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# Neither Punishments nor Rewards: Fostering Tax Compliance through the Rawlsian Veil of Ignorance in a Laboratory Experiment

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*Abstract:* It is well known that different deterministic mechanisms (like formal audits and material punishments) can stem free riding behaviour in social dilemmas. The behaviouralist literature identified then several other environmental and psychological variables which can influence agents' attitude to cooperate. By means of a repeated tax compliance game run in an experimental laboratory, our study measures the effects of a Rawlsian veil of ignorance on cooperation over time. In particular we found that in our experimental design the (laboratory) veil of ignorance has an effect both on the ex-ante distribution of votes concerning the adoption of a specific tax regime and on the ex-post tax compliance level between treatments, but not on compliance across rounds, which shows to be decreasing.

*JEL Code:* D63, C91, H26,

*Keywords:* Experimental Economics, Inequality, John Rawls, Tax Compliance, Veil of Ignorance

*“Models of tax evasion need to take into account that taxpayers may not only want to maximise their interests, however defined, but also desire to see justice and fairness realised”*

*Wenzel*

## **Introduction**

In the early 70's Allingham and Sandmo (1972) proposed a utility function which aimed to explain individual tax compliance as a risky portfolio choice based on only two exogenous parameters, the probability of being audited and the fine amount in case of ascertained misbehaviour. However, the proposed (normative) model proved to be insufficient to describe accurately agents' observed tax behaviour, that is their basic theoretical framework could not predict in a satisfying way tax payers' actual choices.

In response to Allingham and Sandmo's limited approach and in order to understand better agents' choice to abide or not by the tax law, the following literature on tax evasion focused the attention on other behavioural variables of psychological, procedural and environmental nature<sup>3</sup> (Andreoni et al. 1988, Braithwaite 2017, Jackson et al. 1986, Feld et al. 2007, Kirchler 2008, Pickhardt et al. 2014, Richardson 2006 and Torgler 2002).

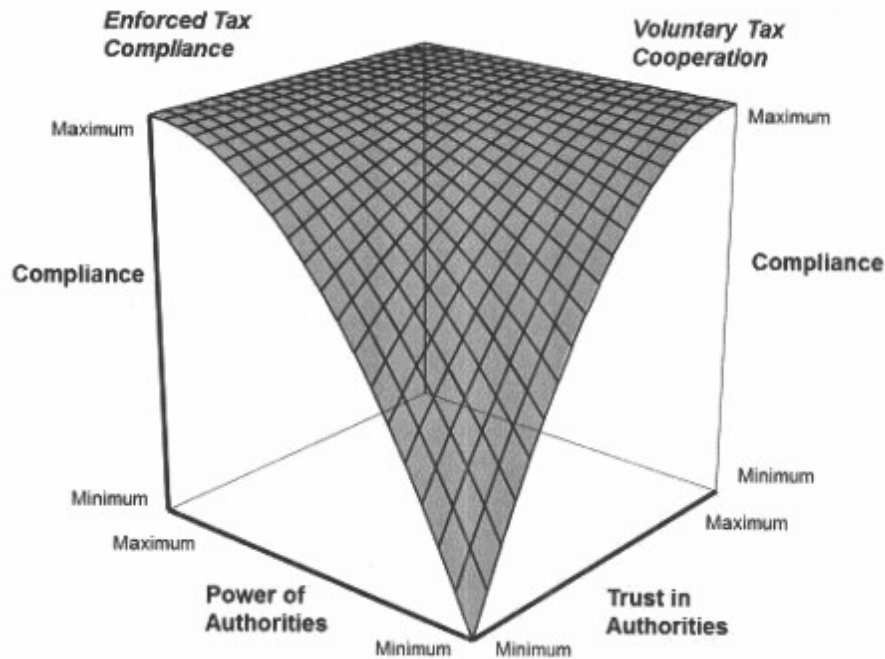
A recent theoretical advance tried then to summarize and to conciliate in a unique conceptual framework the standard economic variables like audit probabilities and fines (gathered together under the label “power of authorities”) with a broad set of behavioural and environmental elements (labelled as “trust in authorities”<sup>4</sup>) which have been recognized

3 Some of the variables which have been recognized to influence agents' tax behavior are: endogenous participation in the definition of tax rules (Tyran et al. 2001); perceived fairness of the tax system (Becker et al. 1987 and Bordonon 1993); audits' sequences in a repeated framework (Kastlunger et al. 2009 and Mittone 2006); having a voice on the destination of the tax revenue (Casal et al. 2016b and Pommerehne et al. 1996); influence exerted by public opinion (Casal et al. 2016b and Kahan 1997); ethical concerns (Alm et al. 2011 and Feld et al. 2002); social norms (Wenzel 2004 and Wenzel 2005).

4 In this paper the locution "trust in authorities" might not precisely coincide with the authors' original meaning. Here "trust in authorities" is meant in its broadest sense, that is as any psychological or environmental element that can enhance voluntary tax compliance.

to impact on tax compliance decisions. The so called “slippery slope” (Figure 1) is “a conceptual tool [which] may serve to understand the importance of determinants of tax behaviour” (Kirchler et al. 2010, p. 214 and Kirchler 2008).

**Figure 1** – Slippery slope geometrical representation



In particular, the “slippery slope” curve is conceived as a surface within a three-dimensional geometrical space. The degree of tax compliance (dependent variable) is measured on the vertical axis, while the two sets of forces which are recognized to drive the decision to abide by the tax law are placed on the horizontal plane.

One axis includes those standard coercive tools which can mechanically enforce compliance (“power of authorities”). The other horizontal axis gathers together all those behavioural elements (“trust in authorities”) which cannot be controlled in a deterministic way but which can influence voluntary tax compliance (Muehlbacher et al. 2011).

Within the “slippery slope” framework formal (power) and informal (trust) forces are conceived to be jointly-responsible in determining the degree of tax compliance<sup>5</sup>.

5 The two sets of forces are recognized to interact dynamically with each other (Filippin et al. 2013, Gangl et al. 2015 and Kirchler et al. 2010). In other words, the two set of variables are not conceived as secluded or independent. Instead they reciprocally influence each other, and they can either enter a positive symbiotic relationship, mutually

Nevertheless, and without questioning the importance of the reciprocal influence between the two mentioned groups of forces, it is important to highlight how according to the analytical representation given to the “slippery curve”, the possibility to achieve full tax compliance by means of one single set of variables is also admitted.

The study carried out in the paper goes in the direction of the just sketched intuition, taking into consideration the theoretical possibility to obtain full tax compliance by means of one single set of forces contemplated by the literature in general and by the “slippery slope” framework in particular. While it is quite immediate to imagine some cases where full tax compliance might be obtained by means of coercive tools (“power of authorities”)<sup>6</sup>, it is not obvious to conceive a frame where full tax compliance is achievable as a pure voluntary mechanism, not enforced by external constraints. In particular we inquire the latter option through an experimental methodology.

Indeed, a controlled environment like an experimental laboratory allows to exclude coercive tools which usually enforce mechanically tax compliance (authorities) from the tax game design<sup>7</sup>. In this way, from a game generally structured as taxpayer vs. tax authority, we move to a tax game framed in the form of taxpayer vs. taxpayer (Pickhardt et al. 2014). Indeed, without authorities or any other kind of exogenous coercive mechanism, the tax compliance game basically becomes a voluntary contribution mechanism where the vertical “trust in authorities” assumes the form of a horizontal “trust in other tax p(l)ayers”.

The specific theoretical framework for the experimental design draws inspiration from the exclusion game (Sacconi and Faillo 2005). The branch of literature based on the

reinforcing each other and then pushing together the tax payer towards full tax compliance, or (coercive) powers and (mis)trust can enter a spiral where they have a negative impact on each other, inducing the economic agent to evade more taxes.

6 It is sufficient to imagine a case where the audit probability is settled to  $p=1$  (Feld et al. 2002), or a case where to stimulate cooperation (read compliance) strong rewarding or punishing institutions are introduced (Fehr et al. 2002, Gintis 2005, Gürer et al. 2006 and Sefton et al. 2007). However informal institutions deserve particular attention, because it has to be taken into account that positive effects on compliance are sometimes counterbalanced by negative effects in terms of average returns (Kroll et al. 2007 and Masclet et al. 2003). Indeed, heterogeneity in beliefs can lead to normative conflicts concerning the right behaviour to adopt (Nikiforakis et al. 2008, Nikiforakis et al. 2012 and Sefton et al. 2007), such that swords without words can be worse than words without swords (Ostrom et al. 1992).

7 Artificially excluding one set of variables automatically prevents any possible dynamic interaction between the two set of forces contemplated by the “slippery slope”, see note number 3.

exclusion game (Degli Antoni et al. 2016, Faillo et al. 2008, Faillo et al. 2014, Sacconi et al. 2005, Sacconi et al. 2010, Sacconi et al. 2011 and Tammi 2011) studies the effects of an impartial and non-binding agreement on a one-shot resource allocation game. The agreement is structured in the perspective of Rawls's social contract theory and its outcomes are interpreted consistently with his idea of the sense of justice (Rawls 1999).

The novelty of the present research is the adoption of some elements belonging to the exclusion game to inquiry the effects of an agreement of Rawlsian type (reached behind a veil of ignorance) on tax behaviour. In particular the sense of justice might be one of those psychological forces which, inducing compliance to the agreement on a chosen tax regime (distributive scheme), directly generates voluntary tax compliance.

Thus, excluding tax authorities and adopting a (laboratory) veil of ignorance to choose a tax regime (sets of tax rates for different levels of income), the research aims to inquire tax compliance behaviour as a pure voluntary mechanism in a Rawlsian framework. The graft of Rawls's social contract theory (and the related experimental literature) in the tax evasion field has further interesting implications beyond testing the two just sketched hypothesis.

First of all, it provides an empirical test for the "slippery slope" shape<sup>8</sup>.

Second, the main aim of inquiring tax evasion should be to find out those tools which can help preventing tax evasion, and the veil of ignorance becomes a potential candidate.

Third, fiscal policies and tax laws as well as the Rawlsian theory have explicit redistributive aims and effects. Fourth, it might be possible to link the Rawlsian concept of the sense of justice to the more familiar concept of the civic duty (Orviska et al. 2002), which sustains that citizens can be collaborative even if the system allows non-compliance, such that their behaviours do not have to be regulated by external audits or sanctions ("powers of authorities"), but by their concern for society and institutions.

Last but not least, it allows to extend the one-shot approach of the exclusion game to the context of repeated games, since (paraphrasing Torgler 2002, p.665) a "serious limitation [of the exclusion game] is the nature of [the] experiment, which [is] static (only

8 If to achieve voluntary compliance is not possible by means of any combination of environmental and psychological variables, the "slippery slope" surface should be revisited and drawn as an asymmetric curve. Furthermore, this revision might have a relevant impact on the dynamic between the two forces.

one round)” while “the decision to [comply] or not is a dynamic rather than a static problem”.

Next Sections are organized as follows. Section 1 explains the theoretical framework on which the experiment is designed and it formulates the predictive hypothesis. Section 2 describes in detail the experimental design. In Section 3 data from the experiment are analysed and discussed. Appendix shows the instructions provided to the experimental subjects of the veil treatment.

## **1. Literature review and theoretical predictions**

In the literature there is compelling evidence of a causation effect between individuals’ participation in the definition of tax rules (rates, audit probabilities, fines, destination of the tax revenue, etc.) and their following level of tax compliance (Alm et al. 1993, Alm et al. 1999, Casal et al. 2016a, Feld et al. 2002, Feld et al. 2006, Pommerehne et al. 1996 and Wahl et al. 2007). In other words, when people have a concrete voice on tax issues a “participation effect” emerges (compared to a situation where the same variables are exogenously assigned, Bortolami 2009 and Bortolami et al. 2009). By and large, rules and institutions legitimized in a direct way enhance the cooperative attitude (Dal Bó et al. 2010), therefore also tax compliance (Feld et al. 2000).

Our tax compliance game takes for granted the well established “participation effect” and makes a step aside. In particular the study focuses on the voting procedure itself, measuring the effects of two distinct voting conditions. One of them is a standard voting procedure: all players are assigned an income level and then they are asked to vote on the tax regime (set of tax rates for the different levels of income) they prefer adopting during a second phase, the actual tax compliance game.

The second voting mechanism is instead hinged on the Rawlsian social contract theory and on some of its recent experimental applications. In particular this treatment adopts a (laboratory) veil of ignorance during the voting phase, that is players are asked to vote for a tax scheme without knowing their personal income level. They become aware of their position in the distribution of wealth only after they reach an agreement on the tax regime. In order to understand better the differences between the two treatments and the

(expected) specific consequences of the veil of ignorance on compliance it is necessary to recall some further details concerning Rawls's social contract theory (1999).

John Rawls opens his *A Theory of Justice* (Rawls 1999) with the following statement:

“although a society is a cooperative venture for mutual advantage, it is typically marked by a conflict as well as by an identity of interests. There is an identity of interests since social cooperation makes possible a better life for all than any would have if each were to live solely by his own efforts [while] there is a conflict of interests since persons are not indifferent as to how the greater benefits produced by their collaboration are distributed” (Rawls 1999, p. 4).

In order to decide about the distribution of benefits generated by socio-economic cooperation, Rawls suggests to adopt an impartial perspective named “veil of ignorance”. This mechanism (of pure procedural justice) guarantees that people unanimously agree on fair principles for the society's main institutions, because the veil of ignorance “excludes the knowledge of those contingencies which sets men at odds and allows them to be guided by their prejudices” (Rawls 1999, p. 17).

Specifically, according to Rawls, behind the veil of ignorance

“no one knows his place in society, his class position or social status; nor does he know his fortune in the distribution of natural assets and abilities, his intelligence and strength, and the like. Nor, again, does anyone know his conception of the good, the particulars of his rational plan of life, or even the special features of his psychology such as his aversion to risk or liability to optimism or pessimism” (Rawls 1999, p. 118).

Therefore, in the ignorance condition, none of the involved parties can design principles which might favour his or her own particular person.

Instead, according to Rawls, the impartial reasoning behind the veil of ignorance is supposed to induce the involved parties to assume the perspective of the worst possible scenario and therefore to design distributive principles which aims to "maximize the expectations of the least favored position" (Rawls 1999, p. 69).

Thus, with the second treatment of our tax game we implement the impartial procedure offered by the veil of ignorance.



More in detail, in our tax game we designed more or less progressive tax regimes such that they have different distributive effects on the lowest level of income. Rawls's theory suggests that a (laboratory) veil of ignorance in the voting phase should influence the individual choice concerning the tax scheme to adopt in the compliance phase (compared to the baseline treatment, where player can vote according to their interest represented by the position in the wealth distribution).

In the veil treatment we asked participants to agree on a tax regime (a scheme of tax rates) before letting them know the income bracket they will belong during the compliance task. Basically, in the veil condition, while voting for a specific tax regime players are deprived of the particular information concerning their place in the distribution of wealth (within the game). Therefore nobody can profit of any specific information concerning her or his own wealth status (within the game) to propose (to vote for) a redistributive scheme which mainly benefits her or his particular position<sup>9</sup>.

Instead, according to Rawls, behind the veil of ignorance players should enter a maximin perspective and vote for the tax regime which maximizes the expectations of the worst-off<sup>10</sup>, represented in our game by the player with the lowest income level. Thus, since the alternative tax regimes that players have to vote on have different material consequences on the wealth of the worst-off, we can formalize the first hypothesis we aim to test with our experiment.

***H1:*** compared to the baseline treatment (where players vote after knowing their level of income in the game), in the veil of ignorance treatment we will observe a shift of votes and tax regimes towards the scheme of tax rates which maximises the wealth of the least

9 That people usually vote for tax rates that advantage their particular position it was demonstrated in other experiments, like (Esarey et al. 2012)

10 So far the evidence is mostly against a strong effectiveness of the Rawlsian veil of ignorance (Aguar et al. 2013, Andersson et al. 1999, Bond et al. 1991, Carlsson et al. 2003 and Frohlich et al. 1987). However we have to take into account that simulating empirically a pure and perfect veil of ignorance such as conceived by John Rawls is clearly an impossible task. Rawls's veil of ignorance excludes much more information than what can be hidden in an experimental laboratory. For example in the game players' personal real wealth and their conception of the good remain perfectly known. Thus subjects can be made neutral only with regard to their role in the game (perspective on specific concerns), that is the position in the income distribution.

advantaged position, that is the position occupied by the player with the lowest level of income.

After having introduced the decision-making model based on the maximin reasoning, Rawls (1999) dedicates a consistent part of his theory to analyse the stability of the impartial agreement. His main aim is to explain how some principles, chosen ex-ante behind the veil, can become stable ex-post in the real world, after the veil is dropped.

This kind of analysis is really important because the agreement, despite being fair, is not conceived as automatically enforced: everyone can free ride, that is, everyone can decide to deviate from the unanimously chosen (distributive) rule because this do not coincide with her or his own ex-post individual interests. Thus, according to Rawls, it becomes necessary to identify a force which can sustain and restore compliance in case tendencies which induce parties to deviate from the agreement emerge.

In dealing with this issue Rawls does not look for external enforcement mechanisms<sup>11</sup>. Instead, he directly looks at the involved parties and their moral psychology. In particular, in Rawls's opinion, every subject taking part in the agreement behind the veil of ignorance is expected to develop a strong and effective (endogenous) desire to act in accordance with the set of the chosen principles.

Said with a Rawlsian terminology, after having reached an agreement behind the veil of ignorance every subject is expected to develop a sense of justice which can counterbalance the individual incentives to deviate from the impartial principles. Thus, by means of the sense of justice (formally based on a system of mutual expectations of compliance) the agreement and its system of principles, even if not binding, are expected to become self-enforcing and therefore stable over time.

Through a laboratory experiment a recent field of literature tried to explore the Rawlsian egalitarian conception and in particular his idea of sense of justice. The so called exclusion game (Degli Antoni et. al 2016, Faillo et al. 2008, Faillo et al. 2014, Sacconi and Faillo 2005, Sacconi and Faillo 2010 and Tammi 2011) is a one-shot resource allocation game with a preliminary voting stage simulating an agreement behind a veil of ignorance. In

11 That would generate a loop of agreements, because another agreement would be necessary to legitimize those enforcing institutions, which should be enforce by other institutions requiring a third agreement and so on and so forth.

other words, before participants are revealed their role in the game (dictator or dummy player), they have the possibility to reach a unanimous agreement about the way to share a common endowment.

Three are the most important features of the exclusion game which reflect the Rawlsian social contract theory. The choice of the sharing rule is taken behind a veil of ignorance, that is all players are required to unanimously vote for a distributional rule not knowing their (future) role in the actual game. In the second stage, the actual exclusion game, players' roles are differentiated with regard to their decision-making powers (some participants enter the dictator role and some of them become dummy players with no voice). Last but not least, the agreement on the distributive norm of the voting phase is not binding in the second phase, that is in the actual exclusion game players assigned to the dictator role are free to share the common endowment regardless the agreement reached in the voting stage.

Thus, given the structure of the exclusion game and according to the standard economic theory, at the second stage every rational economic agent in the dictator position should make the choice which maximizes his or her own material payoff regardless the specific sharing rule unanimously approved in the previous voting phase. However, the provided experimental evidence discloses how the (unconstrained) ex-post compliance with the ex-ante chosen distributive norms is unexpectedly high even in those cases where groups agreed on an egalitarian (maximin and counter-maximizing) distribution.

The observed behaviour was justified and explained through the Rawlsian concept of the sense of justice. In particular, the adopted model of social conformist preferences (Grimalda et al. 2005) takes into consideration the psychological utility (Attanasi et al. 2006 and Attanasi et al. 2008, Geanakoplos et al. 1989) that is gained by complying with the impartial agreement and that compensates dictator players for their material loss.

Consistently with the mentioned theory and its empirical evidence collected in the exclusion game we can formulate our second hypothesis

**H2:** in the veil treatment tax compliance will be at least as high as in the baseline treatment<sup>12</sup>

12 We cannot formulate an hypothesis which goes in a more precise direction because we have neither previous empirical evidence on veiled vs. no veiled agreements nor a specific Rawls's conjecture on those two conditions (except that a no veiled agreement would not be reached).

However, as for the exclusion game structure and its Rawlsian interpretation, an interpretative limitation emerges. In particular that game is structured as a one-shot compliance task. Instead the sense of justice and the related compliance behaviour, such as conceived by Rawls himself, are not one-shot occurrences. They are not occasional achievements, but they are rather conceived as the product of a dynamic process, self-enforcing over time.

Indeed, according to Rawls, in order to be stable “the scheme of social cooperation [...] must be more or less regularly complied” (Rawls 1999, p. 6). Indeed, in Rawls’s opinion, “[o]nce a system of co-operation [...] is set up and a period of uncertainty survived, the passage of time renders it more stable, given an evident intention on the part of all to do their part” (Rawls 1963, p. 291). In other words a “system in which each person has, and is known by everyone to have, a sense of justice is inherently stable [because] the forces making for its stability increase as time passes (Rawls 1963, p. 293).

This is to say that the goal to justify the (dynamic) concept of the sense of justice with the result of a one-shot (static) game should be considered partially achieved, especially after it was demonstrated that testing a feedback only once is likely to produce misunderstandings as much in the outcomes themselves as in their interpretation (Hertwig and Ortmann 2001). Thus, conceiving a game design where it is possible to repeat the actual compliance task, like our tax game, easily allows to check the path of compliance, improving in this way the theoretical and empirical interpretation of the sense of justice.

Since after the veil of ignorance is dropped compliance (driven by the sense of justice and its system of mutual beliefs) is described by Rawls as a self-enforcing process and it is expected to be more and more stable over time, and since our tax game is designed to repeat the compliance task across many rounds, it is possible to formulate the third hypothesis we aim to test with our experiment

**H3:** in the veil treatment the tax compliance path will be at least constant across rounds

According to all the elements described so far and in particular to the mentioned model on conformist reciprocity (Grimalda et al. 2005), the system of reciprocal beliefs,

activated by the veil of ignorance, is fundamental in order to sustain compliance<sup>13</sup> (Rawls 1963, Rawls 1999): a player decides to comply with the agreement, even if that means to renounce to a share of her material payoff, on the condition she believes that the other players who took part in the impartial agreement will act or would have acted the same way<sup>14</sup>.

That means that in the veil treatment compliance across rounds is expected to be linked to beliefs regarding other players' compliance. In other words,

***H3a:*** in the veil treatment the tax compliance path across rounds will be aligned with players' beliefs

The last two predictions are implicitly based on dynamic psychological equilibria, which take into consideration the update of beliefs through time (Attanasi et al. 2006, Battigalli et al. 2005).

## **Experimental design**

At the beginning of every experimental session students are randomly divided in groups of three participants. Single groups face then two chronologically ordered phases. In the first phase players are asked to vote for a tax scheme to adopt during the second phase, the actual tax compliance task. A tax scheme (or regime) is a set of different tax rates which apply to three given levels of income (see Table 1). The two treatments differentiate only with regard to the voting stage: according to the treatment the income levels are assigned before (baseline) or after (veil condition) the voting stage. The compliance phase is then identical for the two treatments.

The experiment is designed with Experimental Currency Units (ECU). 4,000 ECU are equivalent to € 1 and participants are aware of the exchange rate because it is explicitly mentioned in the initial instructions (see Appendix). Within every group players are

13 Beliefs are widely recognized to have an impact on the cooperative attitude in general (Chang et al. 2004, Chaudhuri 2011, Fischbacher et al. 2010, Frey et al. 2007, Kahan 1997, Keser et al. 2000, Tyran et al. 2001)

14 The dynamic is very different from models of pure conformity, which assume we adapt our own behaviour to match others' expectations on us (Cialdini et al. 2004 and Cialdini et al. 1998).

randomly assigned<sup>15</sup> (according to the treatment, before or after the vote) one of the following levels of income: 1,500 ECU, 2,000 ECU or 3,000 ECU.

Once assigned the endowment level keeps constant during the experiment, that is individual income does not change across rounds. Moreover, within every group the income levels are exclusive, that is it is not possible that two or three participants of a group have got the same endowment. Given the income exclusivity the initial expected income is 2.167 ECU, while the inequality of the initial distribution, measured by a simple standard deviation, is equal to 764 ECU.

Table 1 describes in detail the tax regimes which participants are asked to vote on. For example tax scheme A tries to mimic the current tax rates applied by the Italian law on personal incomes: 23% for yearly incomes up to € 15,000, 27% for incomes which range from € 15,000 to € 28,000 and 38% for incomes between € 28,000 to € 55,000<sup>16</sup>. The inequality of this tax scheme is measured by a standard deviation calculated on the final distribution (full compliance case) of 371 ECU. In other words if players choose the tax regime A, and they decide to fully comply with it, they can reduce the initial inequality from 764 ECU to 371 ECU.

The other schemes vary in the progressiveness of the tax rates applied to the three levels of income. Tax schemes D and B are more progressive, that is they generate more equal ex-post distributions of wealth than tax scheme A. In particular tax scheme B allows to reach the most equal distribution of wealth, with a standard deviation of 128 ECU.

On the contrary, tax scheme C presents a flat rates structure and it generates the most unequal ex-post distribution, with a standard deviation of 527. That means that tax scheme C, despite reducing the initial inequality, generates an ex-post distribution of wealth which is four times more unequal than the distribution generated by tax scheme B<sup>17</sup>.

15 The decision to provide windfall endowments, despite being an extremely controversial issue (Ackert et al. 2006, Antinyan et al. 2015, Cherry et al. 2002, Cherry et al. 2015, Clark 2002, Harrison 2007, Mittone et al. 2012 and Spraggon et al. 2009), is intentionally made to simulate a contingent distribution of assets, fortune and social circumstances. Indeed, the presence of some kind of “undeserved” inequality is a central issue in the Rawlsian social contract theory (Rawls 1999, pp. 10-15).

16 Technically the higher tax rates do not apply linearly to the whole income, but only on the proportion of income that exceeds the lower threshold.

17 In order to take into account inequality we could have also calculated a Gini index, which is 0.23 for the initial distribution, 0.08 for the regime A, 0.03 for tax scheme B, 0.11 for tax regime C and 0.06 for tax scheme D.

**Table 1<sup>18</sup>** – Tax regimes (ECU)

initial endowment	1,500	2,000	3,000	tax revenue	rate	compounded tax revenue	ex-post redistribution (full compliance)			expected wealth	dev.st. (inequality)
tax scheme A rate taxes	0.23 345	0.28 560	0.37 1,110	2,015	2.1	4,232	2,566	2,851	3,301	2,906	371
tax scheme B rate taxes	0.09 135	0.25 500	0.46 1380	2,015	2.1	4,232	2,776	2,911	3,031	2,906	128
tax scheme C rate taxes	0.31 465	0.31 620	0.31 930	2,015	2.1	4,232	2,446	2,791	3,481	2,906	527
tax scheme D rate taxes	0.19 285	0.22 440	0.43 1,290	2,015	2.1	4,232	2,626	2,971	3,121	2,906	254

All the tax schemes are designed to generate exactly the same expected tax revenue (2,015 ECU in case of full compliance). The tax revenue is then multiplied by a capitalization factor of 2.1 and distributed in equal shares (1/3) to the three players of the considered group<sup>19</sup>. Given the structure described so far, also the final expected wealth is constant across the tax regimes (2,906 ECU).

This particular structure has two implications concerning the voting phase: first, any utilitarian reasoning centred on maximizing the expected average utility (Harsanyi 1978) is formally avoided; second, the choice between tax schemes does not involve any explicit trade-off between efficiency and equality.

Nevertheless, the proposed tax schemes clearly have different distributive effects. Therefore subjects are expected to focus and to base their voting decisions only on redistributive concerns.

However, this does not change the inequality ranking between tax regimes

18 The values in the table are calculated assuming the full compliance case. All the values, except the tax rates, are reported in ECU.

19 In particular, the equal share distribution has three distinct implications which can be deepened in (Esarey 2012 and Fischbacher et al. 2014): the redistributive structure is conceived as a mechanism of transfers even if it is not a zero-sum game; every tax regime redistributes income from above average earnings to below-average incomes; players holding a different income level and facing different tax rates have different returns on the paid taxes.

Thus in the first (baseline or veiled) phase of the game every group has a maximum of 6 rounds to vote for a tax schemes. In order to access the second phase participants are required to reach a unanimous consensus on a specific tax scheme. Those groups which do not reach a unanimous agreement about the tax scheme by the 6<sup>th</sup> round (included) cannot enter the second phase of the game and they are paid the show up fee. The unanimous agreement is therefore an essential precondition to enter the actual tax compliance game.

The second phase of the experiment concerns the actual tax compliance task: for 10 rounds players<sup>20</sup> are asked to pay taxes according to the (endogenous) tax scheme unanimously voted by their group during the first phase and to their own (exogenously assigned) level of income.

As mentioned in the Introduction, the compliance phase of our game is characterized by the absence of any external enforcement mechanism which can audit or sanction players' deceptive behaviour. This means that the (second) compliance phase basically reproduces the structure of a repeated public good game (Chaudhuri 2011 and Ledyard 1995) where the public good is represented by the tax revenue. In other words, since the agreement on the tax scheme of the first phase is not conceived as binding, in the second phase players are asked to pay taxes on a voluntary basis in exchange of a monetary public good.

Given the voluntary mechanism on which the tax compliance game relies on, the payoff function for the single individual at every round is

$$(1) \quad \pi_i(t_i, t_{i \neq i}) = E_i - (t_i) + \frac{\beta}{n} \sum_i^n (t_i)$$

$$\text{with } \frac{\beta}{n} = \frac{2.1}{3} 0.7$$

where  $E_i$  represents the assigned endowment (level of income),  $t_i$  measures the paid taxes for every individual,  $\beta$  is the capitalization rate and  $n$  is the number of players per group.

This payoff function implies that the social optimum is theoretically reached when all players fully contribute to the tax revenue (public good). However, since the ratio between the capitalization factor and the number of players per group is less than 1 and since there are no external enforcement mechanisms ("authorities") to stem tax evasion, the actual tax

20 In the instructions the number of rounds is not communicated.



game of the second phase mirrors a standard public game, including its theoretical predictions. In other words, in our experimental design the standard Nash equilibrium applies requiring every player to not comply at all (to contribute zero) to the chosen tax regime (to the formation of the tax revenue).

However, although the game is “authority free” and the standard equilibrium predicts a pure free-riding behaviour as the best response to others’ behaviour, as mentioned in the previous Section, adopting a veil of ignorance in the voting phase is supposed to modify the psychological equilibrium of the game, generating sense of justice to the impartial agreement and therefore tax compliance.

Lastly in the game, contemporary to the compliance decision and through an incentivized structure, players are asked to predict the level of compliance of the other two players belonging to their same group. In each group the player with the best (cumulative) predictions earns an extra bonus of €2. Predictions are then used like an indicator of beliefs about others’ behaviours.

Except for the show-up fee and the bonus for the predictions, subjects are cumulatively paid for all the decisions they took across the 10 compliance rounds (Laury 2006). This choice was made with the intention to remark the dynamic process of compliance, which is not supposed to be framed as a series of one-shot decisions independent one from each other.

As mentioned earlier, the experiment is then run under two distinct treatments concerning the voting phase: the baseline treatment and the veil treatment. In the former treatment the veil is removed and players vote after they are assigned their endowments. In the latter, which is inspired by the Rawlsian theory and its behaviouralist interpretations, during the voting phase subjects are not revealed their personal level of income.

## **Data analysis and discussion**

All the experimental sessions took place in the Computable and Experimental Economics Laboratory (CEEL) of the University of Trento. They were run using the open source software for economic experiments oTree. Each session lasted about 1 hour. The experiment involved a total of 153 students (69 in the baseline treatment and 84 in the veil

treatment), who voluntarily decided to participate after a public call. On average students were 22, half of them were female and 48% of them were enrolled in programs related to the economic disciplines. Students were paid by means of bank transfers and on average they earned € 10.50 (show-up fee of €3.00 included).

In the experimental laboratory students were randomly assigned to a computer terminal. All the emplacements were isolated by separation walls to avoid communication. Students read the instructions on the computer screen. The instructions were also read aloud by one of the experimenters in order to ensure common knowledge. Before the actual experiment started six control questions about the structure of the game were asked. At the end of the experiment a non-incentivized questionnaire was provided and 94% of the participants declared that the initial instructions were clear.

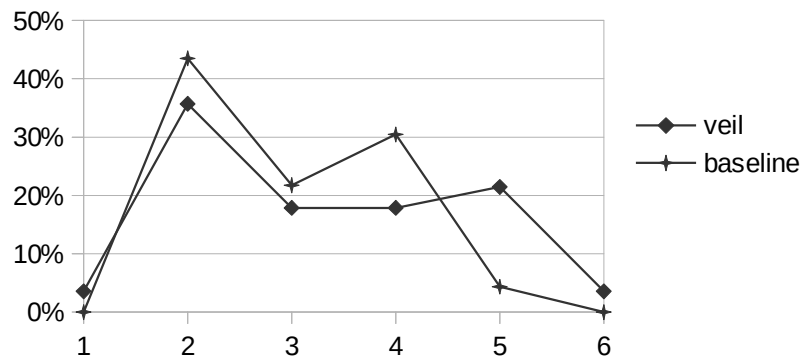
Following the instructions, at the beginning of the phase 1 of the experiment, regardless the treatment, students were randomly assigned to a group of three participants. Therefore a total of 51 groups (23 in the baseline treatment and 28 in the veil condition) took part in the experiment.

In both treatments all the groups accessed phase 2, that is all players reached a unanimous agreement on a specific tax regime. Chart 1 provides the details regarding the round number in which an agreement was reached.

In general almost half of the agreements were reached during the second voting round, showing a quite high propensity of coordination. However, it seems also that the veil of ignorance slowed down the coordination process towards unanimity<sup>21</sup>. Indeed, in the no-veil treatment basically all the groups reached the agreement by the fourth round, while the veil “constrained” 25% of the groups to wait up to the sixth round to find a unanimous consensus on a scheme of tax rates.

21 The opposite was somehow expected since the veil of ignorance is supposed to homogenize players' perspectives concerning the distributive priorities.

Chart 1 - Round of agreement



During phase 1 in the baseline (veil) treatment a total amount of 198 (276)<sup>22</sup> votes were provided. In Charts 2 and 3 it is possible to observe the percent distribution of votes concerning the different tax regimes. In the two charts tax schemes are ordered from the one which maximizes the wealth of the player with the lowest income level (B) to the one with the most contained effects on the poorest player (C).

Chart 2 - Distribution of votes per tax regime

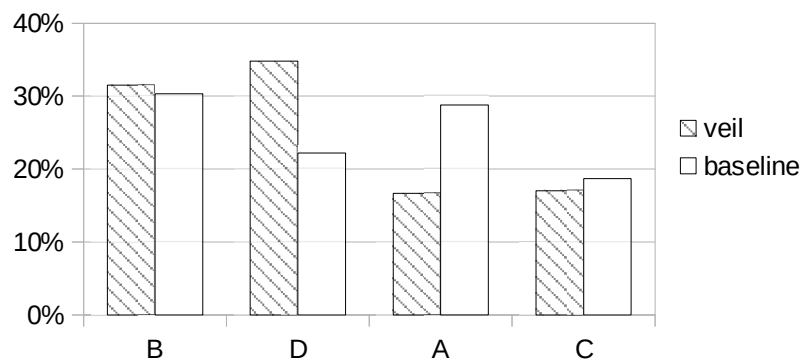
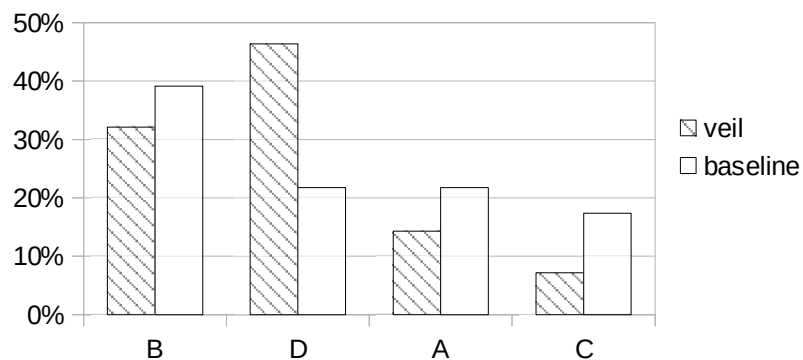


Chart 3 - Distribution of chosen tax regimes



<sup>22</sup> This is another evidence about the “unanimity slowdown” in the veil treatment compared to the baseline design: in the former case players voted on average 3.3 times, in the latter 2.8.

From the charts showed above we can claim that our hypothesis **H1** is, strictly speaking, disproved: the veil of ignorance did not produce any effect on the number of votes provided to the tax regime which maximizes the expectations of the least advantaged player, that is the tax scheme B. Nevertheless, the charts show that a veil effect exists, even if not in favour of the tax regime B. In particular, the veil of ignorance shifted the votes from the tax schemes A and C to the tax regime D, which is the second most advantageous for the player with the lowest level of income.

Indeed, in the veil condition the tax scheme D was chosen almost half of the times, compared to a 22% in the baseline treatment. This is an interesting empirical regularity. It shows us that there is a hard kernel of students thinking that the tax regime B is the fairest one regardless the treatment. On the contrary the veil produces an effect on a share of participants who are not really convinced about the fairness of the two least progressive tax schemes.

Furthermore, it is interesting to notice how the vote dynamic between the two treatments is mainly driven by male students (Charts 4 and 5).

Chart 4 - Distribution of female votes per tax regime

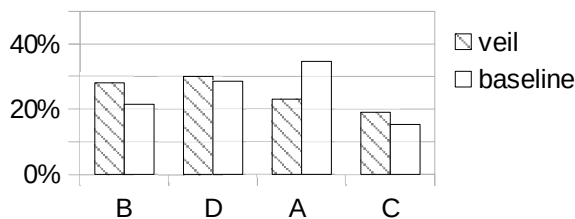
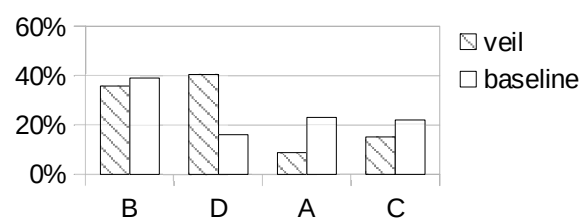


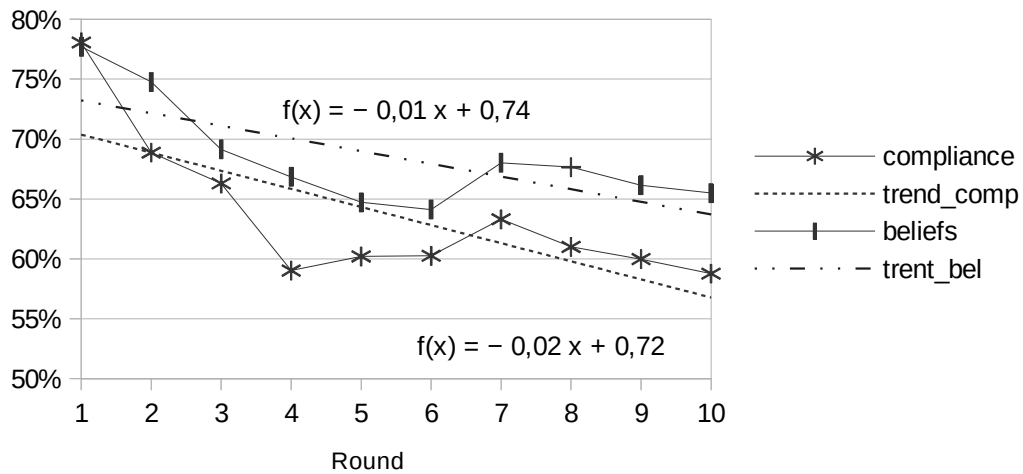
Chart 5 - Distribution of male votes per tax regime



As for the individual compliance, looking at the aggregate data (obtained by pooling together the two treatments), we cannot draw different conclusions from previous results achieved in repeated public good games without punishments (Fehr et al. 2002, Kroll et al. 2007, Ledyard 1995 and Chaudhuri 2011). Substantially the average individual compliance in the first round starts about 80% and then it steadily declines up to less than 60% in the last round<sup>23</sup> (Chart 6).

23 Compliance level might be higher than what it is usually find in the related literature, but in interpreting our results we have to take into account the participation effect generated by the voting procedure (see Section 1).

Chart 6 - Individual compliance and beliefs



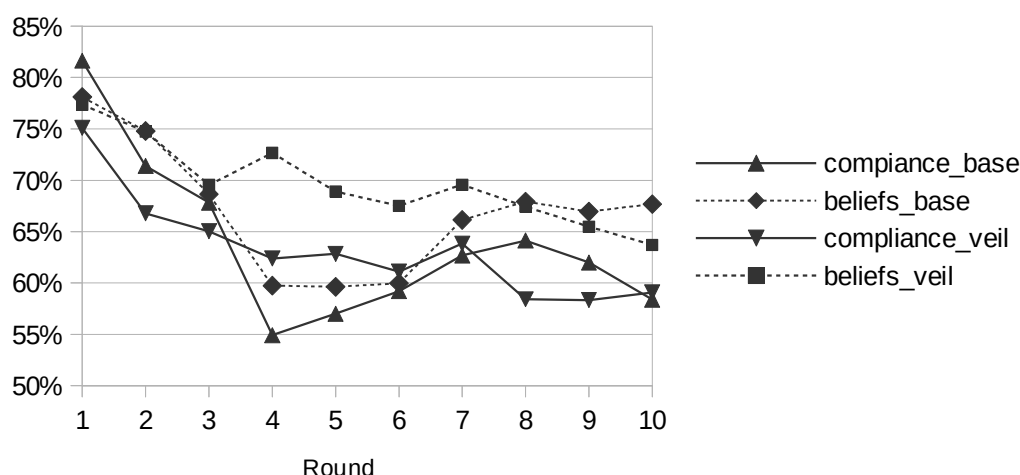
Focusing the attention on the aggregate predictions concerning others' compliance we can notice two interesting empirical facts. In the first instance, beliefs and compliance perfectly match (only) in the first round (78%). Despite this initial flawless match, from the second round onward a gap (average 4, maximum 7 percent points) emerges between the two variables.

In second place, even though the two measures slightly tend to diverge across rounds<sup>24</sup>, the compliance rate follows the beliefs path. In general this is consistent with the so called reaction theories (Attanasi 2008, Croson et al. 2004), which claim that individual choices and actions are basically driven by beliefs on others' behaviour. Thus players comply with a tax regime in the (discounted) measure they expect the other players in the group will comply.

When data are then the separated according to the treatment (Chart 7) we find that compliance in the first rounds is higher in the baseline treatment than in the veil treatment. However, in general, across rounds we do not observe any significant difference in compliance levels. On average compliance in the baseline design is 64%, while it is 63% in the veil treatment. This result is coherent with our hypothesis **H2**.

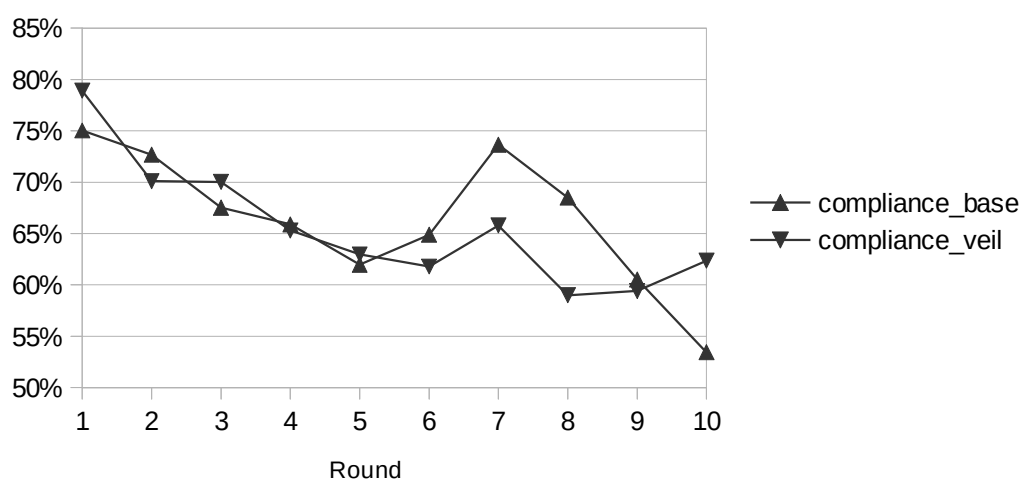
24 The increasing divergence between predictions and compliance might be due to the experimental structure. Subjects do not receive a feedback on others' individual contributions, but they are only shown the total tax revenue generated in each round. However, the fact that aggregated beliefs and average compliance follow a similar (decreasing) path (Chart 6) indicates that players can clearly adjust their behaviour in response to their beliefs.

Chart 7 - Individual compliance and beliefs by treatment



The just mentioned result is not as pleonastic as it might seem to be at a first glance. The consideration that about 25% of experimental subjects behind the veil of ignorance “changed their mind” and accepted a fairer tax regime to adopt in phase 2, joined with **H2** constitutes a result in favour of the veil of ignorance. Indeed, the fact that people can move to fairer tax schemes, where the tax rates are lower for the poorest and higher for the richest, without that this shift impacts on the average level of tax compliance (Chart 8) is certainly a merit of the veil of ignorance procedure, which should not be undervalued.

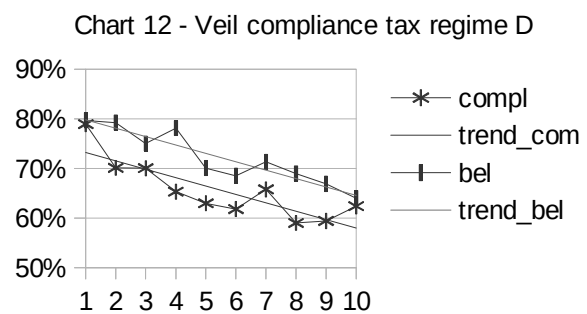
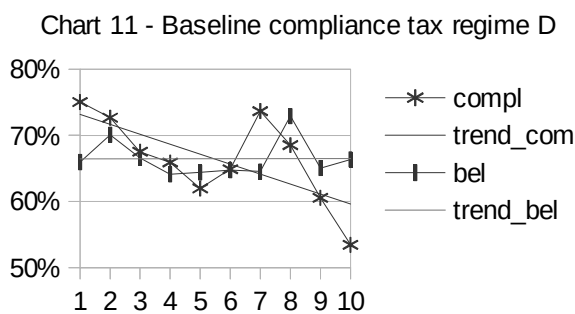
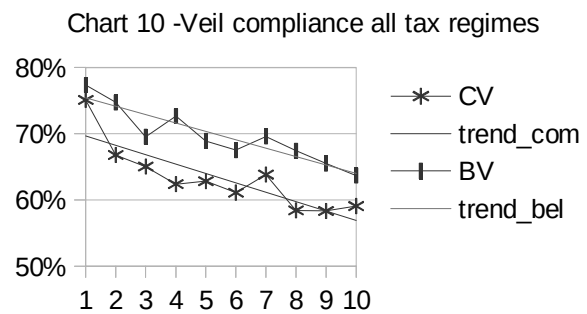
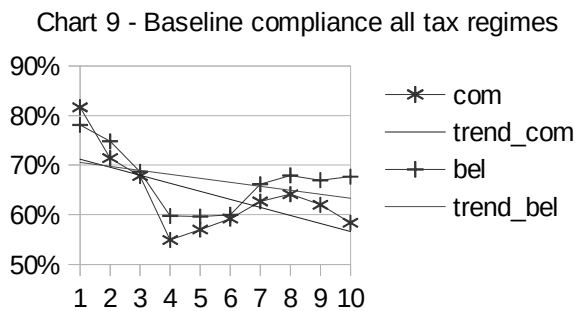
Chart 8 - Compliance tax regime D



Going back to the general dynamic of tax compliance, we observe (Chart 7) that in the veil treatment the compliance path is constantly decreasing, that is in our game compliance across rounds is neither self-enforcing nor stable as predicted by the theory.

Thus we have to reject **H3**. The rejection of the hypothesis results also focusing only on tax regime D (Chart 8), the one that impacted mostly on the deliberative voting in phase 1 and that produced the major reallocation of votes between the two treatments.

However, **H3a**, which according to (Grimalda et al. 2005) predicts an alignment between beliefs and compliance in the veil treatment is verified (Chart 10), while that is not true in the baseline treatment (Chart 9) because the two measures diverge across rounds. The effect of the veil on this two variables is even more evident when we focus on participants' behaviour and predictions who chose tax regime D. Looking at the trend lines of compliance and beliefs in the veil treatment (Chart 12) we can clearly see that the two measures, despite showing a constant gap, are almost perfectly aligned. On the contrary, in the baseline condition (Chart 11), the two measures do not have a common direction with regards to the tax scheme D.



However, even though behaviours are aligned to predictions, in our specific design choosing a non-binding (tax regime) distributive scheme behind a veil of ignorance did not produce a stable path of (tax) compliance as predicted. Instead, consistently with the standard literature, voluntary compliance keeps being fragile and the impossibility to

communicate or to sanction free riders after the agreement represents a strong limit to the duration of cooperation and therefore of compliance itself (Fehr et al. 2002, Kroll 2007 and Ostrom et al. 1992).

The fact that the impartial perspective offered by the veil of ignorance cannot generate, by means of sufficiently stable beliefs, a constant level of compliance across rounds has two immediate implications.

First of all the conclusions related the one-shot exclusion game (Faillo et al. 2008, Faillo et al. 2014, Sacconi et al. 2005, Sacconi et al. 2010 and Sacconi et al. 2011) may need to be reviewed in order to take into account the limited effect, also across time, of a (laboratory) non-binding agreement behind a veil of ignorance. Indeed, although the reciprocal conformity model (Grimalda et al. 2005) is verified, because round by round the compliance level is directly correlated with beliefs, the veil of ignorance cannot boost beliefs to keep compliance high across rounds<sup>25</sup>.

Furthermore, the results concerning the tax compliance levels in our experiment shed light on a portion of the “slippery slope” curve (Kirchler 2008 and Kirchler et al. 2018), which might have been misrepresented. In particular the “slippery curve” should be reshaped and conceived as an asymmetric curve, because it has not been proved yet that full tax compliance can be based on the sole “trust in authorities (people)”.

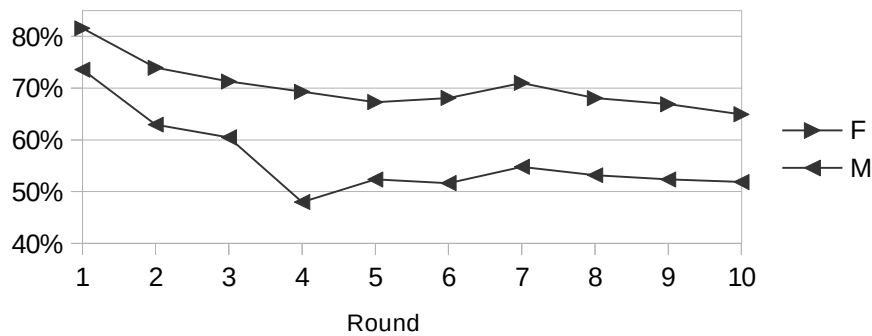
Given that in the two treatments we did not observe differences in compliance levels, we are allowed to pool the data together in order to identify some interesting empirical regularities which were not taken into account by the predictive hypothesis.

For example, consistently with previous studies (Kastlunger et al. 2010) there are on average almost 15 percent points of difference between male and female tax compliance (Chart 13). Instead, there are not observable differences concerning the field of studies (economic field versus all other disciplines).

25 More specifically, the dynamic concerning the update of beliefs in the should be enquired (Battigalli et al. 2005)

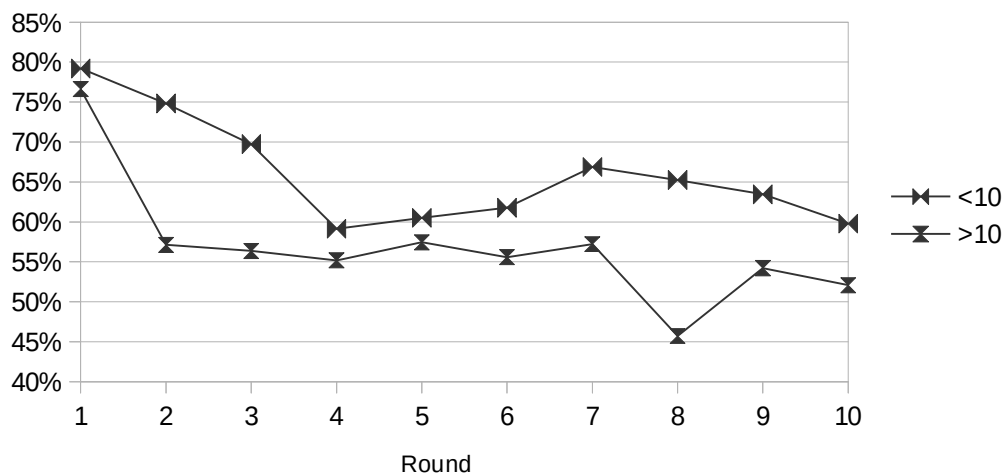


Chart 13 - Gender compliance



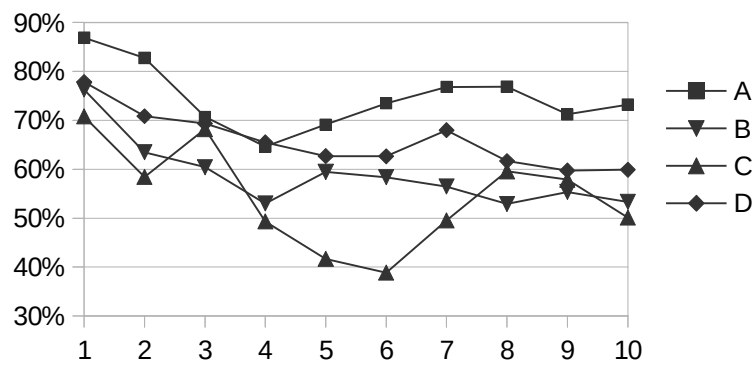
It is also interesting to highlight the differences in behaviours that emerge linked to the accumulated “experimental experience” (Chart 14). Despite starting about at the same level, players who previously took part in more than 10 experiments (compared to those who have less experience) show a huge drop in compliance between the first and the second round, and their compliance level keeps lower across all rounds.

Chart 14 - Individual compliance and number of previous experiments



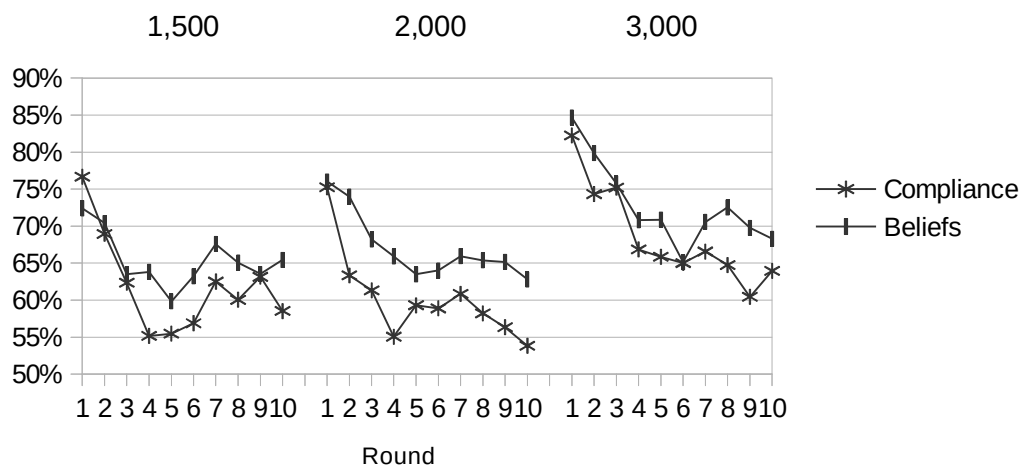
Focusing then the attention on some variables which are less general and more pertinent to the experimental design, we can observe differences in compliance rates between tax regimes (Chart 15). In particular, the chosen tax scheme had an impact on the ex-post compliance. In particular the tax scheme A was the most complied (on average 75%), while the tax regime C was that one with the lowest average compliance (54%). Compliance with tax scheme C was also constantly lower than compliance with the tax regime A.

Chart 15 - Individual compliance per tax regime



In the end we can observe that across rounds compliance was higher for the players endowed with the highest level of income (on average 69%). Taking into account also the related predictions, we can observe again (Chart 16) how behaviours are driven by expectations on others' compliance (Croson et al. 2004 and Grimalda et al. 2005). In particular it seems to be clear that rich players pay more taxes (in percent terms) than the poorest ones because they think the latter will comply more. The opposite occurs for the lowest level of income. Since poor players think that richer ones will contribute less, the former comply less (on average 61%).

Chart 12 - Compliance and income level (EMU)



## Conclusions

Moving from the exclusion game design, we tried to test some further hypothesis related to the Rawlsian social contract theory, in particular to the pure veil effect. Thus, with

our experiment we aimed to test the compliance dynamic related to a binding agreement reached behind a (laboratory) veil of ignorance. Our game, such as designed (with 3 players and 4 tax regimes), shows that the veil of ignorance procedure has an important effect on the votes allocation and a partial effect on compliance.

Indeed, the consideration that behind the veil of ignorance about 25% more (compared to the baseline treatment) of experimental subjects voted for a fairer tax regime with this choice having no impacts on the level of tax compliance represents a result in favour of the veil of ignorance. However, the laboratory veil could not generate a stable effect across time, because compliance showed to be monotonically decreasing round by round. These results have relevant implications not only for the Rawlsian moral psychology and its experimental literature, but also for the “slippery slope” framework.

A possible modification of our tax game might consider the introduction of some sanctioning mechanisms in the compliance phase, also because John Rawls himself in one passage admitted that tax compliance cannot rely on the sole sense of justice:

“even in a well-ordered society the coercive powers of government are to some degree necessary for the stability of social cooperation. For although men know that they share a common sense of justice and that each wants to adhere to the existing arrangements, they may nevertheless lack full confidence in one another. They may suspect that some are not doing their part, and so they may be tempted not to do theirs. The general awareness of these temptations may eventually cause the scheme to break down. The suspicion that others are not honoring their duties and obligations is increased by the fact that, in the absence of the authoritative interpretation and enforcement of the rules, it is particularly easy to find excuses for breaking them. Thus even under reasonably ideal conditions, it is hard to imagine, for example, a successful income tax scheme on a voluntary basis. Such an arrangement is unstable. The role of an authorized public interpretation of rules supported by collective sanctions is precisely to overcome this instability. By enforcing a public system of penalties government removes the grounds for thinking that others are not complying with the rules. For this reason alone, a coercive sovereign is presumably always necessary, even though in a well-ordered society sanctions are not severe and may never need to be imposed. Rather, the existence of effective penal machinery serves as men’s security to one another” (Rawls 199, p. 211).

## **Appendix: instructions of the veil treatment**

Good morning,

We kindly ask you to read carefully this instructions. The instructions will be also read aloud by one of the experimenters. If at the end of the instructions you will have any doubt, please raise your hand and wait for one of the experimenters to answer to your questions.

### **EXPERIMENT**

You are about to take part in an experiment which aims to investigate the tax attitudes of individuals who receive an income. During the experiment you will not be allowed to communicate in any way with other participants. If you violate this rule you will be excluded from the experiment without being paid. The amount of money you can earn will depend on your decisions and on those of other participants. The decisions you make will remain completely anonymous and no one will be able to associate your choices to your name. At the end of the experiment the payment will be made by a bank transfer to your bank account.

The experiment will be run using Experimental Currency Units (ECU). 4.000 ECU are equivalent to €1.00. You will also earn €3.00 as show-up fee (SF) and €2.00 if you win the bonus (B).

### **PHASE 1**

At the beginning of phase 1 you will be randomly assigned to a group of people composed by other two participants. Each group will therefore be composed by three subjects. The group will be permanent, that is its participants will remain the same until the end of the experiment.

In phase 1, along with the other two players of your group, you will have to vote for the tax rates scheme to adopt on three levels of gross income. The possible gross incomes are equal to 1.500 ECU, 2.000 ECU and 3.000 ECU and within the group there will not be two subjects with the same level of income. In phase 1 you will not know what level of income that will be assigned to you (this information will be communicated to you only in phase 2). Therefore you will have to choose the scheme of tax rates before you are assigned a level of income. The tax regimes you can choose from are shown in the paper table next to the keyboard of your computer station (Figure 2) and which you can consult at any time during the experiment. All values (except percentages) are in ECU.

**Figure 2 – Screenshot voting phase**

schema aliquote/reddito lordo	1.500	2.000	3.000	reddito netto + 1/3 gettito fiscale		
<b>schema A</b>	345 (23%)	560 (28%)	1.110 (37%)	2.565	2.850	3.300
<b>schema B</b>	135 (9%)	500 (25%)	1.380 (46%)	2.775	2.910	3.030
<b>schema C</b>	465 (31%)	620 (31%)	930 (31%)	2.445	2.790	3.480
<b>schema D</b>	285 (19%)	440 (22%)	1.290 (43%)	2.625	2.970	3.120

The scheme of tax rates must be approved unanimously, i.e. all the subjects belonging to a group have to express the same choice about the type of tax to adopt in phase 2. In phase 1 you will have 6 rounds to reach unanimity:

- if the unanimity will be reached in any of the 6 available rounds you and your group will proceed immediately to phase 2 of the experiment, where only the voted scheme will be available;
- if at the end of the round number 6 you will not reached a unanimous agreement on the tax scheme for you and your group the experiment will end here, and you will be paid only the show-up fee of €3.00.

## PHASE 2

Phase 2 is made up of a predetermined number of rounds that will not be announced, therefore none of you will know it. However, all the groups that will access phase 2 will have the same number of rounds available. At the beginning of phase 2 you will be randomly assigned one of the expected income levels: 1.500 ECU, 2.000 ECU or 3.000 ECU. Within the group there will not be two subjects with the same income level and the income that will be assigned to you at the beginning will remain the same for all the rounds of phase 2.

At each round of phase 2 you will be asked to decide how much tax to pay according to the own income and the tax rates scheme voted during phase 1. The total amount of taxes paid by each participant of the group will constitute the tax revenue of the group. The tax revenue will be then multiplied by a capitalization factor of 2.1 and after that it will be redistributed in the same proportion (one third) to each participant of the group.

In the same screen where you will declare the amount of taxes you wish to pay, you will be also asked to predict the behaviour of the other two participants of the group. The player who will provide the best predictions on all rounds of phase 2 will get a bonus (B) of € 2.00 which will be added to his final payment. If two (or three) players provide equally correct predictions, the bonus will be awarded to both (or all three).

If you and your group access phase 2, the amount in € you will earn will be determined as follows:

$$\sum (\text{assigned income in ECU} - \text{tax paid ECU} + 1/3 * (\text{tax revenue ECU} * 2,1)) / 4.000 \text{ ECU} * € 1.00 + € 3.00 \text{ SF} + [€ 2.00 \text{ B}]$$

Before proceeding with the experiment you will be asked to answer some brief control questions.

## References

- Ackert, L. F., Charupat, N., Church, B. K., & Deaves, R. (2006). An experimental examination of the house money effect in a multi-period setting. *Experimental Economics*, 9(1), 5-16.
- Aguiar, F., Becker, A., & Miller, L. (2013). Whose impartiality? An experimental study of veiled stakeholders, involved spectators and detached observers. *Economics & Philosophy*, 29(2), 155-174.
- Allingham M. G. & Sandmo A. (1972), *Income Tax Evasion: A Theoretical Analysis*, *Journal of public economics*, 1(3-4), 323-338.
- Alm J., Jackson B. R. & McKee M. (1993). *Fiscal Exchange, Collective Decision Institutions, and Tax Compliance*. *Journal of Economic Behavior & Organization*, 22(3), 285-303.
- Alm J., McClelland G. H. & Schulze W. D. (1999), *Changing the Social Norm of Tax Compliance by Voting*, *Kyklos*, 52(2), 141-171.
- Alm, J., & Torgler, B. (2011). Do ethics matter? Tax compliance and morality. *Journal of Business Ethics*, 101(4), 635-651.
- Andreoni, J., Erard, B., & Feinstein, J. (1998). Tax compliance. *Journal of economic literature*, 36(2), 818-860.
- Antinyan, A., Corazzini, L., & Neururer, D. (2015). Public good provision, punishment, and the endowment origin: Experimental evidence. *Journal of Behavioral and Experimental Economics*, 56, 72-77.
- Attanasi, G., & Nagel, R. (2006). Actions, Beliefs and Feelings: An Experimental Study on Dynamic Psychological Games.
- Attanasi, G., & Nagel, R. (2008). A survey of psychological games: theoretical findings and experimental evidence. *Games, Rationality and Behavior. Essays on Behavioral Game Theory and Experiments*, 204-232.
- Battigalli, P. and Dufwenberg, M. (2005): "Dynamic Psychological Games", mimeo, August 2005 (previous version: IGIER working paper 287)

- Becker W., Büchner H. J. & Slesnick, S. (1987), *The Impact of Public Transfer Expenditures on Tax Evasion: An Experimental Approach*, Journal of Public Economics, 34(2), 243-252.
- Bordignon M. (1993), *A Fairness Approach to Income Tax Evasion*, Journal of Public Economics, 52(3), 345-362.
- Bortolami F. & Mittone L. (2009), *Does Participating in a Collective Decision Affect the Levels of Contributions Provided? An Experimental Investigation*, Cognitive and Experimental Economics Laboratory, Department of Economics, University of Trento, Italia, (No. 0902).
- Bortolami F. (2009), *How to Explain the Participation Effect: Is It a Question of Different Expectations and Communication? A Preliminary Investigation*, Cognitive and Experimental Economics Laboratory, Department of Economics, University of Trento, Italia, (No. 0904).
- Braithwaite V. (Ed.). (2017), *Taxing democracy: Understanding tax avoidance and evasion*. Routledge.
- Casal S., Kogler C., Mittone L. & Kirchler E. (2016a), *Tax Compliance Depends on Voice of Taxpayers*, Journal of Economic Psychology, 56, 141-150.
- Casal S. & Mittone L. (2016b), *Social Esteem Versus Social Stigma: The Role of Anonymity in an Income Reporting Game*, Journal of Economic Behavior & Organization, 124, 55-66.
- Chang, J. J., & Lai, C. C. (2004). Collaborative tax evasion and social norms: why deterrence does not work. Oxford Economic Papers, 56(2), 344-368.
- Chaudhuri, A. (2011). Sustaining cooperation in laboratory public goods experiments: a selective survey of the literature. Experimental Economics, 14(1), 47-83.
- Cherry, T. L., Frykblom, P., & Shogren, J. F. (2002). Hardnose the dictator. American Economic Review, 92(4), 1218-1221.
- Cherry, T. L., Kroll, S., & Shogren, J. F. (2005). The impact of endowment heterogeneity and origin on public good contributions: evidence from the lab. Journal of Economic Behavior & Organization, 57(3), 357-365.



- Cialdini, R. B., & Goldstein, N. J. (2004). Social influence: Compliance and conformity. *Annu. Rev. Psychol.*, 55, 591-621.
- Cialdini, R. B., & Trost, M. R. (1998). Social influence: Social norms, conformity and compliance.
- Clark, J. (2002). House money effects in public good experiments. *Experimental Economics*, 5(3), 223-231.
- Croson, R. T. A. and Miller, M. (2004): Explaining the Relationship between Actions and Beliefs: Projection vs. Reaction, mimeo
- Dal Bó, P., Foster, A., & Putterman, L. (2010). Institutions and behavior: Experimental evidence on the effects of democracy. *American Economic Review*, 100(5), 2205-29.
- Degli Antoni G., Faillo M., Francés-Gómez P. & Sacconi, L. (2016), *Distributive Justice with Production and the Social Contract: An Experimental Study*, *Econometrica Working Papers*, N.60 September.
- Esarey, J., Salmon, T. C., & Barrilleaux, C. (2012). What Motivates Political Preferences? Self-Interest, Ideology, and Fairness in a Laboratory Democracy. *Economic Inquiry*, 50(3), 604-624.
- Faillo M., Ottone S. & Sacconi L. (2008), *Compliance by Believing: An Experimental Exploration on Social Norms and Impartial Agreements*, available at SSRN 1151245.
- Faillo M., Ottone S. & Sacconi L. (2014), *The Social Contract in the Laboratory: An Experimental Analysis of Self-Enforcing Impartial Agreements*. *Public Choice*, 163(3-4), 225-246.
- Fehr E., Fischbacher U., & Gächter S. (2002), Strong reciprocity, human cooperation, and the enforcement of social norms. *Human nature*, 13(1), 1-25.
- Feld, L. P., & Frey, B. S. (2007). Tax compliance as the result of a psychological tax contract: The role of incentives and responsive regulation. *Law & Policy*, 29(1), 102-120.

- Feld L. P. & Kirchgässner G. (2000), *Direct Democracy, Political Culture, and the Outcome of Economic Policy: a Report on the Swiss Experience*, European Journal of Political Economy, 16(2), 287-306.
- Feld L. P. & Tyran J. R. (2002), *Tax Evasion and Voting: An Experimental Analysis*, Kyklos, 55(2), 197-221.
- Filippin, A., Fiorio, C. V., & Viviano, E. (2013). The effect of tax enforcement on tax morale. European Journal of Political Economy, 32, 320-331.
- Fischbacher, U., & Gächter, S. (2010). Social preferences, beliefs, and the dynamics of free riding in public goods experiments. American economic review, 100(1), 541-56.
- Fischbacher, U., Schudy, S., & Teyssier, S. (2014). Heterogeneous reactions to heterogeneity in returns from public goods. Social Choice and Welfare, 43(1), 195-217.
- Frey, B. S., & Torgler, B. (2007). Tax morale and conditional cooperation. Journal of Comparative Economics, 35(1), 136-159.
- Frohlich, N., Oppenheimer, J. A., & Eavey, C. L. (1987). Laboratory results on Rawls's distributive justice. British Journal of Political Science, 17(1), 1-21.
- Gangl K., Hofmann E., & Kirchler E. (2015), Tax authorities' interaction with taxpayers: A conception of compliance in social dilemmas by power and trust. New ideas in psychology, 37, 13-23.
- Geanakoplos, J., Pearce, D., & Stacchetti, E. (1989). Psychological games and sequential rationality. Games and economic Behavior, 1(1), 60-79.
- Gintis H. (Ed.). (2005), Moral sentiments and material interests: The foundations of cooperation in economic life (Vol. 6). MIT press.
- Grimalda, G., & Sacconi, L. (2005). The constitution of the not-for-profit organisation: reciprocal conformity to morality. Constitutional Political Economy, 16(3), 249-276.
- Gürerk, Ö., Irlenbusch, B., & Rockenbach, B. (2006). The competitive advantage of sanctioning institutions. Science, 312(5770), 108-111.
- Harrison, G. W. (2007). House money effects in public good experiments: Comment. Experimental Economics, 10(4), 429-437.

- Harsanyi, J. C. (1978). Bayesian decision theory and utilitarian ethics. *The American Economic Review*, 68(2), 223-228.
- Hertwig, R., & Ortmann, A. (2001). Experimental practices in economics: A methodological challenge for psychologists?. *Behavioral and Brain Sciences*, 24(03), 383-403.
- Jackson B. R., & Milliron V. C. (1986), Tax compliance research: Findings, problems, and prospects. *Journal of accounting literature*, 5(1), 125-165.
- Kahan D. M. (1997), *Social Influence, Social Meaning, and Deterrence*, *Virginia Law Review*, 349-395.
- Kastlunger, B., Dressler, S. G., Kirchler, E., Mittone, L., & Voracek, M. (2010). Sex differences in tax compliance: Differentiating between demographic sex, gender-role orientation, and prenatal masculinization (2D: 4D). *Journal of economic psychology*, 31(4), 542-552.
- Kastlunger, B., Kirchler E., Mittone L. & Pitters, J. (2009). Sequences of audits, tax compliance, and taxpaying strategies. *Journal of Economic Psychology*, 30(3), 405-418.
- Keser, C., & Van Winden, F. (2000). Conditional cooperation and voluntary contributions to public goods. *The Scandinavian Journal of Economics*, 102(1), 23-39.
- Kirchler E. (2007), *The economic psychology of tax behaviour*. Cambridge University Press.
- Kirchler E., Hoelzl E., & Wahl I. (2008), Enforced versus voluntary tax compliance: The “slippery slope” framework. *Journal of Economic Psychology*, 29(2), 210-225.
- Kroll S., Cherry T. L. & Shogren, J. F. (2007), *Voting, Punishment, and Public Goods*, *Economic Inquiry*, 45(3), 557-570.
- Laury, S. K. 2006. “Pay One or Pay All: Random Selection of One Choice for Payment.” Georgia State University, Economics Center Working Paper Series 2006–24.
- Ledyard, O. (1995). Public goods: some experimental results. In J. Kagel & A. Roth (Eds.), *Handbook of experimental economics*. Princeton: Princeton University Press (Chap. 2).

- Masclet, D., Noussair, C., Tucker, S., & Villeval, M. C. (2003). Monetary and nonmonetary punishment in the voluntary contributions mechanism. *American Economic Review*, 93(1), 366-380.
- Mittone L. (2006), Dynamic behaviour in tax evasion: An experimental approach, *The Journal of Socio-Economics*, 35(5), 813-835.
- Mittone, L., & Ploner, M. (2012). Asset legitimacy and distributive justice in the dictator game: An experimental analysis. *Journal of Behavioral Decision Making*, 25(2), 135-142.
- Muehlbacher, S., Kirchler, E., & Schwarzenberger, H. (2011). Voluntary versus enforced tax compliance: Empirical evidence for the “slippery slope” framework. *European Journal of Law and Economics*, 32(1), 89-97.
- Nikiforakis, N., & Normann, H. T. (2008). A comparative statics analysis of punishment in public-good experiments. *Experimental Economics*, 11(4), 358-369.
- Nikiforakis, N., Noussair, C. N., & Wilkening, T. (2012). Normative conflict and feuds: The limits of self-enforcement. *Journal of Public Economics*, 96(9-10), 797-807.
- Orviska M. & Hudson J. (2003), *Tax Evasion, Civic Duty and the Law Abiding Citizen*, *European Journal of Political Economy*, 19(1), 83-102.
- Ostrom, E., Walker, J., & Gardner, R. (1992). Covenants with and without a sword: Self-governance is possible. *American political science Review*, 86(2), 404-417.
- Pickhardt M., & Prinz A. (2014), Behavioral dynamics of tax evasion—A survey. *Journal of Economic Psychology*, 40, 1-19.
- Pommerehne W. W. & Weck-Hannemann H. (1996), *Tax Rates, Tax Administration and Income Tax Evasion in Switzerland*, *Public Choice*, 88(1-2), 161-170.
- Rawls, J. (1963). The sense of justice. *The Philosophical Review*, 72(3), 281-305.
- Rawls J. (1999), *A Theory of Justice*, Revised Edition, Harvard University Press.
- Richardson G. (2006). Determinants of tax evasion: A cross-country investigation. *Journal of International Accounting, Auditing and Taxation*, 15(2), 150-169.
- Sacconi L. & Faillo, M. (2005), *Conformity and Reciprocity in the 'Exclusion Game': An Experimental Investigation*, University of Trento Economics working paper, (12).

- Sacconi L. & Faillo, M. (2010), *Conformity, Reciprocity and the Sense of Justice: How Social Contract-Based Preferences and Beliefs Explain Norm Compliance: the Experimental Evidence*, Constitutional Political Economy, 21(2), 171-201.
- Sacconi L., Faillo M. & Ottone S. (2011), *Contractarian Compliance and the Sense of Justice': A Behavioral Conformity Model and Its Experimental Support*, Analyse & Kritik, 33(1), 273-310.
- Sefton, M., Shupp, R., & Walker, J. (2007). The effect of rewards and sanctions in provision of public goods. *Economic Inquiry*, 45(4), 671–690.
- Spraggon, J., & Oxoby, R. J. (2009). An experimental investigation of endowment source heterogeneity in two-person public good games. *Economics letters*, 104(2), 102-105.
- Tammi T. (2011), *Contractual Preferences and Moral Biases: Social Identity and Procedural Fairness in the Exclusion Game Experiment*, Constitutional Political Economy, 22(4), 373-397.
- Torgler, B. (2002). Speaking to theorists and searching for facts: Tax morale and tax compliance in experiments. *Journal of Economic Surveys*, 16(5), 657-683.
- Tyran, J. R. and Feld, L. P. (2001) Why people obey the law. Experimental evidence from the provision of public goods. Working Paper, University of St. Gallen.
- Tyran, J. R., & Feld, L. P. (2006). Achieving compliance when legal sanctions are non-deterrent. *The Scandinavian Journal of Economics*, 108(1), 135-156
- Wahl I., Muehlbacher S. & Kirchler, E. (2010), *The Impact of Voting on Tax Payments*, *Kyklos*, 63(1), 144-158.
- Wenzel M. (2004), An analysis of norm processes in tax compliance. *Journal of economic psychology*, 25(2), 213-228.
- Wenzel M. (2005), Motivation or rationalisation? Causal relations between ethics, norms and tax compliance. *Journal of Economic Psychology*, 26(4), 491-508.