DOES PERCEIVED GOVERNMENTAL EFFICIENCY IN MANAGING TAX MONEY DRIVE COMPLIANCE? EVIDENCE FROM A TAX GAME

BĂTRÂNCEA LARISSA-MARGARETA
LECTURER PHD, „BABEŞ-BOLYAI” UNIVERSITY CLUJ-NAPOCA
FACULTY OF BUSINESS
larissabatrancea1707@yahoo.com

NICHITA RAMONA-ANCA
PHD CANDIDATE, „BABEŞ-BOLYAI” UNIVERSITY CLUJ-NAPOCA
FACULTY OF ECONOMICS AND BUSINESS ADMINISTRATION
ancanichita@ymail.com

BĂTRÂNCEA IOAN
PROFESSOR PHD, „BABEŞ-BOLYAI” UNIVERSITY CLUJ-NAPOCA
FACULTY OF ECONOMICS AND BUSINESS ADMINISTRATION
i_batrancea@yahoo.com

Abstract:
Tax compliance, i.e. citizens’ disposition to pay taxes either voluntary or enforced, is an extremely important topic at any moment, but mostly when governments have to finance public goods with few tax money. In the light of these realities, governments have to find ways of providing public goods by boosting tax compliance. In order to achieve this goal, various factors influencing compliance have to be considered among which the efficiency of the government in managing tax money. In an experimental tax game preceded by a self-reported tax compliance attitudes questionnaire, we show that the information concerning government’s efficiency significantly influences tax payments. Moreover, tax compliance attitudes act as a mediator between the independent variable scenario (i.e., information about government efficiency) and the dependent variable tax payments.

Keywords: tax compliance attitudes, economic experiment, government efficiency.

JEL classification: G02; G28; H26.

1. Introduction

From the early dawns of mankind, taxes have been a constant reality in all societies across time. According to Torgler (2007: 5) [26], Ancient Egyptians were no strangers to taxation as pharaohs levied significant amounts of money to accomplish their architectural visions. Along the process Egyptian rulers had to deal with tax evasion and corruption among tax collectors called “scribes”. If the first inconvenience was solved through increased “auditing” of taxpayers, the second one diminished through tighter monitoring of field tax collectors with the help of special tax collectors and granting higher salaries to all categories of collectors. In the same vein, the Rosetta Stone, the famous artifact that unraveled the meaning of hieroglyphs, contained information about the Egyptian taxation system retrieved from pictograms portraying a tax amnesty which ended with setting free imprisoned tax evaders and erasing their remaining debts. Moreover, Adams (1994: 8) [1] takes note of Ancient taxation issues reminding that pharaoh Khiti recommended his tax collectors to treat poor taxpayers with leniency, even erase debt or skip auditing if taxpayers barely made ends meet.

As societies evolved, the purpose of tax collecting has changed. If in the past taxes served as sources ready to finance rulers’ and state officials every whim, nowadays they are used to provide public goods from which both state officials and ordinary taxpayers can derive utility. Another notable difference is that today’s people are more aware of the importance of taxes for the evolution of society as a whole than they were in the old days. With respect to this issue, raising tax awareness is a key priority for tax authorities in various countries around the world. Besides media campaigns aimed at mitigating tax evasion and corruption, tax authorities try to incentivize taxpayers in
paying their share through decreasing taxes if paid before due date or granting special prizes to the most aware and active citizens. A notable example in this sense is given by the US Internal Revenue Service (IRS) which grants through its Whistleblower Office the “Informant Award” to any taxpayer who shares solid evidence about another person failing to pay taxes. Provided that the IRS uses his information, the taxpayer in question is entitled to receive up to 30% of the amount collected by the IRS from the exposed non-compliant person.

When it comes to paying taxes, two types of behavior can emerge: compliance and non-compliance. Tax compliance is defined by four characteristics (Franzoni, 2000: 54) [11]: 1) true reporting of the tax base; 2) correct computation of the liability; 3) timely filing of the return; 4) timely payment of the amounts due. If taxpayers fail to meet any of the four characteristics, their behavior is categorized as non-compliance. Depending on the reasons which drive taxpayers to pay their dues, compliance can be either voluntary or enforced as suggested by the “slippery slope” model (Kirchler, Hoelzl and Wahl, 2008) [16]. On one hand, voluntary compliance is positively linked to trust in tax authorities. According to the concept, taxpayers pay taxes on a voluntary basis because of several reasons, among which: duty to behave as model citizen; willingness to contribute to the well-being of other citizens; willingness to do the right thing (Kirchler and Wahl, 2010; Wahl, Kastlunger and Kirchler, 2010) [17]-[29] etc. On the other hand, enforced compliance is related to the power of tax authorities. According to the concept, among the reasons which boost enforced compliance are the following: risk of being audited and fined; willingness to avoid severe punishment (either financial through fines or legal through freedom deprivation); insufficient knowledge about taxation in order to ensure evasion without attracting authorities’ attention (Kirchler and Wahl, 2010; Wahl, Kastlunger and Kirchler, 2010) [17]-[29]. By the same token, depending on the legality of taxpayers’ actions, non-compliance can be avoidance or evasion. Tax avoidance refers to legally decreasing tax liabilities by using the loopholes into the tax law (Webley, 2004) [30], while tax evasion means deliberating breaking the law in order to decrease tax liabilities (Elffers, Weigel and Hessing, 1987) [10]. Tackling the issue of tax avoidance, US Supreme Court Justice George Sutherland mentioned that “the legal right of a taxpayer to decrease the amount of what otherwise would be his taxes, or altogether avoid them, by means which the law permits, cannot be doubted”. Therefore, if tax avoidance is tolerated in some countries and banned in others, tax evasion triggers negative attitudes everywhere around the world.

As Andreoni, Erard and Feinstein (1998) [4] briefly underline, tax compliance deals with the concepts of equity, incidence, and efficiency. Fiscal equity refers to levying fiscal liabilities by taxing citizens differently according to their contribution capacity. Thus, horizontal equity is achieved when taxpayers with similar situations are approached in the same manner: tax authorities set the same income tax for taxpayers belonging to the same social category. Namely, two taxpayers who obtain equal amounts of income from two different sources will pay the same income tax. The motto for horizontal equity is “equal treatment for equal taxpayers”, and its application eliminates the disadvantages of arbitrary fiscal discrimination (Hillman, 2003: 472) [14]. Vertical equity is achieved when taxpayers with different situations are approached in distinct manners: tax authorities establish different income taxes for taxpayers belonging to different social categories. Namely, two taxpayers who obtain different amounts of income from the same source will pay distinct income taxes. Although the two taxpayers contribute differently to the state budget, the concept of equity stands in the sense that both do the same sacrifice (i.e., give up to a percentage of their income for the benefit of the state). The motto of vertical equity is “equal treatment for unequal taxpayers” (Hillman, 2003: 472) [14]. Taking into account the abovementioned aspects, it can be stated that a tax system is perceived as equitable when every taxpayer is attributed a fiscal burden that matches his capacity of generating taxable income/revenue. Incidence refers to the study of the groups who bear the tax burden (Fuller ton and Metcalf, 2002) [12]. In other words, it assumes analyzing the effects of tax policies on the distribution of economic welfare (Kotlikoff and Summers, 1987: 1043) [18].

In the following the focus will be on the concept of efficiency, more precisely on governments’ efficiency in managing tax money. In theory, efficiency is defined as a ratio between the effort undertaken to generate a certain effect and the effect itself. Therefore, efficiency is at maximum when it generates the highest effect level with the lowest effort level. As leading economists Samuelson and Nordhaus (1998) [20] stated, a government is efficient in managing tax money when it uses these resources with maximum yield in order to satisfy taxpayers’ needs. In terms of effort undertaken with taxation, the government incurs certain costs to ensure proper tax collection, namely: implementing the fiscal policy through tax authorities; increasing awareness through media coverage about the importance of paying taxes; hiring tax agents for auditing and sanctioning non-compliant taxpayers; notifying taxpayers about unpaid taxes. When talking about the effect of taxation, it materializes through social and investment policies designed to provide adequate public goods.

Generally, governments which levy higher taxes also achieve higher efficiency in using tax money. One possible explanation for this economic reality is the fact that high levels of taxes make authorities more responsible and more accountable towards taxpayers. And this is because the only situation in which taxpayers are willing to
incurred high tax burdens is when the quality of public goods provided by the state match their financial efforts. For example, Scandinavian countries have one of the highest taxation in the world, but they also provide the highest quality public goods. Not to mention that according to the 2011 Transparency International Corruption Perceptions Index which measures the perceived level of public sector corruption and ranges from 0 (highly corrupt) to 10 (very clean), Scandinavian countries are the least corrupted countries in the world with Denmark and Finland ranking second (9.4), Sweden fourth (9.3), and Norway sixth (9). The efficiency with which governments manage tax money is influenced also by the type of democracy. In this sense, direct democracies (i.e., citizens make decisions on the tax system directly, without representation) seem to be more efficient than representative democracies (i.e., citizens vote for representatives who later make decisions on their behalf). Being a direct democracy, Switzerland has one of the most efficient tax money management in the world. The efficiency from the public sector spilled also into the private sector making Switzerland world-known “banker of the banks”.

There is definitely a positive two-way link between government efficiency in managing public funds, either perceived (through information provided by the media) or experienced (through the quality of public goods) and taxpayers’ levels of compliance. On one hand the more efficient the governments, the more compliant the taxpayers. Related to this issue, Scandinavian countries represent again the epic example: the high efficiency of their governments translates into a compliance level of over 95% among taxpayers. On the other hand, a high level of compliance can increase efficiency in the sense that costs of monitoring taxpayers and applying deterrent strategies decrease. Thus, governments have more tax money at their disposal to invest in public goods. Slemrod (1992: 7) [21] briefly elaborated on this aspect: “From the tax collection standpoint, it is extraordinarily expensive to arrange an enforcement regime so that, from a strict cost-benefit calculus, noncompliance does not appear attractive to many citizens. It follows that methods that reinforce and encourage taxpayers’ devotion to their responsibilities as citizens play an important role in the tax collection process”. If taxpayers develop the belief that the government inefficiently handles public money, this particular belief might influence their behavior and turn tax compliance (either voluntary or enforced) into non-compliance (either avoidance or evasion). To mitigate such negative consequence, governments have to implement transparent fiscal policies, give proper and prompt information to the taxpayers regarding any changes into the tax system, and be accountable for any of the decisions implemented.

The present study aims at investigating the extent to which perceived governmental efficiency drives tax compliance behavior. In addition, it also aims at exploring whether self-reported attitudes concerning tax compliance are mediating actual behavior elicited through a tax game. The remainder of the article is the following. Section 1 gives some directions concerning tax literature. Section 2 presents the method, with focus on the subject pool, material, and procedure used in the study. Section 3 is dedicated to the results and interpretations. The ending part of the paper contains the discussion and concluding remarks.

2. Literature review

Literature on tax compliance flourished after Becker’s “theory of crime” study and the publication of the first theoretical models of tax evasion (Allingham and Sandmo, 1972; Srinivasan, 1973; Yitzhaki, 1974) [2]-[22]-[28]. Since then, both theoretical and empirical research (either surveys or experiments) focused on one of the most intriguing and difficult to answer questions: why people pay taxes? This particular issue is known in the literature as the “puzzle of tax compliance”. Related to the aforementioned puzzle, Alm and Torgler (2011: 635) [3] take things forward by stating the following: “Still, the puzzle of tax compliance is not why there is so much cheating. Instead, the real puzzle is why there is so little cheating. Typically, the percent of all individual income tax returns that are audited is often less than 1% and the penalties on even fraudulent evasion are only a fraction of unpaid taxes. Virtually all economic models of taxpayer behavior conclude that there should be much more tax evasion than is actually observed. However, most people pay most of their taxes most of the time”. Indeed, the classical model of tax evasion (Allingham and Sandmo, 1972) [2] is built on the image of a taxpayer behaving like a typical Smithian homo oeconomicus: rational utility maximizer who will evade taxes every time opportunities arise, provided the benefits obtained from evasion exceed the costs of being sanctioned. In spite of these gloomy predictions, the majority of studies invalidate the main assumptions of the classical model of tax evasion and its results, namely that taxpayers evade almost all the time and that tax evasion correlates negatively with audit probability and punishment degree. Various authors suggested that, besides the economic standpoint, other perspectives (e.g., psychological, political, etc.) should be considered when analyzing compliance (for a detailed overview, see Kirchler, 2007; Andreoni et al., 1998) [15]-[4].

Regarding the economic factors which influence tax compliance, the list considered is somehow generous and includes among all predicting variables the following: audit probability (either one-shot or repeated), income, tax...
rate, and fine. For example, related to the variable income, Witte and Woodbury (1985) [31] propose and estimate a model concerning the implications of income tax law on compliance. According to their empirical results, compliance is negatively related to moral ambivalence and positively related to audit probability, information reporting and tax withholding. Guala and Mittone (2005) [13] investigate the influence of multiple audits on compliance behavior in a repeated tax game. The authors conclude that compliance mitigates in the rounds following an audit only to increase again along with the likelihood of another audit. This phenomenon is known in the taxation literature as the “bomb-crater” effect, notion coined by Guala and Mittone.

As for the psychological factors, for instance, Braithwaite (2003) [7] proposes an interesting concept measuring the distance between taxpayers and tax authorities called motivational postures. In her view, these postures express “the interconnected sets of beliefs and attitudes that are consciously held and openly shared with others” (Braithwaite, 2003: 18) [7]. The concept was developed by categorizing taxpayers’ statements concerning their exposure to the tax authorities retrieved from various self-report questionnaires. Thus, the five motivational postures are as follows: “commitment”, “capitulation”, “resistance”, “disengagement”, and “game-playing”. The first two express a small distance between taxpayers and tax authorities, while the last three show a large distance. “Commitment” characterizes taxpayers who want to pay taxes out of moral or ethical considerations. “Capitulation” refers to taxpayers who recognize authorities’ legitimacy and decide to cooperate with them. In the case of “resistance”, taxpayers are portrayed as aversive and always questioning authorities’ legitimacy, “disengagement” refers to taxpayers who decide not to get involved in the fiscal system, and “game playing” is familiar to taxpayers who are interested in identifying and using the loopholes into the tax law. Taking into consideration the two types of behavior (compliance vs. non-compliance), it can be stated that the first three represent attitudes of compliance, while the last two attitudes of non-compliance.

The category of political determinants includes besides government efficiency in managing tax money variables like tax law complexity, tax system complexity, or governance quality. Relative to latter variable mentioned, Torgler, Schaffner, and Macintyre (2007) [27] report data collected through field experiments, laboratory experimental, and surveys. The authors show that governance quality in general and voice and accountability, rule of law, political stability and absence of violence, regulatory quality and corruption control in particular impact on tax compliance.

3. Method

3.1. Participants

The subject pool was made out of 60 participants, all students in Economics from Babes-Bolyai University (61.7% females, age ranging between 19 and 23 years, $M = 21.2$, $SD = 1.01$, $MD = 21$); 71.7% coming from an urban area, 40% with work experience (41.67% in trade, 37.5% in services, 20.83% in agriculture). The subjects were recruited on a voluntary basis, from a database compiled by the authors during previous research studies.

3.2. Material and procedure

The procedure of the present research study consists of four steps which will be described in the following.

Step one: survey on compliance attitudes

First, subjects had to fill in a paper-pencil questionnaire. Each questionnaire was structured into two parts: 20 items concerning voluntary compliance (5 items), enforced compliance (5 items), tax avoidance (5 items), and tax evasion (5 items); socio-demographical data. Each item contained an answering scale from 1 = complete agreement/high probability to 7 = complete disagreement/low probability. The socio-demographical variables collected were age, gender, environment, work experience, and work domain. All items were adopted from the tax compliance inventory TAX-I (Kirchler and Wahl, 2010) [17]. The wording of the voluntary and enforced compliance items contained abstract terms, while the wording of the tax avoidance and tax evasion items contained concrete behavioral intentions.

More specifically, the four scales used in the questionnaire were as follows. The voluntary compliance (VC) scale included 5 items concerning taxpayers’ willingness to cooperate with tax authorities based on moral, ethical considerations, or social norms (e.g., “When I pay my taxes as required by the regulations, I do so because I regard it as my duty as citizen”). The enforced compliance (EC) scale contained 5 items referring to taxpayers’ perceptions of tax authorities’ power to deter non-compliant behavior (e.g., “When I pay my taxes as required by the regulations, I do so because a great many tax audits are carried out”). The tax avoidance (TA) scale was made out of 5 items expressing fictitious scenarios stating concrete legal mitigations of tax dues. At the end of the scenarios, participants were inquired about their likeliness of engaging in such behavior (e.g.,
You could take a detailed look at the tax regulations yourself to search for potential savings. How likely would you be to take this detailed look at the tax regulations? The tax evasion (TE) scale included 5 items, each describing also a fictitious scenario stating concrete illegal mitigations of tax dues. Like in the case of tax avoidance items, we asked participants how likely they would be to display such behavior (e.g., “A customer paid in cash and did not require an invoice. You could intentionally omit this income on your income tax return. How likely is it that you would omit this income?”).

For the translation of the questionnaire a double procedure with two independent translators was used in order to eliminate any possible inconsistencies: a first translation from English to Romanian was followed by a second one from Romanian to English. Completing the questionnaire took approximately 10 minutes.

**Step two: effort task**

After filling in the questionnaires, subjects had to perform an effort task consisting of counting ones from a sheet of paper with 129 ones and 135 zeros over a period of two minutes. The purpose of the task was to provide participants the opportunity of earning an income which would be later subject of a tax game. In addition, we wanted to involve participants in a lifelike situation and make them work for their income, as we were interested in taxes paid on wage income. We chose not to simply endow participants in the beginning of the tax game to avoid a lottery winning cognitive bias. According to mental accounting theory (Thaler, 1980; 1985; 1999) [23]-[24]-[25], people treat money differently especially when it comes from different sources, i.e. wage or lotto. Generally they value more money obtained thorough effort and have the tendency to squander money easily obtained.

Each one counted correctly was worth three experimental monetary units (EMU). The amount gained by each subject was determined as the number of ones counted correctly multiplied by three. If a participant reported a number of ones above 129, his income would decrease by the additional ones counted incorrectly multiplied by three. The following exchange rate was implemented: 1EMU = .05 lei.

**Step three: tax game**

In step three, participants were informed that they would have to perform a one-shot paper-pencil tax game which consisted of declaring the amount earned during the effort task and paying the income tax of 16%, according to the Romanian tax code. After the general instructions, participants received a scenario about government efficiency in managing tax money: half of the scenarios indicated that the government was spending tax money in an efficient way; the other half indicated that the government was spending tax money in an inefficient way. In the following, participants were given a standardized tax form requesting them to declare the income earned during the effort task, compute, and pay the 16% tax rate corresponding to this income.

**Step four: survey on reasons behind tax compliance behavior**

At the end of the tax game, participants filled in an ex-post questionnaire with both closed and open-ended questions stating the reasons for which they declared/not declared the entire income and paid all tax dues.

### 4. Results

As a first step into the analysis, we computed descriptives (mean, standard deviation, median, skeweness) and correlations between the 5 items of each scale in order to establish whether all items can be considered for further analysis. Table 1 contains this information.

<table>
<thead>
<tr>
<th>Item</th>
<th>M</th>
<th>SD</th>
<th>MD</th>
<th>Skeweness</th>
<th>VC1 Correlations</th>
<th>VC2</th>
<th>VC3</th>
<th>VC4</th>
<th>VC5</th>
</tr>
</thead>
<tbody>
<tr>
<td>VC1</td>
<td>3.02</td>
<td>1.61</td>
<td>3.00</td>
<td>-.05</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VC2</td>
<td>3.15</td>
<td>1.36</td>
<td>3.00</td>
<td>-.16</td>
<td>.74**</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VC3</td>
<td>3.17</td>
<td>1.48</td>
<td>3.00</td>
<td>-.10</td>
<td>.68**</td>
<td>.81**</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
As it can be observed from the table 1, all 20 items are suitable for further analysis as there were neither skewed items nor items generating floor or ceiling effects. Based on this fact, we obtained indices for the scales of voluntary compliance, enforced compliance, tax avoidance, and tax evasion by averaging the answers to the five items included in each scale. Furthermore, descriptive statistics (mean, standard deviations, median) were computed and the normal distribution was checked. According to both Kolmogorov-Smirnov and Shapiro-Wilk tests, data are normally distributed. Correlations of the four scales were also considered assuming a positive relation between voluntary compliance and enforced compliance, and between tax avoidance and tax evasion. In addition, we expect a negative relation between compliance scales (either voluntary or enforced) and non-compliance scales (either avoidance or evasion). These preliminary analyses are displayed in table 2.

Table 2. Descriptive statistics, Cronbach alphas, correlations of the voluntary compliance, enforced compliance, tax avoidance, tax evasion scales.

<table>
<thead>
<tr>
<th>Scale</th>
<th>M</th>
<th>SD</th>
<th>MD</th>
<th>Alpha</th>
<th>VC</th>
<th>EC</th>
<th>TA</th>
<th>TE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voluntary compliance (VC)</td>
<td>3.10</td>
<td>1.33</td>
<td>3.30</td>
<td>.94</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
From the above table, one can see that the assumptions regarding the positive and the negative correlations were confirmed and that the scales used in the questionnaire proved to be highly reliable.

Further, a principal component analysis (PCA) was conducted on the 20 items with orthogonal rotation (varimax). The Kaiser-Meyer-Olkin measure verified the sampling adequacy for the analysis, KMO = .90, and all KMO values for individual items were above .79. Bartlett’s test of sphericity \( \chi^2(190) = 1383.71, p < .001 \), indicated that the correlations between items were sufficiently large for PCA. An initial analysis was run to generate eigenvalues for each component in the data. Two components had eigenvalues over Kaiser’s criterion of 1 (11.76 and 3.75 respectively) and in combination explained 77.54% of the variance. Thus, we took into consideration two factors, i.e. compliance, containing the voluntary and enforced items and non-compliance, containing the tax avoidance and tax evasion items. All items showed factor loadings above 0.40.

In order to investigate the extent to which the perceived governmental efficiency in managing tax money drives tax compliance behavior, we ran a linear regression with scenario as predictor and tax payments as dependent variable, expecting that the relationship between the two is statistically significant. As mentioned before, variable scenario refers to the information given to participants with respect to the efficiency/inefficiency with which the government spends tax money, while tax payments variable indicates tax liabilities paid by participants during the tax game. As expected, scenario significantly predicted tax payments, \( \beta = .50, t(58) = 4.85, p < .001 \), meaning that the information given to participants shaped their decision to comply or not with tax requirements. Moreover, scenario explains a significant proportion of variance in tax payments, \( R^2 = .29, F(1,58) = 23.56, p < .001 \).

Mediation analyses
To determine whether subjects’ attitudes towards compliance influence their actual behavior in the tax game, mediation analyses were conducted with scenario as independent variable (IV), tax payments as dependent variable (DV) and compliance and non-compliance as mediators.

Mediating effect of compliance
In order to conduct mediation analysis as suggested by Baron and Kenny (1986) [5], we ran two additional linear regressions besides the one involving variables scenario and tax payments. The first regression studied the relation between variables scenario and compliance, while the second one between variables scenario, tax payments and compliance (as mediator). Regression analyses revealed significant influences of the predictor on the dependent variable. In the first case, scenario was related to compliance, \( \beta = 2.33, t(58) = 14.37, p < .001 \), and it significantly explained the variance in compliance, \( R^2 = .78, F(1,58) = 206.59, p < .001 \). In the second case, compliance had a significant influence on tax payments when scenario was also predictor, \( \beta = .16, t(58) = 2.01, p < .05 \), explaining a significant variance in tax payments, \( R^2 = .34, F(1,58) = 14.42, p < .001 \).

As it can be noticed in figure 1, the standardized regression coefficient mitigated significantly when controlling for compliance. Moreover, other two mediation conditions were fulfilled: scenario was a significant predictor of both compliance and tax payments.
Figure 1. Standardized regression coefficients for the relation between scenario and tax payments mediated by compliance.

Note: **p <.01; the number in parentheses indicates the standardized regression coefficient when the mediating variable is included in the analysis.

Running the Sobel test yielded the statistic $Z = 2.00, SE = .19, p = .04$. Therefore, according to this analysis, it is confirmed that compliance significantly mediates the relationship between scenario and tax payments. Regarding the type of mediation, based on the fact that the correlation between IV and DV has been reduced to a non-significant level due to the mediator we can state that a full mediation has been identified. In addition, the indirect effect and the total effect have to be considered: the first is represented by the value of the initial correlation between IV and DV which now goes through the mediator to the DV; the second is represented by the correlation between the IV and DV. The ratio between the indirect effect (.41) and the total effect (.54) equals .76 meaning that more than two thirds (76%) of the effect of the IV on DV goes through the mediator, and only less than one third is direct. Thus, full mediation is also supported by this ratio.

*Mediating effect of non-compliance*

Like in the first mediation analysis, we ran two additional linear regressions. The first regression referred to the relationship between variables scenario and non-compliance, while the second one referred to the variables scenario, tax payments and non-compliance (as mediator). Significant influences of the independent variable on the dependent variables were confirmed. Thus, in the first regression, scenario influenced non-compliance, $\beta = -1.89, t(58) = -6.00, p < .001$, and it significantly explained the variance in non-compliance, $R^2 = .38, F(1,58) = 36.05, p < .001$. In the second regression, non-compliance was related to tax payments when scenario was the second predictor, $\beta = -1.10, t(58) = -2.43, p < .05$, explaining a significant variance in tax payments, $R^2 = .36, F(1,58) = 15.73, p < .001$.

Although the abovementioned relations reached significance ($p < .001$), variable non-compliance does not qualify as a mediator because the standardized coefficient of the relationship scenario-non-compliance-tax payments is higher than the coefficient of the original relationship scenario-tax payments (Baron and Kenny, 1986) [5]. Figure 2 confirms this conclusion.

![Diagram showing the relationship between scenario, non-compliance, and tax payments]

Figure 2. Standardized regression coefficients for the relation between scenario, tax payments, and non-compliance.

Note: **p <.01; the number in parentheses indicates the standardized regression coefficient when non-compliance is included in the analysis.

*Ex-post questionnaires analysis*

In the ex-post questionnaire, participants indicated the reasons behind their tax compliance behavior. Figure 3 shows the overall answers given by the participants.
As it can be seen in figure 3, half of the participants indicated that complying with the tax law and thus paying entire taxes was the “right thing to do”. At the other end, only 10% didn’t pay taxes on the basis that they “found opportunities not to comply”. Taking into consideration variable gender, the distribution of participants’ reasons is presented in the following two figures.

In the case of both men (61%) and women (49%), the foremost tax compliance reason was the “right thing to do”, meaning that the majority of participants complied voluntarily and paid all tax dues. Regarding men, the second reason in ranking was “decided not to comply”, indicating that 22% of male participants evaded taxes during the tax game. Regarding women, the second ranked reason was “tax system not efficient”, meaning that 32% female participants complied on an enforced basis even though the tax system was not efficient. These results are in line with recent studies focused on gender behavioral differences stating that women are more prone to following social norms and are more risk averse than men (e.g., Croson and Buchan, 1999; Eckel and Grossman, 2008; Loewenstein et al., 2001) [8]-[9]-[19].

5. Discussion and conclusions

The present study focused on highlighting a possible relationship between taxpayers’ compliance behavior and the perceptions regarding government’s efficiency in managing public funds. Moreover, we investigated whether attitudes towards compliance/non-compliance act as a mediator in the relationship between perceived efficiency of the government and tax payments.

The subject pool consisted of 60 Economics students from Babeș-Bolyai University recruited on a voluntary basis. They were randomly selected from a database compiled by the authors during previous research projects. Financial incentives were provided according to participants’ performance in the study. The behavioral data was collected on a paper-and-pencil basis after the implementation of four steps as follows: an ex-ante questionnaire measuring attitudes toward compliance with emphasis on voluntary compliance, enforced compliance, tax avoidance, and tax evasion; an effort task designed to provide participants with the opportunity of earning income
based on performance in a restricted time period; a tax game in which participants had to declare the income earned during the effort task, compute and pay 16% taxes corresponding to this income; an ex-post questionnaire aimed at eliciting participants' compliance/non-compliance reasons.

The methodology used in the data analysis was various, ranging from descriptive statistics, correlations, reliability analysis, factor analysis, regression analysis to mediation analysis.

First and foremost, we computed descriptive statistics for the compliance/non-compliance items in the ex-ante questionnaire to check their suitability for further analyses. All 20 items were considered fit, and moreover, they proved to be highly reliable with Cronbach alphas of 0.94 and above.

Next, a principal component analysis (PCA) with orthogonal rotation was run on all 20 items included in the ex-ante questionnaire administered before the tax game. Based on the resulting eigenvalues and the fact that the highlighted components accounted for 77.54% of total variance, we took into consideration two factors (compliance and non-compliance).

Mediation analyses (Baron and Kenny, 1986) [5] run on the relation between perceived government efficiency and tax payments (with compliance and non-compliance as mediators), backed by the Sobel test, revealed that compliance did qualify as a mediator.

In the end we analyzed participants' reasons to comply stated in the ex-post questionnaires and concluded that most of them paid tax dues because this was the “right thing to do”. Variable gender had also influence on reported reasons, with women being more inclined to follow social norms and being more risk averse than men.

The study has some limitations. Firstly, all participants were students with little or no experience in tax payments, aged 19-23, which may not be familiar with tax legislation. Secondly, the employed sample might not be entirely representative for the student population, as not all students had the chance to be included in the database compiled by the authors. In the light of these realities the reported results should be interpreted with caution.

The shortcomings of this study pave the avenues for future research. One possible avenue is to run the study on representative samples of both students and experienced taxpayers. This would enable us a comparison between the two categories in order to detect possible differences and generalize findings to a certain degree. Another path to develop the study would imply organizing field experiments to check if behavior elicited during the tax game matches behavior in real situations. Last but not least, the study could be replicated in other countries to stress upon the cross-cultural differences between taxpayers and tax legislation.

All in all, the reported results highlight the significant impact of the perceived government efficiency on tax payments. In other words, the more a government is perceived as efficient in managing tax money the more taxpayers comply with existing legislation. In addition, they suggest that taxpayers’ behavior also falls under the incidence of attitudes towards compliance, especially the voluntary and enforced compliance instances. Therefore, governments should make additional efforts in raising their efficiency levels. In response to their actions, taxpayers’ voluntary compliance level could increase, thus giving governments more financial resources to provide citizens with high quality public goods.

Acknowledgements
This work was supported by the project “Post-Doctoral Studies in Economics: training program for elite researchers–SPODE” co-funded from the European Social Fund through the Development of Human Resources Operational Program 2007-2013, contract no. POSDRU/89/1.5/S/61755.

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