Do Stakeholder Comments Influence Regulator Behavior? Evidence from a Public Goods Experiment

Stephen N. Morgan, Nicole M. Mason, and Robert S. Shupp
Department of Agricultural, Food, and Resource Economics
Michigan State University
snmorgan@msu.edu

DRAFT
Please do not circulate or cite without author permission

Selected paper prepared for presentation at the 2017 Agricultural and Applied Economics Association Annual Meeting, Chicago, Illinois, July 30-August 1

1. INTRODUCTION

Stakeholder participation is a core element of agri-environmental regulatory policy at the national, state, and local levels of government (Crow et al. 2016). Supporting both procedural transparency (Irvin and Stansbury 2004) and the transmission of local knowledge (Langbein and Kerwin 1985), public input has evolved from field meetings with rural producers, to stakeholder advisory boards, to a more inclusive and sophisticated platform for online comments where any interested individual, firm, or organization can provide feedback on a proposed regulation directly to bureaucratic policymakers at the agency level. Under the auspices of the Administrative Procedure Act, all federal rulemaking in the United States must provide citizens the opportunity to submit "written data, views, or arguments" that will be given "consideration" by the regulating agency (PL 79-404). Leveraging this channel, individuals and interest groups attempt to exert influence over the final rules and policies governing agri-environmental behavior by brining them closer to a participant's ideal policy position (Yackee 2006; Crow et al. 2016). While agencies are required to solicit and respond to stakeholder input, there is no requirement that these comments have any influence on the final decision of the regulatory body (West 1995). Building on recent scholarship, the goal of this research is to experimentally test the ability of stakeholder comments to influence rulemaking and answer the question: how do public comment participation mechanisms influence the behavior of agri-environmental regulators?

Understanding how stakeholder comments might affect regulator decision-making will benefit agricultural stakeholders who face opportunities to engage in the rulemaking process as well as regulatory agencies. First, this research will support stakeholder assessment of when to engage in regulatory participation mechanisms. Providing comments on a proposed regulation is costly for the individual, and must be weighed against any expected benefits that could be earned by successfully influencing a final rule. Relevant costs might include the opportunity cost of time to read and respond to a proposed regulations, consulting costs to prepare the written comment, and social costs of being publicly associated with a policy position (Irvin and Stansbury 2004). Clarifying the extent to which comments might impact resulting decision rules in a stylized public goods scenario with costless participation may present an upper bound on the economic returns to participation. Second, this research supports the efficient allocation of agency resources regarding participation mechanisms. If stakeholder comments have no impact on final rules and outcomes, then we may reasonably question their continued existence. While some previous research argues that there may be behavioral implications on stakeholders themselves in terms of trust in the rulemaking process (Tyler 1990) or compliance outcomes (Morgan et al. 2016), regulatory agencies might well achieve these outcomes by utilizing resources for implementation or monitoring and enforcement activities.

This paper analyzes the effects of stakeholder comment mechanisms on regulator decision-making in a laboratory context. To test the behavioral impacts of receiving comments, we use a public goods experiment with a voluntary contribution mechanism (VCM). In this experiment, individuals choose how to invest an endowment in either a private account or a group account. Different rates of return make it Pareto optimal for all individuals to allocate their tokens to the group account, yet individual incentives may drive players to only contribute to the private account. Our key innovation is the introduction of a contribution rule, recommending a contribution level to the group account. A designated policymaker chooses the rule, where the

main treatment is whether or not other players are able to provide comments about their preferences for a minimum contribution rule. Additionally, we implement an enforcement mechanism to test the effects of participation on regulator choices a regulator knows there will be sanctions for those who do not abide by their decision.

This paper proceeds as follows. Section 2 discusses previous literature on regulatory decision-making in the face of public deliberation and highlights our contributions to the literature. Section 3 presents the economic model underpinning the economic experiment. Section 4 describes the experimental design, and section 5 analyzes results. Finally we conclude and discuss potential implications of this work in section 6.

2. CONTRIBUTIONS TO EXISTING LITERATURE

This research makes several key contributions to the broad literature on agri-environmental decision-making and experimental economics. The first contribution is to experimentally measure the effects of stakeholder comment on regulator behavior in the governance of a pure public good. Early attempts to estimate the impact of comments in observational data provided mixed results. Magat et al. (1986) find no impact of comments on effluent regulations by the Environmental Protection Agency (EPA) while Cropper et al. (1992) find strong evidence that comments change the propensity of EPA regulators to cancel pesticide regulations. Focusing on the textual analysis of a broad range of proposed rules and interest group comments, Yackee (2006) finds strong evidence that bureaucratic regulators respond to comments by changing final regulations to more closely match the ideal points of the interest groups who engage with the comment mechanism. The challenge in this literature is the underlying heterogeneity present in the salience of the issues being discussed, the types of regulations under consideration, and the linkages of stakeholder comments to the timeline of rulemaking decisions (Crow et al. 2016). Additionally, the competition of interest groups makes it challenging to assess the ability of comments to get final policies closer to their Pareto optimal levels. By conceptualizing a pure public good environment that pays direct monetary returns to experimental participants, we will be able to assess how comments change the exact level of regulation chosen by a policymaker rather than measuring probabilities of a change occurring.

The second contribution is to investigate the interaction of comment and enforcement mechanisms on regulator behavior. Previous research has focused predominately on the effects of enforcement on compliance outcomes. Severe sanctions can be useful in motivating increased compliance among stakeholders, provided sanctions are sufficiently large to outweigh any expected gains from defecting from a rule (Becker 1968; Polinsky & Shavell 2000; Qin and Wang 2013). Additionally, when individuals are able to participate in selecting the enforcement mechanism through a majority rule vote, compliance outcomes are further improved (Tyran and Feld 2006). Kroll et al. (2007) show that voting alone does not increase compliance but if the voters can endogenously enforce the punishment then compliance increases. Kamei et al. (2015) find that informal sanctions are more popular and efficient with participants when formal sanctions entail costs to the group as a whole. Building upon this participation-enforcement linkage, we argue that similar effects may be observed among regulators. Comments may change regulator differently when in the presence of a complementary enforcement mechanism, because regulators may take into account the idea that noncompliers will be sanctioned, even if the rule is far from their ideal point. Via this experiment, we will be able to test if regulators respond differently to comments under voluntary or mandatory compliance regimes.

3. ECONOMIC MODEL

Conceptualizing agri-environmental regulation as a mandated contribution towards pure public goods, we implement a linear public goods game with a voluntary contribution mechanism (VCM). In the standard VCM, each individual i in a group of N individuals maximizes their utility U_i by choosing the number of points they would like to allocate to a private account and to a group account.

$$U_i = \left(E_i - x_i\right) + P\sum_{i \in N} x_i \tag{1}$$

Equation (1) models individual utility in this game. E_i is the player's initial endowment at the beginning of the game. We let x_i be the number of points the individual chooses to contribute to the group account. Individual earnings from their private consumption is then given by $\left(E_i - x_i\right)$, where individuals get the full value of any points placed in their private account. Individual earnings from the group account are calculated as a multiple of total group contributions where P is the marginal per capita return (MCPR). The MCPR is the marginal return to an individual of a one point contribution to the public good. Thus, total earnings from the group account are given by $P\sum_{i \in N} x_i$. Each point placed in the group account will then return NP points to the group as a whole.

Differential rates of return may make it Pareto optimal for all individuals to allocate their total endowment to the group account while at the same time incentivizing individuals to only contribute to the private account. These incentives are described in Croson (2007) where the pure public goods problem arises when $\frac{1}{N} < P < 1$. In this environment, classical economic theory would expect to see an optimal contribution of $x_i^* = 0$ which is also the best response to the allocation decisions of any other member of the group (i.e. $\frac{\partial x_i^*}{\partial x_j} = 0 \quad \forall i \neq j \in N$). In this case, we would expect a unique equilibrium where all participants contribute zero resources to the public good and would have earnings equal to their initial endowment.

Adding an exogenous punishment mechanism to the linear public goods environment changes the nature of equilibrium play based on the probability and severity of punishment. Suppose there is a rule r, which specifies the minimum number of points that an individual must contribute to the group account. Participants in a state of noncompliance with a rule ($x_i < r$) will be observed with probability λ and will face a fine of q points. Expected returns for the individual now become:

$$U_i = \begin{cases} \left(E_i - x_i\right) + P\sum_{i \in N} x_i, \text{if } x_i \geq r \\ \left(E_i - x_i\right) + P\sum_{i \in N} x_i - \lambda q, \text{if } x_i < r \end{cases} \tag{2}$$

The decision faced by the individual is now a threshold problem. Building on the incentives provided when $\frac{1}{N} < P < 1$, the contribution decision to maximize individual payoffs now becomes a choice between contributing zero points to the group account or setting $x_i = r$. Comparing the expected payoffs under each scenario, we find that the optimal decision rule is:

$$x_i = \begin{cases} r \text{ if } r < \dfrac{\lambda q}{1-P} \\ 0 \text{ otherwise} \end{cases} \tag{3}$$

Thus we see that optimal response to an exogenous contribution rule is determined by the MCPR as well as the probability of being caught in a state of noncompliance and the severity of the fine. With this enforcement scheme, standard theory would now predict that we may observe positive equilibrium contribution rates depending upon the parameterization of the problem (e.g. $x_i^* = r$).

4. EXPERIMENTAL DESIGN

The experiment has two treatments and uses a 2X2 design (see Table 1). The first treatment is along the dimension of participation, where players are offered the chance to submit private comments on their preferences for a minimum contribution threshold to the group account. Once comments are submitted, an individual randomly selected to be the policymaker reads the comments and chooses a minimum contribution rule (MCR). The MCR can be any whole number of points ranging from zero to the entire endowment. Having the rule be determined endogenously better reflects the formation of agri-environmental regulation in practice: e.g., individuals who comment are attempting to influence the final outcome of the regulation but have no guarantee that their comments will be taken into account. The control group are not invited to submit comments yet play the same VCM game. This means that a policymaker will still determine the MCR to the group account but with no comments.

The second treatment is applied along the enforcement dimension. An individual is faced with both a direct punishment cost such as a fine and a probability of their noncompliance being observed. Thus, when individuals are making compliance decisions they will take into account the expected cost of noncompliance rather than only the value of the punishment. The enforcement mechanism is applied at the end of every round in the experiment.

Following Sefton et al. (2007), all treatments/sessions include two stages. Stage 1 involves 5 rounds of a standard VCM game to acquaint participants with the play of the game followed by Stage 2 which includes 5 separate games (25 rounds) under the four treatment conditions.

Parameterization and Implementation

The experiment was designed using the Python-based experimental software oTree (Chen et al. 2016), and run with undergraduate students in a computer lab at Michigan State University during April 2016 and February-March 2017. Treatments were conducted in 12 sessions, with three session for each treatment. Due to the structure of the groups and the need to have five players in each group, sessions were run with either 15 or 20 subjects. At the beginning of each session, participants were randomly divided into groups of five. These subjects then played a standard VCM game (Stage 1) as practice, to familiarize themselves with the contribution mechanisms and the general layout of the software.

The rest of the experiment consisted of five individual games, each played for five rounds. At the beginning of each game, participants were randomly assigned to a role. The first role is referred to as a player, and there were four players assigned to each group. The second role is referred to as the policymaker and each group had a single policymaker. A subject's role remained the same for all five rounds of the game yet the experiment was structured so that each participant had the opportunity to be the policymaker during one of the five games. At the end of each game, participants were randomly sorted into new groups to minimize potential social effects across games.

Parameters were chosen to be largely consistent with previous public goods experiments. All players were provided with an endowment of 25 points and asked to divide those points between a group account and a private account. Players keep the full value of any points allocated to the private account. For each point allocated to the group account, each player in the group received 0.4 points. This means that each point placed in the group account returns 1.6 points to the group as a whole at the end of a round. Thus, the MPCR is 0.4 points and structures incentives consistently with a pure public goods problem.

In stakeholder comment treatments, all players were asked to provide any comments they wish to provide about their preferences over a MCR to the group account. In this context, the MCR is the minimum number of points that the policymaker believes each player should allocate to the group account during each round. After all players submitted their comments about the MCR, these comments were provided to the group's policymaker anonymously and in a random order. The policymaker read the comments and chose a MCR for the group that could range from 0 to 25 points. The policymaker and subsequent MCR were the same for all five rounds of each game. For completing the task of reading the comments and choosing a MCR, the policymaker was paid a salary of 25 points per round. In no comment treatments, the policymaker in each group chose a MCR without receiving any comment from players. Once the MCR was chosen, the rule was communicated to players who proceeded with the linear public goods game. It's important to note here that the policymaker is playing the role of bureaucrat, and has not been endowed with any preferences over the public good. Their salary remains the same no matter what level they choose for the MCR.

In enforcement treatments, the same process is followed with the exception that all subject are informed in the instructions about the existence of an exogenous punishment mechanism. In this experiment we set the probability of being punished at 50% and the fine equal to the initial endowment, 25 points. The sanctioning mechanism was chosen to be consistent with previous work on exogenous punishment mechanisms and was shown to be the most efficient probabilistic punishment mechanism in a variation on the linear public goods game by Qin and Wang (2013). At the end of each round, the software identifies each individual who has contributed less than the MCR to the group account, and determines whether or not they are sanctioned according to the parameters described above.

At the end of each round, the players received the following feedback:

- the number of tokens they contributed to their private and group account
- the MCR chosen by the policymaker
- the anonymous contributions of other group members to the group account
- whether or not the individual was sanctioned, and the level of the sanction
- total earnings from the previous round

After each 5 period game, participants were randomized into new roles and groups as described above and the process is repeated. Participant earnings were recorded at the end of every round and at the end of the experiment, point earnings were totaled across all 5 games and converted to dollars at a rate of $0.03 per point. At the end of the experiment, subjects were presented with a performance summary describing their earnings in each game and their total earnings for participation. Upon completion of the experiment, participants also completed a short demographic survey (results by treatment are summarized in Table 6).

4. RESULTS

Each of the 215 participants in this experiment had the opportunity to play the role of policymaker during one game. This results in a dataset of 215 policymaker decisions when pooled across the four treatment categories. Table 2 presents averages by treatment for the key of interest in this analysis. P-values from pairwise mean comparisons across treatments are contained in Table 3.[1]

The presence of the stakeholder comment mechanism raises the chosen minimum contribution rule above both the control group and the enforcement only treatment. We observe that on average, policymakers exposed to player comments choose a MCR around 20 points (80% of the initial endowment) as opposed to 13 points in the control group (52% of the endowment) and 17 points (68% of the endowment) in the enforcement only treatment. Comparing these means, the effects of the comment treatment are significantly larger than those of enforcement alone, however the comment treatment is indistinguishable from the comment with enforcement treatment. This suggests that the presence of comments provides a stable coordination mechanism to which policymakers are particularly responsive. Additionally, it's interesting to see that there appears to be no additive effect of comments combined with complementary enforcement mechanisms. For a more detailed analysis of the effects of each treatment category, we will turn to regression analysis.

In this experiment, each policymaker can choose any MCR between zero and 25 points. To account for the bounded nature of the MCR decision, we use a Tobit model where the dependent variable is the level of the MCR chosen by the policymaker. Independent variables include indicator variables for each treatment where the control group (no comment no enforcement) serves as the reference category and game dummy variables. To check whether participant experience in previous games (this experiment has 5 games) has an effect on policymaker behavior, we include two measures to capture play in the game prior to when a subject fulfills the role of policymaker. First we include the previous average contribution to the group account as a regressor to capture how cooperative individuals were in the last game. We would expect that a policymaker exposed to more cooperative individuals would be more likely to choose a higher MCR, ceteris paribus. Second, we include a measure of the MCR chosen in the previous game, to determine if this might be serving as an anchor for the regulator in the current game.

Coefficients from the Tobit specifications are presented in Table 4. In the rest of this analysis we will focus on the average partial effects (APEs) presented in Table 5 for ease of interpretation. Across all model specifications, we find strong evidence that exposure to stakeholder comments increase the level of the MCR chosen by the policymaker. These increases move the rule closer to the Pareto optimal contribution rule of 25 points and away from the standard free-riding equilibrium of zero contributions. Focusing on the estimates in model (2),

[1] These results are similar when compared via nonparametric Mann-Whitney U tests.

we find that, on average, the comment treatment increases the chosen MCR by 11.50 points or 46% of the endowment and the comment with enforcement treatment by 10.74 points. Meanwhile the enforcement only treatment raises the MCR by 4.35 points on average. Additionally, we find that while all treatments are significantly larger than the control group, the comment treatment and the comment with enforcement treatment are statistically indistinguishable from one another. This suggests that the effects of comment are similar across institutional structures and outweigh any independent effect of the enforcement regime.

Model (4) presents APEs after accounting for participant experience in their previous game and group combinations. While the impacts of treatment remain unchanged, we observe no significant effect of either player average contributions or the MCR chosen in the last game. This increases our confidence in the randomization scheme and the idea that games can be treated as independent observations across time. There is however a significant game effect, where policymakers appear to choose higher rules if they are given the task in a later game.

5. DISCUSSION & POLICY IMPLICATIONS

Agri-environmental programs often incorporate stakeholder participation elements in an effort to increase community ownership of policies designed to protect environmental resources (Hajer 1995; Fischer 2000). Using these mechanisms, interest groups attempt to influence agency rulemakers and secure final rules and policies more closely aligned with their own ideal positions (Yackee 2006). We find significant evidence that the implemented type of stakeholder comment participation increases the level of contributions regulators choose to impose on other participants in the game. These results hold across multiple model specifications, and we find no additional effects of complementary institutions such as enforcement on regulator behavior.

This research faces several important limitations on our broader conclusions that deserve highlighting. First, as a lab experiment, external validity of the findings is a weakness of the method in general. While our findings hold in the rigid and controlled environment in the lab, there is no guarantee they would hold in the presence of competing institutions or individual heterogeneity. Second, our use of undergraduate students as participants in the experimental protocol is potentially problematic to the extent that undergraduate students are not representative of the broader population of participants in agri-environmental regulatory schemes. While valid, we would argue that this concern is lessened by the fact that current participation mechanisms in the U.S. would certainly allow undergraduate students to submit comments. A third concern worth highlighting is the salience of the rewards in this experiment. Each point earned was worth $0.03 to the subject. These earnings may not be enough to approximate real-world behavior. In many cases, agri-environmental regulations dealing with the provision of public goods may require costly investments in new operating strategies or new technologies that allow firms or individuals to meet regulatory standards. Regulation in the face of requiring large capital investments could be very different than behavior in this experimental setting.

Shedding new light on the relationship between public comments and regulatory is important for several reasons. First, what role is there for government agencies to carefully design public comment efforts? Our results suggest that these comments have a large impact on regulator behavior, but this is in the context of a homogenous group of participants. A diverse body of participants may be required to achieve optimal regulatory outcomes and prevent regulatory capture. Second, this research calls into question arguments that the quality of comments determines their level of influence. Many of the comments submitted in this

experiment were minimal, often just suggesting a preferred MCR, yet we still observe a large effect suggesting that regulators may respond to key pieces of information in even unsophisticated submissions. Finally, this work comes at a critical time for agriculture and supports producers by fostering more transparent and inclusive regulatory institutions. This work will generate discussion about the value of potential mechanisms to ensure that all stakeholders have a chance to provide input to regulators, increasing the democratic nature of the policymaking process.

REFERENCES:

Becker, G. (1968). Crime and Punishment: An Economic Approach. *Journal of Political Economy*, *76*(2), 169-217.

Chen, D., Schonger, M., & Wickens, C. (2016). oTree – An open source platform for laboratory, online, and field experiments. *Journal of Behavioral and Experimental Finance*, 9(1), 88-97.

Claassen, R. 2012. "The Future of Environmental Compliance Incentives in U.S. Agriculture: The Role of Commodity, Conservation, and Crop Insurance Programs", EIB-94, U.S. Department of Agriculture, Economic Research Service, March.

Cropper, M.L., Evans, W.N., Berardi, S.J., Ducla-Soares, M.M. and Portney, P.R., 1992. The determinants of pesticide regulation: A statistical analysis of EPA decision making. *Journal of Political Economy*, *100*(1), pp.175-197.

Croson, R.T., (2007). "Theories of commitment, altruism and reciprocity: Evidence from linear public goods games." *Economic Inquiry*, *45*(2), pp.199-216.

Crow, D. A., Albright, E.A. and Koebele E. 2016. "Public Information and Regulatory Processes: What the Public Knows and Regulators Decide." *Review of Policy Research* 33(1): 90-109.

Cuellar, M. F. 2005. "Rethinking regulatory democracy." *Administrative Law Review*, 75, 412–499

Dannenberg, A., Lange, A., & Sturm, B. 2014. "Participation and commitment in voluntary coalitions to provide public goods." *Economica*, *81*(322), 257-275.

Fischer, F. (2000). Citizens, experts, and the environment: The politics of local knowledge. Durham, NC: Duke University Press.

Gallier, C., Kesternich, M., & Sturm, B. (2014). Voting for burden sharing rules in public goods games. *ZEW-Centre for European Economic Research Discussion Paper*, (14-056).

Hajer, M. A. (1995). The politics of environmental discourse: Ecological modernization and the policy process. Oxford, England: Clarendon Press.

Irvin, R.A. and Stansbury, J., 2004. Citizen participation in decision making: Is it worth the effort?. *Public administration review*, *64*(1), pp.55-65.

Kamei, K., Putterman, L., & Tyran, J. R. (2015). State or nature? Endogenous formal versus informal sanctions in the voluntary provision of public goods. *Experimental Economics*, *18*(1), 38-65.

Kroll, S., Cherry, T. L., & Shogren, J. F. (2007). Voting, punishment, and public goods. *Economic Inquiry*, *45*(3), 557-570.

Langbein, L., & Kerwin, C. M. (1985). Implementation, Negotiation, and Compliance in Environmental and Safety Regulation. *Journal of Politics*, *47*, 854-880.

Magat, W., Krupnick, A.J. and Harrington, W., 2013. *Rules in the making: A statistical analysis of regulatory agency behavior*. Routledge.

Polinsky, A. Mitchell, and Steven Shavell. (2000). "The Economic Theory of Public Enforcement of Law." *Journal of Economic Literature*, 38(1): 45-76.

Qin, X. and Wang, S., 2013. Using an exogenous mechanism to examine efficient probabilistic punishment. *Journal of Economic Psychology*, *39*, pp.1-10.

Sefton, M., Shupp, R., & Walker, J. M. (2007). The effect of rewards and sanctions in provision of public goods. *Economic Inquiry*, *45*(4), 671-690.

Shapiro, S. and Borie-Holtz, D. 2013. The Politics of Regulatory Reform. New York, NY: Routledge

Tyler, T. R. (1990). *Why people obey the law*. New Haven, CT: Yale University Press.

Tyran, J. R., & Feld, L. P. (2006). Achieving Compliance when Legal Sanctions are Non-deterrent*. *The Scandinavian Journal of Economics*, *108*(1), 135-156.

West, W.F., 1995. *Controlling the bureaucracy: Institutional constraints in theory and practice*. ME Sharpe.

Yackee, S.W., 2006. Sweet-talking the fourth branch: The influence of interest group comments on federal agency rulemaking. *Journal of Public Administration Research and Theory*, *16*(1), pp.103-124.

TABLES:

TABLE 1: EXPERIMENTAL TREATMENTS

Participation Treatment	Enforcement Treatment	
	No Enforcement	Enforcement
No Participation	55 Participants	50 Participants
Stakeholder Comment	55 Participants	55 Participants

TABLE 2: AVERAGES BY TREATMENT FOR MINIMUM CONTRIBUTION RULE

	Control	Comment Only	Enforcement Only	Comment with Enforcement
Minimum Contribution Rule	13.25	20.95	17.34	20.67
	(7.355)	(6.389)	(6.068)	(6.299)
Standard deviation in parentheses.				

TABLE 3: HYPOTHESIS TESTING BETWEEN TREATMENT AVERAGES FOR MINIMUM CONTRIBUTION RULE

	MCR
Null Hypothesis	
Control = Comment	0.000
Control = Enforcement	0.000
Control = Comment with Enforcement	0.000
Comment = Enforcement	0.000
Comment = Comment with Enforcement	0.314
Enforcement = Comment with Enforcement	0.000
P-values reported from two-sided test of differences in means.	

TABLE 4: TOBIT COEFFICIENT ESTIMATES OF TREATMENT ON THE MINIMUM CONTRIBUTION RULE

	(1)	(3)	(5)	(7)
Comment Only	11.856***	11.843***	11.221***	11.905***
	(2.121)	(2.027)	(2.379)	(2.238)
Comment & Enforcement	11.021***	11.082***	9.788***	10.394***
	(2.046)	(1.939)	(2.598)	(2.469)
Enforcement Only	4.630***	4.592***	3.669*	3.907**
	(1.720)	(1.654)	(2.010)	(1.920)
Game 2		0.600		
		(1.952)		
Game 3		5.319**		4.565**
		(2.260)		(2.026)
Game 4		5.579**		5.115**
		(2.192)		(2.008)
Game 5		6.082**		5.575**
		(2.391)		(2.287)
Previous Game Average Player Contribution			0.144	0.164
			(0.173)	(0.171)
Previous Game Contribution Rule			0.024	-0.067
			(0.125)	(0.127)
Constant	13.909***	10.383***	12.794***	9.907***
	(1.288)	(1.930)	(2.214)	(2.138)
Observations	215	215	172	172

Standard errors in parentheses and clustered at the group level.
*** p<0.01, ** p<0.05, * p<0.1

TABLE 5: TOBIT AVERAGE PARTIAL EFFECTS OF TREATMENT ON THE MINIMUM CONTRIBUTION RULE

	(1)	(2)	(3)	(4)
Comment Only	11.504***	11.495***	10.994***	11.655***
	(2.069)	(1.983)	(2.339)	(2.202)
Comment & Enforcement	10.674***	10.738***	9.566***	10.149***
	(1.983)	(1.884)	(2.535)	(2.407)
Enforcement Only	4.385***	4.350***	3.525*	3.744**
	(1.623)	(1.563)	(1.927)	(1.837)
Game 2		0.569		
		(1.850)		
Game 3		5.141**		4.420**
		(2.191)		(1.978)
Game 4		5.396**		4.960**
		(2.117)		(1.949)
Game 5		5.891**		5.414**
		(2.329)		(2.240)
Previous Game Average Player Contribution			0.141	0.160
			(0.168)	(0.167)
Previous Game Contribution Rule			0.024	-0.065
			(0.122)	(0.124)
Observations	215	215	172	172
Hypotheses	**p-value**			
H0: Comment = Comment & Enforcement	0.731	0.747	0.633	0.606
H0: Comment = Enforcement	0.001	0.000	0.003	0.001
H0: Comment & Enforcement = Enforcement	0.001	0.001	0.008	0.004

Standard errors in parentheses and clustered at the group level.
*** p<0.01, ** p<0.05, * p<0.1

TABLE 6: AVERAGE VALUES BY TREATMENT FOR DEMOGRAPHIC SURVEY VARIABLES

	Control	Comment Only	Enforcement Only	Comment with Enforcement	Total
Age	20.15	21.04	20.14	20.38	20.43
	(1.711)	(3.418)	(1.539)	(1.556)	(2.247)
Male = 1	0.382	0.582	0.429	0.545	0.486
	(0.486)	(0.493)	(0.495)	(0.498)	(0.500)
Michigan Resident	0.709	0.836	0.776	0.782	0.776
	(0.454)	(0.370)	(0.417)	(0.413)	(0.417)
Years at MSU	2.564	2.873	2.592	2.673	2.678
	(1.125)	(1.028)	(1.160)	(1.130)	(1.117)
Number of Econ Courses	1.218	1.091	1.163	1.127	1.150
	(1.261)	(1.529)	(1.778)	(1.653)	(1.561)
Any Ag Experience?	0.145	0.109	0.0816	0.145	0.121
	(0.353)	(0.312)	(0.274)	(0.353)	(0.327)

Standard deviation in parentheses.