
Monograph:
Lenton, P. and Mosley, P. (2010) Incentivising Trust. Working Paper. Department of Economics, University of Sheffield ISSN 1749-8368

Sheffield Economic Research Paper Series 2009004

Sheffield Economic Research Paper Series

SERP Number: 2009004

ISSN 1749-8368

Pamela Lenton and Paul Mosley

Incentivising trust

January 2010

Department of Economics
University of Sheffield
9 Mappin Street
Sheffield
S1 4DT
United Kingdom
www.shef.ac.uk/economics

Abstract:

We argue that trust can be incentivised by measures which increase the ability of trusters to protect themselves against risk. We work within the framework originally established by Berg *et al* (1995) in which trust is measured experimentally as the ability to generate reciprocity in response to an initial offer of money within a two-person game. An incentive is conveyed both by means of variations in the multiplier applied to the first player's initial offer and by giving the first player the opportunity to insure themselves against the possibility that the second player will fail to reciprocate their initial offer. Measured trust is strongly responsive to both these incentives. Thus third parties have the ability to influence the outcome of the game, not only, as in the analysis of Charness *et al* (2008), by punishing failure to reciprocate and rewarding 'good' initial offers, but also by offering protection which strengthens the first player's risk efficacy, or ratio of assets to risk.

Key words: Experimental economics; Game theory; Risk; Reciprocity

JEL codes: A13; C70; C73; D81;

Acknowledgments

We gratefully acknowledge the support of the ESRC (grant RES 000 221168) and the RES Small Academic Awards Scheme. We also thank Sarah Brown, Jennifer Roberts and three anonymous referees for their invaluable comments.

INTRODUCTION

There is now a large literature attesting to the importance of social capital, and specifically of interpersonal trust, in determining the level of economic efficiency and economic development. Following Putnam's demonstration (1993) of the importance of social networks in determining relative rates of development in northern and southern Italy, Knack and Keefer (1997) and Whiteley (2000) have demonstrated statistically that indices of trust are significantly correlated with inter-country variations in economic growth, and La Porta *et al*. (1997) have shown that trust is positively associated with judicial efficiency and the absence of corruption. As the literature has developed, so a range of alternative measures of trust has evolved. The original practice of assessing trust by means of attitudinal questions (such as the World Values Survey's 'Generally speaking, would you say that most people can be trusted or that you can't be too careful in dealing with people?' [1]) has been supplemented by more precise and easier-to-interpret experimental methods, which have been used to measure trust and its correlates in environments as diverse as Zimbabwean resettlement schemes (Barr 2003), Ugandan villages (Mosley and Verschoor 2005) and the Harvard first-year economics classroom (Glaeser *et al*. 2000). From these experimental studies have come a range of findings on the correlates of trust, which suggest, in particular, that trust levels tend to be higher amongst the better-off, the more educated, older people, and those in denser social networks.

The big gap which remains in all of the literature is the question of how trust-relationships are encouraged, made and broken. Even if we know that richer and more educated individuals and societies trust one another more than the poorer and less educated, we do not know why, nor do we know a great deal about the processes by which distrust can be turned into trust, either in the political or in the interpersonal sphere. One interesting aspect of this is the role, if any, of market processes in incentivising trust. For whereas markets exist for most factors of production which are

[1] *World Values Survey* page 3, available at http://www.worldvaluessurvey.org

significant in the development process, such as labour, physical capital and human capital, trust, a scarce resource though it is, is classically a commodity which cannot be bought with money. More intriguingly still, the application of standard *non-market* methods for increasing the degree of public trust in services – such as the increasingly tough audit procedures being used for 'quality assurance' in health and education which often turn out not to increase the degree of trust that the public profess in that service (O'Neill, 2002). The question of what actually will motivate trust, and what will demotivate it, is therefore germane. In this paper we tackle this question by comparative experimental analysis of the determinants of trust and of trust-building processes.

Our definition of trust is confined to that of generalised trust: trusting behaviour occurs between individuals who have no previous knowledge of each other.[2] This definition excludes particularised trust as defined by Berggren et al (2006), which is trust between individuals who do have previous knowledge of one another. Our point of departure is that generalised trust increases our vulnerability to the actions of others; that is, it exposes us to an increased risk that others will exploit us, in the hope of deriving benefit from the possibility that they will do the opposite and behave in a mutually equitable manner. Thus, a situation in which trust between two individuals does not exist because of mutual fears about possible exploitation by others may be replaced by a situation in which those fears are discounted sufficiently for a trusting interchange to occur. Like Berggren et al (2006) we believe that institutions do influence the level of generalised trust and the idea which we explore here is that an element of distrust can be removed by the discovery, or the deliberate provision, of evidence which reduces the costs of trusting for the truster. The literature on this point (eg Berg *et al* 1995, Glaeser *et al*. 2000, Barr 2003) treats trust-increasing evidence as coming from the truster's past 'social history', that is her personal background and her experience of other people including the trustee, but as stated above with generalised trust there is no 'social history' on which to base a judgement.

[2] For an overview of generalised versus particularised trust see Berggren *et al* (2006).

We posit that trusting behaviour may derive from sources which do not relate to evidence from the past. Here we focus on the trust between specifically identified individuals, or *dyadic trust* (Hudson 2006), who have no history on which to base any judgment of each other. In particular, trust may be induced because the trustee provides a pledge of future good behaviour which is believed, or because she or a third party provides a material incentive, such as insurance against betrayal, which reduces the costs of trusting for the truster. We call trust induced by this means *incentivised trust*. Incentivised trust is trust which derives from the provision of evidence which increases the truster's *risk efficacy*, or the reserves which the truster has at her disposal to cope with breach of trust, by contrast with affective trust (Faulkner 2008) in which the truster feels betrayed if her expectations of the trustee's behaviour are not met. Two examples of incentivised trust are guarantees given to consumers to refund the purchase money on defective goods, which encourage uncertain consumers into the market, and peer-monitoring arrangements, which act as bona-fides to encourage uncertain lenders to lend even to those without collateral.

II. EXISTING LITERATURE AND HYPOTHESES

There is a large literature surrounding the concept of trust, ranging from the determinants of trust (Glaeser *et al* 2000; Barr 2003, Fahr and Irlenbusch 2008), to the link with social capital and its formation (Berggren *et al* (2006), the effects of trust and social capital on business and economic growth (Putnam 1993; La Porta *et al* 1997; Knack and Keefer 1997; Woolcock 1998; Zak and Knack 2001: Duffner *et al* 2009) and the value of trusting behaviour for the wellbeing of society (Hudson 2006). However, none of this literature has examined the issue of whether the amount of trust can be increased, or decreased, by material incentives. In this paper we examine this issue using an experimental approach.

Much of the burgeoning experimental literature on trust consists of variations on the classic two-person 'reciprocity game' of Berg *et al* ('BDM')(1995)[3]. In this game, the

[3] For reviews of results from the BDM game see Barr (2003) and Mosley and Verschoor (2005).

first player, player A, is handed an initial amount of money, average $10, of which she can allocate any proportion to a player B whom she cannot see or contact. This amount is then tripled by the experimenter, playing the role of banker, to give player B an incentive to invest in her, and player B then decides how much of this tripled amount to give back. Later variations on this model, both in the form of computer simulations (Anderhub *et al* 2002; Cox 2004) and empirical experiments (Glaeser 2003; Charness *et al* 2008; Cochard *et al* 2004), have repeated the basic two-shot BDM game one or more times, and in some cases revealed players' identities to one another, with a view to increasing the amount of information available to trusters as they decide how much trust to give to the trustee. An important further step forward is taken by Charness *et al* (2008), who introduce into the game a third party empowered to punish a responder who has been excessively selfish, which is one way of incentivising trust. They find that these penalties have a strong and significant effect on the amounts offered by and returned to player A.

We develop the approach of Charness *et al* (2008), allowing the experimenter, instead of imposing penalties for those who do not reciprocate, to offer rewards for those who do. We do this in two ways, first by varying the multiple by which player A's initial offer is multiplied as it reaches player B, and second by offering player A insurance against the possibility that her initial offer will not be reciprocated. Both of these incentives offer some compensation against the possibility of trust not being reciprocated, which acts as an incentive to the first mover, player A, to cultivate a reputation for being trustworthy.

The size of the multiplier may incentivise player A to offer player B a larger amount in the hope that player B will return a higher positive amount. For example, if we assume a 50 percent probability of player B returning half of player A's multiplied offer, a multiplier of 4 implies that an offer of £5 from player A gives player B £20 and £5 would be the average return whereas a multiplier of 2 implies that an offer of £5 from player A gives player B £10 but only £2.50 would be returned on average. Therefore we state our first hypothesis:

H_1: The larger the multiplier the greater the amount offered by player A.

If player A can insure against any losses he may initially offer a greater amount than previously because his defences against the risk of potential exploitation, or *risk efficacy,* are enhanced. Thus our second hypothesis is:

H_2: Player A will offer a greater proportion of his available amount to offer to player B if he has protection against his vulnerability.

Player B has no information about player A. The only signal he actually receives is the amount sent by player A. If player A sends a large proportion of the amount available to send to player B, player B may determine that player A is trusting and acknowledge this signal by returning a higher amount. Thus our third hypothesis is:

H_3: Player B will return a larger proportion of his amount available to return where player A has offered a high proportion of his available amount to send.

We have included an insurance game in which player A is given the opportunity to insure against losses should player B choose not to return any money. If risk averse, and hence not trusting of player B, player A would always choose to insure against losses. With insurance against losses player A would then offer player B his remaining balance in order to take full advantage of the multiplier. Thus our fourth hypothesis is:

H_4: If offered insurance against losses, Player A will take out insurance and offer player B his remaining balance.

III. EXPERIMENTAL DESIGN AND DATA

As in Glaeser *et al*. (2000) we use a combination of survey and experimental methods. In our experiments, we replicate the original 'reciprocity game' of Berg *et al*

(1995), and use exactly their definition of trust, but vary the game in three ways. First, we use an expanded version of the pre-survey to elicit information about the causes of creation or erosion of trust. Second, we vary the multiplier for reciprocal 'trusting' behaviour: an equal number of Player B respondents received double, triple and four times the original Player A offer. And third, we incentivise trusting behaviour by introducing an opportunity for player A to insure against losses.

Altogether 90 investment games were conducted in December 2005 and February 2006. Three hundred and fifty undergraduate and postgraduate students in the departments of economics at the universities of Sheffield and Glasgow were emailed to invite them to take part in the experiment. Those students who indicated that they would like to participate in the experiments were provided with a pre-game survey questionnaire to complete (*see Appendix A*) which used as point of departure that administered by Glaeser *et al* (2000). The questions asked included typical personal and family background characteristics such as age, ethnicity, parental education and income (captured as a one-zero variable by inquiring whether the student had taken the maximum available student loan). In addition, we wished to assess the individual's level of altruism, personal social capital, and political attitudes, captured through questions on immigration levels and capital punishment. Finally, we included a question from the World Values Survey standardly used to measure trust scores on a cross-sectional basis:

'Generally speaking, would you say that most people can be trusted or that you can't be too careful in dealing with people'?

In total 180 students responded to the questionnaire, a response rate of just over fifty percent. Individuals who completed the survey questionnaire were invited to take part in the experiment. This enabled us to play 90 games, 54 games in Sheffield and 36 in Glasgow, using in each case a double-blind procedure similar to that employed in the 'BDM' game and to that of Cochard *et al* (2004). Nine of these games were single-shot games (one offer from player A, and one response from player B); in the remaining 81 cases, this basic game was repeated, with the opportunity for player A to purchase

insurance against lack of reciprocity being offered in 35 of these cases. This insurance offer, communicated to player A's only, was made in the form:

'Do you wish to consider taking out insurance, to cover the possibility that you may not receive from player B as much as you offered?'

If you pay a premium of £1 you will get back the full amount you offered minus the premium should player B not return the full amount of your offer. If you pay a premium of 50p you will get back half of the amount you offered, minus the premium, if player B returns less than the amount you offered.

For each game our subjects were randomly selected to be either 'player A' or 'player B' and seated in separate rooms. No players knew the identity of the person with whom they were playing: only the experimenter and the monitor were aware of this as they passed the offers between each player. Each player received an initial endowment of £5, and the amount given by player A to player B was, with equal likelihood, multiplied by a factor of either 2, 3 or 4, in order to vary the incentive to trust. The ratio of the amount given to player B by player A to his/her initial endowment was recorded. Similarly the amount returned by player B to player A was recorded by the experimenter and the ratio of the amount given to the amount available to give was calculated. In round 2 of the repeated games both players received a second amount of £5 which was added to their current balance at that point and the game play was repeated. In the insurance game, player A was offered, in both rounds, the opportunity to insure against the possibility of being 'exploited' by player B – i.e. having his offer not reciprocated. This insurance took the form of an insurance premium of either £1 or 50p to cover all or half the amount 'lost to exploitation', as described in the previous paragraph[4]. We focus our attention on analysis of our repeated games in this paper and especially on the behaviour of player A when he faces the opportunity to insure against losses, for the main reason stated by Cox (2004 p262) that "…the single-game experimental designs used to generate the data in these experiments do not discriminate between actions motivated by trust or reciprocity …" Table 1 below shows summary statistics for our single games and repeated games.

[4] We do not concern ourselves with the strict definition of fair and unfair insurance in this paper. We are more concerned with the opportunity player A has to insure against losses.

Table 1: Summary statistics for all games.

	Repeated games N=81	Single game N=9
Final balance player A(£)	14.30	8.36
Final balance player B (£)	18.79	14.22
Final balance joint (£)	33.10	22.58
Player A: ratio of initial offer to initial endowment	0.77	0.72
Player B: ratio of first-round return to first-round endowment (after multiplier applied)	0.44	0.29
Player A: ratio of second-round offer to second-round endowment	0.40	-
Player B: ratio of second-round offer to second-round endowment	0.31	-
Proportion male	0.63	0.67
Proportion on maximum loan (ie with relatively low incomes)	0.07	0
Proportion postgraduate	0.56	0.44
World Values Survey trust-measure[5]	3.05	2.89
% who would/do vote in elections	26	33

IV. RESULTS

Consistent with the findings of other investigations (Cochard *et al* 2004), we see from the summary statistics shown in Table 1 that the ratio of the amount offered by player A, and that returned by player B, is greater in the repeated game than in the single game. Table 2 shows the mean statistics for all our games separately. Our figures reveal

[5] This measures answers to the question:
'Generally speaking, would you say that most people can be trusted or that you can't be too careful in dealing with people'? measured on a five point Likert scale.

similar final balances for both individuals, separately and jointly between the non-insurance game and the insurance game where player A did not take up the opportunity to insure. In all our games, we find that in the first round of play the ratio of the offer made to the amount available to offer made by player A is greater than the ratio in the second round of play, which can be explained in terms of a reputation effect: players learn through the rounds to do as they expect to be done by. In addition, in the first round of play the ratio of the return made by player B to the amount available to offer is always greater than the ratio in the second round of play. This can be explained by the reciprocity hypothesis; player B seeks, in the spirit of mutual signalling, to maximize the joint payoff, to entice player A to offer a high amount in the subsequent period. The final return made by player B does not need to indicate trust and player B may be opportunistic in the end game, a result found by others (Anderhub *et al* 2002; Cochard *et al* 2004).

Table 2: Mean statistics for repeated games with and without insurance

	No insurance	Insurance game	
		Not taken	Insurance taken
	N = 46	N= 18	N= 17
Final balance player 1	13.30	13.11	17.34
Final balance player 2	18.33	17.33	20.18
Final balance joint	31.63	30.44	37.51
Ratio 1 player A offer 1	0.77	0.70	0.80
Ratio 2 player B return 1	0.43	0.39	0.51
Ratio 3 player A offer 2	0.38	0.37	0.40
Ratio 4 player B return 2	0.33	0.29	0.33

Mean of means taking multiplication factor of offer into account

In our first two hypotheses we are particularly interested in how player A behaves, and in how he responds to incentives which enable him to increase his risk efficacy and protect himself against potential exploitation. Table 3 reports the difference in player A‘s offer in respect of each round according to the multiplication factor to which the reward is subject. A clear pattern is observable: whilst the ratio of the second offer is always below that of the first offer, it clearly increases with the level of reward. Thus it appears

that trusting behaviour is not a constant, but is affected by the level of payoff, consistent with *hypothesis* H_1 that the greater the multiplier the larger is the amount offered by player A.

If player A can insure against losses he will have protection against his vulnerability and will try to maximise the amount that may be returned to him. We suggest that this demonstrates a strategy of attempting to maximise one's own payoff: the higher offer made by player A signals trust in, and a sense of fair play towards, player B but is conditioned and incentivised by the fact that he is insured. *Hypothesis* H_2, that player A will offer more of his amount if he has protection from vulnerability, receives some support from the behaviour of some player A's in our game. However, some player A's, even though insured, did not give all their possible funds available to player B. This may be because some player A's were inequality- averse and realised that if player B did not return a positive amount then they would be considerably worse off in relation to the final balance of player B.

Table 3: Player A behaviour when insurance taken, classified by multiplication factor applied to Player A's offer.

	Multiplication factor	Mean proportion
Ratio1 player A offer1	X2	0.70
Ratio3 player A offer2	X2	0.30
Ratio1 player A offer1	X3	0.82
Ratio3 player A offer2	X3	0.48
Ratio1 player A offer1	X4	0.94
Ratio3 player A offer2	X4	0.53

Tables 4a and 4b reveal estimates for simple regressions of the log of the final balance of player A and the log of the joint balance for the insurance games in an attempt to understand whether 'reciprocal trust', in the sense of participants' combined final balances, can be seen as incentivised by the level of reward and by the opportunity to insure against losses, controlling for the ratio of amount offered and returned to the amount available at each stage. We build our final specification by adding one variable at

a time, which enables us to check the robustness of our estimates. Our results demonstrate that all estimates are indeed robust across specifications.[6]

Table 4a Player A - repeated game with insurance

Dependent variable = Ln Final balance player 1. OLS estimation				
Specification	1	2	3	4
N=35 games	Coefficient (std error)	Coefficient (std error)	Coefficient (std error)	Coefficient (std error)
Level of reward	0.331*** (0.071)	0.231*** (0.063)	0.229*** (0.059)	0.252*** (0.054)
Ratio 1 player A round 1		0.749*** (0.184)	0.727*** (0.171)	0.563*** (0.161)
Ratio 2 player B round 1			0.477** (0.195)	0.323* (0.182)
Ratio 3 player A round 2				0.222 (0.193)
Ratio 4 player B round 2				0.473** (0.195)
Insurance taken by player A				0.161* (0.082)
Constant	1.664*** (0.214)	1.420*** (0.186)	1.226*** (0.190)	1.056*** (0.178)
Adjusted R^2	0.38	0.58	0.64	0.71

***/**/* indicates significance at the 1/5/10 percent level

Interestingly, the first offer ratio and the final return ratio are the most important of our ratios of amount given to amount available to give and are both highly significant, with the coefficient higher on the opening offer than the final return. This result lends support to *hypothesis H_3,* that player B will return a larger proportion where player A has offered a high amount of his available funds. Thus, our findings indicate that player A's level of trust can be incentivised, increasing his reputation (supporting the reputation hypothesis

[6] Four specifications are reported here. A full set of results is available from the authors upon request.

in the literature) which in turn increases player B's reciprocity (supporting the reciprocity hypothesis in the literature).

Table 4b Joint final balance - repeated game with insurance

Dependent variable = Ln Joint Final balance. OLS estimation				
Specification	1	2	3	4
N=35 games	Coefficient (std error)	Coefficient (std error)	Coefficient (std error)	Coefficient (std error)
Level of reward	0.418*** (0.075)	0.286*** (0.057)	0.286*** (0.057)	0.291*** (0.054)
Ratio 1 player A round 1		0.984*** (0.165)	0.989*** (0.167)	0.835*** (0.161)
Ratio 2 player B round 1			-0.118 (0.190)	-0.293 (0.183)
Ratio 3 player A round 2				0.343* (0.194)
Ratio 4 player B round 2				0.179** (0.194)
Insurance taken by player A				0.186** (0.083)
Constant	2.205*** (0.226)	1.884*** (0.167)	1.933*** (0.186)	1.838*** (0.179)
Adjusted R^2	0.47	0.74	0.74	0.78

***/**/* indicates significance at the 1/5/10 percent level

We find that *hypothesis H_4* is not supported, as not all player A's who were offered insurance took up the offer. We wondered why, given the opportunity to insure, more player A's did not take up this opportunity. In this light of this puzzle, we have attempted to identify the determinants of taking up insurance, and in particular whether our measures of social capital taken in our pre-game survey could be influential. This was done by running a simple probit model.

Table 5 shows the results of our probit model of the probability of taking insurance given that the insurance game was being played. Once again we test the robustness of our estimates by adding our covariates one at a time. We find no significant difference between males and females in the probability of insuring. Our correlates of trust, the World Values Survey measure of trust and whether the subject votes, are both significant and work in the direction we expected. That is, participation in voting and being more trusting of others both are associated with a lower probability of taking up insurance. Thus it appears that voting - an indicator of community-oriented behaviour - leads to a higher probability of trusting behaviour and hence to a lower likelihood of insurance.

Table 5: Probability of player A taking out insurance

Dependent variable = Probability of taking insurance offer. Probit estimation			
Specification:	1	2	3
N=35	Coefficient	Coefficient	Coefficient
	(std error)	(std error)	(std error)
Male	0.265	0.028	0.415
	(0.449)	(0.512)	(0.581)
WVS trust		-0.801***	-0.983***
		(0.281)	(0.315)
Vote			-1.249*
			(0.706)
Constant	-0.210	2.273**	2.851
	(0.365)	(0.970)	(1.083)
Pseudo R^2	0.01	0.24	0.32

***/**/* Indicates significance at the 1/5/10 percent level

The World Values Survey trust measure, which has been claimed to be a weak measure of trust with respect to the amount sent by each player in the experimental trust game (Glaeser 2000) performs extremely well in these games as an indicator of whether or not player A will take advantage of an opportunity to insure. The coefficient on this measure is highly significant and also robust across specifications indicating that the

more predisposed to trust, in a World Values Survey sense, is player A the less likely she is to seek to insure against losses.

V. CONCLUSIONS

In this paper we investigate whether trust can be incentivised; more specifically, whether introducing a third party who raises players' risk efficacy can influence the level of trust demonstrated by the first player in a repeated Berg-Dickhaut-McCabe game. We conducted investment games under experimental conditions within the Department of Economics at the Universities of Sheffield and Glasgow during 2005/2006. Our results indicate that trust can be incentivised, in the sense that first-player offers within the context of a repeated BDM game are significantly larger if they show evidence that the fear of exploitation of their trust has been overcome by material incentives which increase their risk efficacy.

We test four hypotheses and find support for our first three: in particular, that trust increases with the size of the multiplier offered as a return on the initial investment, reciprocity is increased where the initial offer is high and willingness to trust is also higher in cases where a third party offers insurance against the possibility that initial offers will not be reciprocated, which strengthens the first player's risk efficacy. Our fourth hypothesis; that all players would take up insurance if offered, was not supported but led to the identification of determinants of taking up insurance, which were strongly negatively correlated with typical social capital measures, such as the World Values Survey measure of trust. Thus, it appears from this evidence that trust varies in relation not only to personal characteristics, which often cannot be altered, but in relation to institutions, which can. On this small-scale experimental evidence, there is an upward-sloping supply curve, in relation not to trust – which indeed cannot be bought – but rather in relation to institutions which protect the truster's risk efficacy, or defences against exploitation. These findings appear tempting but are urgently in need of further robustness-testing against a broader sample of respondents.

REFERENCES

Anderhub, V.,Engelmann, D., Guth, W. (2002). An experimental study of the repeated trust game with incomplete information. *Journal of Economic Behaviour & Organisation* 48, 197-216.

Barr, Abigail, (2003), Trust and expected trustworthiness: experimental evidence from Zimbabwean villages', *Economic Journal* 113(July), 614-631.

Berg, J., Dickhaut, J., McCabe, K. (1995). Trust, reciprocity and social history. *Games and Economic Behaviour* 10, 122-142.

Berggren, Niclas and Jordahl, Henrik (2006) Free to Trust: Economic Freedom and Social Capital, *Kyklos* 59, 141-169.

Brandts, J. Figueras, N. (2003). An exploration of reputation formation in experimental games. *Journal of Economic Behaviour and Organisation* 50, 89-115.

Charness, G., Cobo-Reyes, R., Jimenez, N. (2008). An investment game with third party intervention. *Journal of Economic Behaviour and Organisation* 68, 18-28.

Cochard, F., Van, P.N., Willinger M. (2004). Trusting behaviour in a repeated investment game. *Journal of Economic Behaviour and Organisation* 55, 31-44.

Cox, James, C. (2004). How to identify trust and reciprocity. Games and Economic Behaviour 46, 260-81.

Dercon, Stefan. (2005). Vulnerability: a micro perspective. Paper presented at World Bank ABCDE conference, May 23-24, Amsterdam.

Fahr, Rene and Irlenbusch, Bernd (2008). Identifying personality Traits to Enhance Trust between Organisations: An Experimental Approach. *Managerial and Decision Economics,* 29, 469-487.

Faulkner, Paul. (2008). Cooperation and trust in conversational exchanges. *Theoria* 23, 23-34.

Gambetta, Diego. (1988). *Trust: making and breaking co-operative relations*, Oxford: Basil Blackwell.

Glaeser, Edward L., David Laibson, Jose Scheinkman and Christine Soutter. (2000). 'Measuring trust', *Quarterly Journal of Economics* (August) 811-845.

Hudson, John (2006). Institutional Trust and Subjective Well-Being across the EU, Kyklos, 59, 43-62.

Knack, Stephen, and Philip Keefer (1997). 'Does social capital have an economic payoff? A cross-country investigation', *Quarterly Journal of Economics,* vol. 112, 1251-1288.

La Porta, R., Lopez-de-Silanes, F., Shleifer, A., and Vishney, R (1997). Trust in Large Organisations' *American Economic Review: Papers and proceedings* 87, 333-338.

Lupia, Arthur and Mathew McCubbins (1998). *The democratic dilemma: can citizens learn what they need to know?* Cambridge: Cambridge University Press.

Mosley, Paul, and Arjan Verschoor (2005). Risk attitudes and the 'vicious circle of poverty'. *European Journal of Development Research,* 17, 59-89. '

O'Neill, Onora. (2002). *A question of trust.* Reith Lectures 2002. London: BBC.

Putnam, R.D (1993). *Making Democracy Work: Civic Traditions in Modern Italy*. Princeton University Press.

Slovic, Paul (1993). Perceived risk, trust and democracy, *Risk Analysis,* 13, 675-681.

Whiteley, Paul (2000). Economic growth and social capital, *Political Studies,* vol. 48, 443-466.

Woolcock, Michael (1998). Social Capital and Economic Development: Toward a Theoretical Synthesis and Policy Framework, *Theory and Society,* 27, 151-208.

Zak, Paul J and Knack, Stephen (2001). Trust and Growth, Economic Journal, 111, 295-321.

APPENDIX A: DATA DEFINITIONS FROM QUESTIONNAIRE

GENDER: male = 1, female=0

AGE: The age, in years, of the respondent.

STUDENT LOAN: Loan exceeds the statutory minimum. 1 = yes; 0= no.

FAMILY MEANS TESTED: 1 = yes; 0 = no.

STUDENT LEVEL: 1 = postgraduate; 0 = undergraduate.

PERSONAL AND POLITICAL ATTITUDES:

Did you Vote in the last election or intend to vote in the next? 1=yes, 0= no.

From the world values survey: 'Generally speaking, would you say that most people can be trusted or that you can't be too careful in dealing with people?': Coded 1-5 on a likert scale: 1 if can't be too trusting through to 5 if most people can be trusted.

APPENDIX B: EXPERIMENTAL PROCEDURE

1: All participants convene in the 'base room'. The overall procedure of the game is outlined i.e. the purpose of our experiments, how the game is to be played, and the structure of rewards for participants.

2: Participants are divided into Player As and Player Bs. The experimenter assigns them into pairs, but the identity of these pairs is known only to the experimenter and monitors.

3: Players A and B each go to their assigned rooms.

4: A monitor lays out £5 on the table in coins and asks player A to offer any desired part of this to player B. The identity of the other player is not specified: Player A is only told that his/her 'partner' is a student within the University, that the amount invested will be doubled/ tripled/quadrupled, and that player B is free to return as much or as little as s/he desires.

5: The amount offered, once multiplied, is then 'transferred' to Player B. The game is repeated once.

6: Each round player A's offer and player B's return is recorded.

7: A second monitor records Player B's return. Each Player B receives an initial stake of £5. In addition s/he receives the multiplied offer from Player A. S/he decides how much of this offer to return to Player A.

8: At the conclusion of the game each player is informed of their 'final balance' and they are presented with a provisional IOU corresponding to this balance.

9: In the insurance game we repeat the stages above but now player A is given the opportunity to take out insurance. They are asked "Do you wish to consider taking out insurance, to cover the possibility that you may not receive from player B as much as you offered? If you pay a premium of £1 you will get back the full amount you offered minus the premium should player B not return the full amount of your offer. If you pay a premium of 50p you will get back half of the amount you offered, minus the premium, if player B returns less than the amount you offered." Player B is aware that they are participating in an insurance game but do not know whether player A has taken advantage of the option to insure.