Málaga Economic Theory
Research Center
Working Papers

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WP 2011-6
October 2011

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Facultad de Ciencias Económicas y Empresariales
Universidad de Málaga
ISSN 1989-6908

An Experimental Analysis of Informational Feedback and Commitment

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ABSTRACT

In this paper we experimentally manipulate the informational feedback and the technology used in two team production games. Production functions are aggregative (a standard linear VCM) or weak link (the minimum or weakest link game, WLM). We analyze two informational conditions, relative to a Baseline (BSL) in which the unique available information is the relevant statistic (team average and team minimum). In the Full Information (FI) condition, subjects get the ranked vector of contributions. In the Traceable Full Information (TFI) condition, subjects are able to trace back individual contributions over time. Our 2x3 factorial design keeps identical full anonymity and full privacy rules in all six experimental treatments. Our results suggest that information matters in a non-linear way, as no significant differences are observed between BSL and FI in any game. High contribution rates are only sustained in the WLM with traceable full information. These differences are consistent with very different commitment patterns across informational conditions. More interestingly, conditional cooperation patterns are shaped by information and commitment rather than by the technology.

1. INTRODUCTION

Humans are typically willing to cooperate to some extent in experimental teams. Different theories are consistent with this regularity, from altruism (Becker, 1974), or confusion (Palfrey and Prisbrey, 1997), to some kind of social preferences linked to reciprocity and conditional cooperation (Fehr and Gächter, 2000; Falk and Fischbacher, 2006, Keser and van Winden, 2000; Gächter, and Fehr, 2001; Croson 2002; or Fischbacher and Gächter, 2004).

In this paper we investigate the effect of informational feedback in a variety of public goods games. The idea is not new. Information about past individual donations is critical to design fundraising campaigns. Croson and Shang (2008) run a field study to find that subjects systematically adapt their donations to the information they receive. Gächter et al. (2008) and Nikiforakis (2010) find that giving subjects information about effort or compensation of peers critically shapes the relationships within teams.[1]

One explanation for this effect is based on the existence of social preferences. In a broad range of public goods experiments social information showed to have a strong effect on conditional cooperation. Frey and Meier (2004) and Fischbacher et al. (2001) support the idea that a significant proportion of subjects base their contribution in the available information. Conditional cooperators adjust their contributions to the public good to the contribution of other subjects. So, information modifies behavior in these games even when it is not monetarily relevant. Bardsley and Sausgruber (2006) document a public goods experiment in which subjects observe the contributions of subjects playing in a different group and finds that contributions are positively correlated across groups.

However, other explanations are possible. Subjects may simply mimic what others subjects do, as proposed in Bernheim (1986). Gächter and Thöni (2008) show that conformism may be the key motivation driving social interaction. Andreoni and Petrie (2004) suggest an alternative based on the role of exemplar behavior. A proportion of subjects are willing to 'do the right thing' as long as they get some credit for it, even in an anonymous setting. They decide to 'lead' their teammates contributing to the public good. Some subjects follow this exemplar behavior, generating a significantly larger contribution to the public good. [2]

[1] Falk and Ichino (2006) conduct a field experiment and find that teams of two workers are more productive when they can observe each other working.

[2] Offerman (2002) is a nice example of exemplar behavior in experimental markets. Information about exemplar firms leads to more collusive behavior (more cooperation between firms).

The empirical evidence in linear public goods experiments is largely inconclusive. Sell and Wilson (1991) find that the mean individual contribution change with individual information. Weimann (1994), Croson (2001), Andreoni and Petrie (2004) and Denant-Boemont et al. (2005) get no positive effect for information without loss of confidentiality. In a team production environment, Mittone and Ploner (2008) and Gächter et al. (2008) find that information weakens reciprocity. While Gächter and Thöni (2005), Clark et al. (2007) and Nikiforakis (2010) report that information about earnings has a negative impact in team production, Güth et al. (2001) and Charness and Kuhn (2007) find no significant effect.[3]

The informational feedback may affect cooperation because it shapes punishment strategies, transforming a linear public goods game into a coordination game.[4] Contributing less than others might be costly if others can credibly reduce their contribution in the future. Informational feedback may act as a coordination device helping groups to converge on a standard. This possibility is mediated by the availability of social information. Traceable information about the behavior of the other group members may play a role in determining the prominence of behavior. Subjects only get full credit for their actions and can only consistently signal over time a cooperative attitude when their decisions can be identified.

To the best of our knowledge, the effect of traceability has never been disentangled in the laboratory. Fox and Guyer (1978) analyze the joint impact of information and accountability. Andreoni and Petrie (2004) and Croson and Marks (2003) relax anonymity by giving subjects the possibility to identify the other group members. Following Andreoni and Petrie (2004), exemplar behavior may play a critical role in social interaction only when the history of past moves becomes available. Our goal in this paper is to check how subjects react to traceable information, even with full confidentiality, and whether or not traceable information encourages efficiency.

Given the coordination issues raised above, we are additionally interested in testing the role of informational feedback when public goods games are produced using different technologies. Croson et al (2005 and 2008) analyze different games (framed and run in an identical way) which just differ in the definition of the production function. An aggregative voluntary contribution mechanism is compared with a "minimum effort game" and a best-shot game. Information shapes conditional cooperation in all three conditions. In the original

[3] The experimental evidence on imitation in markets shows that providing information about the earnings of other firms may generate more competition and less cooperation (Huck et al. 1999, 2000, Offerman et al., 2002). Fatas, Jaramillo and Morales (2011) show that getting information about the average earnings of the other firms in the market leads to extreme competitive behavior.

[4] See Guillen et al. (2010) for a theoretical elaboration of this idea.

experiments by Van Huyck et al. (1990) on minimum games, full information decreased the degree of efficiency achieved by subjects.[5] However, Berninghaus and Ehrhart (2001) and Riechmann and Weimann (2008) suggest that information is critical to guarantee coordination.

This paper tries to coherently study the effects of social information on voluntary public good provision in two different games: a linear public good game (VCM) and a public good game where the social outcome comes from the minimum contribution to the public good (based on a weakest link mechanism, WLM). All experiments are identically framed with a unique difference coming from the production function (aggregative for the VCM, a multiple of the minimum contribution, in the WLM).

We implement three informational conditions: (i) information about the relevant statistic (the Average or Minimum contribution depending on the game), which is our baseline (BSL hereafter), (ii) the ranked vector of contributions (Full Information treatment, FI hereafter), and (iii) individually traceable information (Traceable Full Information treatment, TFI hereafter). Our results support the idea that traceability is the key issue to enhance contribution. Some subjects strategically use the informational conditions to send persistent signals to their teammates. Their commitment makes a significant difference at the aggregate level, because it becomes more frequent when traceability is available, boosting cooperation. But, it also shapes conditional cooperation in very similar ways across games. The rest of the paper is organized as follows: Section 2 explains the two games and their experimental implementation. Section 3 reports the results, and Section 4 concludes.

2. Experimental Design

We use a 2 x 3 experimental design in which we vary the technology and the information conditions. We experimentally study the VCM and the WLM under three information conditions[6]. In our BSL subjects get information about the relevant statistic, while in the other two information conditions subjects get full information about the past actions of all the other group members. The unique difference comes from traceability: whereas in the FI condition subjects get the ranked vector of contributions (from top to bottom), in the TFI condition subjects get traceable information about every individual contribution of their team mates.

[5] The very same result is obtained in Devetag (2005), being both results related with the ones obtained by Croson and Marks (1998) in a different coordination game.

[6] In all treatments subjects had a history table with information about all previous rounds and individual earnings, subdivided by individual and public account.

Thus, individual contributions to the public good are displayed according to a commonly known subject number. At the end of each period of this treatment, information is revealed, so they know exactly what each group member contributes throughout the experiment.

The experiments involve 20 periods in both games. At the beginning of the experiment the composition of groups of four subjects is randomly determined and does not change. In both games in each period $t,(t=1,2,...20)$ subjects are endowed with *e = 50* ECU (Experimental Currency Unit), which can be either privately consumed, or invested in the public account. Subjects are asked to simultaneously and privately allocate their endowment between an individual account and a public account.

In the VCM the individual payoff is determined by the following payoff function:

(1) $$\pi_i(x_i, x_{-i}) = a(e - x_i) + b\sum_{i=1}^{n} x_i$$

Where $\pi_i(.)$ denotes *i*'s payoff; *e* is the endowment and x_i is *i's* contribution to the group output; *a* is the return from the private contribution (1 in our case) and *b* is the marginal per capita return (MPCR) from the group contribution. Under standard assumptions (nb>a>b), each subject has a dominant strategy to free ride for any given allocation of his or her three partners. This result extends to the finitely repeated game. The parameters used in the experiment (e=50; a=1; b=0.5; n=4) are standard and lead to a unique inefficient Nash Equilibrium. Yet, as nb>a this equilibrium outcome is socially inefficient. The socially efficient outcome is to contribute everything for all *i*.

The WLM setting is close to the one described above. Individual earnings are the sum of the individual contributions to the individual account and twice the group's minimum contribution to the public account. The individual payoff is determined by

(2) $$\pi_i(x_i, x_{-i}) = a(e - x_i) + nb\min(x_i, x_{-i})$$

In the stage game, there are multiple Nash equilibria in pure strategies (every symmetric contribution profile is an equilibrium of the stage game). Complete contribution of all endowments to the public good is the Pareto-efficient equilibrium. Any unit allocated to the public account in excess of the minimum is both an individual and a social loss. This 2 x 3 experimental design is outlined in Table 1.

We follow standard experimental procedures. All experimental sessions were run at the experimental laboratory of the University of Valencia (LINEEX). Subjects were undergraduate students (mostly from business and economics), with no prior experience in these games. Average earnings were around 20€ and each session lasted around 60 minutes. Before the experiment began, written instructions were read[7]. The experiment did not start until subjects had answered a simple test correctly.

3. RESULTS

3.1. THE EFFECT OF INFORMATION AND TRACEABILITY ON BEHAVIOR.

Table 2 reports aggregate results showing the average public good provision by game and information treatment over different times horizons. Average public good provision looks quite similar in BSL and FI treatments for the VCM (14.69 vs. 14.95); provision even declines in the WLM (20.63 vs. 13.83). Differences are never significant (p-value = 0.6630 for the VCM, and p = 0.6698 for the WLM) [8]. The effect of traceable information (TFI) is apparent. Independently of the game, public good provision increase by around 50% when you consider the 20 rounds. This difference is statistically significant. [9]

[Table 2 around here]

Figure 1 and Figure 2 plot public good provision over the 20 rounds subjects played. Figure 1 shows for the VCM a dynamic pattern pretty consistent with others found in similar linear public good games[10]: provision starts around 45% of the endowment and decline over time. However, provision never fully collapses to complete free riding. The dynamic of BSL and FI are remarkably close, while provision in the TFI is permanently above the one found in the other treatments (with the exception of the last periods). The effect of traceability starts in the first period, even when only in the VCM differences between TFI and FI/BSL are significant in the first period[11]. Differences between FI and the BSL are small in absolute terms and never significant. [12]

[7] Translated instructions are available in the appendix. Original instructions in Spanish are available upon request.
[8] To determine the significance of the differences we use the non-parametric Mann-Whitney test.
[9] Mann-Whitney test p-values are, for the VCM, p= 0.0148 for BSL vs. FI comparison, and p=0.0640 for FI vs. TFI comparison. For the WLM, p=0.0361 and p=0.0047, respectively.
[10] In fact, trends are remarkably close to the ones observed in Croson et al. (2005), with identical parameters but a surprise restart design.
[11] Mann-Whitney p-values are 0.0211 for BSL vs. TFI comparison and 0.0257 for FI vs. TFI comparison.
[12] Mann-Whitney p-values = 0.4751 and 0.9425 for the VCM and WLM, respectively.

[Figure 1 around here]

[Figure 2 around here]

Figure 2 (WLM) shows that average contribution in the different treatments are ordered in a slightly different way (contribution in WLM-FI is systematically below WLM-BSL), but these differences are never significant. [13] In line with previous results (see Croson, 2001, Andreoni and Petrie, 2004, or Weimman, 1994), complete information *per se*, as in FI, does not guarantee a significant increase in public good provision.[14] Traceability yields again significantly larger provision levels. For the WLM case, public good provision for WLM-TFI is around 60% larger than for WLM-BSL[15].

[Figure 3 here]

Figure 3 represents the same data shown in Figures 1 and 2, looking for the differences across games played under the same informational conditions. As in Croson et al. (2005), we find only minor differences are observed across games in the BSL and FI conditions.[16] Provision under the TFI condition show persistent differences: provision is significantly larger in the VCM during the first periods, [17] but trends cross each other and the opposite effect is observed in most of the periods. The gap becomes large in the last rounds, when provision reaches a 75% level in the WLM, while it falls to less than 13% in the VCM.

3.2. Behavioral determinants

How can we explain these results? If our initial hypothesis is right, and subjects anticipate that signals become salient when individual decisions can be traced over time, we should find more subjects using this opportunity in the TFI, especially in the first rounds. Taking as an arbitrary initial block the first five rounds, we define as a *High Commitment* group (HC) a group in which at least one subject always contributes her full endowment in this initial block. The rest of the groups are classified as *Low Commitment* groups (MC).[18] Table 3 presents the distribution of HC and LC groups in each game for FI and TFI treatments. Given that

[13] Mann Whitney p-values = 0.6698.
[14] See Croson and Marks (1998) for a step level public good game and van Huyck et al. (1990) for the WLM.
[15] Mann-Whitney p-value = 0.0361 for BSL vs. FI comparison; and p-values = 0.0047 for FI vs TFI.
[16] Provision is significantly higher for the VCM in both information treatments (BSL and FI) in the first period; Mann Whitney p-values are 0.0413 and 0.0216, respectively.
[17] Differences are even marginally significant in the first period; Mann-Whitney p-value is 0.0507
[18] It is not difficult to see the specificity of this definition. However, our results are robust to alternative definitions of commitment (changing the number of rounds, or giving room for a more flexible definition of commitment).

subjects get no information about individual decisions in the BSL, we exclude this treatments from this analysis. Relative to FI, traceable information significantly increases the frequency of HC groups in both games (0% vs. 22.22% for the VCM and 33.33 vs. 53.85% for the WLM).[19] Our results are consistent with the idea that subjects anticipate the potential effect of traceable information.

[Table 3 around here]

Table 4 shows the average provision by commitment levels. HC groups provide more public good than LC ones in both games. [20]

[Table 4 around here]

Figure 4 plots the mean public good provision for the HC groups in TFI treatments from each game. HC groups keep the level of public good provision over the 75% almost every round. For the VCM this large public good provision level is kept over this level until the last five rounds, when the average provision falls almost to the free-rider level. However, for the WLM, HC groups keep high levels of provision over all the experiment, ending in the last period above 85%.

[Figure 4 around here]

Table 5 shows average normalized earnings for HC and LC groups respectively. Looking at Table 5, we can appreciate that while average earnings for LC groups substantially lower than average earnings for HC groups in the TFI treatments, no differences appears between group commitment types for the FI treatments[21].

[Table 5 around here]

Figure 5 shows the average earnings by initial group commitment pooling the data by treatment (that is, FI (TFI) observations include HC groups from the VCM and the WLM). Figure 5 clearly shows that without traceability (as in FI) earnings do not differ.[22] However this picture

[19] Using a chi-squared test for difference in distributions between the FI and TFI treatments we can reject the hypothesis of equal proportions χ^2 test P-values are: 0.0087 for VCM and 0.0000 for WLM.

[20] Using the non-parametric Wilcoxon-Mann-Whitney test we can reject the hypothesis of equal distribution for the two commitment groups (p= 0.0404 for VCM and 0.0003 for WLM).

[21] We might take in account that there are no HC groups in the FI treatment for the VCM.

[22] Mann-Whitney test p-value is 0.3681

changes when traceable information is available. In this case, earnings of HC groups increase drastically (around 30%) relative to LC groups[23].

[Figure 5 around here]

3.4 CONDITIONAL COOPERATION PATTERNS

A number of competing models have been proposed to explain deviations from equilibrium and from efficiency.[24] In these models, participants try to match the allocations of their counterparts. Thus, only if others contribute to the public good, conditional cooperators contribute. Table 6 follows the analysis of Croson (2007) and Croson et al. (2010), presenting the results of panel data estimations, using random effect at the individual level, for FI and TFI. The dependent variable is individual i's contribution to the public good in period t. Independent variables include *Period* (indicator variable for the period t) and a measure of what the individual's counterparts did last period (all three lagged individual decisions): *LagMax-i*, *LagMed-i* and *LagMin-i*. *LagMax-i* indicates the maximum contribution to the public good observed by a subject in the previous period, not including her own, while *LagMed-i* and *LagMin-i* are the median and minimum lagged contribution of the other group members.

[Table 6 around here]

Following the similar informational environments analyzed in Croson et al. (2005) and Croson (2006), every lagged contribution should matter in the VCM, while only the minimum should become focal in the WLM. Our results are consistent with this. In the VCM-FI condition, subjects positively react to both the lagged maximum and the lagged minimum contribution to public good[25]. In the WLM-FI treatment, only the lagged minimum contribution is statistically significant. When traceability is available, in the VCM-TFI every contributions matter. In the WLM-TFI, however, subjects react now to the lagged minimum, maximum and median contribution.

In Table 7 we present the results of additional panel data regressions. Here we interact the lagged variables (Lagmaxi/Laggmini) with the commitment group variables (HC/LC). The dependent variable is again individual contributions to the public good in period *t*. The

[23] Mann-Whitney test p-value is 0.0001

[24] See Sugden (1984), Andreoni (1995), Palfrey and Prisbey (1997), Croson (1998), Sonnemans et al. (1999), Fischbacher et al. (2001), Keser and van Winden (2000), and Brandts and Schram (2001).

[25] Our resuts show how both the lagged maximum and the lagged minimum contribution are statistically significant ($p< 0.05$).

independent variable includes the period t, and interaction variables. These variables include the lagged maximum (LagMax-i) interacted with a dummy for the HC (LC) groups and the lagged minimum interacted with a dummy for the HC (LC) groups. If these interactions are significant this tells us that the effect of theses lagged variable is significantly different for different commitment levels.

[Table 7 around here]

LagMin-i is always positive and significant, though the magnitude of the response in the HC groups is twice as much as in the LC groups. In the TFI treatment, subjects in HC groups pay attention to both the *LagMax-i* and the *LagMin-i*, while subjects in LC groups, as in FI, only focus in the *LagMin-i* contributions.

4. CONCLUSIONS.

Several results from previous experimental work show that information is an important feature to understand cooperation. The purpose of this paper is to examine whether and how information affects subjects' behavior in two public goods games (the VCM and the WLM). We systematically alter the social information set providing individual information, first, and traceable information later. Our implemented treatments allow us to investigate how subjects react to variations on amounts (and quality) of information about the contribution behavior of the other group members. We conjectured that by providing a richer informational environment would aid groups for achieving optimal outcomes.

We found, first, that information matters, but individual information alone has a modest effect on the public good provision. In contrast, being able to trace back individual contributions but not knowing the identity, can significantly increase public good provision. However, the effectiveness of different information sets depends on the game played. We found that, although traceable information is effective in both games, it works much better in the long run in the WLM than in the VCM.

Looking more deeply, we discovered that traceable information has a significant effect on the formation of "good examples" within the groups by promoting some kind of group commitment to the social optimum (traceability enhances the existence of individuals who are willing to contribute the full endowment systematically in the first five periods). Our results indicate that commitment under traceable information seems be the key to great public good

provision and earnings. Commitment by itself is not enough. When people can get credit for their actions groups where some subjects show strong commitment present larger levels of public good provision.

Our results replicate the finding that subjects are conditionally cooperative in these public good games (see, Croson et al. 2010). However, looking within the group commitment levels we find different forms of conditional cooperation contributions depending on the information condition. Subject's contributions in both HC and LC groups are responsive to the minimum contribution of the others in FI. Nonetheless, under TFI individual contributions respond to both the maximum and the minimum contribution in HC groups, and as in FI, to the minimum contribution in LC groups. That is, conditionally cooperative behavior of LC groups' subjects is not significantly different in both informational conditions.

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7. APENDIX: INSTRUCTIONS (FULL INFORMATION TREATMENTS)

The aim of the experiment is to study how individuals take decisions in certain contexts. The instructions are easy and if you follow them carefully you will be earn an amount of money which is privately and anonymously paid to you at the end of the experiment. Should you have any questions please raise your hand first before you ask. Any communication between you and the other participants is prohibited during the experiment. If you do not comply with this rule, you will be excluded from the experiment.

1. The experiment consists of 20 rounds. In each round you form part of a group of 4 participants. The computer randomly determines the composition of your group at the beginning of the experiment. The composition of your group will remain the same throughout the experiment. You will not be told the identities of the group members at any time.
2. In each round every participant receives an initial endowment of 50 ECU (Experimental Currency Units). You only have to decide how much of this amount you want to assign to a Group Project (GP). The remainder will automatically be assigned to an Individual Project (IP).
3. Your payoff from the Individual Project equals your assignment to the Individual Project and does not depend on the decisions of the others.
4. The computation of the payoff from the Group Project depends on the Group Project, which equals the total amount assigned to the Group Project (that is the sum of your assignment to the Group Project and the corresponding assignments of the other three members of your group).This total amount assigned to the Group Project will be multiplied by two and divided equally among the four group members.
5. In summary, your round payoff is determined as follows:

    - Individual payoff = payoff from the Individual Project + payoff from the Group Project
    - 50 ECU – assignment to Group Project+ (2 x Group Project)/4

6. After each round you will get information about the individual allocations to the GP in your group, ranked from top to bottom, so you will not be able to identify decisions across periods. Additionally, you will receive information about your payoff in every round broken up to the payoff from the Group Project and the Individual Project. You also will receive the same amount of information for all past.
7. At the end of the experiment, the sum of your individual payoffs over the 20 rounds will be privately paid to you at the exchange rate of **200 ECU=1€.**

7. TABLES

TABLE 1 SUMMARY TABLE

Game	Treatment	Information	#Groups	# Subjects
VCM	BSL	Average	13	52
	FI	Vector	7	28
	TFI	Traceable	9	36
WLM	BSL	Minimum	9	36
	FI	Vector	12	48
	TFI	Traceable	26	104

TABLE 2 DESCRIPTIVE STATISTICS (PUBLIC GOOD PROVISION)

		Information Condition		
		BSL	FI	TFI
Round 1	VCM	21.6	20.71	28.31
	WLM	12.33	13.5	19.81
Round 20	VCM	10.92	5.89	6.33
	WLM	12.22	11.25	37.69
Overall	VCM	14.69	14.95	23.65
	WLM	20.63	13.39	34.83

TABLE 3. DISTRIBUTION COMMITMENT # GROUPS AND %

	VCM		WLM	
	FI	TFI	FI	TFI
Low commitment	7 100.00%	7 77.78%	8 66.67%	12 46.15%
High commitment	0 0%	2 22.22%	4 33.33%	14 53.85%

TABLE 4 PUBLIC GOOD PROVISION BY COMMITMENT

	VCM		WLM	
	FI	TFI	FI	TFI
LC	14.95	19.82	11.39	24.39s
HC	--	37.04	17.39	43.78

TABLE 5 AVERAGE (NORMALIZED) EARNINGS BY INITIAL COMMITMENT

	VCM		WLM	
	FI	TFI	FI	TFI
LC	64.95	69.82	55.85	71.47
HC	-	87.04	58.00	91.11

TABLE 6 CONDITIONAL COOPERATION PATTERNS

Random Effects regression results (S.E.).
Dependent variable: Individual contribution

	VCM		WLM	
	FI	TFI	FI	TFI
Const	13.646 (1.138)***	15.899 (3.494)***	12.610 (3.812)***	3.498 (1.081)***
Period	-0.494 (0.076)***	-0.616 (0.163)***	-0.400 (0.145)***	-0.05 (0.048)
LagMax-i	0.148 (0.062)**	0.133 (0.071)*	0.081 (0.05)	0.289 (0.065)***
LagMed-i	0.088 (0.080)	0.258 (0.080)***	0.011 (0.105)	0.349 (0.07)***
LagMin-i	0.206 (0.097)**	0.218 (0.101)**	0.637 (0.101)***	0.297 (0.086)***
Nº Obs.	532	684	912	1976
R-sq:				
Between	0.3633	0.7593	0.8467	0.9818
Overall	0.2868	0.4644	0.6339	0.8834
Prob>chi2	0.0000	0.0000	0.0000	0.0000

*p<0.10. ** p<0.05. *** p<0.01.

TABLE 7. CONDITIONAL COOPERATION PATTERNS BY COMMITMENT

Random Effects regression results (S.E.).
Dependent variable: Individual contribution

	FI	TFI
Constant	20.90***	14.57***
	(2.107)	(2.745)
Period	-0.573***	-0.222
	(0.165)	(0.142)
HC*Lagmaxi	0.0409	0.385***
	(0.0732)	(0.1000)
HC*Lagmini	0.525***	0.339***
	(0.152)	(0.0852)
LC*Lagmaxi	0.0425	0.0870
	(0.0517)	(0.0774)
LC*Lagmini	0.245***	0.715***
	(0.0827)	(0.0955)
Nº Obs.	1444	2660
R-sq:		
Between		
Overall		
Prob>chi2		

*p<0.10. ** p<0.05. *** p<0.01.

8. Figures

Figure 1. Public Good Provision VCM

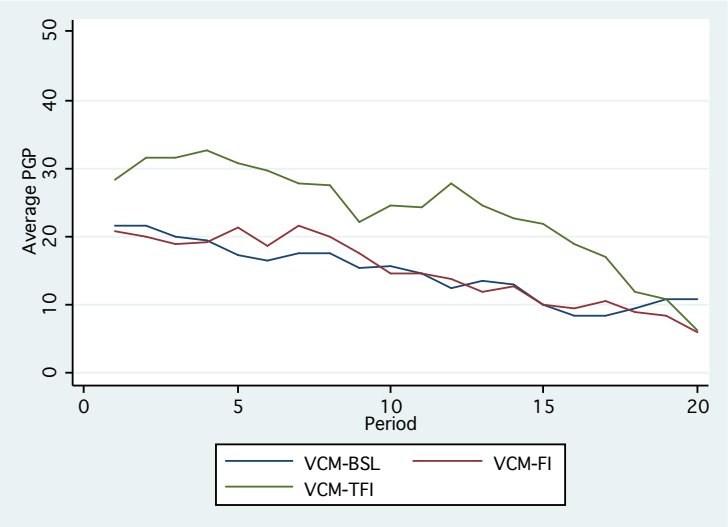


Figure 2 Public Good Provision WLM

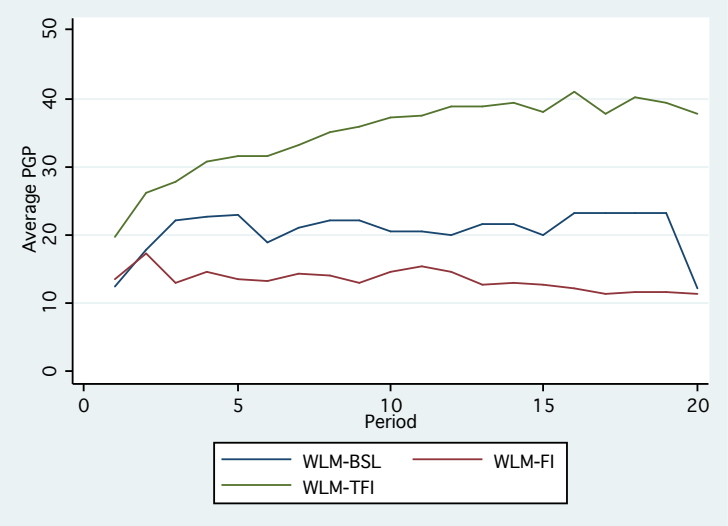
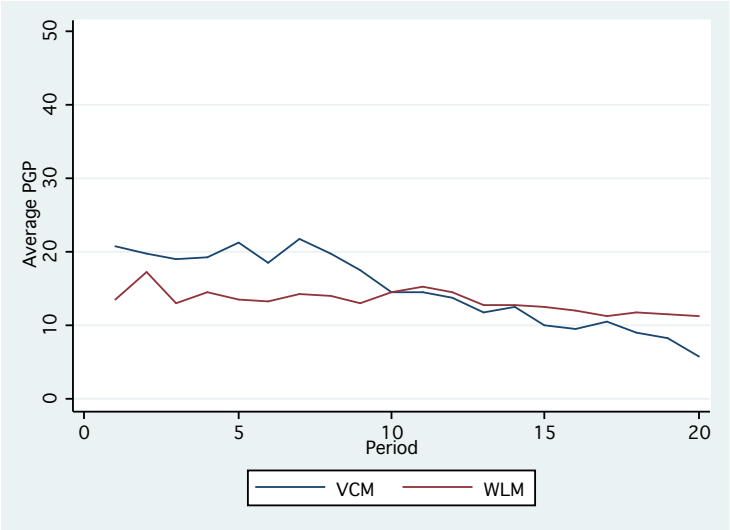


FIGURE 3. PUBLIC GOOD PROVISION BY GAMES

BSL (AVG/MIN.)

FI



TFI

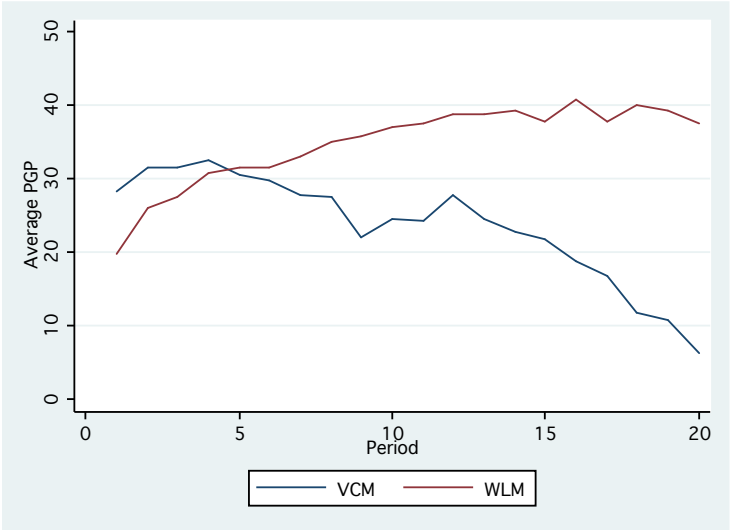


FIGURE 4 AVG PGP HC GROUPS IN TFI BY GAMES

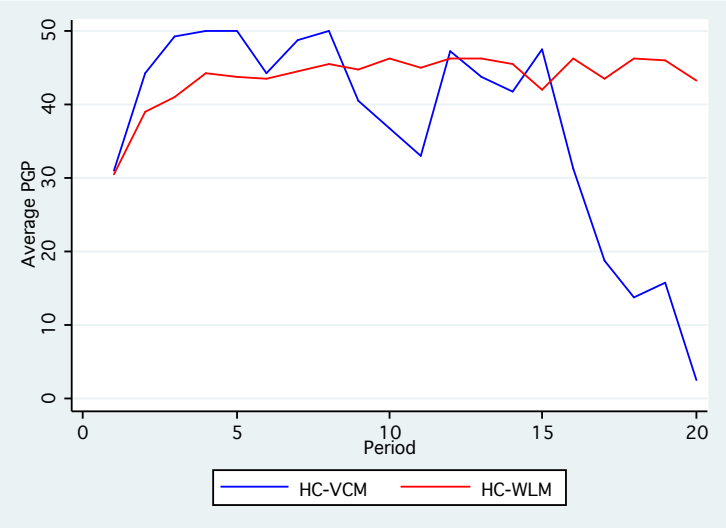


FIGURE 5: EARNINGS BY INITIAL COMMITMENT : (FI VS TFI)