior and Organization*, Dec. 2004, 55 (4), 447–65.

Engelmann, Dirk and Andreas Ortmann, "The Robustness of Laboratory Gift Exchange: A Reconsideration," Working Paper, CERGE-EI, Prague, Czech Republic, 2002.

Engle-Warnick, James and Robert L. Slonim. "The Evolution of Strategies in a Repeated Trust Game." *Journal of Economic Behavior and Organization.* 2004, 55, 553–573.

Ensminger, Jean. "Market Integration and Fairness: Evidence from Ultimatum, Dictator, and Public Goods Experiments in East Africa" in *Cooperation, Reciprocity and Punishment: Experiments in 15 Small-Scale Societies*, Joseph Henrich, Robert Boyd, Samuel Bowles, Colin Camerer, Herbert Gintis, Richard McElreath, and Ernst Fehr, editors. London: Oxford University press, 2004.

Fehr, Ernst, Simon Gächter, and Georg Kirchsteiger. "Reciprocity as a Contract Enforcement Device: Experimental Evidence." *Econometrica*, 1997, 65, 833–860.

Fehr, E., E. Kirchler, A. Weichbold, and S. Gächter, "When Social Norms Overpower Competition: Gift Exchange in Experimental Labor Markets," *Journal of Labor Economics*, 1998, 16, 324–351.

Fehr, E., G. Kirchsteiger, and A. Riedl "Does Fairness Prevent Market Clearing? An Experimental Investigation," *Quarterly Journal of Economics*, 1993, 108, 437459.

Fehr, Ernst, Alexander Klein, and Klaus Schmidt. "Contracts, Fairness, and Incentives." working paper, 2004.

Fehr, Ernst and Klaus Schmidt, "Theory of Fairness, Competition, and Cooperation," *Quarterly Journal of Economics*, August 1999, 114(3), 817-68.

Glaeser, Edward L., David I. Laibson, José A. Scheinkman, and Christine Soutter, "Measuring Trust." *Quarterly Journal of Economics,* August 2000, 115, 811–846.

Gneezy, Uri, "The W Effect of Incentives." working paper, 2003.

Gneezy, Uri, "Deception: The role of consequences." *American Economic Review*, forthcoming, 2005.

Gneezy, Uri, and Aldo Rustichini. "A Fine Is a Price." *Journal of Legal Studies*, January 2000, 29, 1-17.

Heal, Geoffrey. "Guarantees and Risk Sharing." *Review of Economic Studies,* 1977, 44 (3), 594–560.

Heiman, Amir, Bruce McWilliams, Jinhua Zhao, and David Zilberman, "Modeling Money-back Guarantees as Financial Options." *Journal of Retailing* , 78, 2002, 193-205.

Kessler, Anke S. and Christoph Lülfesmann, "Bilateral Bargaining, Unverifiable Quality, and Options to Return." *Economic Theory*, Vol. 23(2), 2004, 395-410.

Knack, S. and P. Keefer. "Does Social Capital Have an Economic Payoff? A Cross Country Investigation." Quarterly Journal of Economics,1997, 112, 1251–1288.

List, John A. "The Behavioralist Meets the Market: Measuring Social Preferences and Reputation Effects in Actual Transactions." working paper, 2004.

Mann, Duncan P. and Jennifer P. Wessik. "Money Back Contracts with Double Moral Hazard." *Rand Journal of Economics*, 1988, 19, 285–92.

Mann, Duncan P. and Jennifer P. Wessik. "Money-Back Warranties vs. Replacement Warranties: A Simple Comparison." *American Economic Review*, 1990, 80 (2), 432–436.

Neugebauer, Tibor. "Intermediaries and Contractual Enforcers, or Making Deals

with Peppe." working paper, 2004.

Rabin, Matthew. "Incorporating Fairness into Game Theory and Economics." *American Economic Review*, 1993, 83, 1281-1302.

Rubinstein, Ariel. "Perfect Equilibrium in a Bargaining Model." *Econometrica*, 1982, 50, 97-110.

Sobel, Joel. "Interdependent Preferences and Reciprocity", working paper, UCSD, 2004.

Levine, D. (1998): "Modelling Altruism and Spitefulness in Game Experiments." *Review of Economic Dynamics*, 1, 593–622.

Van Huyck, John B.; Battalio, Raymond C.; Walters, Mary F. "Commitment versus Discretion in the Peasant-Dictator Game." *Games and Economic Behavior*,July 1995, 10(1), 143-70.