

International Center for Public Policy

Working Paper 20-09

June 2020

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Compliance? The Effects of the Spanish *Renta
Web* Initiative from a Sociology of Taxation
Perspective**

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Can Prepopulated Tax Returns Enhance Tax Compliance? The Effects of the Spanish *Renta Web* Initiative from a Sociology of Taxation Perspective

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June 2020

Abstract

This paper explores the effects of pre-populated personal income tax returns on taxpayers' tax morale and tax filing behavior. The special questionnaire about *Renta Web* included in the 2016 wave of the Spanish Institute for Fiscal Studies Fiscal Barometer surveyed individual perceptions about pre-populating income tax returns. Using probit regression analysis, we test whether pre-population affects tax morale. Secondly, we test whether pre-population influences perceptions about tax filing behavior. Our main results show that the relationship between making changes on the prefilled tax form and the likelihood of facing an audit do influence Spaniards' tax morale, as well as their perceptions about tax filing behavior. Moreover, pre-population features by themselves do not have a clear impact on tax morale or tax filing behavior. Several policy implications arise from the results.

Keywords: pre-populated tax returns, tax morale, tax filing behavior, *Renta Web*, Spain

JEL Classification: H26, K42, O33

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Acknowledgements: We thank the Spanish Institute for Fiscal Studies for providing access to the Fiscal Barometer survey that includes information about the *Renta Web* initiative. Eduardo Sanz-Arcega thanks the Government of Aragon and the European Regional Development Fund (Public Economics Research Group) for their funding. We are indebted to Antonios Koumpias for many valuable inputs.

1. Motivation

The introduction of electronic and automated tax filing systems provides Tax Authorities with good opportunities for efficiency and revenue gains (Lee, 2016; Kochanova et al., 2020). One of the most important innovations in this area in recent years is the use of pre-populated tax returns (also known as prefilled returns) in tax filing.

However, to date, there is little information in the tax compliance literature about the actual impact of pre-populated income tax returns on tax morale, as well as on individual perceptions on “how prefilled—and particularly, incorrectly prefilled—tax returns affect the compliance behavior of taxpayers” (Fochmann et al., 2018: 2). Several laboratory and field experiments have shown that pre-population can have a heterogeneous impact on tax revenues according to the underreporting opportunities present to individual taxpayers (Bruner et al., 2015; Fochmann et al., 2018). However, there has been no systematic evaluation of taxpayers’ behavior with respect to any active pre-populated income tax returns program (Kotakorpi and Laamanen, 2016). The central aim of this paper is to contribute to fill this void in the literature.

Spain’s Tax Administration stands on the forefront of pre-population practices (Deloitte, 2017). Spain’s tax authorities pre-populate the entire income tax return in full (save capital gains and losses), provided that taxpayers are not self-employed or hold foreign assets. Notwithstanding, even self-employed taxpayers can receive a nearly fully pre-populated income tax return from the tax authority. The most recent policy change was the introduction in 2016 of pre-populated income tax returns to a much larger number of taxpayers through the *Renta Web* program. Our

analysis is based on a novel dataset based on a special questionnaire about the *Renta Web* initiative that was included in the 2016 wave of the Spanish Fiscal Barometer.¹

The contributions of this paper are twofold. We are first to examine whether pre-population might have an impact on tax morale in a country already used to some extent to prefilled tax returns. Second, taking into account the relationship between pre-population and monitoring, namely the likelihood of facing an audit, we test whether pre-population influences perceptions about taxpayers' filing behavior, especially shedding light on how taxpayers are perceived to respond to an under- or over-assessment of their liability by the Tax Authority. Apart from the few laboratory experiments mentioned above, to the best of our knowledge the effect of pre-populated income tax returns on individuals' perception about taxpayers' tax filing behavior has remained unknown up to now.

In our empirical analysis, we find that the relationship between making changes on the prefilled tax form and the likelihood of facing an audit does influence Spaniards' tax morale, as well as their perceptions about tax filing behavior. These results are fully supported by several robustness checks. On the other hand, pre-population features by themselves do not have a clear distinctive impact on tax morale or on perceptions about tax filing behavior. These results generally replicate those found previously in the lab experiment literature.

The rest of the paper is organized as follows. Section 2 reviews the relevant literature on tax morale and tax filing behavior. Section 3 presents the empirical analysis. Section 4 concludes, discusses some policy implications, and explores future areas of research.

¹ The Fiscal Barometer is an annual survey conducted by the Spanish Institute for Fiscal Studies.

2. Literature Review and Basic Framework

Evaders need not only have the opportunity and the ability to commit fraud, but also, most importantly, the will to do so (Kleven et al., 2011). This is why tax compliance levels (or the degree to which taxpayers observe tax rules) across the world are considerably higher than the levels predicted by neoclassical economics, based on the Allingham and Sandmo (1972) model (Alm et al., 2019). This is also why overcoming the limitations of the *homo economicus* framework led to the birth of a strand of the literature aimed at studying the determinants of tax morale (or why do people voluntarily pay taxes). The link between tax morale and compliance, though not unambiguously stated (Guerra and Harrington, 2018), has gained causal support (Cummings et al., 2009; Halla, 2012; Koumpias and Martínez-Vázquez, 2019).

The introduction at a large scale of a pre-populated tax return program opens the question of whether that supply-side technological innovation might affect individuals' tax morale, and ultimately how it might influence perceptions about their filing behavior, and, as a consequence, their tax compliance. Theoretically, pre-population is aimed at providing accurate tax returns and effectively reducing taxpayers' compliance costs. From the Tax Authority self-perspective, pre-population may also serve as a tool to improve enforcement through better monitoring (OECD, 2005; IOTA, 2008; Cordes and Holen, 2010).

However, pre-population is expected to have a heterogeneous impact on tax revenues according to the underreporting opportunities presented to individual taxpayers (Bruner et al., 2015; Fochmann et al., 2018). These heterogeneous effects have been confirmed by lab experiments measuring the effect of pre-populated tax returns on compliance.² Notwithstanding that

² In a lab experiment using undergraduate students, Bruner et al. (2015) find increased under-reporting when the pre-populated tax form specifies an under-assessed tax liability and increased tax evasion when there are more opportunities to under-report income. Kotakorpi and Laamanen (2015) exploit a natural experiment between 1995 and 2004 in Finland where a subset of

experimental evidence, to date no empirical evidence has been provided on the effect of pre-population on tax morale, nor on the effect of pre-population on individual perceptions on how other taxpayers may change their tax filing behavior.

Bearing that in mind, this section provides first a brief review of the literature on tax morale so that next we can bridge it to the literature on pre-populated tax returns. In this section we also discuss the common theoretical justifications for the introduction of pre-populated tax returns, emphasizing the role played by individual attitudes towards this specific technological innovation, as well as beliefs on how it may affect other taxpayers' tax filing behavior.

According to the most recent literature, the determinants that shape tax morale might be classified in three dimensions: (i) socioeconomic characteristics and values of the subject (namely, age, gender, civil status, educational level, income, risk aversion, financial satisfaction and happiness, ideology, national pride, altruism, religious, ethics, being helped by a tax advisor to file taxes); (ii) behavior of others that impact on the subjects' own compliance motivations (namely, general level of evasion, tax horizontal inequities, different tax evasion opportunities among social groups, universal social benefits); and (iii) opinions, beliefs and indexes about the role and performance of the State (namely, variables related to five issues—citizens' trust in government, democratic participation, territorial organization, tax-benefit system and Tax Authority) (López-Laborda and Sanz-Arcega, 2016). The existing empirical evidence on tax

taxpayers received partially pre-populated tax forms using employer data. They show that partially pre-populating tax returns shifted reporting of deductible expenses from items in the tax form that were left blank to the ones that were pre-populated. Fonseca and Grimshaw (2017) carried out an artefactual field experiment and found that the correct pre-populated values have no effect on compliance, but incorrect pre-populated income values reduces compliance. Both results could be explained by citizens' trust in the pre-population process innovation. Finally, in a lab experiment Fochmann et al. (2018) find support for the case that correct prefilling enhances compliance.

morale is fairly robust, generally supporting the role of the three sets of determinants advanced in the literature.³

However, the empirical evidence is considerably scanted on the role played by pre-populated tax returns on tax morale. From a theoretical standpoint, one way to interpret pre-populated tax returns in the context of the previous literature is to consider it as a Tax Authority innovation. From that perspective, three series of effects may follow—the first two associated to the “State” dimension of tax morale and the third related to “the behavior of others” dimension.

First, as we have already discussed, pre-populated tax returns reduce taxpayer compliance costs, promote accuracy, and serve as a deterrence tool, presumably leading to higher tax morale and even also improved compliance (Holtzblatt, 2007; Cordes and Holen, 2010). However, again, so far little evidence has been provided on this.⁴

Second, pre-population can also be seen as a change in the way citizens relate to the Tax Authority. Depending on the citizenry’s level of trust in this governmental innovation, in which impartiality plays a crucial role (Rothstein and Teorell, 2008), pre-population may end up either enhancing or decreasing tax morale (Kirchler et al., 2008). In other words, it is taxpayers’ perceptions about the fair functioning of this technological supply-side innovation that matters most in explaining how pre-population might influence citizens’ tax morale (Fonseca and Grimshaw, 2017).

³ This is also the particular case for Spain, as summarized in the Appendix I.

⁴ For the specific case of deductions, Gillitzer and Skov (2018) exploit data from the Danish Tax Authority to shed light on the impact of prefilled deductions on total tax revenue. Surprisingly to their hypothesis, they found that prefilling deductions doubles the total amount of claimed deductions. Moreover, if the Tax Authority makes mistakes in the pre-populated tax form under-assessing taxpayers’ liabilities, that would directly diminish the costs of evasion (Duncan and Li, 2018), negatively impacting tax morale.

Third, pre-population may also influence subjects' tax morale depending on their beliefs about other taxpayers' filing behavior. If the regular citizen thinks taxpayers in general are willing to game the system, mistakes in the pre-populated tax form that under-assess a large number of taxpayers' liabilities might also likely damage the general level of tax morale (Fochmann et al., 2018).

Lastly, regarding the effects of pre-population on tax filing behavior, the prior literature has mainly tried to answer the following question: "What would motivate a taxpayer to change her pre-populated tax returns?" Here, the most significant determinant is likely to be the taxpayer's perception of how making changes on the pre-populated tax return will affect the probability of being audited. This is so from a rational choice perspective (Becker, 1968) and from a behavioral perspective (Ariely, 2008; Castro and Scartascini, 2015). Therefore, the case in which the Tax Authority makes a mistake on the pre-populated tax form is of particular interest for this literature (Fonseca and Grimshow, 2017; Fochmann et al., 2018).

However, as already noted, "there is almost no evidence regarding how prefilled—and particularly incorrectly prefilled—tax returns affect the compliance behavior of taxpayers" (Fochmann et al., 2018: 2). To the best of our knowledge, the links between making changes in the prepopulated form and the likelihood of facing an audit remain unexplored in the literature. This is the reason why the second aim of this paper is to explore taxpayers' perceptions about how other taxpayers' filing behavior may be affected by pre-populated tax returns.

3. Empirical Analysis

In this section, we carry out two main empirical tests aimed at providing evidence on the link between pre-populated tax returns and tax morale, as well as between pre-population and perceptions about tax filing behavior. The first empirical exercise contrasts the effects of pre-

population on tax morale. The second exercise tests whether pre-population is perceived to affect taxpayers' decisions to change pre-filled returns, when the Tax Authority makes a mistake on the pre-populated tax form. The empirical work is conducted using data from the 2016 wave of the Spanish Institute for Fiscal Studies Fiscal Barometer.

3.1 Formal Testing Hypotheses

First, in order to formally test whether Spaniards' perceptions about the *Renta Web* initiative enhance tax morale across the citizenry, we formulate the three following hypotheses:

H1.1: Renta Web matches theoretical justifications in favor of pre-population—reducing compliance costs, promoting accuracy and improving monitoring and compliance—enhancing tax morale.

H1.2: Citizen's perception that taxpayers in general want to game the system, taking advantage of eventual pre-population mistakes, harms tax morale.

H1.3: Citizens' trust on Renta Web, as a non-biased tool, enhances tax morale.

The second empirical exercise focuses on how the perceived likelihood of an audit might affect taxpayers' willingness to amend returns incorrectly pre-filled by the Tax Authority. To this end, we formulate the three following hypotheses:

H2.1: Citizens think taxpayers will consciously accept a pre-populated tax return that under-assesses their tax liability if amending the tax pre-populated tax form increases the likelihood of facing an audit by the Tax Authority.

H2.2: Citizens think taxpayers will seek to legally reduce their otherwise over-assessed tax liability in Renta Web, if they feel that making changes in the pre-populated tax form does not affect the likelihood of facing an audit.

H2.3: Citizens think taxpayers take compliance-enhancing filing decisions thanks to the Renta Web initiative.

3.2 Data

The survey data are obtained from the 2016 wave of the Spanish Institute for Fiscal Studies Fiscal Barometer, a survey carried out by the Spanish Ministry of Finance since the early 1990s. The Fiscal Barometer gathers interviews on Spanish residents about their views on the public sector, from the revenue and expenditure sides, and with a special focus on citizens' views on tax evasion issues. The sample is representative at the national and regional levels (Área de Sociología Tributaria, 2017).

The 2016 wave interviewed circa 3,000 subjects and included a special questionnaire on the Spanish pre-populated tax returns program—the *Renta Web* initiative (see Área de Sociología Tributaria, 2017: 68-75). In particular, the 2016 special questionnaire gathered individual perceptions on the accuracy, simplicity, and auditing features that might stem from the *Renta Web* initiative. In addition, the survey interviewed citizens about individuals' perceived response to incorrect pre-population returns, as well as on their beliefs about the connection between making changes in the prefilled form and the likelihood of facing an audit.

Table 1. Descriptive Statistics

Variable	No. Obs.	Smallest	Largest	Mean	Std. Dev.	Skewness	Kurtosis
Tax morale	3017	0	1	0.68	0.47	-0.75	1.57
Consc. accept. under.	3017	0	1	0.23	0.42	1.30	2.70
Legally diminish. liab.	3017	0	1	0.51	0.50	-0.02	1.00
Renta Web	3017	0	1.05	0.52	0.43	-0.00	1.40
Nothing matters	3017	0	1	0.27	0.44	1.06	2.12
Audit if change	3017	0	1	0.30	0.46	0.88	1.78
Age1	3017	0	1	0.08	0.27	3.04	10.26
Age2	3017	0	1	0.25	0.43	1.16	2.35
Age3	3017	0	1	0.29	0.45	0.92	1.84
Age4	3017	0	1	0.15	0.36	1.98	4.91
Age5	3017	0	1	0.23	0.42	1.29	2.66
Woman	3017	0	1	0.51	0.50	-0.06	1.00
Married	3017	0	1	0.60	0.49	-0.42	1.17
Immigrant	3017	0	1	0.03	0.16	6.00	37.00
Big city	3017	0	1	0.27	0.45	1.02	2.05
Rural	3017	0	1	0.21	0.41	1.43	3.03
Rich region	3017	0	1	0.41	0.49	0.38	1.15
Foral	3017	0	1	0.06	0.24	3.74	15.02
Tertiary education	3017	0	1	0.15	0.36	1.91	4.64
Secondary education	3017	0	1	0.64	0.48	-0.58	1.34
Prof. or businessman	3017	0	1	0.10	0.30	2.71	8.34
Retired	3017	0	1	0.24	0.43	1.23	2.51
Student	3017	0	1	0.06	0.24	3.68	14.55
Salaried worker	3017	0	1	0.39	0.49	0.47	1.22
Unemployed	3017	0	1	0.12	0.32	2.35	6.54
Universal	3017	0	1	0.58	0.49	-0.32	1.11
Good management	3017	0	1	0.25	0.43	1.15	2.33
Falkinger hypothesis	3017	0	1	0.35	0.48	0.61	1.34
Bad use	3017	0	1	0.49	0.50	0.06	1.00
Worse than Europe	3017	0	1	0.66	0.47	-0.69	1.48
Concrete tax evaders	3017	0	1	0.68	0.47	-0.79	1.62
Tax advisor	3017	0	1	0.30	0.46	0.87	1.75
No taxpayer	3017	0	1	0.30	0.46	0.88	1.77
Tax evasion extended	3017	0	1	0.59	0.49	-0.36	1.13
Prosecution	3017	0	1	0.45	0.50	0.21	1.04
More compliance	3017	0	1	0.51	0.50	-0.03	1.00
Simplicity	3017	0	1	0.56	0.50	-0.24	1.06
Accuracy	3017	0	1	0.49	0.50	0.02	1.00

Source: Authors' elaboration

In descriptive terms, three main comments of major interest might summarize Spaniards' opinion on the *Renta Web* initiative (based on Área de Sociología Tributaria, 2017: 61-64). First, *Renta*

Web is positively assessed by the Spanish citizenry. In the view of half of the respondents, the pre-population software deserves credit for making the tax filing process simpler, improving both the accuracy of tax information and the prosecution of evasion, and increasing overall compliance. In addition, the opinion about the positive effect of *Renta Web* on tax compliance is weaker than for the other two indicators (simplicity and accuracy).

Second, regarding the opinions about how taxpayers respond to an over- or under-assessment of their tax liability by *Renta Web*, while 23 percent of the interviewees think people just would consciously evade taxes by accepting the prefilled tax form in case of under-assessment, half of the respondents believe taxpayers would legally seek to reduce their liability if facing an over-assessment. Moreover, in the latter case, 15 percent of the interviewees think people just accept the pre-populated tax form without knowing they are paying too much.

And third, regarding the perceived functioning of the *Renta Web* program in terms of the likelihood of facing an audit, while a little more than a third of the respondents attribute a neutral relationship between either making or not making changes on the prefilled form and the probability of being audited, 20 percent of the interviewees think that not making any changes on the prefilled form increases the likelihood of an audit, and 30 percent believe that the probability increases if the tax liability is dramatically decreased.

Finally, it is worth noting that a third of the respondents selected the “does not know/does not answer” option on each of the aforementioned issues.

3.3 Identification Strategy and Variables of Interest

Following the previous literature on tax morale and pre-population (Giachi, 2014; López-Laborda and Sanz-Arcega, 2016; Fonseca and Grimshow, 2017; and Bruner et al., 2015) and

taking into account the discrete nature of our variables of interest, in order to test our hypotheses formulated above, we estimate a series of probit models with the following general form:

$$Y_i = X_i\beta + Z_i\gamma + u_i \quad (1),$$

where Y_i is the dependent variable; X_i is a vector of variables of interest; Z_i is a vector of control variables; and u_i is the error term.

First, we estimate the effects of pre-population on tax morale. Therefore, Y_i , the dependent variable, is “tax morale”, which the literature widely describes as a dummy variable taking a value of 1 if the interviewee thinks tax evasion is unjustifiable and 0 otherwise (see Forteza and Noboa, 2019, or Giachi, 2014, as recent examples).

For our baseline estimation, the vector of independent variables of interests, X_i , includes three variables associated to our three hypotheses that refer to individual perceptions on the *Renta Web* initiative. Firstly, to contrast H1.1, namely whether theoretical justifications for pre-population actually enhance tax morale, we define a variable measuring taxpayers’ perceived improvement in the tax revenue process, namely:

- “Renta Web”, which is the first principal component of the four following variables,⁵ each one referring to one of pre-population theoretical strengths: decreasing compliance costs, increasing information accuracy, improved monitoring, and compliance enhancing:

⁵ We chose the principal components technique for categorical variables because the inter-correlations between the four variables on the features of the *Renta Web* initiative—question 22 of the questionnaire—are about 0.60. The first principal component obtained is able to explain 1.07 of the cumulative variance, its eigenvector is worth 2.90, and all the four variables that make up the principal component have a similar and positive effect on it, ranging from 0.21 to 0.35.

- “Prosecution”: a dummy variable taking a value of 1 if the interviewee agrees or strongly agrees with the following statement: “Thanks to *Renta Web* prosecuting tax evaders is easier”, and 0 otherwise.
- “More compliance”: a dummy variable taking a value of 1 if the interviewee agrees or strongly agrees with the following statement: “Thanks to *Renta Web* more people comply”, and 0 otherwise.
- “Simplicity”: a dummy variable taking a value of 1 if the interviewee agrees or strongly agrees with the following statement: “Thanks to *Renta Web* complying takes less time”, and 0 otherwise.
- “Accuracy”: a dummy variable taking a value of 1 if the interviewee agrees or strongly agrees with the following statement: “*Renta Web* gathers taxpayers’ fiscal data accurately and completely”, and 0 otherwise.

Secondly, in order to test H1.2, namely how others’ honest or dishonest behaviors may affect individuals’ tax morale, we define the following variable of interest:

- “Consciously accepting underestimation”: a dummy variable taking a value of 1 if the interviewee thinks the vast majority of taxpayers consciously evade taxes by accepting their prepopulated tax returns when *Renta Web* underestimates their true tax liability, and 0 otherwise.

Finally, in order to contrast H1.3, namely the potential relationship between individuals’ tax morale and citizens’ trust in pre-population, we define the following variable of interest:

- “Nothing matters”: a dummy variable taking a value of 1 if the interviewee thinks the likelihood of an audit remains the same whether a taxpayer does or does not make changes on the prepopulated tax returns.⁶

The vector of controls, Z_i , includes canonical determinants found in the previous literature, namely variables related to the three dimensions of determinants that influence tax morale: (i) socioeconomic characteristics and values of the subject, (ii) behavior of others that impact on the subjects’ own compliance motivations, and (iii) the State dimension. As we will explain later, we conjecture that these additional controls might also apply for the second empirical exercise.

Regarding the operationalization of the variables, we follow previous works on tax moral determinants, especially those that also exploited the Spanish Fiscal Barometer (Gracia de Rentería, 2011; Giachi, 2014; López-Laborda and Sanz-Arcega, 2016). Then, we detail the variables of the vector of controls:

- “Age1”: a dummy variable taking a value of 1 if interviewee is between 18 and 24 years old and 0 otherwise.
- “Age2”: a dummy variable taking a value of 1 if interviewee is between 25 and 39 years old and 0 otherwise.
- “Age4”⁷: a dummy variable taking a value of 1 if interviewee is between 55 and 64 years old and 0 otherwise.

⁶ This means subject’s responses to questions 25 and 26 of the questionnaire were “the likelihood of an audit remains the same” and “making changes does not affect the likelihood of an audit.”

⁷ In order to avoid collinearity, subjects aged between 40 and 54 are omitted (what would be “Age3”). Moreover, we break down population into age groups because the previous literature has identified quadratic effects on the causal link between age and tax morale (Gracia de Rentería, 2011; López-Laborda and Sanz-Arcega, 2016).

- “Age5”: a dummy variable taking a value of 1 if interviewee is 65 or more years old and 0 otherwise.
- “Female”: a dummy variable taking a value of 1 if interviewee is a woman and 0 otherwise.
- “Married” (or cohabiting): a dummy variable taking a value of 1 if interviewee is married or lives with a stable partner and 0 otherwise.
- “Immigrant”: a dummy variable taking a value of 1 if interviewee is an immigrant and 0 if she/he is not an immigrant.
- “Big city”: a dummy variable taking a value of 1 if interviewee lives in a city with more than 200.000 inhabitants and 0 otherwise.
- “Rural”: a dummy variable taking a value of 1 if interviewee lives in a town with less than 10.000 inhabitants and 0 otherwise.
- “Rich region”: a dummy variable taking a value of 1 if interviewee lives in regions with per capita income above the national average—according to 2016 Spanish Statistical Office data, these regions are Aragon, Balearic Islands, Catalonia, Madrid, Basque Country, Navarre, and La Rioja—and 0 otherwise.
- “Foral”: a dummy variable taking a value of 1 if interviewee lives in foral region—Basque Country and Navarre—and 0 otherwise.⁸
- “Tertiary education”: a dummy variable taking a value of 1 if interviewee’s highest level of education is tertiary (college) education and 0 otherwise.

⁸ Spain’s foral regions (the Basque Country and Navarre) have a special financing system that is significantly more decentralized than the one applied to the rest of the regions (known as the “common regime” regions). Moreover, it is worth mentioning that the foral system allows both regions not to participate in intergovernmental solidarity funds, which makes them the best financed regions in terms of tax revenues per capita.

- “Secondary education”: a dummy variable taking a value of 1 if interviewee’s highest level of education is secondary (high school) education and 0 otherwise.
- “Professional or businessman”: a dummy variable taking a value of 1 if interviewee is a professional or businessman and 0 otherwise.
- “Retired”: a dummy variable taking a value of 1 if interviewee is retired and 0 otherwise.
- “Student”: a dummy variable taking a value of 1 if interviewee is a student and 0 otherwise.
- “Salaried worker”: a dummy variable taking a value of 1 if interviewee is a salaried worker and 0 otherwise.
- “Unemployed”: a dummy variable taking a value of 1 if interviewee is unemployed and 0 otherwise.
- “Universal”: a dummy variable taking a value of 1 if interviewee agrees or strongly agrees with the following statement about the functioning of public services and benefits: “Their access is universal,” and 0 otherwise.
- “Good management”: a dummy variable taking a value of 1 if interviewee agrees or strongly agrees with the following statement about the functioning of public services and benefits: “They are well managed,” and 0 otherwise.
- “Falkinger hypothesis”: a dummy variable taking a value of 1 if interviewee agrees or strongly agrees with the following statement: “The functioning of public services and benefits is adequate related to the amount people pay in taxes,” and 0 otherwise.⁹

⁹ Due to its high collinearity with “good management”, this variable is omitted in the regressions. The results obtained from exchanging these two variables are substantially the same.

- “Bad use”: a dummy variable taking a value of 1 if interviewee agrees or strongly agrees with the following statement about the functioning of public services and benefits: “Citizens overuse them,” and 0 otherwise.
- “Worse than Europe”: a dummy variable taking a value of 1 if interviewee finds that the relationship between quality of public services and taxes paid is worse in Spain than in the rest of Europe, and 0 otherwise.
- “Concrete tax evaders”: a dummy variable taking a value of 1 if interviewee thinks that concrete segments of the population systematically commit tax fraud, and 0 otherwise.
- “Tax advisor”: a dummy variable taking a value of 1 if interviewee is helped by a tax advisor in order to comply with her taxes, and 0 otherwise.
- “No taxpayer”: a dummy variable taking a value of 1 if interviewee does not have to submit a tax return (presumably income tax form), and 0 otherwise.
- “Tax evasion extended”: a dummy variable taking a value of 1 if interviewee finds that tax evasion is well extended, and 0 otherwise (barring the existence of even big tax evasion cases, people comply with taxes, or does not know/answer).

The second exercise estimates the effect of the *Renta Web* initiative on Spaniards’ perceptions on taxpayers’ tax filing behavior, relating individual beliefs on making changes on the pre-populated form and the likelihood of facing an audit. To test the formulated hypotheses, we estimate three separate models.

In order to contrast H2.1 and H2.3 the first model includes as the dependent variable “Consciously accepting underestimation”, which is a dummy variable taking a value of 1 if the interviewee thinks the vast majority of taxpayers consciously evade taxes by accepting their prepopulated tax returns when *Renta Web* underestimates their true tax liability, and 0 otherwise.

To test H2.2 and H2.3, the second model constructs the dependent variable “Legally diminishing liability”, which is a dummy variable taking a value of 1 if the interviewee thinks the vast majority of taxpayers consciously make changes, decreasing to the best of their knowledge their tax liability when *Renta Web* overestimates their true tax liability, and 0 otherwise.

The vector of independent variables, X_i , common to both models, consists of the following two variables that capture the potential causal link between the likelihood of facing an audit and making any changes on the tax form within the pre-populated framework:

- “Audit if change”: a dummy variable taking a value of 1 if the interviewee thinks the likelihood of an audit increases if the changes made on the pre-populated tax returns significantly decrease the tax liability.
- “Renta Web”, as defined above.

The vector of controls, Z_i , is similar to the one included within the tax morale model. In fact, tax morale determinants consist of the same factors highlighted in the literature on tax compliance determinants (Alm et al., 2019). This is why we claim these same factors are relevant for the second estimation. At the same time, this allows us to extend the empirical evidence on tax filing behavior within a pre-population framework by considering the factors pertaining to the three tax morale dimensions as potential determinants of tax filing behavior.

3.4 Results

In the absence of collinearity,¹⁰ the results obtained provide partial support to our hypotheses. On the one hand, the relationship between making changes on the pre-filled tax form and the

¹⁰ As a general rule, if a given variable presents a Variance Inflation Factor higher than 10, the variable can be seen as a linear combination of others also present in the estimation. None of our explanatory variables gets a value higher than 6, so multicollinearity can be discarded.

likelihood of facing an audit do influence Spaniards' tax morale, as well as their perceptions about others' tax filing behavior. On the other hand, pre-population features by themselves do not have a clear impact on tax morale or even perceptions about tax filing behavior. The latter might be a result coherent for a country where the citizenry is already used to pre-populated tax returns. Nevertheless, it is worth noting that as we have conjectured the determinants associated with the three dimensions that influence Spaniards' tax morale—socioeconomic characteristics and values of the subject, behavior of others, and the State dimension—also become determinants of perceptions about tax filing behavior within a pre-population framework.

In what follows, we describe in more detail the empirical results. We begin with those related to tax morale, shown in Table 2.

Table 2. Tax Morale Estimations

Variable	Baseline estimation	Robustness check
	Marginal Effects (p-value)	Marginal Effects (p-value)
Renta Web	0.03 (0.33)	0.04 (0.12)
Consciously accepting underestimation	-0.03 (0.33)	-0.03 (0.38)
Nothing matters	0.10 (0.00***)	
Audit if change		-0.06 (0.02**)
Age1	-0.08 (0.25)	-0.08 (0.21)
Age2	-0.06 (0.17)	-0.05 (0.20)
Age3	-0.06 (0.15)	-0.06 (0.16)
Age5	-0.15 (0.02**)	-0.15 (0.02**)
Woman	0.04 (0.10)	0.04 (0.10)
Married	0.03 (0.31)	0.03 (0.31)
Inmigrant	0.07 (0.34)	0.06 (0.40)
Big city	-0.00 (0.97)	0.01 (0.77)
Rural	-0.05 (0.11)	-0.05 (0.09*)
Rich region	0.04 (0.11)	0.05 (0.08*)
Foral	-0.06 (0.26)	-0.05 (0.39)
Tertiary education	0.08 (0.09*)	0.08 (0.07*)
Secondary education	-0.03 (0.39)	-0.03 (0.44)
Professional or businessman	-0.09 (0.10*)	-0.08 (0.13)
Retired	0.14 (0.00***)	0.14 (0.01***)
Student	0.07 (0.28)	0.08 (0.22)
Salaried worker	0.02 (0.65)	0.03 (0.62)
Unemployed	0.05 (0.35)	0.06 (0.25)
Universal	0.05 (0.06*)	0.05 (0.03**)
Good management	-0.06 (0.04**)	-0.07 (0.03**)
Bad use	-0.04 (0.11)	-0.04 (0.10)
Worse than Europe	-0.03 (0.32)	-0.02 (0.44)

Concrete tax evaders	-0.00 (0.94)	0.00 (0.95)
Tax advisor	0.04 (0.16)	0.04 (0.14)
No taxpayer	-0.08 (0.02**)	-0.08 (0.02**)
Tax evasion extended	0.00 (0.90)	0.01 (0.55)
<hr/>		
N	3017	3017
Log pseudolikelihood	-1814.58	-1823.74
Wald chi²	(29) 89.13	(29) 80.76
Prob > Chi²	0.00	0.00
Pseudo R²	0.040	0.035
% correctly classified	65.20 %	65.16 %

*** Significant at 1 %; ** significant at 5 %; * significant at 10 %

Source: Authors' elaboration

The estimates in the first column of Table 2 show that individuals' perception that *Renta Web* does not aim at auditing people that make (or do not make at all) any changes on the prefilled form does result in the enhancement of tax morale (which provides support to H1.2). This result is confirmed by the robustness check carried out in the second column of Table 2, where other things being equal, we substitute the variable of interest "Nothing matters" with a variable that may point in the opposite direction: the likelihood of an audit increases if changes are made on the prefilled form ("Audit if change"). In this case, the belief that the likelihood of an audit depends on making changes on the pre-populated form decreases tax morale. In sum, we obtain strong evidence supporting the proposition that pre-population can be labelled as a tax morale determinant, but only through the trust taxpayers' show on the functioning of *Renta Web*. On the other hand, the intrinsic features of the pre-populated returns or taxpayers' willingness to game the system do not seem to have an impact on the level of tax moral (which does not support either H1.1 or H1.2).

Moreover, Spaniards' tax morale appears to be determined by canonical factors associated to the socioeconomic and the State dimensions of tax morale, far beyond the *homo economicus* archetype. In line with previous findings in the literature, living in relatively richer regions enhances tax morale, and living in rural areas decreases tax morale (for example, similar results

were obtained by López-Laborda and Sanz-Arcega, 2016). Moreover, people with a college degree and those who are retired also show a higher level of tax morale (as in Alarcón et al., 2009, or Bilgin, 2014), while people over 65 in general¹¹ and “no taxpayers” show lower tax morale (López-Laborda and Sanz-Arcega, 2016).

In addition, it is interesting to note that variables associated to the level of tax evasion or the compliance behavior of others are not statistically significant, while those linked to public spending are. In this sense, the belief that public service benefits are universal promotes tax morale (as in Gracia de Rentería, 2011).

What are taxpayers’ motivations to amend returns incorrectly prefilled by the Tax Authority?

The estimation results are shown in Table 3. Tax filing behavior within a pre-population framework seems to be driven by the link between making changes on the tax form and the likelihood of facing an audit, which again provides support for H2.1 and H2.2. In addition, they are also driven by beliefs about tax evasion, while the pre-populated tax return features by themselves do not have a significant impact on filing behavior (thus, not supporting H2.3).

Table 3. Tax Filing Baseline Estimations

Variable	Consciously accepting underestimation	Legally diminishing liability
	Marginal Effects (p-value)	Marginal Effects (p-value)
Renta Web	0.00 (0.98)	0.04 (0.22)
Audit if change	0.09 (0.00***)	0.14 (0.00***)
Age1	0.01 (0.85)	0.09 (0.15)
Age2	0.02 (0.65)	0.06 (0.18)
Age3	-0.00 (0.98)	0.07 (0.11)
Age5	-0.05 (0.40)	0.06 (0.40)
Woman	-0.05 (0.01**)	-0.01 (0.61)
Married	0.02 (0.45)	0.05 (0.12)
Immigrant	-0.07 (0.23)	-0.10 (0.19)
Big city	-0.00 (0.92)	0.07 (0.03**)
Rural	-0.03 (0.27)	0.05 (0.13)
Rich region	0.01 (0.80)	-0.04 (0.18)
Foral	0.12 (0.02**)	0.16 (0.01***)
Tertiary education	.001 (0.76)	0.07 (0.19)

¹¹ This result might be explained by a low past labor force participation rate for cohorts over 65.

Secondary education	-0.01 (0.85)	0.02 (0.61)
Prof. or businessman	-0.04 (0.30)	-0.01 (0.93)
Retired	-0.01 (0.89)	-0.03 (0.60)
Student	0.03 (0.63)	-0.05 (0.52)
Salaried worker	0.01 (0.86)	0.02 (0.66)
Unemployed	-0.03 (0.56)	0.07 (0.32)
Universal	0.03 (0.15)	0.05 (0.07*)
Good management	-0.09 (0.00***)	-0.06 (0.04**)
Bad use	0.02 (0.24)	0.07 (0.00***)
Worse than Europe	-0.05 (0.04*)	-0.03 (0.23)
Concrete evaders	0.12 (0.00***)	0.19 (0.00***)
Tax advisor	0.01 (0.62)	0.01 (0.66)
No taxpayer	0.05 (0.10*)	-0.03 (0.48)
Tax evasion extended	0.05 (0.03**)	0.08 (0.00***)
N	3017	3017
Log pseudolikelihood	-1500.90	-1917.60
Wald chi²	(28) 123.57	(28) 163.90
Prob > Chi²	0.00	0.00
Pseudo R²	0.066	0.078
% correctly class.	77.56 %	63.84 %

*** Significant at 1 %; ** significant at 5 %; * significant at 10 %
Source: Authors' elaboration

More specifically, respondents assert that people who consciously accept an under-assessment of their true tax liability as well as those who legally diminish their prefilled liability are motivated by their belief that making changes on the tax form would lead to being audited. But those same decisions are also thought to be driven by opinions on tax evasion by others, namely, individuals who feel that there are concrete social groups who evade the most, and that tax evasion is well extended across the entire country. Nonetheless, while evaders would want to avoid an audit, (presumed) honest taxpayers do not care about being monitored by the Tax Authority.

These findings are confirmed by the robustness checks carried out in Table 4. There, we substitute the variable of interest “Audit if change” with the already defined variable “Nothing matters”. As conjectured, if making changes on the pre-populated form does not affect the likelihood of an audit, people facing an over-assessment would try to amend the returns to reduce

their initially inflated liability. This important result might match compliance to the perceived neutrality of *Renta Web* in terms of facing an audit. Moreover, as expected, the beliefs that there are persistent groups of evaders and an extended general level of evasion would also encourage evasion behavior.

Table 4. Tax Filing Robustness Check Estimations

Variable	Consciously accepting underestimation	Legally diminishing liability
	Marginal Effects (p-value)	Marginal Effects (p-value)
Renta Web	0.02 (0.54)	0.05 (0.11)
Nothing matters	-0.03 (0.15)	0.10 (0.00***)
Age1	0.02 (0.77)	0.11 (0.08*)
Age2	0.02 (0.55)	0.07 (0.12)
Age3	0.00 (0.93)	0.07 (0.08*)
Age5	-0.04 (0.45)	0.06 (0.39)
Woman	-0.05 (0.02**)	-0.01 (0.72)
Married	0.02 (0.44)	0.05 (0.10)
Immigrant	-0.07 (0.24)	-0.10 (0.20)
Big city	0.00 (0.88)	0.07 (0.03**)
Rural	-0.03 (0.33)	0.06 (0.05*)
Rich region	0.00 (0.93)	-0.05 (0.07*)
Foral	0.15 (0.01***)	0.19 (0.00**)
Tertiary education	0.02 (0.69)	0.07 (0.17)
Secondary education	-0.00 (0.97)	0.03 (0.49)
Prof. or businessman	-0.04 (0.40)	-0.00 (0.96)
Retired	-0.01 (0.90)	-0.03 (0.67)
Student	0.04 (0.59)	-0.05 (0.51)
Salaried worker	0.01 (0.79)	0.03 (0.62)
Unemployed	-0.02 (0.66)	0.06 (0.36)
Universal	0.04 (0.10*)	0.05 (0.10)
Good management	-0.09 (0.00***)	-0.06 (0.04**)
Bad use	0.03 (0.18)	0.08 (0.00***)
Worse than Europe	-0.05 (0.05**)	-0.04 (0.18)
Concrete evaders	0.13 (0.00***)	0.21 (0.00***)
Tax advisor	0.01 (0.65)	0.01 (0.84)
No taxpayer	0.05 (0.11)	-0.03 (0.36)
Tax evasion extended	0.05 (0.02**)	0.08 (0.00***)
N	3017	3017
Log pseudolikelihood	-1514.08	-1928.80
Wald chi²	(28) 105.38	(28) 161.93
Prob > Chi²	0.00	0.00
Pseudo R²	0.058	0.073
% correctly class.	77.63 %	62.08 %

*** Significant at 1 %; ** significant at 5 %; * significant at 10 %.

Source: Authors' elaboration

Finally, both the baseline estimations and the robustness check results highlight the weak relevance of a number of socioeconomic and institutional factors in understanding perceived tax filing behavior. In sum, survey respondents believe that taxpayers' filing behavior is mostly influenced by three types of factors: (i) those directly associated with the perceived relationship of making changes on the pre-populated tax return; (ii) the probability of being audited; and (iii) beliefs about the general level of tax evasion.

4. Concluding Remarks

The introduction of pre-populated tax returns potentially offers a window of opportunity for more efficient tax system with lower compliance costs and less evasion, that is, with revenue gains. However, with the exception of a few lab experiments, little information exists about the effect of prefilled tax returns on tax morale and the perceptions on tax filing behavior. This paper aims at contributing to fill this void in the literature.

To the best of our knowledge, we are the first to test econometrically whether the use of pre-populated tax returns enhances tax morale. A second contribution of this paper is to examine taxpayers' attitudes toward what can be considered the "weakest link" with the innovation of pre-populated returns: the presence or occurrence of under-estimated or over-estimated tax liabilities and their effects.

For our empirical analysis, we exploit the special questionnaire included in the 2016 wave of the Spanish Institute for Fiscal Studies Fiscal Barometer, which surveyed the Spanish citizenry attitudes toward *Renta Web*. Spain is a good case study because it has been an early-adopter of prefilled income tax returns within the international practice, and currently, its Tax Authority is still aiming at significantly extending the scope of its application. The last update of the prefilled returns initiative in Spain was the *Renta Web* program launched in 2016.

Our main empirical findings show, on the one hand, that the impact of pre-population on tax morale depends on citizens' perceived relationship between making changes on the prefilled tax form and the likelihood of facing an audit. These results are supported by the robustness checks we carry out in the paper. On the other hand, perceptions on tax filing behavior within a pre-population framework are determined by the link between making changes on the tax form and the likelihood of facing an audit.

Several policy implications follow from our results. First, the evidence identifies potential revenues gains stemming from the trust Spanish taxpayers' show towards the pre-populated tax returns initiative. In this sense, based on the three types of public policies aimed at reducing tax evasion identified by Alm (2011)—enforcement, service, and trust—and given the high rate of ignorance among Spanish taxpayers regarding prefilled returns (Área de Sociología Tributaria, 2017), the Tax Authority should make an effort to inform taxpayers about the neutral functioning of pre-populated returns. It is not in vain that the ways people form their beliefs depend on the information they are exposed to (Chetty et al., 2009). Therefore, reducing the present high rate of ignorance among Spanish taxpayers regarding prefilled returns would directly contribute to improve overall tax compliance.

And second, the potential deterrence role of prefilled tax returns is confirmed by Spaniards' attitudes towards *Renta Web*. This is manifest most clearly when exploring the relationship between tax filing behavior and the likelihood of facing an audit. This offers yet another reason to the commonly shared argument about the importance of increasing the Tax Authority's budget so to enable more audits.

Finally, we are aware of the limitations that emerge regarding the linkage between survey data and real actions (illustratively, Casal and Mittone, 2016), as well as the intrinsic constraints that

the exact content of the questionnaire may pose. In this sense, the present paper opens additional future research avenues. One possibility of major interest would be to run experiments in collaboration with the Tax Authority in order to match Spaniards' perceptions on pre-population to their actual tax filing behavior.

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Appendix

Table A1. Spaniards' Individual Tax Morale Determinants

Authors	Database and period	Estimated model	Variables and impact on tax morale
Alarcón et al. (2016)	University of Murcia Fiscal database (2007 and 2013)	Logistic regression (GLM)	Educational level (+), Self-employed (-), High income (+)
López-Laborda and Sanz-Arcega (2016)	Institute for Fiscal Studies Fiscal Barometer (2003-2010)	Probit and OLS	Living in wealthy región (-), helped by tax advisor in order to comply with taxes (-), urban (+), people pay taxes because of withholding (-), just concrete socioeconomic groups evade (+)
Bilgin (2014)	World Values Survey (2005)	Ordered Probit	Age (+), Income (-), Financial satisfaction (-), National pride (+), Students (+)
Giachi (2014)	Institute for Fiscal Studies Fiscal Barometer (2003-2009) and Centre for Sociological Research, Survey on Tax Policy (2001-2010)	Logit	Trust in Treasury and Tax System (+), age (+), region of residence (+/-), educational level (+), time (+)
Llácer (2014)	Regional Catalan Government survey on values and distributive justice (2010)	Logit	Age (+)
Molero and Pujol (2012)	Lab experiment with students	Binomial logit	I want to become a professional in Finance (-), others evade taxes (-), evasion as a firms' need (-), inefficient public management (-), high taxes (-)
Gracia de Rentería (2011)	Institute for Fiscal Studies Fiscal Barometer (2003-2008)	Probit	Urban (+), Age (+), Evasion is negative (+), Students (+), Evasion is common (-), Evasion decreased (+), Access to public services (+), Good public management (-), Living in wealthy regions (-), Compliance costs (-), Living in foral regions (+)
Martínez-Vázquez and Torgler (2009)	World Values Survey and European Values Survey (1981,	Ordered Probit	Religious (+), National pride (+), Age (+), Woman (+), Income (-), Trust in Parliament (+)

	1990, 1995 and 1999/2000)		
Alarcón, De Pablos and Garre (2009)	University of Murcia Fiscal database (2005)	Binomial logit	Age (+), Level of education (+), Income (+), Fair tax system (+)
Alm and Gómez (2008)	Centre for Sociological Research, Survey on Tax Policy (2005)	Probit	Age (+), Evasion extended (-), Taxes imply social benefits
Torgler y Schneider (2007)	World Values Survey (1995)	Ordered Probit and Probit	National pride (+), democrat (+), living in Navarre (-), Trust in legal system (+)
Prieto Rodríguez et al. (2005)	International Social Survey Programm 1998, Religion module	Ordered Probit	— Mayor Age (+), Urban (+), Radical party (-), governing party (+)
Martínez Cabrera and Sanz Sanz (1999)	Fiscal Barometer, Centre for Sociological Research (1997)	Logit	Evasion tolerated (-), tertiary education (-), fraud extended (-), public management efficiency (+), benefiting from social spending (+), high audit probability (+)
De Juan et al. (1994)	Fiscal Survey, Centre for Sociological Research (1991)	Logit	Students (+), risk aversion (-), altruism (+), evasion extended (-), tax equality (+), high audit probability (+)

Source: López-Laborda and Sanz-Arcega (2016) and author elaboration