FIELD OF FOCUS 4
SELF-REGULATION AND REGULATION
INDIVIDUALS AND ORGANISATIONS

UNIVERSITÄT
HEIDELBERG
ZUKUNFT
SEIT 1386

Journal of Self-Regulation and Regulation
Volume 03 (2017)

Can CSR-based Self-regulation be a Substitute for Legal Regulation? Conclusions from Public Goods Experiments

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Abstract:

This article discusses various arguments, which question the effectiveness of self-regulation as an instrument to implement societally preferred environmental and social standards**.** Special focus is set on experimental results. These results indicate that it is not plausible that effective self-regulation in areas such as environmental protection or social standards is actually feasible under market conditions. The experimental evidence is much more in favor with the traditional approach that environmental or social standards should be implemented by general laws under the surveillance of an executive state body**.**

Keywords:

Self-regulation; Corporate Social Responsibility; Experimental Economics; Economic Policy; External Effects

DOI:10.11588/josar.2017.3.40134

Can CSR-based Self-regulation be a Substitute for Legal Regulation? Conclusions from Public Goods Experiments

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1 Introduction

The idea that private companies should engage in self-regulation in such areas as environmental protection or social standards gains growing support. Governments and government-appointed bodies have developed codes of conduct such as the "UN Global Compact" (UN Global Compact (2015)) or the "German Sustainability Codex" (Deutscher Nachhaltigkeitskodex (2015)), which demand private firms to engage actively in environmental and social policy targets beyond legal requirements. Company associations like the "International Chamber of Commerce" support these codes of conduct publicly.

This paper examines whether self-regulation can be a substitute for legal regulation in the field of environmental protection or social standards. A special focus is set on results from behavioral experiments. To clear the terminology, the following distinctions are useful:

(1) It is often possible for a private company to improve, e.g., its resource efficiency, such that company profits grow. At the same time, such measures can be presented to the public as voluntary environment-friendly self-regulation.

(2) Under a market structure of monopolistic product differentiation, a private company can often commit itself to environmental protection standards or social minimum standards such that a special customer group is willing to pay an additional mark-up over costs and the company profits grow.

(3) In the case of negative external effects caused by the production of a private company, social welfare improving measures, e.g., a reduction of greenhouse gas emissions, are possible at the expense of company profits.

Cases (1) and (2) will not be called "voluntary self-regulation" in the following. They are examples of normal profit-maximizing behavior of private companies. Since Adam Smith's famous statement about the functioning of the "invisible hand"[2], it is a basic insight of welfare economics that markets can provide an institutional framework that

1 JEL-Classification: H4, K2, L2, L21, L51, C92.
Acknowledgement: I gratefully acknowledge valuable and stimulating comments on an earlier draft by two anonymous reviewers.

2 „It is not from the benevolence of the butcher, the brewer, or the baker that we expect our dinner, but from their regard to their own self-interest. We address ourselves not to their humanity but to their self-love, and never talk to them of our own necessities, but of their advantages" (Smith 1776: Bk.1, Ch. 2, [2])).

aligns private self-interest with the public interest. Therefore, many profit-maximizing activities of a company are also in the public interest. According to McWilliams et al. (2006), such activities may be called "strategic CSR". In the following, "self-regulation" is used to designate company activities as described by case (3), i.e. measures, which increase the public welfare but reduce the profit of a single firm. They are classified as "real CSR" by McWilliams/Siegel et al. 2006.

2 Is Self-regulation under Market Conditions Possible?

A couple of arguments can be stated against the possibility of effective self-regulation under market conditions:

(1) Under the behavioral assumptions of the neoclassical theory, all economic agents are rationally behaving maximizers of their individual utility. From the latter part of the assumption ("maximization of individual utility"), it follows that the owner of private companies will not engage in voluntary self-regulation, if it reduces the profit of their company. From the first part of the assumption ("rationality"), it follows that in game theoretic contexts, where players make decisions independently, they will always play strategies, which will lead to a Nash equilibrium. In this type of equilibrium, no player can benefit by changing the strategy, when all other players keep their strategies unchanged.

This has important consequences for the market behavior of private companies: In competitive markets with more than one supplying company, companies will *not* tacitly cooperate and reduce supply quantities to form a cartel and share the maximum possible monopoly profit. Even though such behavior would ensure the maximum average profit for all companies, every single company could increase its individual profit in such a situation by being uncooperative and increasing its supply quantities. Therefore, the formation of a collusive cartel would not be a stable equilibrium. Since all companies are aware of this scenario, they will choose a strategy based on a reaction function, which maximizes their profit for arbitrary supplies of the other companies. The intersection point of the reaction functions of all companies represents the stable Nash equilibrium. In this Nash equilibrium, the individual profits are smaller than the shared monopoly profit and converge to the profit level under perfect competition as the number of players grows.[3] This formal result is the theoretical backbone of standard competition policies, which try to maintain a high number of competitors in a market.

Intuitively spoken, a market with more than one company represents a "prisoner's dilemma" from the perspective of single companies. Cooperation could help to increase individual profits, but is not chosen as a strategy, because every company

3 For a textbook exposition see (Tirole 1988: Chapter 5).

knows that other companies would then have a strong incentive to defect. Consequently, under the behavioral assumptions of neoclassical theory, private companies will not cooperate on markets, even if cooperative behavior can help to increase their profits.[4] They will therefore also not cooperate on markets, if cooperative behavior in form of voluntary self-regulation can help to increase the public welfare. Even if the costs of cooperation, necessary to increase public welfare, can be completely shifted to the customers such that they do not decrease individual company profits, every company will still have an incentive to defect. This is the case, because defection saves the costs of the self-regulation measures and increases thereby profits of the defector. In other words, under the assumptions of the neoclassical theory, cooperation to establish self-regulation between firms on competitive markets suffers from the same incentive problems as cooperation between firms to establish a cartel. As a result, it would be inconsistent with any governmental competition policy, which relies on neoclassical market theory, to assume that voluntary self-regulation is possible under such circumstances.

However, the behavioral assumptions of the neoclassical theory have come under criticism. Behavioral experiments show that real humans are more cooperative than postulated by the neoclassical theory. Do these results speak in favor of the possibility of voluntary self-regulation? Section 3 will discuss this question in detail. However, even if this question can be affirmed, a couple of other arguments against the possibility of self-regulation under market conditions will remain, as the following survey shows.

(2) A further problem of self-regulation, targeted to reduce external effects, is caused by the informational requirements. The social costs of external effects are typically no publicly available information. They are not given by market data. Therefore, the damage caused by negative externalities, e.g. the emission of greenhouse gasses, has to be estimated. These kinds of estimations lead to a multitude of evaluation problems.[5] In the last instance, these have to be solved based on societal compromises. In constitutional democracies these kinds of tasks are assigned to parliaments. It is not very likely for private companies to properly predict the results of such complex decision processes.

(3) However, even if problem (2) was solved and a private company had all the information necessary and was willing to accept the lower profits from an engagement in

4 Laboratorial tests of Cournot oligopoly theory (quantity setting behavior) find a tendency towards the Nash equilibrium for repeated games, if conditions are sufficiently symmetrical for all players (e.g. Cox/Walker 1998; Huck/Normann et al. 1999 and Davis 2011). For the case of Bertrand oligopoly theory (price setting behavior) laboratorial tests typically find price cycles, where prices are first set in a collusive way, then move towards the Nash equilibrium and finally return to collusion again (e.g. Bruttel 2009 and Leufkens/Peeters 2011). The standard explanation for these differences is that quantities are strategic substitutes while prices are strategic complements, what eases collusion in the case of price setting behavior.

5 For a survey see Buchholz/Heindl 2015.

voluntary self-regulation without cooperation by other companies, it would be questionable whether such a policy was sustainable under market conditions: Postulating neoclassical financial market theory, a stock company practicing this kind of self-regulation would experience a reduction in its stock price below the stock price under perfect profit maximization. On a continuing base, this would provoke a hostile take-over, which would lead to an exchange of the "self-regulation management" by a profit maximizing management. Of course, it is possible to question the degree of empirical corroboration of neoclassical financial market theory in general. There is however, strong empirical evidence that there are such take-over mechanisms in reality.[6]

(4) A further problem appears regardless of the way a company is financed: If a company's management is no longer committed to the profit interests of its owners, but must also pursue alternative targets ("multi-stakeholder approach"), it can evade any control. Theoretically, it is certainly possible to maximize an objective function that contains not only a profit target but also environmental or social policy targets if the corresponding weights for these targets are well-defined. In practice, however, it is not clear, who would be able to ensure the adherence to such a target function by the management. The standard principal-agent problem between owners and the management is exacerbated: With reference to its environmental and social obligations, the management can escape the control of the owners and with reference to its profit target it can escape the control of the "stakeholders". Thus, the management becomes a servant of "multiple masters", who can be played off against each other. In practice, the objective function is then no longer well-defined and a leeway for corporate corruption results (Jensen 2001). Empirical experience confirms the importance of this problem[7].

To sum up, a couple of arguments cast doubt on the possibility of self-regulation under market conditions. But all these arguments are ultimately based on empirical value judgments concerning the degree of empirical corroboration of theories. The next section will focus on empirical tests of the behavioral assumptions of the neoclassical theory.[8]

6 While in the 80s and 90s, corporate raider like Carl Icahn or the equity funds of investment banks like Drexel Burnham Lambert dominated the scene, by the end of the 90's so called "activist investor funds" came up. Typically these funds do not take over inefficient enterprises, but set the management under pressure, very often with passive support of "Index Funds" (The Economist 2014). In the year 2014, e.g. three well-known American companies (HP Inc., eBay Inc. and Symantec) were forced by "activist investor funds" to sell large parts of their business.

7 Cf. Karmann 2016; Engels/Behringer 2015; Hetzer 2008.

8 Levitt/List 2007 doubt, whether laboratory experimental results can be applied to real world contexts. As they point out, in reality usually much more factors influence human behavior as in laboratory experiments. This can hardly be denied, because controlled laboratory experiments deliberately restrict the number of influencing factors. Therefore, any application of experimental results to real world contexts must consider this. However, contrary to Levitt and List (2007: 153–154), this problem emerges also if the results of laboratory experiments of natural sciences (e.g. physics or biology) have to be applied to real world contexts (e.g. weather or ecosystems). The consideration of the differences

3 Results of Behavioral Experiments

3.1 Self-regulation as a Public Goods Game

The behavioral assumptions of the neoclassical theory have come under criticism. Experiments show that real humans do often not behave as implied by the homo economicus hypothesis (HEH). For instance, experiments based on the "ultimatum game" show that humans across different cultures are significantly more cooperative as the HEH implies (Henrich/Boyd et al. 2005). Given this higher ability to cooperate it seems possible that private companies might successfully cooperate in self-regulation. As already mentioned, the voluntary organization of self-regulation by private companies under market conditions has the structure of a "Prisoner's dilemma", which is typically called "Public Goods Game" (PGG) in the context of behavioral experiments with more than two players. If all companies cooperate to achieve a specific self-regulation target, they may reach this target without any reduction in their monetary profits, e.g. when they succeed to levy the costs of self-regulation from their customers. If the realization of the self-regulation target provides the owners an additional non-monetary benefit ("feeling good, because a specific social or environmental standard is reached"), it is possible that their total profit (monetary plus non-monetary profit) is then higher than in the case without self-regulation. The consequences of the alternative assumption will be discussed in section 3.2. However, if all companies cooperate, it is likely that each single company has an incentive to act as a free-rider, save the costs of cooperation and increase total profits above the profit level with cooperation.[9] If every company yields to this temptation, then cooperation will not take place and the self-regulation target cannot be reached. The outcome will, thus, be a non-cooperative Nash equilibrium. The question is, what kind of behavior results, if real humans make the decisions?

The PGG is one of the most frequently tested behavioral games. The results are unambiguous: When the game is played as a one-shot game, human behavior is more cooperative than predicted by Nash equilibrium. However, when the game is repeated more often, cooperation erodes as the number of repetitions grows (Figure 1), such that the contributions of single players for the public good converge towards zero (Ledyard (1995)).[10] In order to stabilize cooperative behavior in a PGG, an institutional framework is necessary that allows for the punishment of free-riders.[11] As the following survey shows, the performance of various possible frameworks can be quite different.

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between experimental conditions and real world conditions is typically the domain of applied sciences (e.g. meteorology, agronomy or engineering).

9 If the costs of cooperation are sufficiently high compared to the non-monetary profit from cooperation.

10 If costs and benefits in a PGG are unsymmetrically distributed, the willingness to cooperate is reduced further (McGinty/Milam 2013).

11 From an evolutionary point of view, this result might at first side be astonishing: Cooperation in a PGG results in a higher return for all players in the long-run. A population of species with a higher return should therefore possess a higher reproductive fitness and, therefore, a higher selective advantage.

3.1.1 Individual Sanctioning of Free-riders

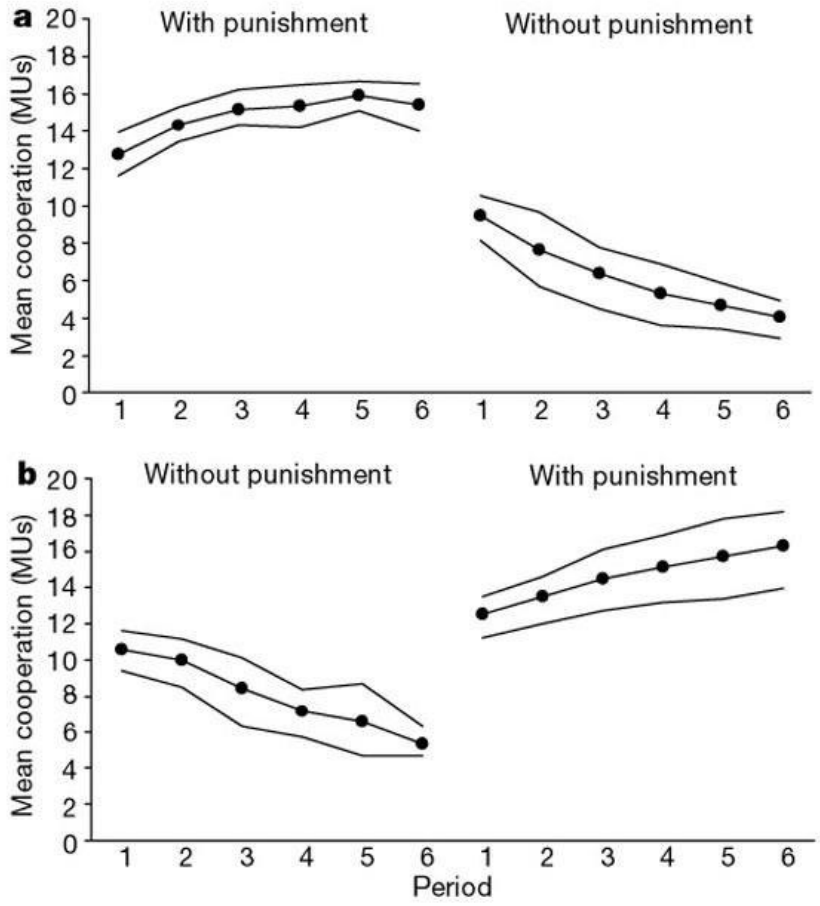
One possible form of sanctioning free-riders is discretionary punishment by other players (peer punishment). To make this possible, every one-shot game is followed by an opportunity to punish. Every player is informed about the behavior of the other players in the one-shot game before. Then every player can punish any other player by paying a certain amount of money, which is multiplied by a leverage factor and subtracted from the return of the other player in the preceding one-shot game. Figure 1 reports the cooperative behavior in a PGG experiment with peer punishment and without punishment by Fehr/Gächter 2002. This study, as well as other studies (Henrich/McElreath et al. 2006; Gürek/Irlenbusch et al 2006 and Rockenbach/Milinski 2006), clearly show that subjects are typically willing to punish free-riders on a peer-to-peer base in a repeated PGG, even if this reduces their own returns. Since punishment helps to stabilize cooperative behavior in a PGG, punishment itself provides a "2nd order public good". Individuals, who cooperate in the PGG but refrain from punishing defectors in a PGG are therefore "2nd order free-riders".

It is, however, not clear whether subjects, who practice peer punishment, actually want to punish "unfair" behavior and thereby provide a 2nd order public good that stabilizes cooperative behavior. Dawes/Fowler et al. (2007) presented an experiment, where the PGG was replaced by a lottery. The subjects received randomly assigned sums, which created a similar pattern of inequality as the returns of the PGG in Feh/Gächter 2002. In the second stage, the subjects had the same possibility to impose costly peer punishment as in Fehr/Gächter 2002. Even though they were fully aware that players with a high return from the lottery had done nothing wrong in a moral sense, they severely punished the top winners of the lottery. The result was statistically indistinguishable from the reduction of returns of defectors in Fehr/Gächter 2002. This indicates that peer punishment may not be caused by negative emotions against non-cooperative behavior or a willingness to stabilize cooperative behavior, but simply by envy. A study by Kiyonari/Barclay 2008, also indicates that subjects did not "approve of punishers more than they did non-punishers, even when non-punishers were clearly unwilling to use sanctions to support cooperation."[12]

However such a population of cooperative players could easily be invaded and exploited by individual players who are not cooperative (defectors). It is, therefore, not clear, as to which strategy maximizes evolutionary fitness in a PGG (Nowak 2006: 48–59).

12 In this study, the subjects passed in a 1st stage a PGG. Then in a 2nd stage, they had the possibility to sanction and/or reward the other subjects. In a 3rd stage, they had again the possibility to sanction and/or reward the other subjects.

Figure 1: Cooperation in a Public Goods Game with and without punishment

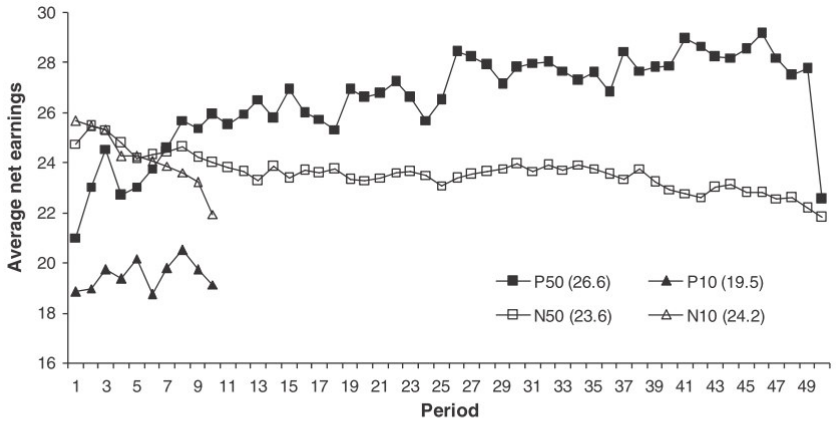


Source: Fehr/Gächter (2002): 137–140.

Another problem with peer punishment is the observation in an experiment of Dreber/Rand et al. 2008 that "people who gain the highest total payoff tend not to use costly punishment." Winners systematically do not punish defectors. Nevertheless, as Dreber/Rand et al. 2008 showed, the punishment behavior of other players is sufficient to increase cooperation in a repeated PGG – but not the average payoff of all players. An experiment of Gächter/Renner et al. 2008 shows that peer punishment can, however, pay in the long-run, when the players are members of relatively small and stable groups (Figure 2).

A further problem that might emerge with peer punishment is "antisocial punishment", which is defined as a punishment of players that contributed more in a PGG than the punisher. Herrmann/Thöni et al. 2008 found "widespread existence of antisocial punishment" but "huge cross-societal variation" in an experiment across 16 countries with different sociopolitical systems: "In some participant pools, antisocial punishment was strong enough to remove the cooperation-enhancing effect of punishment". Interestingly, the degree of antisocial punishment was negatively correlated with indicators for "civic cooperation" and the "rule of law" of these countries.

Figure 2: Average Net Earnings in Public Good Games with and without Punishment



Average net earnings in public goods experiments with punishment opportunities (P experiments) and with no punishment opportunities (N experiments). The experiments lasted either 10 periods (P10 and N10) or 50 periods (P50 and N50). The numbers in parentheses are the average earnings across all periods (N10 and N50, earnings from the public goods contribution stage; P10 and P50, earnings from the public goods contribution stage minus punishment expenditures minus received punishment).

Source: Gächter/Renner et al. (2008): 1510.

In other PGG experiments, systematic retaliatory peer punishment has been observed. In standard PGG experiments, every one-shoot PGG is followed by one punishment round only. However, in many real-world cooperation problems, there are often opportunities to repunish punishers. In a study by Nikiforakis 2008, every PGG was therefore followed by two punishment rounds to allow for retaliatory punishment. The results showed that the "the threat of revenge weakens cooperators' willingness to punish free-riders and leads to a breakdown of cooperation." However, by allowing for five instead of only one round of repunishment, Fehl/Sommerfeld et al. 2012 found that the possibility "for further escalations in terms of vendettas can maintain cooperation".[13]

All these results show the sensitivity of cooperation based on peer punishment from situational circumstances. This leads to the question, whether there are more robust mechanisms to sustain cooperation in a PGG than peer punishment.

An obvious alternative to punishment is a reward. If the players in a multi-period PGG have the possibility to reward other players after every PGG round, this can also help to stabilize cooperation as shown by Sefton/Shupp et al. 2007. However, "in the reward treatment, contributions subsequently decrease to a level below that observed in the absence of opportunities to reward. Thus, the opportunity to reward by itself is insufficient to sustain contributions. In contrast, we find that sanctioning sustains public goods provision at a level above that observed in the absence of sanctioning opportunities, and so sanctioning appears to be a more effective mechanism for sustaining contributions." One disadvantage of rewards compared to punishment is that rewards have to be paid for every case of cooperative behavior, while punishment has to be applied

13 This result is supported by experiments of Denant-Boemont/Masclet et al. 2007 and Nikiforakis/Engelmann 2011.

only in the case of non-cooperative behavior. Consequently, in the case of success, the costs of punishment fall while the costs of rewards grow. Sefton/Shupp et al. 2007 found that a combination of punishment and reward possibilities can be a complementary institutional mix: “Our treatment allowing both sanctions and rewards suggests a synergistic relationship between the two. While initially subjects use rewards more frequently than sanctions, over time the use of rewards declines at a faster rate than the use of sanctions, so that in later rounds, rewards are used less frequently than sanctions.” This result is also supported by other studies (Milinski/Rockenbach 2006; Sutter/Haigner et al. 2010). Taken together, these findings do not indicate that rewards itself can be a more robust institutional framework as punishment.

A further alternative to punishment is “reputation building”, also called “indirect reciprocity”. Indirect reciprocity can appear in many real-world contexts. It is, therefore, interesting to study the applicability of indirect reciprocity as a means to stabilize cooperation. To do so, a design is typically used where PGG rounds are combined with a so called “indirect reciprocity game” (IRG), where every player acts as a receiver and a sender. The sender is informed about the behavior of the receiver in the PGGs and IRGs beforehand and decides how much of an amount of money given to her, is sent to the receiver. The amount of money sent is typically tripled. If the sender sends nothing, she keeps the amount given to her and the receiver receives nothing.

As the experiment of Krambeck/Milinski et al. 2002 showed, such an alternation of PGGs and IRGs can, stabilize cooperation in the PGGs. As soon as subjects do not expect that a PGG is followed by an IRG, cooperation erodes. This indicates causality from IRG rounds to cooperation in PGG rounds. Interestingly, in an experimental design by Milinski/Rockenbach 2006, where “each player can choose between joining a group in which the public goods game is followed by both costly punishing (…) and an indirect reciprocity (…) game, and a group in which the public goods game is followed solely by an indirect reciprocity game,” “subjects even prefer a combination of reputation building with costly punishment.” This “interaction between punishment and reputation building boosts cooperative efficiency” in the experiment. The authors conclude that costly punishment does not “become extinct in environments in which effective reputation building provides a cheaper and powerful way to sustain cooperation.” People prefer institutional setups, where both mechanisms can be combined. They prefer not to rely on reputation building alone.

3.1.2 Institutions to Sanction of Free-riders

The problems of individual sanctioning of free-riders like 2nd order free riding, antisocial punishment, and retaliatory punishment arise from the fact that single players sanction other players on the basis of discretionary decisions. It is, therefore, interesting to ana-

lyze how subjects decide, who have the possibility to choose between individual sanctioning ("peer punishment") and sanctioning by a publicly financed rule-based institution ("pool punishment").

The experiment of Milinski/Traulsen et al. 2012 offered players the possibility to choose between both forms of punishment. To do so, the subjects first played a couple of rounds, where they have the opportunity to gain experience with both forms of punishment. Then they played 25 rounds with the possibility to choose between pool and peer punishment. To analyze the influence of 2nd order punishment, i.e., the possibility to punish 2nd order free-riders, on this decision, the first 10 rounds are played without 2nd order punishment, and then the possibility of 2nd order punishment is introduced.

The results showed that pool punishment is clearly preferred to peer punishment, if the possibility of 2nd order punishment exists. If players who cooperate in the PGG but do not punish defectors in the PGG can be punished for this kind of 2nd order free riding, they prefer to opt to pay for a "police-like" institution, which executes "pool punishment". This institution punishes all defectors in the PGG with a fine, which is the higher, the more players have chosen pool punishment and support the institution with a "tax-like" payment. It is interesting to note that this transition to pool punishment happens, although it reduces the efficiency of the results: Since peer punishment typically disciplines 1st order free-riders after a couple of rounds only, the average amount of money that has to be spent for peer punishment falls quite fast. The tax for pool punishment however, has to be paid in every round, irrespective of whether a punishment is necessary or not. Therefore, rule-based peer punishment is more expensive for every player as discretionary peer punishment. The fact that pool punishment is nevertheless preferred by most players, indicates the existence of a risk premium that players are willing to pay for the safety provided by a rule-based institution. In the words of the authors of this study: "our players have democratically built up a pool punishment organization within their group and have forgone the opportunity to decide individually who is to be punished, as predicted. Pool punishment seemed to be a safe haven, but it came at a significant loss of efficiency. Following Hobbes, the goal of the establishment of a central authority is not to achieve the best for all, but to prevent the worst for all in a stable society."

These results of Milinski/Traulsen et al. 2012 are supported by a supplementary experiment of Hilbe/Milinski et al. 2014. In this experiment, the subjects first gain experience with two types of "punishment institutions" over 20 rounds: One institution, which punishes only 1st order free-riders (those that do not contribute in the PGG) and another institution, which punishes 1st and 2nd order free-riders (those that do not contribute to finance the punishment institution, i.e. "tax evaders"). If no player supports a punishment institution, the following PGG is played as a game without punishment for free-riders. If at least one player paid taxes, the corresponding institution was established, and the free-riders of 1st and 2nd order were punished with 1 €. The average tax for each

tax payer was the lower the higher the number of players, n, who support the punishment institution (0,05+0,45/n € for an institution with 1st order punishment and 0,05+0,5/n for an institution with 1st and 2nd order punishment). After these introductory rounds, the actual experiment starts. The players are assigned either to a "foot-voting" or a "majority-rule" regime for the following 15 rounds. Under the foot-voting regime, they can decide between a punishment institution with 1st order or with 1st and 2nd order punishment in every round. Under the majority-rule system, they have to decide right in the beginning for the remaining 15 rounds, whether they want to establish a tax-financed punishment institution with 1st order punishment only or with 1st and 2nd order punishment.

The results show that all players who chose the majority-rule system vote for a punishment institution with 1st and 2nd order punishment. Those players who choose the foot-voting regime first favored an institution with 1st order punishment. Since this leads to 2nd order free riding, which increases the tax rate for players that support the institution with 1st order punishment, the majority of all players migrates to the institution with 1st and 2nd order punishment towards the end of the game. Since under the majority-rule system, an institution with 2nd order punishment is established, the average return of a player is significantly higher compared to the foot-voting system. The authors conclude "a pool punishment regime with 2nd punishment can emerge if individuals have the freedom to bind each other with a majority vote, but not if they can individually reconsider their decision after each round. In our experiments, democracy prompts individuals to commit themselves and to make institutional choices that enhance the welfare of all."

3.2 Self-regulation when the Return of Cooperation is smaller than the Return of Non-cooperation

As the experimental evidence shows, the stabilization of cooperative behavior is difficult even under the conditions of a PGG, where the cooperation of all players would not reduce profits. As a result, the players prefer pool punishment to peer punishment, i.e. they prefer a tax-financed executive authority, which practices rule-based punishment of non-cooperative behavior, to a self-regulatory approach, based on the decentralized punishment of non-cooperative behavior. This leads to the question how players decide, when full cooperation of all players leads to a lower total return for all players than non-cooperation? Such a scenario is not represented by the payment structure of a PGG. It is, however, likely that this type of payment structure often emerges in contexts, where private companies engage in self-regulation to meet certain environmental or social standards. For example, under the currently available production technologies, it is likely that a conversion to greenhouse gas neutral production yields more costs to a private company than additional sales. This is typically the case in markets, where standardized

products are sold under strong price competition since product differentiation cannot attract sufficient customers willing to pay mark-ups over costs.

Under such conditions, the incentive to cooperate and engage in effective self-regulation is even smaller for a private company than under the conditions of a PGG. Cooperation under the more favorable payment structure of a PGG is already very difficult and requires an institutional design that allows the sanctioning of free-riders, as section 3.2. has shown. Therefore, it is likely that such an institutional design is even more necessary when the full cooperation of all players leads to a lower total return than non-cooperation. There is no reason to assume that cooperation will be easier, if the return of cooperation is smaller.

4 Conclusions

Given the experimental results, it is not plausible that effective self-regulation in such areas as environmental protection or social standards is actually feasible. The experimental evidence is a good deal more in favor with the traditional approach, that environmental or social standards should be implemented by general laws.

This result does not really come as a surprise. If companies could easily cooperate on markets to implement self-regulation targets, companies could also easily cooperate under such conditions to implement collusive cartels to increase their profits. Thus, the market mechanism would generally fail to spur competition. Although empirical experience shows that collusive cartels can emerge on markets with a small number of competitors, collusive cartels are typically not observed if the number of competitors is sufficiently large.[14] Consequently, competition policies trying to keep the number of competitors large, reduce the scope for self-regulation *and vice versa*.

One way to make self-regulation by private companies possible under market conditions is to allow for legally binding agreements between competing companies for self-regulation purposes – a kind of legalized "self-regulation cartel". Such an approach, however, gives rise to further problems: *Firstly*, as already mentioned in section 2, the social costs of external effects are typically unknown to private companies. In constitutional democracies these are determined by the parliaments on the basis of a societal compromise. *Secondly*, a legal exception to allow for a "self-regulation cartel" would make a public control of potential abusive practices[15] necessary. It is, therefore, dubitable, whether the legalization of "self-regulation cartels" can provide an advantage compared to the traditional approach, where societally desired standards are implemented by general laws**.**

Another way to establish a kind of "hybrid" self-regulation under market conditions is "governance in the shadow of hierarchy" (Windhoff-Héritier/Rhodes 2011). Following

14 For experimental evidence see: Dufwenberg/Gneezy 2000.

15 For example: hidden quantity or price agreements and hidden blockades of market entry via special self-regulation designs.

Héritier/Lehmkuhl 2011: 50, this concept is based on two basic features: "(1) public policy-making involving the inclusion of private actors, and/or (2) public policy-making outside the traditional democratic-representative governmental arenas and the 'democratic circuit'." According to Héritier/Lehmkuhl 2011: 55 self-regulation is "costly to devise and to implement. As a consequence, industry is only likely to engage in collective action if confronted with a credible legislative threat or the 'shadow of hierarchy'. In other words, governments have to exert some pressure before industry takes the necessary self-regulatory steps."[16] Such a type of hybrid self-regulation has the advantage over pure self-regulation that governments can try to influence the extent and target of regulation in the direction of societal preferences. A disadvantage is, however, that it does not eliminate the basic dilemma structure of a PGG, which is faced by the companies: If a sufficient number of companies cooperates to avoid the "legislative threat" from the government, all companies will enjoy an advantage over a stricter legally binding regulation. However, at the same time, every single company can take advantage of non-cooperative behavior. As a consequence, the government would have to monitor the behavior of single companies and exert credible threat on single companies – in a similar way this is done under legally binding regulation.[17] This raises the question, whether hybrid self-regulation can really be of net advantage to a government compared to legally binding regulation.

From the special perspective of an institution like the European Commission, this seems to be possible, because "these soft modes of governing allow for some action without implying a formal competence loss for [the EU] member governments. From the viewpoint of the Commission, which is more eager to communitarize, new modes present a default option or second-best solution. The latter would have preferred the Community Method but anticipates the opposition of member states to the Commission's attempt to propose legislation in matters previously solely of domestic competence. (Héritier/Lehmkuhl 2011: 56), square brackets added by me)" Of course, this advantage

16 Campbell 2007 provides a set of 8 propositions, which he holds to be necessary to increase the likelihood that corporations will act in socially responsible ways. Proposition 4 states that "corporations will be more likely to act in socially responsible ways" if it is based on a "perceived threat of state intervention".

17 An empirical example for a case, where such a regulatory monitoring of single firms helped to establish internationally accepted regulatory standards are the safety standards in the aviation industry (Mills 2016). At the beginning of the year 2001, the International Air Transport Association (IATA) has founded the IOSA project to organize the standardization of international safety standards. The need for such a standardization was caused by two reasons: Firstly, the sharing of air rights with other carriers (code-share agreements) required a certification of safety standards to manage the reputation risk of cooperation. Secondly, national regulators, like the US Federal Aviation Administration or the European Aviation Safety Administration, required mandatory audits based on inconsistent standards. As a result the IATA "estimated that overlapping and redundant audits cost airlines over $3 billion during the 1990s" (Mills 2016: 5)). The IOSA project of the IATA successfully established in cooperation with its members and national regulators internationally accepted safety standards for audits (Mills 2016). Since these audits were legally required and controlled by national regulators, a monitoring problem as typical for the voluntary provision of public goods did not emerge.

of hybrid self-regulation from the special perspective of the European Commission is questionable from the perspective of democratic legitimacy. As stated by Héritier/Lehmkuhl 2011: 68 "the new modes as defined above are detached from the principal arena of democratically legitimate policy-making under representative government. They operate outside the classic 'democratic circuit'." In a similar vein Bellamy/ Castiglione et al. 2011 concluded "[…] such forms of involvement fall short of a number of normative requirements normally associated with democratic legitimacy. On the one hand, they do not meet the more stringent standards of democratic representativeness; while, on the other, they fail to provide citizens with enough assurance for general compliance, or that the externalities of decision-making will be fully considered without penalizing the interests of those not directly involved in the decision-making process." Consequently, while it is simple to find a descriptive explanation for the preference of hybrid self-regulation by institutions like the European Commission, it seems to be more difficult to find easy answers to the normative questions raised by this approach.

This leads back to the question posed in the introduction of this article, why the idea of pure self-regulation of private companies is so intensively propagated by national governments and company associations? One simple answer to this question could also be the self-interest of these institutions. For a government, it is typically much easier to publicly demand a nonbinding CSR-engagement of private companies than to accept the full responsibility for the unwanted side-effects of binding laws that make environmental or social standards obligatory for all companies. Such side-effects can be higher costs for goods and services and lower real income growth for the electorate. For company associations like the International Chamber of Commerce, propagation of hard-to-control self-regulation might be a simple instrument to avoid effective and legally binding regulation. In a well-founded documentation the NGO "Greenpeace" comes to the conclusion "The International Chamber of Commerce is the self-appointed voice of global business, which has embraced UN sustainable development processes since 1992. The problem is that its love for the UN is conditioned on that body's acquiescence to purely voluntary agreements when it comes to sustainability" (Greenpeace 2012). A systematic empirical analysis of the "rise of market liberalism across the OECD from the year 1977 to 2007 has led Kinderman 2009 to the conclusion that "the rise of CSR coincided with the liberalization, deregulation, privatization, and a fraying if not outright disintegration of the post-war compromise and 'organized capitalism'."[18]

To sum up, the idea that private companies should engage in self-regulation in such areas as environmental protection or social standards is not really convincing. Too many problems are raised by this approach. It is therefore hard to see, how CSR-based self-regulation could be a substitute for legal regulation based on general laws under the surveillance of an executive state body.

18 Similar conclusions are drawn by Kinderman 2011 from an analysis of "the co-evolution of Corporate Social Responsibility and neo-liberalism in the UK".

5 Bibliography

Bellamy, Richard / Castiglione, Dario / Follesdal, Andreas / Weale, Albert (2011): Evaluating Trustworthiness, Representation and Political Accountability in New Modes of Governance, in: Windhoff-Héritier, Adrienne / Rhodes, Martin (eds.): New modes of governance in Europe: Governing in the shadow of hierarchy, Palgrave Macmillan: London, 135–162.

Buchholz, Wolfgang / Heindl, Peter (2015): Ökonomische Herausforderungen des Klimawandels, in: Perspektiven der Wirtschaftspolitik 16:4, 324–350.

Bruttel, Lisa (2009): The critical discount factor as a measure for cartel stability?, in: Journal of Economics / Zeitschrift für Nationalökonomie 96:2, 113–136.

Campbell, John (2007): Why would corporations behave in socially responsible ways? An institutional theory of corporate social responsibility, in: Academy of Management Review 32:3, 946–967.

Cox, James / Walker, Mark (1998): Learning to play Cournot duopoly strategies, in: Journal of Economic Behavior & Organization 36:2, 141–161.

Davis, Douglas (2011): Behavioral convergence properties of Cournot and Bertrand markets: an experimental analysis, in: Journal of Economic Behavior and Organization 80:3, 443–458.

Dawes, Christopher / Fowler, James / Johnson, Tim / McElreath, Richard / Smirnov, Oleg (2007): Egalitarian motives in humans, in: Nature 446, 794–796.

Denant-Boemont, Laurent / Masclet, David / Noussair, Charles (2007): Punishment, counter-punishment and sanction enforcement in a social dilemma experiment, in: Economic Theory 33, 145–167.

Dreber, Anna / Rand, David / Fudenberg, Drew / Nowak, Martin (2008): Winners don't punish, in: Nature 452:7185, 348–51.

Dufwenberg, Martin / Gneezy, Uri (2000): Price competition and market concentration: an experimental study, in: International Journal of Industrial Organization 18:1, 7–22.

Engels, Jens / Behringer, Stefan (2015): Korruption in der Geschichte: ein Blick in die Vergangenheit mit Aussichten für die Zukunft, in: ZRFC, Risk, Fraud & Compliance 10:2, 62–66.

Fehl, Katrin / Sommerfeld, Ralf / Semmann, Dirk / Krambeck, Hans-Jürgen / Milinski, Manfred (2012) I dare you to punish me-vendettas in games of cooperation, in: PLoS ONE 7:9, e45093.

Fehr, Ernst / Gächter, Simon (2002): Altruistic punishment in humans, in: Nature 415, 137–140.

Gächter, Simon / Renner, Elke / Sefton, Martin (2008): The long-run benefits of punishment, in: Science 322:5907, 1510.

Greenpeace (2012): Greenwash + 20 – How some powerful corporations are standing in the way of sustainable development, www.greenpeace.org/international/en/publications/Campaign-reports/Climate-Reports/GreenwashPlus20/ (25.01.2017).

Gürerk, Özgür / Irlenbusch, Bernd / Rockenbach, Bettina (2006): The competitive advantage of sanctioning institutions, in: Science 312:5770, 108–111.

Henrich, Joseph / Boyd, Robert / Bowles, Samuel / Camerer, Colin / Fehr, Ernst / Gintis, Herbert / McElreath, Richard / Alvard, Michael / Barr, Abigail / Ensminger, Jean / Henrich, Natalie / Hill, Kim / Gil-White, Francisco / Gurven, Michael / Marlowe, Frank / Patton, John / Tracer, David (2005): "Economic man" in cross-cultural perspective: Behavioral experiments in 15 small-scale societies, in: Behavioral and Brain Sciences 28, 795–815.

Henrich, Joseph / McElreath, Richard / Barr, Abigail / Ensminger, Jean / Barrett, Clark / Bolyanatz, Alexander / Cardenas, Juan / Gurven, Michael / Gwako, Edwins / Henrich, Natalie / Lesorogol, Carolyn / Marlowe, Frank / Tracer, David / Ziker, John (2006): Costly punishment across human societies, in: Science 312:5781, 1767–1770.

Herrmann, Benedikt / Thöni, Christian / Gächter, Simon (2008): Antisocial punishment across societies, in: Science 319:5868, 1362–1367.

Hetzer, Wolfgang (2008): Korruption: Konzerne und Komplizen – Unternehmenskriminalität oder Ordnungswidrigkeit?, in: Europäisches Wirtschafts- und Steuerrecht: EWS 19:3, 73–83.

Héritier, Adrienne / Lehmkuhl, Dirk (2011): Governing in the Shadow of Hierarchy New Modes of Governance in Regulation, in: Windhoff-Héritier, Adrienne / Rhodes, Martin (eds.): New modes of governance in Europe: Governing in the shadow of hierarchy, Palgrave Macmillan: London, 48–74.

Hilbe, Christian / Milinski, Manfred / Traulsen, Anne / Röhl, Thorsten (2014): Democratic decisions establish stable authorities that overcome the paradox of 2nd punishment, in: Proceedings of the National Academy of Sciences of the United States of America (PNAS), 111:2, 752–756.

Huck, Steffen / Normann, Hans-Theo / Oechssler, Jörg (1999): Learning in Cournot oligopoly – an experiment, in: The Economic Journal 109:454, 80–95.

Jensen, Michael (2001): Value Maximization, Stakeholder Theory, and the Corporate Objective Function, http://papers.ssrn.com/sol3/papers.cfm?abstract_id=220671 (25.01.2017).

Karmann, Christopher (2016): Korruption von global agierenden Unternehmen: Regelungssysteme der Bekämpfung, Nomos: Baden-Baden.

Kiyonari, Toko / Barclay, Pat (2008): Free-riding may be thwarted by second-order rewards, rather than punishment, in: Journal of Personality and Social Psychology 95, 826–842.

Kinderman, Daniel (2009): Why do some Countries get CSR sooner, and in Greater Quantity, than Others? The Political Economy of Corporate Responsibility and the Rise of Market Liberalism across the OECD: 1977-2007, Discussion Paper SP III, Wissenschaftszentrum Berlin für Sozialforschung, 209–301.

Kinderman, Daniel (2011): 'Free us up so we can be responsible!' The co-evolution of Corporate Social Responsibility and neo-liberalism in the UK 1977–2010, Socio-Economic Review 10:1, 29–57

Krambeck, Hans-Jürgen, Milinski, Manfred / Semmann, Dirk: (2002): Reputation helps solve the 'tragedy of the commons', in: Nature 415, 424–426, in: Journal of Personality and Social Psychology 95:4, 826–842.

Levitt, Steven / List, John (2007): What Do Laboratory Experiments Measuring Social Preferences Reveal about the Real World?, in: The Journal of Economic Perspectives 21:7, 153–174.

Leufkens, Kasper / Peeters, Ronald (2011): Price dynamics and collusion under short-run price commitments, in: International Journal of Industrial Organization 29:1, 134–153.

McGinty, Matthew / Milam, Garrett (2013): Public Goods Contribution by Asymmetric Agents: Experimental Evidence, in: Social Choice and Welfare 40:4, 1159–1177.

McWilliams, Abagail / Siegel, Donald / Wright, Patrick (2006): Corporate Social Responsibility: Strategic Implications, in: Journal of Management Studies 43:1, 1–18.

Milinski, Manfred / Rockenbach, Bettina (2006): The efficient interaction of indirect reciprocity and costly punishment, in: Nature 444, 718–723.

Milinski, Manfred / Traulsen, Arne / Röhl, Thorsten: (2012): An economic experiment reveals that humans prefer pool punishment to maintain the commons, in: Proceedings of the Royal Society Biological Sciences, DOI:10.1098/rspb.2012.0937.

Mills, Russell (2016): The interaction of private and public regulatory governance: The case of association-led voluntary aviation safety programs, in: Policy and Society 35:1, 43–55.

Nikiforakis, Nikos (2008): Punishment and counter-punishment in public good games: Can we really govern ourselves?, in: Journal of Public Economics 92:1-2, 91–112.

Nikiforakis, Nikos / Engelmann, Dirk (2011): Altruistic punishment and the threat of feuds, in: Journal of Economic Behavior and Organization 78, 319–332.

Nowak, Martin (2006): Evolutionary Dynamics: Exploring the Equations of Life. Harvard University Press: Cambridge, Massachusetts.

Rat für Nachhaltige Entwicklung (2015): Deutscher Nachhaltigkeitskodex, http://www.deutscher-nachhaltigkeitskodex.de/nc/de/dnk/der-dnk-standard.html?cid=222&did=310&sechash=3039ca2f (05.04.2017).

Sefton, Martin / Shupp, Robert / Walker, James (2007): The effect of rewards and sanctions in provision of public goods, in: Economic Inquiry 45:4, 671–690.

Sutter, Matthias / Haigner, Stefan / Kocher, Martin (2010): Choosing the carrot or the stick? Endogenous institutional choice in social dilemma situations, in: The Review of Economic Studies 77:4, 1540–1566.

Smith, Adam (1776): Adam Smith, An Inquiry into the Nature and Causes of the Wealth of Nations, http://geolib.com/smith.adam/won1-02.html (03.03.2015).

The Economist (2015): Activist funds – An investor calls, http://www.economist.com/node/21642175 (26.01.2017).

Tirole, Jean (1988): The Theory of Industrial Organization, MIT Press: Cambridge, Massachusetts.

UN Global Compact (2015): UN Global Compact, https://www.unglobalcompact.org/ (12.12.2015).

Windhoff-Héritier, Adrienne / Rhodes, Martin (2011): New modes of governance in Europe: Governing in the shadow of hierarchy, Palgrave Macmillan: London, New York.

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The ***Journal of Self-Regulation and Regulation*** is an open-access peer-reviewed online-journal serving as a outlet for edge-cutting interdisciplinary research on regulatory processes in individuals and organizations. It is published by the research council of Field of Focus 4 (FoF4) of Heidelberg University. The research council (RC) stimulates and coordinates interdisciplinary activities in research and teaching on self-regulation and regulation as part of the university's institutional strategy „Heidelberg: Realising the Potential of a Comprehensive University", which is funded by the Federal Government as part of the excellence initiative.

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Imprint:

Journal of Self-Regulation and Regulation Volume 03 (2017)

Research Council of Field of Focus 4, Heidelberg University
Forum Self-Regulation and Regulation
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69117 Heidelberg, Germany
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Internet: https://www.uni-heidelberg.de/fof4

Publisher: Research Council of Field of Focus 4, Heidelberg University
Spokesperson: Sabina Pauen, Department of Psychology
Editorial Team: Melanie Bräunche, Sabine Falke

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