



# MASS MEDIA ON TAX FRAUD

## Abstract

*Mass media has a huge influence in our daily life. The clothes we wear, the music we like or the country where we want to live can be influenced by the way we perceive our world through the news. However, no one has analyze so far the impact these news can have in one our main columns as a society, our tax system.*

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## **Introduction and Hypotheses.**

Taxes are a vital column in our society. By paying our taxes we contribute to our social security system and have public services such as health or education. However not everyone agrees in the necessity of this and considers governments should not provide these services as a private system would be more efficient as not everyone has the same necessities. This is, among others, one of the multiple arguments people use to justify and evade taxes. But, what is more interesting is that, although they do not want to pay, they as individuals still pay more than the standard model predicts they should pay as rational individuals if those evaders would truly think they wouldn't need these services.

This seems to contradict what people use to think about underreporting their income when doing their declaration. We might have come with the wrong idea that we pay because otherwise we will be caught and fined for sure. However, if we take a look at this problem from a mathematical point of view, chances of being caught are pretty small while the benefit of not paying our taxes is higher compared with the odd probability of being fined. This is what Allingham and Sandmo (1972) stated in their model more than 40 years ago. From that moment onwards, many have tried to find an explanation for this inconsistency and understand why we pay more than expected contradicting our rational instinct.

Some researchers found as a possible explanations the existence of third agents in the system. (Kleven, Kreiner, and Saez, E. ,2009) Others concluded that we overestimate the probability of being audit or caught as we are more afraid of the lost than attracted to the reward. (Scholz and Pinney, 1995). Notwithstanding, there is a third explanation that it is not based in extrinsic but intrinsic motivations. In this sense, Cowell (1990) is the first author to make a deeply analysis of the intrinsic motivations such as guilty, duty or support for the institutions among others to explain why we do not avoid our obligations as citizens, at least not as much as we could.

These intrinsic motivations when putting them all together is what people tend to define as tax morale and that can be summarized as our personal reasons to pay taxes in addition to our legal obligations. Many studies have been written analyzing the intrinsic and also some extrinsic motivations that determines our tax morale. However, no one has previously consider the effect mass media has on them and how the news or the way of broadcasting the information might also have an influence. Mass media can make us feel more or less guilty,

more or less in debt with the government to pay our taxes or even make us feel that we are a weirdo for not cheating as is part of our nowadays culture.

For this reason, this paper tries to analyze the previous literature regarding tax fraud, focusing in tax morale, an extend the knowledge in this matter including mass media as another factor that might influence the citizens' behavior. In order to do so, it looks at the previous studies that have analyzed the effects of mass media in other fields such as politics or people concerns in order to search for a link between tax fraud and mass media. This study do not focus only in the news but considers also the way the news are broadcasted, the order in which they appear and tries to analyze the multiple effects news might have in us as individuals.

In this sense, based on the previous literature the following hypotheses are tested through this thesis.

*H1: News that inform about tax fraud but do not include the fine or punishment for the fraudster create a "call effect" by reducing our tax morale, making easier to justify tax fraud.*

*H2: News that inform about tax fraud and includes the fine or punishment for the fraudster create an adverse effect by increasing our tax morale, making harder to justify tax fraud.*

These hypotheses, apart from the previous studies included in the literature review, are mainly based on the herd behavior idea discussed among others by Banerjee (1992). According to this theory, people look at others decision and make their own according to what have been the consequences experimented by other individuals. Hence, by seeing others committing fraud, we are tempted. However, whether the fraudster is fined or not makes the difference. Mass media has different ways to tell the same story or include specific information that can make us notice the consequences or not.

In order to analyze and test these hypotheses, section II analyzes the previous literature related with tax fraud, specially tax morale and mass media. After that, and experiment that includes the basic principles that need to be consider in order to test these hypotheses is described. Due to the limited resources that I have for this thesis the experiment is conducted on an alternative method, a survey. Once the data has been gathered, I proceed to analyze the results in order to confirm or reject the previous hypotheses. In the last part of this thesis the implications of this study as well as the possible problems faced during this work and its possible solutions for future research are discussed.

## **Literature Review**

Since Allingham and Sandmo (1972) model, many papers have been written in the last decades studying tax evasion and its possible reasons. Until that moment, most of the papers analyzed the relation between taxation and risk taking but did not delve into the factors that affected individual's decisions when considering whether or not to evade taxes.

Allingham and Sandmo (1972) model helped to show how people decide whether to report the total amount obtained during the tax year, a partial amount or nothing at all depending on the expected benefits from the money they evade and the cost of being caught. This model focuses only on the monetary costs and benefits. Cost of evading arise when there is a risk of being audit. Therefore, when no audit is feasible or unlikely to occurs, individuals will not declare anything at all or a very small part as benefits are larger than costs. This assumption seems to contradict the empirical evidence where tax compliance seems to be high compared with the probability of being audited (Andreoni, Erard and Feinstein, 1998; Dwenger, Kleven, Rasul, and Rincke, 2014).

Clearly, there are some factors that researchers need to consider when studying what drives people behavior when reporting their taxes that Allingham and Sandmo did not consider in their first model. For this reason, in order to connect the empirical evidence with the theoretical analysis, different studies have been developed in order to find those factors that could explain these differences. Among the studies that tried to explain why we see such a high level of compliance regardless of the low audit probability we can interfere three major explanations.

(Kleven, Kreiner, and Saez, E. ,2009; Kleven, Knudsen, Kreiner, Pedersen and Saez, 2011), argue that even though an audit from the tax authorities per se is low, the use of third agents such as firms, banks or shops might work as well as a way to control for evasion. In this sense, they analyze the differences between the income the individuals need to include by themselves in their tax return (self-reporting income) or the income that has been already provided by a third agent to the tax authorities such as your salary (third-party reporting). In both studies they show how the income that has to be self reported is more frequently underreported than the income that has been already reported to the tax authorities by a third party. As most of our income comes from third parties, this might explain the differences we see between the model that does not consider these third party agents and what we

observe in the data obtained from real life. Nevertheless, they also mention that in addition to these third party agents, there are other reasons we need to consider.

One of these arguments and the second explanation used to justify this inconsistency between the model developed by Allingham and Sandmo and the empirical evidence is the one that says people overestimate the probabilities of being audit (Scholz and Pinney, 1995). By using the Duty Heuristic, an extension of the "low-information rationality" approach (Popkin, 1991) they argue that the duty citizens have for paying taxes or follow the rules, might interfere with the risk they perceive associated with breaking the law or underreporting their income on their tax return. Hence, those individuals that have a higher feeling as a citizen will perceive a higher risk of evading while those who do not feel that duty with their government will perceive a lower risk. In addition to this idea, they propose something very important for this study which is the fact that increasing penalties do not reduce tax evasion if citizens remain unaware of this increase. However, increasing their duty as citizens might affect tax evasion by tricking their perception.

What can be highlighted about this study and second explanation is the fact that, regardless they are discussing how people perceive the risk, they start including some factors that are also related with the third explanation and the one this paper will discuss about. These are mostly intrinsic motivations, but also extrinsic factors, that all together lead to what is known as tax morale. In any case, the two previous explanations play a major role for understanding tax evasion and needs to be included also as the three alternatives proposed complement each other.

Nevertheless, once those two alternatives have been explained it is time to focus on the literature written about the main point of this paper and the factor that is going to be studied through this thesis . In this sense, it is useful to start with the work of Cowell (1990). The last explanation proposed to understand the difference between real life and the model comes from a mostly intrinsic point of view. In this sense, Cowell (1990) indicates that taxpayers might not only consider monetary amounts but take into account also social norms and feeling of guilt. Hence, Cowell is considering social factors that might have an effect at the moment the individual decide whether or not to evade.

Cowell (1990) is one of the first authors that used intrinsic motivations to explain possible differences between the model of Allingham and Sandmo (1972) and the data obtained from real life. From that moment onwards, different authors have been working on these intrinsic

motivations to define, understand and see how they can be used to improve tax filing all over the world by modifying our tax morale.

In order to dig deep into this concept, it is a good start to give a more detailed definition of tax morale. According to the OECD, tax morale can be defined as "the motivation of a country's citizens to paying taxes, in addition to legal obligations" (C. Daude H. Gutierrez A. Melguizo, 2012). This definition refers to the moral obligation of paying taxes according to a citizen's duty. However, other authors prefer to relate this term with economic terminology such as utility. Hence, Luttmer and Singhal (2014) define tax morale as a "term capturing non-pecuniary motivations for tax compliance as well as factors that fall outside the standard expected utility framework". According to these authors, tax morale includes those factors that do not report a monetary benefit or increase our utility, at least according to our standards. These definitions do not exclude each other. What both definitions might imply is the fact that tax morale is more linked with the feeling of guilt than with an expected reward for doing things right as Scholz and Pinney (1995) already explained in order to understand why people overestimate risks when analyzing the options of being caught.

The definition of tax morale hence implies a feeling of guilt not related with a monetary cost. Therefore, it is useful to know what can have an effect in this feeling and how can be used to decrease tax evasion as fines or auditing might not be as effective as expected. Due to the importance of this for the governments, the OECD has studied which characteristics and factors are higher related with tax morale (C. Daude H. Gutierrez A. Melguizo, 2012)

In the study of the OECD, they divide the variables that have an effect on tax morale in two groups. Socio-economic characteristics such as marital status, religion, gender, education, employment, economic status and economic problems and variables related with the institutions such as support for democracy, trust in government or preferences for redistribution. From all these variables, those that are more relevant when asking people if they find justifiable to evade taxes are, support for democracy, age, trust in government, gender, religion and education. Even though there are more socio-economic characteristics that are highly related with tax morale, those variables related with the institutions have a higher weight.

But, how can someone use this knowledge? According to C. Daude H. Gutierrez A. Melguizo (2012) old people and females have a higher tax morale and regardless the fact that governments cannot change the gender or make people older they can at least consider this information when developing awareness campaigns regarding taxes. Furthermore, B. Torgler

(2005) studied how tax morale in Switzerland were higher compared to other countries due to the fact they have a participative democracy. By letting citizens participate in the country's decisions, government might send a message of trust. Hence, by increasing participation of citizens in the political agenda of a country, tax evasion might decrease.

On the other hand, some governments prefer to use that feeling of guilt that might drives our tax morale directly. The HMRC for example keep and update a list with the name of individuals who deliberate evaded taxes<sup>1</sup>. Meanwhile the city of Patna in Bihar, India prefers a more intrusive method and uses singers in front of shopkeepers to force them to pay their taxes. However, some governments have an alternative method that focus on the good citizens or those with high-paying taxes instead of focusing on the evaders. For example, The Bureau of International Revenue from Philippines released in 2014 the country's top 500 individual taxpayers for 2013. The list included sportsmen, businessmen and some government officials. Even television and print campaigns have been used in some countries like Italy<sup>2</sup>.

On the other hand, it is clear that the media have a huge effect in our perception and how individuals perceive the environment and the institutions. The effect of advertisements in our life is obvious. Italy tried to get advantage of this by using a campaign to denounced tax evaders and define them as parasites. However, advertising is not the only way governments or individuals can use media to change our minds. Sometimes while we are watching the news on television we can see that depending on whether the channel is liberal or conservative, the same story can be told in completely different way. Hence, television news programs might have a higher impact that what we like to believe in our lives.

This is exactly what Iyengar, Peters and Kinder (1982) proved with a simple experiment. By manipulating the newscast of either ABC or NBC, they studied how people prioritize and give more importance to those problems they see on television and in special those that appears at the beginning of the news. Is it true that they cannot change completely the way people think in general but just reinforce individual's preferences as some researchers already stated (Patterson and McClure 1976; Sears and Chaffee, 1978). They can decide which problems are more important for the people by selecting the right news. As Cohen (1962) said, "mass media may not be successful much of the time in telling people what to think but the media are stunningly successful in telling their audience what to think about".

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<sup>1</sup> <https://www.gov.uk/government/publications/publishing-details-of-deliberate-tax-defaulters-pddd>

<sup>2</sup> [http://www.nytimes.com/2011/08/09/business/global/italy-tries-to-get-tax-cheats-to-pay-up.html?\\_r=1](http://www.nytimes.com/2011/08/09/business/global/italy-tries-to-get-tax-cheats-to-pay-up.html?_r=1)

However, including these news to make these issues part of our daily life it is not the only way newscast can affect us. Iyengar and Simon (1993) studied three different effects, Priming, Agenda-Setting and Framing. Priming effect, creates an opinion in citizens prior to an event. Agenda-setting effect determines the weight we give to different problems depending on the time used during the news covering that problem. Framing is easier to explain by dividing the way we broadcast the news in two different groups, thematic and episodic. Episodic looks at the news as something individualistic and people place the blame in that individual feeling less sympathy and at the same time less related with the problem and therefore with looking for a solution. Thematic presents the issue as a general problem. There is no concrete person to blame and therefore people feel more related with that issue and with a possible solution as they feel they are part of the problem.

Therefore, we can focus the attention of people and make them feel guilty on different levels. We can make tax fraud one of the main concerns of our society by including these news just at the beginning of the newscast, using the right amount of time, and making this problem something thematic and not Episodic. However, still another problem might appear if we don't make this right. It could be possible that by bombarding citizens with so many news involving tax fraud they finally accepted this as something normal and inevitable. Basically the human being imitates what it sees. Hence, if someone sees repeatedly people evading taxes and not being punished, might be that he accepts this as a big problem but at the same time, considers he should do the same as people are not being punished. Might be that this sounds a bit familiar for some south-European readers.

Following this way of thinking is something we do every day without realizing we are doing it. When we decide whether we have dinner in this or in that restaurant, if we should go to the cinema to see the action or the drama movie and so on, most of the time our decision is highly affected by what others have done previously (Banerjee, 1992). This same process occurs in any citizen's mind when deciding whether or not do something that might be against the law. Most of the times we found ourselves asking "If the neighbor did it, Why I shouldn't?" However we do not look only at our neighbor to make a decision, we also consider what our society do in general. Then, if most of the individuals do commit fraud as anyone can see every day in the news, it is hard to consider fraud as a negative action even though law says that. If everyone does it, we can do it and we are not any worse than others. This is the self-concept maintenance developed by Mazar, Amir and Ariely (2008) that allows people to cheat just a little without losing their concept of being the most honest individuals as others are even worse.



The above is just a summary of all the possible reasons to explain why the first model ever created to explain tax fraud differs from reality. Focusing at the behavioral factors and also including most of the main literature regarding the influence of mass media and herd behavior. There are multiple factors that drives our behavior and that contradicts the classical economy theory. Factors, variables and elements that make us behave irrational. Nowadays, mass media is something common in our daily life, reading the news, watching the newscast or checking the digital newspapers are a daily routine in our lives. However, its effects have not been analyzed regarding something with we have to deal every day in the news and that are the cases of fraud. Can be an international organism, a famous football player, actors, even presidents and a long list, fraud is a something that is always in the news but the effects this might have in us as taxpayers has not been analyzed before.

## **EXPERIMENT**

To analyze the correlation and possible effects of mass media in tax fraud, I developed an experiment that could test and measure for possible effects. After that and using as a reference the experiment, I created a survey that could be conducted due to the impossibility of running the experiment. The idea behind the experiment as well as the survey is described below.

### **What I want to test with this experiment?**

I want to analyze the effect of mass media in tax fraud. Investigate the effect of the news in the willingness of individuals to cheat when they see fraud has been committed by recognized people but punishment or sentence is not public or there is no punishment at all. In addition to this, I would like to test also if there is any difference in the willingness to cheat when individuals are aware of the sentence.

### **How many treatments do I need?**

For the experiment I will need three treatments. First treatment will not be influenced at all. This will be our control treatment. Second treatment will receive stimulus by negative news related with corruption involving recognized people that were not punished. Finally, third treatment will be influenced by news related with corruption involving recognized people that were judged and sentenced.

Experiment will be divided in two parts, in the first part subjects will be influenced by the news while they are waiting in an individual room for the second part of the experiment. In the second part of the experiment I will measure the influence of the stimulus that the individuals have received during the first part of the experiment. In order to measure only the effects, the environment for the second part will be similar for all subjects in the experiment for each treatment.

### **How can I influence the subjects? Part 1**

Before measuring tax fraud, I need to influence subjects to analyze the effects.

Individuals will be placed in separated rooms where they will wait for the official experiment to start. These rooms will be the waiting rooms. In the waiting rooms where

subjects will stay before starting with the "official" experiment, there will be placed a television screen and newspapers with different news depending of the treatment. During the first part of the experiment, subjects will receive different stimulus from television and newspapers depending of the treatment.

Individuals shouldn't be aware that those elements are there to influence their behavior. In real life not everyone read the news or watch the television. I would like to control for this effect by not forcing subjects to interact with the stimulus during the waiting period and just let them interact with them if they want to.

In order to develop the setting for the first part, I will use as a base-line the work of Iyengar, Peters and Kinder (1982). In their paper, they analyze the effects of television news programs on the political ideas of individuals.

For the first part of the experiment, I will adapt the experiment conducted by the authors. In this case, the experiment will have the following conditions:

Rules first part:

- Subjects will wait the same time in the room before entering into the second room to complete the second part of the experiment. Time in the waiting rooms have to be enough to let individuals interact with the elements if they want to. Hence, they will wait for 5 minutes in the room. While they wait in the room, television will be off for subjects in treatment 1, showing images of a case of tax fraud involving recognized people that have not been sentenced for subjects in treatment 2 or, showing images of a case of tax fraud involving recognized people that have been sentenced for subjects for treatment 3. Regarding the television, sound will be on.

Subjects will wait alone in these waiting rooms, after those 5 minutes they will start with the second part of the experiment where is it possible to analyze if there is any effect on tax fraud depending on the stimulus.

- As mentioned above, conditions in the waiting rooms will be different for each different treatment but similar for each individual within the same treatment.

- Treatment 1: Television will be switched off. No newspapers will be located in the room. Subjects in this treatment will receive no stimulus before entering in the second part of the experiment.

- Treatment 2: Television will show a recorded news program from an online media. Among different news, treatment 1 will visualize news related with the corruption that involves different world wide rich recognized people.

<https://www.youtube.com/watch?v=z9CbvRzOK5w>

In this program, they just mention famous people involved in this case without including any punishment, fine or possible consequence for the people involved. Newspapers including this case or others similar to this one will be located also in the room

- Treatment 3: Television will show a recorded news program from an online media. However, in this case, video will show a recognized person that has been sentenced by the cases of corruption where he has been involved.

<https://www.youtube.com/watch?v=aHwVX0dkr38>

Video clearly mention the penalty as well as the ban from participating on any sport's activity for 8 years.

Newspapers including this case or others similar to this one will be located also in the room

### **How can I measure tax evasion? Part 2**

Second part will recreate a progressive tax system. Conditions are similar for all treatments. Hence, I can measure the differences among treatments based on the first part.

For this second part of the experiment, I use as a reference a similar experiment ran by Friedland, Maital & Rutenberg (1978) but without including modifications among treatments as they did. All of them will participate with the same rules.

#### Rules second part:

- Subjects in this part will participate in the experiment at the same time. Once they leave the waiting rooms, they will be gather together in the second room where an experimenter will read the instructions (Appendix 1) before starting with the experiment.

- Subjects will be informed about the conditions and "tax laws" that are applicable in the room while doing the second part of the experiment. They will receive a document with instructions explaining how to proceed to declare taxes during the experiment (Appendix 2), a table where they will declare all the information relevant for each period (Appendix 3) and tax rates applicable in this experiment (Appendix 4)

- Subjects will receive a fix amount during each of the ten periods. This will be their salary. This amount will be the same for every individual. This amount increases each period for all the participants in the same proportion.

-At the end of each period, they will report their gross income and taxes according to the instructions they received at the beginning of the second part of the experiment. They can keep the instructions during the experiment

- After reporting their taxes for each period, one of the subjects will be audited randomly. Auditing will happen in each period with a 50% probability. Probability of being audited will be equal to  $\frac{N-(N-1)}{N} \cdot 100$  where N will be the number of subjects in the treatment.

-If the subject audited has committed fraud, he will be fined with ten times the amount that was not declared (Gross income - Reported income), this amount will be deducted from his/her net income and will be taking into account for the final net income in order to determine the reward at the end of the experiment.

- After ten periods, individuals will receive an amount that will vary depending on the final net income they have and that will be equal to their Gross income - Taxes - Fines. Hence, those who evaded taxes and were not caught are more likely to receive a higher reward, while those who were fined will be highly penalized and therefore, reward will be much lower.

-Communication is not allowed during the second part of the experiment among subjects.

Risk aversion will have an important influence and therefore we need to control for it. Reward will be provided depending on the final amount. Those individuals with a higher net income at the end of the experiment will be rewarded with a higher amount. Hence, we incentive evasion in an equal form for everyone but including sanctions at the same time as in a normal environment. Even though reward will never be lower than 0 regardless of the final net income, if the final amount of an individual is negative we will subtract an amount from a show up fee that individuals receive at the beginning of the experiment just for participate-

### **Participants and specific conditions.**

The experiment will be a "between subjects" experiment divided in two parts; second part will be divided in ten periods. There will be a fix show up fee that allows to subtract earnings in case an individual come up with a negative amount at the end of the experiment and a variable reward that will be related with the performance during the task.

For the experiment, control treatment is expected to have a higher variance as it has no influence and therefore different results are more likely. On the other side we have two treatments that will be influenced and therefore outcome could be easier to predict. Therefore, initially a lower variance can be assumed for them. For simplicity in the explanation I assume variance is equal for both.

Regarding the cost of each observation, treatment 3 will have a lower fraud rate than treatment 2 while control treatment will be in the middle. Nevertheless, in order to simplify the experiment we will assume an equal price for the three observations by assuming that no matter what, the three treatments have the same maximum price. By using this simplification we can determine the proportion of individuals by merging treatment 2 and 3 in one when comparing with control treatment. In this sense I will use the following terms:

$n_1/n_2$ =proportion of participants for control group with respect to treatments 2 and 3

$\sigma_1$  = variance for control treatment

$\sigma_2$ = variance for treatments 2 and 3

$p_1$ = price for control treatment

$p_2$ = price for treatments 2 and 3

To solve the proportion I will use the equation:

$$\frac{n_1}{n_2} = \frac{\sigma_1}{\sigma_2} \cdot \sqrt{\frac{p_2}{p_1}}$$

Where  $p_2=p_1 \rightarrow \sqrt{\frac{p_2}{p_1}} = 1$  and therefore  $\frac{n_1}{n_2}$  depends only on the variance for the treatments.

In this regard, I consider treatments 2 and 3 have a lower variance than control treatment therefore  $\sigma_2 < \sigma_1$ . For the purpose of this experiment I assume  $\sigma_1=0.3$  and  $\sigma_2= 0.2$  which means that for control group it is necessary to have 1.5 times more individuals compared to treatment 2 or 3. Hence, there are 10 individuals for treatment 2 and 10 for treatment 3, control group requires 15 individuals in order to correct for the different variance.

Depending on the total number of individuals available for the experiment, I create groups for each treatment where I keep a fix percentage of 50% women 50% men for each treatment in order to control for gender differences. Finally, in order to control for other differences,

used of an heterogeneous group is recommended. Students should be the best option for this purpose.

**Reward system. Incentives**

Experiment has two incentives. A show up fee that allows to subtract money in case any of the participants end up with an amount lower than zero and an amount that varies depending on the final net income. The higher the net income, the higher the final amount a participant can receive.

## **SURVEY**

In order to test the effect of mass media in tax fraud I need to find a way to influence individuals and measure any possible deviation from their standard behavior in normal circumstances. Even though an experiment is the optimal alternative to measure any influence, due to different limitations, such as monetary limitations among others, I will use a less useful but still valid method to measure the effects of different news.

The method used to analyze the effect of mass media for the purposes of this thesis is an online survey without any monetary compensation for the participants but that tries to keep the spirit of the experiment explained above. First problem for this method is that there are not options to create an online survey that allows to run a survey where options are assigned randomly without paying. Hence, I create three different surveys and send all of them to every participant. Then, participants can choose any of the links I sent them.

Survey for control treatment does not include any news while treatment one and treatment two include the news mentioned above in the experiment. Regarding the questions, they are the same for the three surveys. In this sense, questions regarding gender, age and occupation in order to define and control for external differences are included.

Initially I tried to focus on an specific target group, students. Some researchers have argued that students are not always the best option as for instance in this case they do not have much experience filing a tax form and often they come from families with a higher than average income, which bias the sample (Fehr et al, 2003). On the other hand, some studies investigate whether students reported different results from other subjects. In this sense Baldry (1987) found no differences in the responses between students and other subjects. Nevertheless, due to the low response rate, I analyze the total sample without any restriction but controlling for age and level of studies.

Regarding the surveys, they only differ in the elements that have an influence in the behavior of the subjects while questions remain the same for the three of them. In this sense, another problem I have to face is the fact that if subjects participate in a game like this one, due to the lack of incentives they do not have reasons to cheat and deviate from standard behavior. While cheating usually implies a benefit with the possibility of a punishment with an unknown probability, in this case, cheating would only imply a lost as experimenter will realize



subject is lying while cheater obtains no benefit from this deviation. Therefore I need to find an alternative to measure tax fraud.

Tax morale might be related with tax fraud on an indirect way and at the same time people tend to lie less about their personal opinion. Therefore, if it is possible to find a link between tax morale and tax evasion, tax morale could be used as a proxy to measure on an indirect way tax evasion. Hence, by analyzing changes in tax morale depending on the information people perceive in the news by substituting the news by the videos mentioned above in the experiment, is possible to measure effects in tax fraud.

By using the Hard-to-tax taxpayers (those individuals that frequently try to avoid paying taxes and are not easy to caught by the tax authorities) Alm, J., Martinez-Vazquez, J., & Schneider, F. (2004) found a correlation between tax morale and tax evasion through the shadow economy. Alm et al (2004) argue that the shadow economy of a country can be a useful but still an imperfect measure of tax evasion. At the same time, they find a negative correlation between the shadow economy of a country and the tax morale of taxpayers. Hence, as long as the government does not take actions to stop the shadow economy and reduce tax evasion, tax morale of individuals remains low. On the other hand when the government does take actions, individuals become aware of the problem and increase their awareness regarding this problem. Tax morale increases.

Therefore, we can assume that tax morale is highly related with tax evasion and that news and different actions taken by multiple agents in an economy have an influence in our tax moral and therefore in the level of tax evasion. Hence, in order to measure the effects of the news on tax fraud, is possible to use tax morale as a proxy. To measure how watching fraudsters being punished or fraudsters committing fraud without consequences can alter our tax morale and based on the results, analyze how can tax fraud can vary.

In this sense, survey presented in this work uses a question similar to that one presented in the European Values Study to measure individuals' tax morale which is the dependent variable. This question is presented alone for control treatment, while for treatments 1 and 2 is included with two different videos for each treatment. In these videos, the same news is broadcasted in a different way. Regarding the independent variables, I include those factors that according to the OECD have a higher influence in tax morale. According to Daude, C., Gutiérrez, H., & Melguizo, Á. (2012) these variables are, in order of importance, support for democracy, age, trust in the government, gender, whether an individual is religious and his/her educational background. Links for the surveys can be found in Appendix 5.

## **Data, Method and Results.**

I obtained the data using an online survey through the website survey monkey. I couldn't have a single survey that assigned individuals randomly to different treatments. Therefore I created three different surveys and give the option to all the respondents to choose one of them. In order to allow individuals to choose an answer one survey of the three available I post them on Facebook and other social medias. Initially I included the three different options with the same layout, being control treatment the first option and treatment two the last option. I realized that the order in which the surveys were included had an effect also in how the people selected the survey they answered. Hence, I modified the order when I re-post the surveys again on Facebook and other social medias. In any case, they were still able to choose the survey they want to answer. Creating a randomization problem.

Once I got the results I reviewed the responses to delete those values that showed some inconsistencies. First step is to remove from the data those responses that are not complete and miss two or more relevant answers. In this sense only one response was missing two or more answers. Another survey was missing one question. In order to avoid dropping this information I decided to include it but using a proxy for this blanket space in the answer. Second step was confirm that every individual answer only one survey. In order to do so I analyze the IP. Even though I mentioned that the survey was anonymous I realized later that survey monkey includes the IP of the computer where you fill in the survey. I checked for duplicates as some subjects already told me they had filled in the three surveys even though the statement included with the survey when posted on social media specifically indicated that they should choose one and only one survey of the three options to complete it. For this reason, I checked and removed those surveys with a duplicated IP. However, I also considered the responses for different questions as sometimes a family or a couple might be using the same computer. This is the case for a Lebanese couple where both spouses completed the survey from the same computer. In such case I did not remove their answers.

Finally, treatment 1 and 2 included a video that tries to influence respondents' tax moral. Hence, it is important to check that respondents watched the whole video and therefore, an effect can be expected. I checked the time people used to complete the survey. If the time is lower than the time someone needs to watch the video or at least most of the video so they

can catch the message I remove the answers too as they probably did not watch the video and hence no effect might be interfere.

Once the data has been filtered I have a total of 69 valid answers out of 83 I had initially. As I mentioned before, the order in which I included the survey on Facebook clearly had an effect on the way people choose to answer. Hence, CT and Treatment 1 have many more answers than T2 as CT and T1 were the first and second option while T2 was the third option initially. In this sense there are 31 answers for CT, 24 for T1 and 14 for T2. Regarding the responses, I categorize the answers as in the paper written by Daude, Gutierrez and Melguizo (2012) in order to make easier to compare the final results. Therefore, for the analysis I consider the following conditions for the independent variables:

- Religion: I included it as a binary variable that takes value 1 if the individual identifies with any religion and 0 otherwise.
- Support for democracy: It is a variable that ranges from 1 to 3 Being 1 strong democrat to 3 not democrat at all.
- Trust in the government: It is a variable that goes from 1 to 5 where 1 means individual does not trust the government of the country where lives at all and 5 individual fully trust the government.
- Age: Instead of considering the age as a linear variable, I directly divided the age in different intervals. These intervals go from 18-25 to 75+. There are a total of 7 possible values. Hence, possible values go from 1 to 7.
- Gender: Another binary variable that takes value 1 when respondent is a female and 0 when is a male.
- Nationality: There are a total of 11 different nationalities being Spanish the predominant one following by Dutch.
- Work Status: Options go from student to disable. A total of seven options that take value 1 to 7.
- Educational attainment: Again seven possible options that go from no studies to PhD. Therefore, seven possible options that go from 1 to 7.
- Treatment: In order to analyze the effect of the news, I consider the treatment as another variable. In this sense, there are three possible values, 1 CT, 2 T1 and 3 T2.

The distribution of the responses for the independent variables can be found in **Appendix 5**. This is how responses are distributed before making any correction or change on them.

Apart from the independent variables, we have the dependent variable I want to analyze. The dependent variable which I am measuring in this study is tax morale, previously described in the literature review. This variable can take values from 1 to 10. Being one individual "can never justified tax fraud" and ten "can always justified tax fraud". Initially I considered creating a binary model to analyze the results according to a probit model by splitting the answers for the dependent variable in two separated groups, pro-fraud and anti-fraud. However, this change grouped different answers within the same category, missing some relevant information. Furthermore, all the answers for treatment three fall in the same category. Hence, this method was useless to analyze this treatment. For this reason I finally decided to use a simple regression.

Next step is to change any string variable we may have in our data set to numerical variables. In this case, I only need to change variable Nationality to a numerical variable. However, when looking at the distribution of the nationalities in Appendix 1 we can see that most of the respondents are from Spain, while there are only 5 Dutch respondents and multiple other nationalities with only one or maybe two respondents. Hence, when analyzing the correlation between nationality and the dependent variable, Tax morale, I found a problem with data. There is only one possible answer for multiple nationalities whether is 1 or 0. As there is only one respondent per nationality, it is impossible to analyze differences within a country as a consequence of the other independent variables. For these cases, Stata drops this data. An option to avoid losing this data is to group all the European countries and all the Non European countries in order to analyze a possible difference and possible changes in tax morale among continents. Hence, before converting this string variable into a numerical variable, I recode the variable and split it among continents.

I do a similar change with WorkStatus, instead of keeping that variable as a categorical variable with four options, I create a dummy variable with two possible values, working and not working, avoiding again that Stata might drop some of the answers from the analysis. Once I correct all the variables it is time to start the analysis of the data.

First step is to determine if there is a real effect as a consequence of the treatments and therefore, conclude partially that news might have an influence on the individuals. In order to analyze this, I check if there is a difference between the expected result I can obtain from an individual under the treatment and an individual without treatment. Easiest way to check this, is to analyze the expected results from treatment and control groups. Hence, I group the two

treatment groups under the same variable and compare it with the control group using a Wilcoxon rank-sum test, also known as the Mann-Whitney U test.

Test analyzes if two samples are from a population with the same distribution and hence, if there is any difference in the results, it might be related with the treatments. I want to understand if the difference in tax morale can be explained by the treatments instead of external factors. Hence, I select Tax Morale as the variable I want to test and compare treatment groups (0) with control group (1). Null hypotheses of this test, indicates that samples are independent and there are no external differences. In such case, differences might be understood as a consequence of the treatments if there is any. After running the Mann-Whitney U test, I obtain a value of  $p=0.0659$  **Appendix 6**. I do not reject the null hypotheses and conclude that the distribution in both groups is the same. In any case, I have other independent variables that still might have an effect in tax morale. In this sense, I need to check individually the possible influence of these independent variables in our dependent variable, tax morale. Considering the number of responses obtained, Fisher exact test is the best alternative for this purpose. This test analyzes if there is a relation between the binary dependent variable and the independent variables. However, dependent variables need to have two categories too. To solve this problem I make the dependent variable a binary variable where value 4 marks the threshold for justifying tax fraud only for this analysis.

Hence, I convert all those non-binary variables into binary variables with two categories in order to analyze if there is any influence. Once I convert the variables and run the test I obtain the following p-values **Appendix 7**: Religion 0.282; Trust in Government 0.035; Support for Democracy 0.000; Nationality 0.172 and; Work Status 0.161. According to these p-values. I can interfere only a possible connection between variables Support for Democracy and Trust in Government with Tax Morale. For all the other independent variables I cannot reject the null hypotheses.

Nevertheless, I want to see also the possible effects of these variables in Tax morale. Even though most of the variables apparently do not have a significant effect in the dependent variable, I will keep them to avoid a regression with only two variable. Hence, next step is to analyze any possible interaction between the independent variables and the dependent variable. I use the variable Tax Morale unmodified for this purpose, running a simple regression.

Dependent variable: Tax Morale	
Independent Variables	
<b>TREATMENTS</b>	
<i>CONTROL GROUP</i> <i>(Reference Level)</i>	-
<i>TREATMENT 1</i>	-0.240 <i>(0.395)</i>
<i>TREATMENT 2</i>	-0.316 <i>(0.478)</i>
<b>RELIGION</b>	0.431 <i>(0.344)</i>
<b>SUPPORT FOR DEMOCRACY</b>	1.056*** <i>(0.259)</i>
<b>TRUST IN GOVERNMENT</b>	0.215 <i>(0.192)</i>
<b>AGE</b>	-0.061 <i>(0.220)</i>
<b>GENDER</b>	-0.360 <i>(0.326)</i>
<b>CONTINENT</b>	-0.025 <i>(0.597)</i>
<b>WORK STATUS</b>	-0.025 <i>(0.394)</i>
<b>LEVEL OF STUDIES</b>	0.000 <i>(0.178)</i>
<b>CONSTANT</b>	0.053 <i>(1.148)</i>
R-Squared	0.349
Nº of Observations	69
<i>Standard errors are reported in parenthesis</i>	
<i>* p&lt;.10 **p&lt;.05 ***p&lt;.01</i>	

First thing that pops out to the eyes of the reader is the fact that treatment 2 and 3 are not statistically significant when compared to control treatment. This means that initially, treatments are not correlated with the dependent variable, tax morale. According to this data and results, the way of telling the same new apparently has effect or at least is not related with changes in tax morale according to the responses.

However, support for democracy is related with tax morale according to this data (p-value 0.000). Due to the problems gathering the data for this thesis and the fact that respondents

could choose the survey they filled, I cannot interfere an effect but only a correlation between the independent variable and the dependent variable.

According to the previous results, I was expecting a correlation also between Trust for the government and Tax Morale, however, this is not the case. (p-value 0.275) On the other hand, all the other variables remain statistically insignificant and therefore, no correlation can be interfered.

However, there is a small chance of finding a correlation between the treatments and the dependent variable Tax Morale. Might be that when grouping both treatments and compare it with the control group this option becomes significant. It could be possible that treatments have an effect but way of telling the new does not affect the response. Hence, might be treatment 1 and treatment 2 have an effect and increase or decrease tax morale compare when we do not have any external influence as for the control group.

To analyze this option, I group treatment one and treatment two under the same category, treat. Hence, those respondents that selected the option with the treatments represent one category while the respondents that selected the option with no treatment represent the second category. Once I do this modification I can proceed to run the regression.

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Dependent variable: Tax Morale

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Independent Variables

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<b>TREATMENT</b>	0.266 (0.360)
<b>RELIGION</b>	0.434 (0.341)
<b>SUPPORT FOR DEMOCRACY</b>	1.065*** (0.250)
<b>TRUST IN GOVERNMENT</b>	0.217 (0.190)
<b>AGE</b>	-0.056 (0.216)
<b>GENDER</b>	-0.364 (0.322)
<b>CONTINENT</b>	-0.020 (0.592)
<b>WORK STATUS</b>	-0.026 (0.390)
<b>LEVEL OF STUDIES</b>	0.003 (0.175)

CONSTANT	-0.228 (1.085)
R-Squared	0.349
Nº of Observations	69

*Standard errors are reported in parenthesis*

\*  $p < .10$  \*\*  $p < .05$  \*\*\*  $p < .01$

By looking at the results, it is obvious that there is no change. The only remarkable fact is that support for democracy remains statistically significant and therefore I can conclude that according to this data there is a correlation between tax morale and support for democracy. Nevertheless, treatments remain statistically insignificant even though in this second case, I am considering both treatments together. For all the other variables, no changes arise and they remain as well statistically insignificant.

Before start analyzing the results, I want to do a final test to confirm that there are not other reasons that could explain this lack of significance but the data. In this sense, another possible explanation for the lack of statistically significant results regarding the variables could be that even though they are not independently significant, they might be jointly significant. In order to test this possibility for the study I run a Chi Square test. This test measure if the independent variables are jointly statistically significant.

- ( 1) Religion = 0
- ( 2) TGovernment = 0
- ( 3) Age = 0
- ( 4) Gender = 0
- ( 5) 2.Continent = 0
- ( 6) 2.WorkStatus2 = 0
- ( 7) Studies = 0

F( 7, 59) = 0.70  
Prob > F = 0.6693

After running the test, I obtain a value of 0.6693 rejecting the null hypothesis and confirming they are not jointly significant. For this test I consider the variables I used for the first regression.

### **Results:**

By looking at the above analysis I can conclude that in general, no statistical significance can be interfere from this data except for some exceptions. Furthermore, main hypotheses of



these thesis are rejected. However, previous results regarding some variables included in this study can be confirmed.

### Result 1. Differences among treatments and control group.

At the beginning of the analysis I tried to find any isolated difference between the treatment and the control groups. In order to do so, I ran a Mann-Whitney U test. With a value of  $p=0.0659$  I could not reject the null hypothesis and concluded that there is no difference between the samples used for the treatments, meaning that, if any difference arises between groups, this difference will not be a consequence of differences among the respondents.

According to the initial hypotheses of this thesis, treatments should have an effect and an influence in tax morale. Therefore, based on this non-parametric test, it seems that at least, I can use the data to analyze if there is any correlation between the treatments and the dependent variable. If this were not the case, and I would have rejected the null hypotheses, this would have implied that differences in tax morale, could arise from differences in the samples and not the variables.

### Result 2. Individual significance

I want to analyze if there is an effect of the variables I have considered for this study and understand if I can recreate the results from other studies. Again, before running any regression I do a non-parametric test to analyze the influence of each independent variable in my dependent variable individually.

After converting the independent and dependent variables into binary variables when required, I only obtain a significant result for variables "Support for Democracy" and "Trust in Government". All the other variables remain statistically insignificant. These results, indicate that only support for democracy and trust in government might be correlated with tax morale according to the responses given by the respondents in this study. However, for all the other independent variables, I cannot conclude any relation with the dependent variable. Contradicting the results obtained from previous studies.

### Result 3. Regression model analysis.

I decide to run the regression and include all the independent variables to analyze any possible change in the variables, even though I do not expect any significant result. I want to see as well if I can interfere any effect of the independent variables "Support for democracy" and "Trust for democracy" in the dependent variable, tax morale.

After solving for some inconsistencies and making some modifications, I see that almost all the independent variables are statistically insignificant, including trust for democracy. Only support for democracy remains significant. With a p-value of 0.000 and a coefficient of 1.65, this independent variable might be correlated with tax morale according to the data. Nevertheless, due to the randomization problem I did when gathering the data, I cannot claim any real effect of this variable in tax morale.

## **Discussion, future research and conclusion.**

This paper tried to contribute to the previous work that focus on tax fraud by adding an additional factor that might be interesting to analyze, mass media. By gathering and connecting different studies, I tried to point out the influence of mass media in our culture as a society and therefore its impact in multiple problems we have to face, among others, tax fraud.

By analyzing different ways to tell the same news and its effects related with tax fraud and, by controlling other factors that have been already proved to have an effect on tax morale, I conducted a survey and later analyze the data in order to determine whether mass media and the news had an effect on our individual tax morale. According to the results obtained after the analysis, I rejected the hypotheses stated at the beginning of this thesis and therefore concluded that so far, there is no proof according to this study that news and the way of broadcasting this information, might be correlated on an individual tax morale.

First thing I need to point out is the fact that I cannot talk about real effects as I did not randomize properly individuals among treatments. Hence, I can only conclude some correlations according to the data I have but not causality.

Even though the results are clearly not significant except for some variables, there are multiple reasons that could explain it and therefore I think it would be a mistake to discard completely the idea that mass media has an effect on tax morale and therefore tax fraud. Unfortunately, due to the lack of funds, the timing and the inexperience of the researcher conducting an experiment like this one, most of the reasons that follow were not solved in time. However, hopefully this thesis and the experience acquired while studying this subject might help future researchers to avoid the same mistakes and delve deeply into the link between mass media and tax fraud.

The main problem I had to face while analyzing tax fraud is basically the lack of numerical data as fraudsters do not like to be caught and try harder than anyone else to hide their tricks and crimes. This makes for the tax authorities almost impossible to get an estimate of the total impact of tax fraud. By developing a field experiment and using tax morale as a proxy of the independent variable, tax fraud, thanks to the connection between both through the shadow economy, this issue were solved for this study. However, nowadays there are multiple studies

that have found an almost accurate way to estimate the level of tax fraud in an specific country (Pulido Alba, 2014). Hence, if the purpose of a study was to focus mainly in one country or in a group of countries, analysis could be conducted directly with data. Nevertheless, this would imply a lack of control over the conditions as you can do in a experiment. Notwithstanding, you can deal with a larger amount of data.

For the purpose of this study, I rather wanted to give a preference to control over quantity of data. Hence, the experiment could help to analyze the behavior of multiple individuals from multiple nationalities according to specific conditions. Is it true that most of the individuals are Spanish. However, more than 10 other nationalities were considered also for the analysis which can help to increase the validity of the results.

Regarding the survey, I realized some mistakes that could have been solved beforehand and shed a better result, in special the process of gathering the information. First problem I had is the fact that you cannot force individuals to watch the whole video or be sure that they are paying the right attention to the questions. In this sense, I tried to control for those individuals that did not watch the whole video by looking at the time they spent on the survey. However, an alternative method could be to run the survey directly on the streets and show the video to the respondents by using an electronic device. Regardless of the different problems this alternative method could have, at least would have solved the problem related with the lack of attention of some participants and the problem of randomization.

This is an issue that I could not solve in time again and that implies I cannot find more than correlations in my results. Respondents were able to choose a survey after taking a look to all of them. This implies that most likely, participants were choosing the shortest one and this could also help to understand the lack of answers for treatment three. This problem of course was not intender but an important drawback when analyzing the results.

Another problem is the small amount of responses I gathered. Unfortunately, by using a common language like the English, you are dropping and not taking into account the answers of those individuals who do not speak this language. At the same time, while the questions are easy to understand and do not require a high level of English, the video might be more complicated even for English speakers with a good level. By using a questionnaire in the official language of each country, the total amount of responses would have increased.

Finally, regarding the method and the survey, when I posted the survey, I specified they had to answer one and only one of the three surveys. However, Initially I posted the three surveys

in the same order. Even though I considered this order without any specific intention, it looks like it has a huge impact in the amount of answers for survey. Someone could argue that surveys two and three had a video and this could be also the reason. However, the difference in the amount of answers between survey one, with no video and survey two, with a video, is almost zero. This means that while option one or two are almost equally selected, option three had lower probabilities of been chosen by a subject. For future research, the best way to avoid this bias, is posting the surveys in a random order or removing any change for the respondents to select the survey.

Nevertheless, what I consider the biggest problem for this study, is the fact that single news cannot change the way we perceive things and therefore, cannot change the culture of fraud already imposed in our society. I think that in order to check for a real influence and measure the real effects, a much longer period of study is needed. Therefore, a survey like this one might be ineffective. Hence, whether analyzing the data by a panel data analysis or by running an experiment that last in time for at least a few years, the effect of mass media in an individual's tax morale and its connection with tax fraud requires more than just a single survey.

Considering all the issues that I found while writing this thesis but also the knowledge and experience obtained, for future research would be interesting to develop a similar experiment that the one proposed in this thesis extending its study for a period longer than a year. During this period the same news related with tax fraud would be broadcasted in a different way for two groups that agreed to participate in this experiment. It would be also necessary to control for other external news and the effect these could have on the subjects. However, this problem would require a deeper analysis.

Another possible option, as mentioned before would be using data instead of running an experiment. Even though, this could imply a higher external validity, it would lack control of the circumstances that could interfere with the main issue which is the analysis of the effect different ways to tell the same new might have.

Despite these problems, I think this study might be useful to raise the interest in this field. While the effects of mass media have been broadly analyzed regarding the effects they have in the weight people give to different problems, or the effect it can have for the political elections for instance, the effects mass media can have in the culture of fraud and in general in our daily life when dealing with taxes have not been studied yet. Nowadays, new ways of

communication are becoming more important, and news are broadcasted through different platforms, whether is through a television or through the screen of your computer.

Unfortunately, while the effects that news can have in multiple others fields have been already studied, the effects the news can have in a problem so big nowadays like tax fraud has been neglected, promoting a culture of fraud that needs to change before this problem turns into an even more important issue for our society.

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**APPENDIX:**

**Appendix 1**

**Instructions**

Once the subjects have been in the waiting room for the first part of the experiment and have received the different stimulus or not stimulus at all, experimenter will read the following instructions out loud.

"Thank you all for participating in this experiment. Experiment consists on an economic game where I will try to recreate an ordinary tax system where you will be asked to declare taxes and file a tax return for each one of the ten periods this experiment last.

Once you enter the following room, I will give you a document that can be consulted during the experiment and that will include all the information that I am explaining now.

Experiment will be divided in ten periods. At the beginning of each period you will receive a fixed amount of money that will be your gross income for that period. After that, you will be asked to complete a table like the following one where you have to report;

Period: This will be the period at the moment.

Gross income: Income you have received this period.

Reported income: Income you want to report this period.

Declared Taxes: Amount of taxes corresponding to the reported income in this period.

Net income: Gross income less declared taxes in this period.

Last three cells will be filled in by the experimenter once you give him the table completed with the previous information.

Period	Gross income	Reported Income	Declared Taxes	Net Income	Audited	Fine	Net income.
1							

Please, bear in mind that income reported in cells "Gross income" and "Reported income" might not be the same. Nevertheless, in order to make the experiment as similar as possible to the real life, at the end of each period and once you have completed the table, your tax return might be audited. In such case, the only period audited will be the current period. Probabilities of being audited are unknown. If your tax return is audited and you underreported income, then you will receive a fine equal to 10 times the difference between the gross income you

received that period and the amount reported in that period. This fine will be deducted from your final net income and will be considered for the final net income at the end of the experiment to determine your final reward.

Once the experiment is over, you will receive a proportional amount of your final net income. If your final income is lower than zero for any reason, we will subtract a proportional part from the show up fee that you received at the beginning of the experiment".

## **Appendix 2**

### **Instructions for the participants,**

Dear participant,

Thank you for collaborating with us in this experiment.

The experiment in which you are going to participate tries to recreate a tax system as in real life. In such sense, we would appreciate that you behave as you would do in real life.

At the end of the experiment you will receive a reward depending on your total net income with respect to the other participants, in this sense, the higher the net income with respect the other subjects, the higher the reward.

Experiment will last for ten periods. At the beginning of each period you will receive a fixed amount. This amount will increase each period. After you have received this amount, you need to report the corresponding taxes for the relevant period using a table like the following one.

Period	Gross income	Reported Income	Declared Taxes	Net Income	Audited	Fine	Net income.
1							

Period: This will be the period at the moment.

Gross income: Income you have received this period.

Reported income: Income you want to report this period.

Declared Taxes: Amount of taxes corresponding to the reported income in this period.

Net income: Gross income minus Taxes in this period.

Last three cells will be filled in by the experimenter once you give him the table completed at the end of each period.

In order to determine the taxes you have to pay in each period, please use the following table:

Brackets	Tax rate %
1.000 or less	15%
1.000 - 1.500	20%
1.500 - 2.000	25%
2.000 or more	30%

Our tax system in the experiment follows a progressive tax rate, if you are not familiarized with such system, please read carefully the following paragraph.

To determine the total taxes you have to pay in a progressive tax system you have to split your total gross income in different brackets. The first 1.000 coins you receive will be taxed at a 15% tax rate, any amount that exceeds those 1.000 coins but lower than 1.500 coins will be taxed at a 20% tax rate and so on. Example, if you earned 1.750 coins in this period, 250 coins will be taxed at a 25% tax rate (1.750-1.500), 500 coins will be taxed at a 20% tax rate (1.750-(1.750-1.500)) and 1.000 coins will be taxed at a 15% tax rate (1.750-(1.750-1.500)-(1.500-1.000)).

Once you have determined the taxes you have to report for this period, please include the total amount on the table and handle it to the experimenter.

At the end of each period your tax return might be audited with an unknown probability. In such case, auditors will analyze if you reported an income lower than your gross income. If that is the case, they will impose a fine equal to ten times the amount underreported. This amount will be taken into account to determine your final net income and therefore the monetary compensation you will receive at the end of the experiment.

This process will be repeated for ten periods. At the end of the tenth period, rewards will be assigned according to the final net income of each subject.

### Appendix 3

Period	Gross income	Reported Income	Declared Taxes	Net Income	Audited	Fine	Net income.
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							

### Appendix 4

#### Tax rates

Brackets	Tax rate %
1.000 or less	15%
1.000 - 1.500	20%
1.500 - 2.000	25%
2.000 or more	30%

### Appendix 5

Treatment	Question 1	Question 2	Question 3	Question 4	Question 5	Question 6	Question 7	Question 8	Question 9
1	1	2	3	6	2	0	Dutch	1	4
1	0	1	1	1	1	1	Spain	1	4
1	0	1	3	1	1	1	Spain	4	4
1	0	3	1	3	1	0	Romania	1	3
1	0	2	4	2	1	1	Dutch	1	4
1	0	2	2	1	2	0	Spain	3	5
1	1	1	1	1	3	1	Spain	3	5
1	0	1	1	1	5	1	Spain	4	4
1	0	2	4	3	2	0	Spain	2	6
1	0	1	3	2	1	1	Ireland	1	3
1	0	1	4	1	2	0	Dutch	2	5
1	0	2	2	1	3	1	Spain	2	5
1	1	2	2	1	2	0	Lebanon	2	5
1	1	2	3	2	2	1	Jordania	2	5
1	1	1	2	1	2	1	Spain	2	4
1	0	1	2	3	2	0	Spain	2	5
1	0	2	3	2	1	1	China	1	4
1	0	2	1	1	3	1	Spain	2	5
1	1	1	2	2	3	0	Spain	2	5

1	0	2	1	5	3	0	Italian	2	4
1	1	3	3	5	1	1	American	1	4
1	1	2	4	1	1	0	Spain	1	3
1	0	1	3	6	1	0	Spain	1	5
1	1	1	2	2	2	0	Spain	2	0
1	0	2	1	2	2	0	Spain	1	5
1	0	3	3	3	1	1	Dutch	1	5
1	0	2	4	1	2	0	Spain	1	5
1	1	2	2	2	1	1	Spain	1	4
1	1	3	3	5	1	1	Spain	1	4
1	0	2	2	1	1	1	Spain	1	4
1	0	1	1	1	4	1	Spain	2	4
2	0	3	1	6	1	0	Spain	1	4
2	1	2	2	2	2	1	Spain	2	5
2	1	1	4	1	4	0	Spain	2	3
2	0	1	1	1	4	0	Spain	2	4
2	0	1	2	2	2	0	Spain	3	4
2	0	2	1	1	4	0	Spain	2	5
2	0	2	2	2	1	1	Bulgary	1	3
2	1	1	1	1	3	1	Spain	3	5
2	0	1	2	1	2	1	Spain	2	5
2	1	1	1	1	2	1	Lebanon	4	4
2	1	2	1	1	1	0	Spain	1	4
2	1	3	1	5	2	1	Spain	2	5
2	0	3	2	5	3	0	Brazil	1	4
2	1	3	3	6	1	1	Dutch	1	4
2	0	3	2	2	1	1	Italian	1	4
2	0	2	1	1	2	0	Spain	4	6
2	1	1	1	1	2	0	Spain	4	6
2	0	1	2	1	2	0	Spain	2	3
2	1	2	1	1	1	0	Spain	1	4
2	0	2	1	1	2	0	Spain	2	4
2	0	2	1	1	2	0	Spain	1	5
2	0	2	1	2	1	1	Spain	1	3
2	1	1	2	1	2	1	Spain	1	5
2	0	2	1	1	2	1	Spain	2	4
3	1	1	1	2	2	0	Spain	2	5
3	1	2	3	3	2	1	Spain	2	5
3	0	1	1	1	4	1	Spain	2	4
3	1	1	1	1	2	1	Spain	2	4
3	0	1	1	1	2	0	Spain	3	5
3	0	2	1	1	2	1	Spain	1	5
3	0	1	1	1	2	1	Spain	3	5
3	0	1	1	1	2	0	Spain	2	5
3	1	1	1	1	2	1	Spain	1	5
3	1	1	2	1	2	1	Spain	1	5
3	0	1	2	1	1	0	Spain	1	4
3	0	2	2	3	1	0	Spain	4	5
3	0	2	1	1	1	1	Spain	1	4
3	0	3	1	1	2	0	Spain	4	3

**Appendix 6**

Treat	obs	rank sum	expected
0	38	1194	1330
1	31	1221	1085
<hr/>			
combined	69	2415	2415
<hr/>			
		unadjusted variance	6871.67
		adjustment for ties	-1403.46
<hr/>			
		adjusted variance	5468.21
<hr/>			
	z =	-1.839	
	Prob > z =	0.0659	

**Appendix 7**

Tax Fraud	Religion		
	Non religious	Religious	Total
Never justifiable	39 37.4	21 22.6	60 60.0
Justifiable	4 5.6	5 3.4	9 9.0
Total	43 43.0	26 26.0	69 69.0
<hr/>			
	Fisher's exact	0.282	

Tax Fraud	Trust in Government		
	NoTrust	Trust	Total
Never justifiable	48 45.2	12 14.8	60 60.0
Justifiable	4 6.8	5 2.2	9 9.0
Total	52 52.0	17 17.0	69 69.0
<hr/>			
	Fisher's exact	0.035	

Support for Democracy			
Tax Fraud	Democrat	Non-Democrat	Total
	56	4	60
Never justifiable	51.3	8.7	60.0
	3	6	9
Justifiable	7.7	1.3	9.0
	59	10	69
Total	59.0	10.0	69.0
	Fisher's exact	0.000	

Nationality			
Tax Fraud	European	Non European	Total
	56	4	60
Never justifiable	54.8	5.2	60.0
	7	2	9
Justifiable	8.2	0.8	9.0
	63	6	69
Total	63.0	6.0	69.0
	Fisher's exact	0.172	

Work Status			
Tax Fraud	Not working	Working	Total
	30	30	60
Never justifiable	32.2	27.8	60.0
	7	2	9
Justifiable	4.8	4.2	9.0
	37	32	69
Total	37.0	32.0	69.0
	Fisher's exact	0.161	

## **SURVEYS:**

### **Introduction**

Welcome and thank you for helping me with my Master Thesis. I would like to ask you some questions regarding your opinion about different topics. Please be aware that your answers will be anonymous. Hence, do not feel afraid for telling the truth as no one will judge you.

At the end of the questionnaire I included some demographic questions. The survey will take about 5-10 minutes of your time.

### **General questions**

1. Do you identify with any of the following religions? (Please select all that apply)

- Protestantism
- Catholicism
- Christianity
- Judaism
- Islam
- Buddhism
- Hinduism
- Native American
- Inter/non-denominational
- No religion
- Other (Please specify)

2. If you think yourself as a Democrat, would you call yourself a strong Democrat or a not very strong Democrat?

- Strong
- Not very strong
- I do not think of myself as a Democrat



3. How much trust do you have in the Government in your current country of residence on a scale from 1 to 5?

I do not trust the Government at all										I fully trust the Government
1	2	3	4	5						

**Control group** (No video)

**Treatment 1** <https://www.youtube.com/watch?v=z9CbvRzOK5w>

**Treatment 2** <https://www.youtube.com/watch?v=aHwVX0dkr38>

4. Do you think that tax fraud can always be justified, never be justified or somewhere in between?

Never justifiable												Always justifiable
1	2	3	4	5	6	7	8	9	10			

**Demographic questions**

5. What is your age?

- 18 to 24
- 25 to 34
- 35 to 44
- 45 to 54
- 55 to 64
- 65 to 74
- 75 or older

6. What is your gender?

- Female
- Male

7. What is your nationality?

(Open answer)

8. Which of the following categories best describes your current status?

- Student
- Employed, working full-time
- Employed, working part-time
- Not employed, looking for work
- Not employed, NOT looking for work
- Retired
- Disabled, not able to work

9. What is the highest level of education you have completed?

- Did not attend school
- Primary school
- High school
- Bachelor or similar
- Post graduate
- PhD