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Artefactual Field Experiment With Real  
Taxpayers

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# Does using behavioural prompts in pre-populated tax forms affect compliance? Results from an artefactual field experiment with real taxpayers\*

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Abstract (175 words)

We report on data from an artefactual field experiment on the effect of pre-populating tax forms with third-party data, as well as using behavioural prompts designed to increase compliance. We use sample of UK taxpayers as our subject pool. The main results of this paper are that: (i) the correct pre-population of values in tax forms has no effect on compliance; (ii) the incorrect pre-population of income values in the tax form reduces compliance; (iii) the introduction of barriers to editing pre-populated fields may worsen non-compliance if the pre-populated values are incorrect; (iv) behavioural prompts concerning descriptive norms of compliance can mitigate the negative impact of incorrect pre-population of tax returns only if they are responsive to behaviour in the filing process; finally (v) a proportion of subjects overpaid taxes when the tax form was populated with a value above the true income. These findings represent important considerations for policy makers.

Keywords: Field experiment; tax compliance; Pre-population of tax returns

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## **1. Introduction**

The objective of any national tax administration is to maximise the amount of tax revenues collected. Doing so means minimising the degree of non-compliance by taxpayers, either due to evasion or genuine error. To this end, the UK Budget in the spring of 2015 announced the introduction of on-line digital tax accounts, which will remove the need to file a tax return.

The UK Government plans that by the end of 2016, five million businesses and one million individuals will have switched to the new digital accounts, and that by 2020 every individual and small business should be able to access their digital tax account (HMRC, 2015).

The proposed benefits of the new system include offering certainty and control over one's tax position; the removal of duplicated data entry; quicker responses from the tax authority; and the ability to share information with third parties. Other advertised benefits include integration to wider government services and personalised taxpayer support. The less publicly lauded benefits are reduced costs for the tax administration service through online interaction with taxpayers, as well as due to potentially fewer filing errors from duplicate entry of data.

An important part of this proposal is the tax authority's use of third party data. Currently, UK taxpayers may be required to enter data into their tax form that is obtainable from other sources (e.g. employment income, income from the ownership of property, or interest on bank accounts; tax-liable or tax-relieving expenses, such as medical insurance benefits or private pension contributions). It is possible for the tax authority to source much of this information from employers, banks or pension companies. Under the proposal for the new digital tax accounts, the tax authority will use the information it already has in taxpayers'

accounts. Therefore taxpayers will not need to re-enter that data when filing their taxes. This amounts to the tax authority pre-populating the taxpayer's tax form.<sup>1</sup>

There are, however, a number of concerns over the introduction of this policy. Chief among them is the possibility that the tax authority will inadvertently pre-populate tax forms incorrectly. On the one hand, taxpayers may simply accept the pre-populated values – a form of status quo bias or behavioural inertia (Samuelson and Zeckhauser, 1988; Madrian and Shea, 2001). This behavioural inertia could lead to unanticipated non-compliance if the tax authority's information underestimates a taxpayer's tax liability, leaving the taxpayer open to an audit and any associated penalties from their non-compliance.<sup>2</sup> Potentially increased levels of non-compliance arising from under pre-population would leave the tax authority with a larger revenue shortfall. Increased over-compliance arising from over pre-population would instead result in a public relations issue from the routine over-charging of taxpayers.<sup>3</sup>

On the other hand, pre-populating tax forms reveals what the tax agency knows (and importantly, what it does not know) about taxpayers' affairs, thus extending the opportunity for deliberate evasion.<sup>4</sup> Such an opportunity for tax evasion would obviously apply to those taxpayers considering evasion under the old tax return system, but, worse still, the incorrect pre-population of the tax form could make those that would have been compliant without pre-population now consider evasion.

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<sup>1</sup> Denmark introduced pre-population of tax forms in 1988 and is now performed to varying degrees in over ten European Union countries, Australia and the State of California (EC, 2012; OECD, 2006). Evidence suggests pre-population of tax forms reduces compliance costs for taxpayers (Vaillancourt, 2011; Klun, 2009).

<sup>2</sup> Importantly, the pre-population of tax forms does not change the fact that the legal responsibility for the correct filing and payment of taxes remains with the taxpayer.

<sup>3</sup> Over-estimating tax liabilities leads to the equally important problem (from the perspective of the duty of care of tax administrations) of taxpayers over-paying their taxes

<sup>4</sup> Kleven et al. (2011) demonstrate in a randomized control trial with Danish taxpayers that opportunity forms an important mechanism in the evasion decision.

In this paper we report the results of an online experiment studying the impact of pre-population of tax forms using UK taxpayers as experimental subjects. The experiment is designed to answer the following questions:

- Does pre-populating tax returns with correct values increase compliance?
- Does pre-populating tax returns with incorrect values decrease non-compliance?
- If the answer to the second question is affirmative, can that effect be mitigated by behavioural prompts imbedded in the tax form?

To answer the first two questions, we implement a one-shot decision artefactual field experiment with real UK taxpayers as our subject pool.<sup>5</sup> In our experiment, subjects play the role of a fictitious taxpayer, who has several income streams and tax-deductible expenses, and have to file a tax return. Their payment depends on the actual income earned minus whatever tax payments are due via their tax declaration (minus any fine if caught evading).

We assess the impact of various forms of pre-population against a baseline condition without pre-population. We additionally combine pre-population of fields in the tax forms with on-screen prompts intended to create barriers to non-compliance. These include the requirement to click on a check box in order to unlock particular entries in the tax form; and warning messages about the likelihood of being audited, which in some cases were responsive to the values inputted by subjects.

We find that partially pre-populating forms with correct data improves compliance. However, the use of inaccurate information significantly decreases compliance. This is due to the fact that some individuals accept the pre-populated value, while others engage in additional non-compliance. We find that the use of behavioural prompts can have both positive and negative consequences. A lock on the pre-populated field with a prompt for honesty can worsen non-

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<sup>5</sup> Harrison and List (2004) provide a taxonomy for economics experiments. They define an artefactual field as being a laboratory experiment conducted with a non-student subject pool.

compliance if the pre-populated values are incorrect. A prompt reminding subjects that a lower declaration of income would lead to a higher probability of audit along with a message concerning a descriptive norm of compliance is much more effective in increasing compliance, but only when it is responsive to the values inputted by the taxpayer; passively displaying the same content on the form does not induce changes in compliance behaviour.

## **2. Literature Review**

A fundamental issue around studying tax compliance is that it is a behaviour which, by its very nature, people wish to conceal. A common approach has therefore been the use of laboratory economics experiments (Alm, 2012). Tax compliance experiments have been performed to examine the effects of a number of different policies. Direct investigations include experiments assessing different forms of an amnesty (Alm, McKee, Beck, 1990), the effectiveness of audit schemes (Collins and Plumlee, 1991; Alm, Cronshaw and McKee, 1993; Alm and McKee, 2004; Tan and Yim, 2014), the ownership of the tax revenue spending process (Alm, Jackson and McKee, 1993), the impact of publicising information about audits and those audited (Alm, Jackson and McKee, 2009; Coricelli et al, 2010; Fortin, Lacroix and Villeval, 2007; Alm, Bloomquist and McKee, 2015), positive inducements to encourage tax filing and compliance (Alm et al, 2012; Bazart and Pickhardt, 2011) and the impact of information services provided by the tax authority (Alm et al, 2010; McKee, Siladke and Vossler, 2011; Vossler and McKee, 2013).

The vast majority of experiments have been conducted with students, the typical sample used in experimental economics. Some researchers (Harrison and List, 2004) criticise the use of students as they lack the necessary expertise to give external validity to the experimental findings. Others (Falk and Heckman, 2009) emphasise the importance of financial incentives, and their dependence on actions as the relevant feature of experimental economics, over and

above contextual expertise. The evidence on subject pool differences with respect to tax compliance experiments is very small. Gërxani and Schram (2006) study compliance differences in Albania and the Netherlands, using students and faculty in high schools and universities; Alm et al. (2015) compare the compliance behaviour of US undergraduate students and university staff; Choo et al. (2015) compare UK undergraduates to a non-representative sample of the UK taxpayer population. While there are level differences in compliance between students and non-students in all studies, there is less consistency in the responsiveness to treatment changes. Alm et al. (2015) report qualitatively similar results in both samples, while Gërxani and Schram (2006) and Choo et al. (2015) find different responses to parameter changes.

While the empirical literature on the determinants of tax compliance is vast, not a lot of it concerns the effectiveness (or lack thereof) of pre-population of tax returns. The little evidence there exists is very recent. Kotakorpi and Laamanen (2015) use data from a natural experiment in the mid-1990s in Finland whereby a subset of Finnish taxpayers had their tax forms partially pre-populated with employer data, while the other taxpayers had to fill a standard non-pre-populated tax return. The authors find that partially pre-populating tax returns led to a higher likelihood to report deductible expenses related to pre-populated fields in the tax form, while reducing the likelihood of reporting both income and deductible expenses that were not pre-populated. The authors argue this evidence is primarily consistent with reduced complexity costs, rather than evasion opportunities.

Bruner et al. (2015) conduct a laboratory experiment studying the effect of pre-populating tax returns using undergraduate students as subjects. In their experiment, subjects are allocated to different income 'types' and also differ on the unreported deductions that are declared by third parties. Subjects in their experiment are asked to file multiple tax returns in a sequence each of which corresponds to a different profile of deductible expenses; in some cases, it is

advantageous to file an itemized deduction, and some where it is not; they also consider a number of audit rates. The authors find that subjects' under-reporting of their tax liabilities increases when the tax form is pre-populated with data that supposes a lower tax liability than the actual one. They also find that providing opportunities for under-reporting leads to higher evasion.

While the focus of our study is slightly different to that of Bruner et al. (2015), the two studies complement each other in several dimensions. Our study looks at a one-shot decision with one set of parameters, where we only vary the pre-populated value in one of the entries, while Bruner et al. look at a wider set of parameters and a more complex type of filing decision. Bruner et al. consider several audit rates, which are invariant to behaviour and known with certainty, while we consider an unknown audit rate, which depends on filing behaviour. Bruner et al. consider a more complex environment due to their focus on itemised vs. non-itemised deductions, as well as matched vs. unmatched income; we focus on a simpler environment, where we manipulate pre-population in multiple ways and we focus on the effect of behavioural nudges. The fact that both studies find that pre-populating tax returns with values that under-estimate taxpayers' liabilities leads to higher non-compliance, lends greater robustness to both sets of results.

### **3. Materials and Method**

The laboratory gives the researcher control over the various parameters that presumably affect the decision under study, though it does so at the cost of using an artificial environment. While there are numerous criticisms of attempts to generalise results from experiments to real world settings (Levitt and List, 2007), for some policies experiments serve as a guide where there would be insurmountable issues to conducting research in the field. The case of pre-population discussed here is one such example, in that it would raise

serious legal and moral questions if the tax authority were to deliberately use incorrect values in taxpayers' filings in order to conduct research.

### 3.1 The Experimental Task

The experimental task used in this study required participants to complete a tax form based on a profile that they were given for a fictitious taxpayer. This profile detailed two sources of income and two corresponding expenses which could be used to reduce tax liabilities. Table 1 outlines the profile used in the experiment.

[Insert Table 1 Here]

The experimental instructions (see the Appendix for a copy of the instructions) detailed that participants would be paid according to the income in their profile minus any tax or fines due from their tax declaration and any potential audit. The instructions also detailed that upon filing their tax return the "experimental tax authority" could audit their tax return. If a participant's tax return were audited, the computer would compare the values in the tax return to the values in the profile. The probability with which the experimental tax authority did so was a function of the actual declared tax liability on the return, but it could never exceed 10%.<sup>6</sup> Participants were required to submit a tax return based on the following fixed (and known) parameters: a tax rate of 40% and a penalty rate applied to unpaid tax of 50%. The values for the probability of audit, the tax rate and the fine rate were set so as to meet the evasion condition for a risk neutral agent (Allingham and Sandmo, 1972).

Although the instructions did not instruct them to do so, participants could increase their financial payment by evading. They could do so by under-declaring income or by over-declaring expenses. In either case, the most they could gain would be to declare a tax liability

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<sup>6</sup> The formula used to determine the probability of audit (which is not revealed to the subjects) was  $p=3.3\%$  if the declared liability was greater than or equal to 45,200 ECU,  $p=6.6\%$  if the declared liability was between 22,600 ECU and 45,199 ECU and  $p=10\%$  if the declared liability was less than 22,600 ECU.

of zero. This translates into a possible gain relative to full compliance of £13.56 (at the time, US\$20.34) for a task which took on average 22 minutes.<sup>7</sup>

The majority of items in the tax return were verifiable if audited. Verifiability is essential for income amounts, as these form a direct part of the participant's payoff; as such the experimenter is required to know the value in order to be able to pay it. Expenses, however, offer the experimenter the ability to set unverifiable items, in that the expenses act to reduce the tax paid, so participants can increase their payoff by raising expenses, but the experimenter does not need to know the true value. Unverifiable expenses potentially allow subjects a greater opportunity to evade, a mechanism found to have an effect in empirical studies (Kleven et al, 2011). We allocated the value of one of the expenses (i.e. Property Expenses) to be equal to the roll of a six-sided die multiplied by 2000 Experimental Currency Units (ECU). As a participant's dice roll is unverifiable, it is rational for them to declare the maximum allowable value for the expenses field – that is, 12,000 ECU, equal to rolling a six. While we can never verify whether an individual misreported that expense item, we can detect non-compliance at the sample level, since the distribution of die rolls (and therefore of declared values on that item in the tax return) should be uniform if subjects are compliant (Fischbacher and Föllmi-Heusi, 2013).

### 3.2 Experimental Design

[Insert Table 2 Here]

The experiment consists of seven different treatments in a between-subjects design, summarised in Table 2. In our baseline treatment, BASE, the tax form was not pre-populated. In the CORR treatment, the tax form had the two values for self-employment income pre-populated with the same total amount as in the profile, and the tax form displayed that the

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<sup>7</sup> Broken down as an average of seven minutes to read the instructions, two minutes to perform the practice round, three minutes to carry out the tax filing and 10 minutes to complete the questionnaire.

information held in the tax authority database was the two values corresponding to the two self-employment income streams in the profile.<sup>8</sup> In the UNDER treatment, the self-employment income field was populated with an incorrect value equal to one of the two sub-items of the self-employment income in the profile and the tax form displayed that the information held in the tax authority database was that single income stream. This captures the case where the tax authority has either incomplete access to third-party data (e.g. an employer not providing this information), or the case where the tax authority is unaware of that stream of income. This error in pre-population leads the tax authority to *under*-estimate the tax liability of the subject. In the OVER treatment, the tax form displayed that the information held in the tax authority database consisted of three values, where one of these was a double-counted entry. Hence, the value used to pre-populate the self-employment field of the tax form was greater than the actual income level in the subject's profile. This error in pre-population leads the tax authority to *over*-estimate the tax liability of the subject.

The experiment contained no direct relationship between the level of pre-population and the probability of audit. That is, the taxpayer is no less likely to be audited when accepting an under pre-populated value than any other value in the appropriate liability range. At first glance this appears to miss a potentially important feature: the probability of audit is reduced for a taxpayer accepting a pre-populated value, albeit an incorrect one. The experimental design does, however, reflect the operational approach of many tax authorities that base their audit decision on the level of reported income compared to some benchmark for the particular type of work or industry of the taxpayer. Simple acceptance of the under pre-populated value therefore actually increases the audit probability relative to compliance, or very small non-

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<sup>8</sup> This corresponds to the case where the tax authority has access to quality third-party reporting and therefore can correctly pre-populate the taxpayer's income (Gale and Holtzblatt, 1997). In the UK, third party reporting forms the basis of the Pay-As-You-Earn (PAYE) system, such that the correct tax is paid at source and many employees are not required to submit a year-end tax return.

compliance, due to the level of the under-reporting relative to the benchmark and the form of the audit rule being used.

We expected a large incidence of non-compliance in the UNDER treatment, either because inertia leads subjects not to change their pre-populated entries, or because subjects learn of the experimental tax authority's ignorance of the true profile values, and engage in active non-compliance. To test whether behavioural prompts can mitigate the negative effects of incorrect pre-population, we consider three additional versions of the UNDER treatment. The first is UNDERGENERIC, which featured a checkbox which participants had to click to unlock the pre-populated income field, and had to re-check in order to confirm the new value they inputted before filing the tax return.

The second version was UNDERALWAYS, which featured the following message: "Most people in your circumstances enter an income value of more than 40,000. Values below this amount are more likely to be audited. Click the tickbox to confirm you wish to proceed." This treatment was intended to trigger a descriptive norm of compliance and reminded subjects of the nature of the audit rule.<sup>9</sup> Finally, the third version was UNDERTRIGGER, in which the same message as UNDERALWAYS was featured, but only if the participant inputted a total self-employment income amount lower than 40,000.

Our choice of prompt in the UNDERALWAYS and UNDERTRIGGER treatments was based on one of the mechanisms used by tax authorities to identify tax evaders which is to target outliers from within a given group, for instance based on industry. For example the "DIF score" of the IRS in the USA will produce "audit flags" for taxpayers deviate from the average behaviour of their group (Alm and McKee, 2004). As the probability of audit is

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<sup>9</sup> Social psychologists have long argued for the effectiveness of descriptive norms as catalysts of behaviour change, e.g. Goldstein et al. (2008), Griskevicius et al. (2008). See Onu and Oates (2014) for a review of the evidence of norms applied to tax compliance.

endogenous with respect to the subject's declaration in the experiment, we can use a prompt to inform subjects of the tax authority's operational process.<sup>10</sup>

### 3.3 Experimental Procedures

The experiment was conducted online between 9 February and 12 April 2015. Participants from the UK taxpayer population were recruited by the market research agency ICM by means of a pre-screening questionnaire. ICM were responsible for all contact with the experimental participants, including the processing of payments. The recruitment materials from ICM instructed that a six-sided die might be required, and gave a number of online links for simulated dice roll web sites for those that did not have access to a physical die. ICM recruited 755 people, and 559 (74%) completed the experiment.<sup>11</sup>

ICM provided each participant with a url to the experimental website, as well as a unique login username and password. The researchers could not match username data to actual participant data, and ICM did not have access to participant decisions, making this a double-blind experimental design. This was made explicit to participants when they were first recruited to participate.

Upon login each participant read an on-screen set of instructions that detailed the task they were required to perform. The instructions told the participants that they would serve as a taxpayer in the experiment, filing a tax report based on a number of income streams and potential expenses in the given profile. The details of the actual income and expenses applicable to them would be given at the appropriate stage in the experiment, at which point would have to complete a tax return. The instructions detailed that the participant's payment

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<sup>10</sup> We opted for the value for income displayed in the prompt to be below the actual value given in the profile, reflecting the process whereby outlying declarations are subject to higher probability of audit. It was also chosen to be above the value used for the pre-population in order for the message to have some degree of saliency.

<sup>11</sup> The drop-out rates of those who started the experiment but failed to complete it were consistent between the treatments. There was, however, some variation in the numbers completing the experiment for each treatment, detailed in Table A2 in the Appendix. The differences in the number of subjects arose from different proportions of those invited by ICM who accessed the experiment.

from the experiment would be based on the income items in the profile minus any tax or fines they were required to pay within the experiment. Participants were also told they would be paid a fixed £5 (US\$ 7.50) for completion of the experiment. The instructions detailed a number of examples of the potential outcomes from various declaration choices – the full set of screenshots is in the Appendix.

After reading the instructions, participants were then asked to complete a practice tax form based on a simple profile for which they were told they would not be paid. Upon completion of the practice form, participants were informed of what payoffs their choices would have produced to under both the condition if they had or had not been audited on their practice tax declaration.

Once participants had completed their tax form, they were shown their tax calculation. They could then either repeat the process in order to change their details or submit their tax return. After submission, the computer randomly determined if they were to be audited and the participants were shown their payoff from the experiment.

Subjects then completed a questionnaire about the experiment and to determine a number of their personal characteristics. They were informed that the questionnaire would not impact their payoff and they were able to leave any question blank if they wished. Finally, participants were told they had completed the experiment and given details of how to opt out of having their responses included in the data set, had they wished to do so.

A participant's experimental balance was calculated at the end of the experiment as the total of the two income streams in the profile minus the tax payable on their declared liability and any fines occurred from the under-payment of tax due. It is important to note that over-declaration of income could not raise participants' payoffs, and the experimental instructions

were clear about this. Participants' earnings in ECU were converted to cash at a rate of 50p per 1,000 ECU; average earnings were £29.62 (US\$ 44.43).

#### **4. Results**

Our analysis will centre around two measures: the first is the rate of compliance, which equals the ratio of declared liability to actual liability. A fully compliant individual is one with a rate of compliance equal to one. The second is the incidence of compliance, which is the propensity of individuals to be fully compliant – i.e. those individuals with a compliance ratio of 1. The key questions we consider are whether the correct or incorrect pre-population of tax forms and the introduction of behavioural prompts lead to a reduction in the propensity for compliance or in the rate of compliance. We will treat each individual decision as an independent observation and make treatment comparisons using standard statistical tests. We complement these with econometric analysis, which also incorporates individual characteristics; it did not provide additional insights, so we relegate it to the Appendix.

[insert Figures 1 and 2 here]

##### 4.1 The Effect of Pre-Population of Tax Returns

Figure 1 displays the average compliance ratio for each treatment; Figure 2 displays the proportion of fully verifiable compliant subjects.<sup>12</sup> We focus first on the effects of pre-population. Our control condition in which there was no pre-population, BASE, reports a very high compliance rate, close to 90%; however, only 70% of subjects were fully compliant in that treatment, which suggests that many of those who evaded did so by relatively small amounts (a qualitatively similar pattern applies to most other treatments).

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<sup>12</sup> The results only include participants who declared a verifiable compliance ratio less than or equal to one. Participants who declared a verifiable compliance ratio greater than 1 are classed as in error and excluded from this section of the analysis.

The CORR treatment, in which the pre-populated entry in the tax return correctly estimated the subject's tax liability on the income entry, had a higher (though not significantly different) average compliance rate than BASE ( $z = 1.262$ ,  $p = 0.207$ ; Mann-Whitney, (henceforth MW) test), as well as a higher (though again non-significant) proportion of fully compliant individuals ( $p = 0.362$ ; Fisher's exact (henceforth FE) test). The OVER treatment, in which the pre-populated entry in the tax return over-estimated the subject's tax liability, had a small, non-significant negative difference in both the proportion of fully compliant individuals ( $p = 0.690$ ; FE test) and average compliance rate ( $z = 0.562$ ,  $p = 0.574$ ; MW test) relative to BASE. In contrast, the UNDER treatment, in which the pre-populated entry in the tax return under-estimated the subject's tax liability, led to a large and significant negative difference in fully compliant participants ( $p = 0.017$ ; FE test), as well as a significant drop in average compliance ( $z = 3.650$ ,  $p < 0.001$ ; MW test) compared to BASE.

[Insert Figure 3 Here]

Figure 3 unpacks the compliance behaviour described in Figure 2 by analysing compliance on each of the verifiable fields in the tax form. In other words, we calculated the proportion of subjects who truthfully declared a value equal to the profile value for each of the three verifiable fields (i.e. self-employment income, property income and self-employment expenses). Figure 3 uncovers several interesting behaviours. Starting with BASE, the proportion of compliant subjects on all three categories is in the 80%-90% range, the highest being Self-Employment Expenses (88%) and the lowest being Self-Employment Income (78%). When Self-Employment Income is correctly pre-populated (CORR), the proportion of compliant subjects on that item is close to 100% -- all but one participant in that treatment accepted the pre-populated amount. The proportion of compliant subjects on Property Income, however, remains roughly the same, 87%, as in BASE, 84%, while the compliance rate on Self-Employment Expenses is slightly smaller. In the OVER treatment, we observe a

slightly higher though non-significant proportion of compliant individuals on Self-Employment Income than in BASE ( $p = 0.828$ , FE test), but a significantly lower proportion of compliant individuals with regards to Self-Employment Expenses ( $p = 0.018$ , FE test). In other words, when the pre-population of income fields is done in a way that hurts subjects, we observe a small shift in non-compliance to non-pre-populated fields.

In the UNDER condition, as expected, the incorrect pre-population of Self-Employment Expenses) lead to a dramatic fall in the proportion of compliant individuals with respect to that field ( $p=0.001$ , FE test), while the proportion of compliant individuals in the other two verifiable fields was unchanged.

It is informative to look at the distribution of returned values in the Self-Employment Income field. Figure 4 illustrates the proportions of each sample that reported particular ranges of value for the Self-employment income field in each of the treatments. The buckets used in Figure 4 reflect the values used in the profile and the treatments. The total value for self-employment income in the profile was 52,300, arising from two separate income figures of 25,200 and 27,100. In the UNDER pre-population treatments, only the value of 25,200 was used to pre-populate the self-employment field, and in the OVER treatment the figure of 25,200 was double counted to give a value of 77,500.

Consistent with the evidence in Figure 3, almost all subjects returned a value equal to that pre-populated in CORR. In the UNDER treatment, around a third of subjects kept the original pre-populated amount, and just over half of subjects corrected the pre-populated value with the profile value; while the remaining 15% of subjects in that treatment replaced the pre-populated value with a higher amount, although short of the profile value itself. Finally, in OVER, only just over 10% of subjects kept the pre-populated value which over-estimated their tax liabilities; 80% of subjects corrected that amount to be equal to the profile value, while

the remainder corrected it to be lower than the profile value. We summarise our results so far as follows.

**Observation 1:** *Correctly pre-populating tax returns leads to small, non-significant increase in compliance relative to no pre-population.*

**Observation 2:** *Pre-populating tax returns with too-low income values leads to a decrease in compliance, driven by some individuals accepting the pre-populated values, and others engaging in further non-compliance.*

**Observation 3:** *Pre-populating tax returns with too-high income values has no overall effect on compliance. However, a non-trivial proportion of individuals accepted the pre-populated values, which would lead to over-payment of taxes.*

#### 4.2 The Effect of Behavioural Prompts

We now turn to analysing the effect of behavioural prompts on compliance behaviour. As such, we use the UNDER treatment as an additional baseline condition, and see whether prompts can “recover” compliance levels back to those observed in the original BASE treatment (or even higher).

Going back to Figures 1 and 2, we see that the effect of behavioural prompts on compliance is rather mixed: in UNDERGENERIC (which had a checkbox which subjects had to un-tick before altering the content of the pre-populated field), both the proportion of fully compliant ( $p = 0.049$ , FE test) and the average compliance rate ( $z = 2.027$ ,  $p = 0.043$ , MW test) are significantly lower than in the UNDER treatment. The introduction of a descriptive norm message plus a confirmation tick box (UNDERALWAYS) had only a slight positive effect on both proportion of compliant individuals ( $p = 1.000$ , FE test) and average compliance rate ( $z = 0.762$ ,  $p = 0.446$ , MW test). In contrast, the same message when triggered by subject’s filing behaviour, was more effective at increasing the average compliance rate ( $z = 2.062$ ,  $p =$

0.039, MW test), although the proportion of fully compliant individuals was not significantly different ( $p = 0.200$ , FE test).

Figure 3 breaks down the fraction of fully compliant individuals on an item-by-item basis. While there is little effect of behavioural prompts on compliance behaviour in the non pre-populated fields, there is a very large effect on the compliance behaviour in the Self-Employment Income field. The introduction of a checkbox in the UNDERGENERIC field leads to a 10 percentage points fall in the proportion of people who were fully compliant in that field: this is likely due to either inertia, or due to reluctance on the part of subjects to overcome the behavioural obstacle posed by the tick box. The distributional analysis of compliance behaviour in the Self-Employment Income field displayed in Figure 4 bears this conjecture out: the proportion of subjects who declared a value equal to that pre-populated in the Under condition was just over 30%, while in the UNDERGENERIC treatment, it is equal to almost 50%.

The generic message about compliance norms had virtually no effect on compliance behaviour in the Self-Employment Income field, when it appeared as a default in the UNDERALWAYS treatment ( $p = 1.000$ , FE test). However, when it appeared as a response to participant behaviour, it led to a 20-percentage points increase in the proportion of compliant entries in the pre-populated field ( $p = 0.048$ , FE test)

**Observation 4:** *The introduction of barriers to editing pre-populated values compounds the non-compliance effect of incorrectly pre-populating tax forms.*

**Observation 5:** *Behavioural nudges incorporating messages about compliance norms and information about audit rates are only effective in changing compliance behaviour when they are responsive to filing behaviour.*

### 4.3 Errors

The error rate, based on the percentage of tax reports with a verifiable liability ratio greater than 1 among treatments excluding the OVER treatment, was 3.5%. The errors consisted of an equal combination of over-reported income and of under-reported expenses. However the error rate was found to be 10% when including the OVER treatment, due to a considerable fraction of subjects (40%) that did not alter the pre-populated self-employment income value in the OVER treatment and therefore over-declared their tax liability. In the following discussion of the OVER treatment, we therefore consider all declarations.

The behaviour of subjects in the OVER treatment can be broken down into a number of categories. The most common action was to alter the self-employment income field to be compliant and to enter compliant values on the other fields. The second most common behaviour was to accept the pre-populated self-employment income value and enter the other values compliantly, thereby over-declaring liability, resulting in an excessive payment of tax and a reduction in potential income from the experiment. Given the tax rate and the exchange rate used for the experiment, this action resulted in a risk free loss of £4.50 (US\$ 6.75) to such subjects. A third type of behaviour was to reduce the level of self-employment income while entering other values compliantly, but not so far as to correct it, leaving those subjects also over-compliant. The fourth type of behaviour observed was to leave the pre-populated value for self-employment but to enter highly non-compliant values in other fields, most notably self-employment expenses. This form of behaviour suggests that for some subjects there was a reluctance to alter the pre-populated values.

### 4.4 Unverifiable Item

We now turn our attention to examine the unverifiable item in the profile. The profile stated that subjects should enter the value of a dice roll multiplied by 2,000 as their value for

property expenses. The value entered was unverifiable by the experimental tax authority, which was explicitly noted in the instructions. Admissible values for the property expenses field were 2,000, 4,000, 6,000, 8,000 10,000 and 12,000 ECU. Subjects entering the highest value of 12,000 ECU gained tax relief on that value, such that the difference between entering the lowest value and the highest value resulted in a risk-free increase in payoff of £2.00 (US\$ 3.00). The following section reviews the results of values reported for property expenses in the experiment in terms of the dice rolls that the values entered represent. A small number of tax reports were initially rejected by the software during the experiment because of inadmissible values entered for the property expenses. The large majority of the rejected values were 0s and were quickly corrected to admissible values.<sup>13</sup>

[Insert Figures 5 and 6 Here]

Figure 5 shows the distribution of the dice rolls reported by all subjects who completed the experiment. A Pearson chi-squared test shows the difference of the distribution of observed dice rolls to the theoretical uniform distribution to be non-significant. The results in Figure 5 show a moderately significant raised level of reporting of a dice roll of 3 and moderately significantly decreased levels of reporting of 5 and 6 compared to the expected theoretical values for a fair dice roll using binomial tests. This result is in contrast to the value predicted that subjects should report from economic theory, which would be a 6 given that the tax authority cannot verify the accuracy of the value. The pattern of results observed is also different to previous results on subjects' behaviour of reporting of dice rolls in experiments which was for significantly raised proportions of higher payoff values at the expense of the lower ones (Fishbacher and Föllmi-Heusi, 2013).

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<sup>13</sup> A very small number of subjects (6) entered a series of inadmissible values and eventually failed to complete the experiment. We note that the proportion of the sample leaving the experiment at this point was much smaller than that who decided not to complete the experiment having read the instructions (49).

Figure 6 shows the dice rolls reported by subject grouped by those that were otherwise compliant on the verifiable fields and those that were non-compliant on the verifiable fields. Figure 6 reveals a difference in the pattern of values reported between these two portions of the sample. Subjects who were otherwise compliant reported a significantly higher proportion of 3s for the dice roll than would be predicted for a fair dice. Subjects who were non-compliant on the verifiable fields reported a significantly higher proportion of 1s for the dice roll than would be predicted.

**Observation 6:** *The pattern of declarations on the unverifiable property expenses field differs between compliant and non-compliant subjects in the verifiable fields.*

#### 4.5 Post-Experimental Survey

Subjects' responses to the post experiment questionnaire revealed a number of categories of motivation for their actions in the experiment. In the BASE treatment, the main categories of reported motivations were a desire to be honest, a desire to be correct and follow the process and an acknowledgement of the decision to evade. A small number of responses were ambiguous, in that they revealed no information or made a statement that was inconsistent with the subject's actual actions. The proportions of the responses in each of these categories were similar to the BASE treatment for the CORR and OVER treatments, but were different for the "UNDER" treatments, where there was an increase in the proportion of subjects acknowledging their evasion decision and a very marked increase in the number of ambiguous reports. The increases in proportions of these two categories were largely at the expense of the proportion of subjects reporting correctness and a desire to follow the process compared to the baseline as their motivation. The increase in the proportion acknowledging the evasion decision supports the conjecture that subjects were aware that the pre-populated value was not equal to the value in the profile and were taking advantage of it. The increase

in ambiguous responses may arise from either subjects wishing to mask non-compliant behaviour or from genuine mistakes. As such, we cannot rule out the alternative that some subjects failed to notice that the pre-populated value was not that of the profile.

The questionnaire responses give some indication that a small portion of subjects failed to understand that increasing expenses would reduce their tax liability and acted to increase their tax liability. However, the majority of subjects who declared a value for the self-employment expenses that was not the value given in the profile did so in their favour, reducing their tax liability.<sup>14</sup> A lack of understanding about the relationship between expenses and tax liability by subjects potentially forms more of an issue for results associated with the unverifiable item as there were restrictions on the values that could be entered. However, as with the verifiable item, the truth was still an option, though in the unverifiable case the truth was from a dice roll rather than a value detailed in the profile.

## **5. General Discussion**

The experiment detailed in this paper reflects potential differences in the design of on-line tax forms in the UK today and those that may be used in the near future under recent proposals for change. The treatments used in the experiment were designed to reflect situations that might arise under the new system relating to the nature and quality of third party reported information used to pre-populate tax forms.

The main results of this paper are that: (i) the correct pre-population of values in tax forms has no effect on compliance; (ii) the incorrect pre-population of income values in the tax form reduces compliance; (iii) the introduction of barriers to editing pre-populated fields may worsen non-compliance if the pre-populated values are incorrect; (iv) behavioural prompts

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<sup>14</sup> Error rates exist in real tax returns, with a figure of 7% quoted for US taxpayers in the literature (Andreoni, Erard, and Freinsein, 1998). While we should compare behaviour in the lab with behaviour in the field with great caution, the results for the majority of treatments presented here are well within this level.

concerning descriptive norms of compliance can mitigate the negative impact of incorrect pre-population of tax returns only if they are responsive to behaviour in the filing process; finally, (v) a proportion of subjects overpaid taxes when the tax form was populated with a value above the true income. These findings represent important considerations for policy makers.

The observation of low error rates relating to the over-reporting of income and under-reporting of expenses on the majority of treatments indicates that most subjects understood the experiment and were able to complete the tax return as required. Confusion aside, there are three main possible reasons why the level of compliance in the pre-populated field is lower in the UNDER treatment than in the BASE treatment. The first is that it is possible that the observed result reflects a lack of care on behalf of participants in the experiment, who simply failed to notice that the pre-populated value for income in their tax return was different to the value in their profile. However, the similar level of compliance in the UNDERALWAYS treatment, where subjects were prompted to accept the pre-populated level of income, and the UNDER treatment lends evidence against this conjecture.

The second is that pre-population serves to prompt the subject to the possibility of evasion, and in particular, to evasion at a given level. However, the lack of effectiveness with regards to non-compliance of the UNDERALWAYS treatment (where subjects were reminded of the risk-based audit rule in addition to being given information regarding a descriptive norm of compliance) suggests this line of reasoning may be flawed.

Finally, subjects may have been reluctant to change the pre-populated value from the one given to them by tax authority. This could be because subjects feared changing the pre-populated field could trigger an audit, or perhaps because subjects trusted the tax authority to compute the correct value for pre-population – even though the instructions detailed that

these values might not be accurate. The observation that 98% of subjects in the CORR treatment did not alter the value, compared to 78% who entered the correct income value into the blank form of the BASE treatment, suggests subjects were reluctant to edit the pre-populated field. In addition, the higher proportion of subjects reporting the pre-populated value for self-employment income in the UNDERGENERIC treatment, where the field must be unlocked to be edited, compared to the UNDER treatment that featured no such lock, further reveals there was a degree of reluctance to change the pre-populated field in this treatment.

A third piece of evidence supporting a reluctance of subjects to alter the pre-populated field is the observation that where correction of the pre-populated was a riskless, payoff-improving behaviour in the OVER treatment, some subjects preferred to greatly elevate their self-employment expenses to make their tax liability compliant (or non-compliant in their favour). Finally, the improved compliance in UNDERTRIGGER, where subjects received the same information as in UNDERALWAYS but only if they completed their tax return with too low a declared tax liability, suggests that the timely reminder of audit information plus others' behaviour may have swayed some of the more reluctant individuals.

However the non-trivial proportion of subjects observed reporting too high an income value pre-populated in the OVER treatment leaves a concern that some subjects simply did not observe that the value used to pre-populate the self-employment field was higher than that in the profile. These findings suggest that while one of the drivers for the primary result is a status quo bias related to subjects' reluctance to change values in the pre-populated field, we cannot rule out a lack of awareness of incorrectly pre-populated values among some subjects as the cause of their non-compliance.

The most striking observation from the results for the unverifiable property expenses declarations is that the majority of subjects did not optimise and take the risk free option of

putting the highest value available for the field. A second feature is that the observed result is largely consistent with a random outcome. Subjects may have simply reported the true value of the die roll out of an intrinsic desire to be honest (Kartik, 2009), or in order to follow the rules of the experiment “correctly”. The relative spike at “3” could also indicate that subjects may have wished to report the average outcome of the die roll.

## **6. Conclusion**

This paper presents experimental evidence on the impact of the pre-population of tax returns and the use of behavioural prompts on tax compliance. Laboratory experiments provide a valuable method for policy-makers to ascertain the behavioural impacts of proposed policy changes in a low-risk, low-cost environment. Our experiment considers the behavioural impacts different ways to pre-populate of tax returns may have and what that means in terms of compliance behaviour. There are a number of policy implications arising from our results.

Firstly, and unsurprisingly, the use of accurate third party information nominally improves compliance. Conversely, the use of inaccurate third party information reduces compliance. This is due to two factors: some of the affected taxpayers will accept the default pre-populated value, while other taxpayers who would otherwise be compliant if the pre-populated information was correct or blank are non-compliant when the value is incorrect.

Secondly, there are methods that the tax authority can use to address the potentially increased levels of non-compliance, but such measures need to be carefully considered. A lock on the pre-populated field with a prompt for honesty actually causes compliance to fall further when the pre-populated value is incorrect and below the true income. This possibly is due to some additional degree of reluctance of some subjects to change the value. A dynamic prompt reminding subjects that a lower declaration of income would lead to a higher probability of audit is much more effective in increasing compliance, particularly in relation to the major

income item in the subject's profile. It should be noted that message used in this experiment is highly specific to the profile used, and the creation of an equivalent message in a real tax system would be non-trivial for the tax authority.

Our experimental design does not allow us to completely determine if the default bias is due to less attention being paid or to an increase in deliberate evasion in the UNDER treatments, however the similar level of non-compliance observed between the treatment with passive non-compliance and another where non-compliance must be confirmed suggests that participants are aware of their actions.

The increased non-compliance with the incorrect pre-population of a tax form forms a potential issue for the tax authority. A further potential issue is the large degree of over-declaration of the actual liability due where the tax form was pre-populated with an income amount about the true value. Systematic behaviour of this form may well harm the reputation of the tax authority if allowed to happen and then discovered.

Our experiment does not directly test the impact on compliance of income unknown by the tax authority. Our subjects faced a decreasing probability of audit in liability; the exact formulation of the audit rule was unknown to them in an attempt to replicate some degree of the operational reality. However, this formulation was not directly linked to the subjects' actual income streams, as would be the case with risk-based audit schemes. It should be noted that failure to declare an income stream, such as done by acceptance of the pre-populated value in the UNDER treatments, actually raised the subjects probability of audit (and undeclared income would have been found for certain in the case of audit).

It is also important to point out that the great advantage of pre-populating tax forms lies in the simplification of the process of filing a tax return, as illustrated by Kotakorpi and Laamanen (2015). This aspect was absent from our experiment, which was designed to be much simpler

than a standard tax form. Future research should address whether the benefits of lower complexity outweigh the risks from inaccurate third-party data. Tax administrations may face varied challenges in an attempt to implement a zero-return (Gale and Holtzblatt, 1997) and such research may help guide authorities to the appropriate policies.

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## Tables

<b>Field</b>	<b>Description</b>	<b>Value (in ECU)</b>
Self Employment Income	Income from contract with local authority	25,200
Self Employment Income	Income for work done for ACS Ltd	27,100
Self Employment Expenses	Cost of Travel to Work	2,500
Property Income	Revenue from letting a flat	20,000
Property Expenses	Cost of estate agent and legal fees for letting of flat	2000 times the roll of a 6-sided die

Table 1: Contents of the taxpayer profile used in the experiment

<b>Treatment</b>	<b>Description</b>
BASE	No information reported and all four fields left blank
CORR	Correct self-employment income streams reported, correct self-employment income pre-populated
OVER	Double counting of one income stream reported, incorrect (value too high) self-employment income pre-populated
UNDER	Omission of one income stream reported, incorrect (value too low) self-employment income pre-populated
UNDERGENERIC	Omission of one income stream reported, incorrect (value too low) self-employment income pre-populated, click of checkbox required to edit pre-populated field (and confirmation of edit)
UNDERALWAYS	Omission of one income stream reported, incorrect (value too low) self-employment income pre-populated. Additional message on screen: “Most people in your circumstances enter an income value of more than 40,000. Values below this amount are more likely to be audited. Click the tickbox to confirm you wish to proceed.”
UNDERTRIGGER	Omission of one income stream reported, incorrect (value too low) self-employment income pre-populated. Same message as UNDERALWAYS only displayed if subject files self-employment income value less than 40,000.

Table 2: Treatments used in the experiment

## Figures

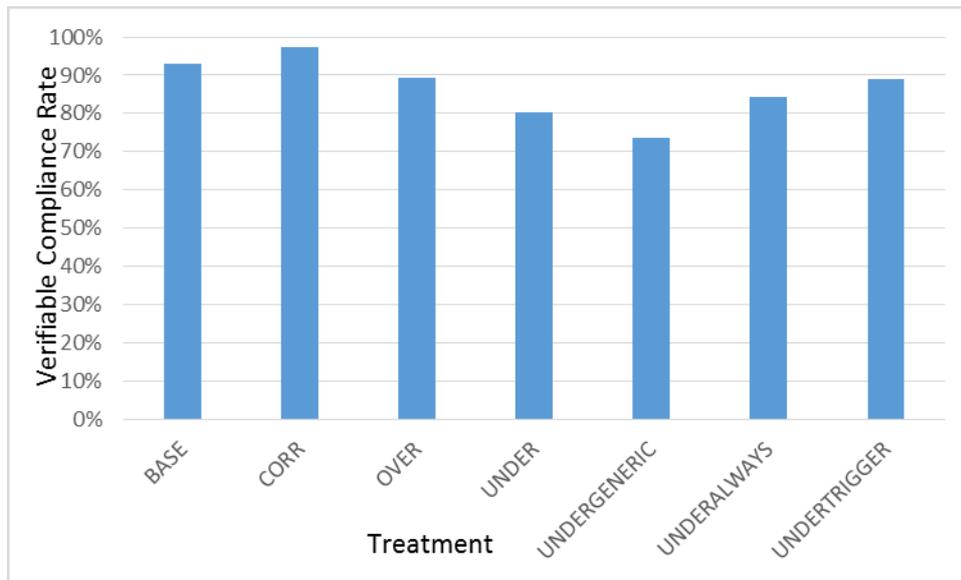


Figure 1 Average verifiable compliance ratio by treatment

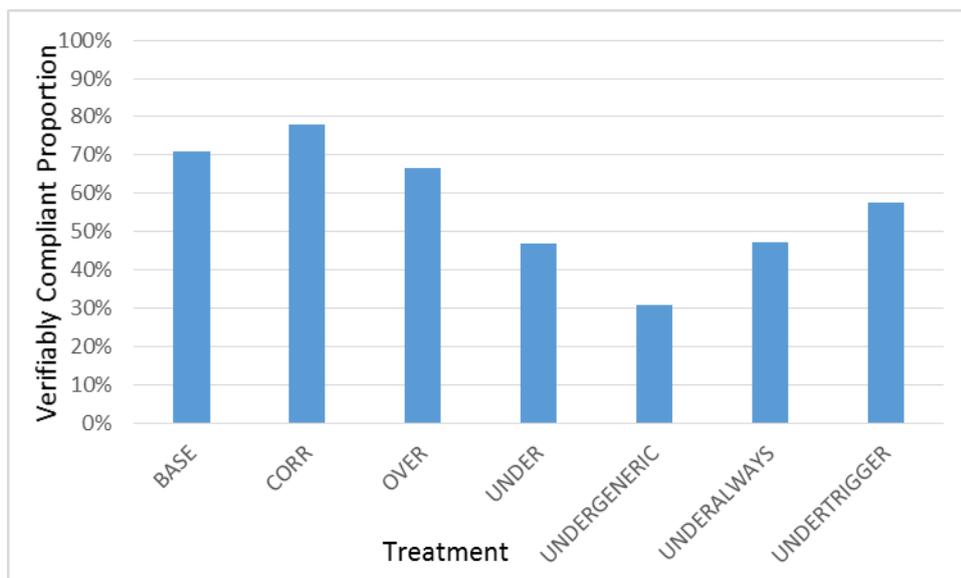


Figure 2: Propensity for verifiable compliance by treatment

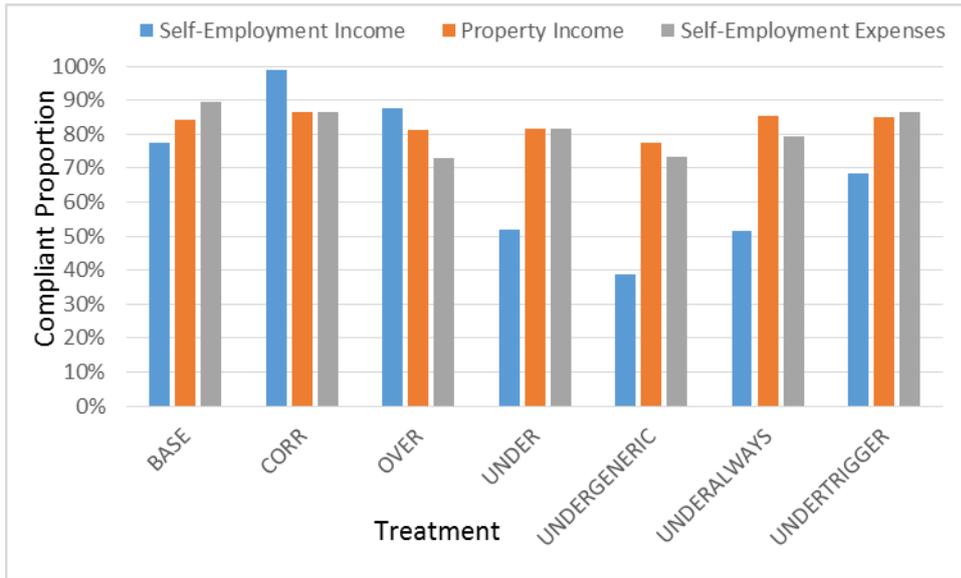


Figure 3: Propensity for verifiable compliance by treatment for each of the verifiable fields in the taxpayer’s tax form

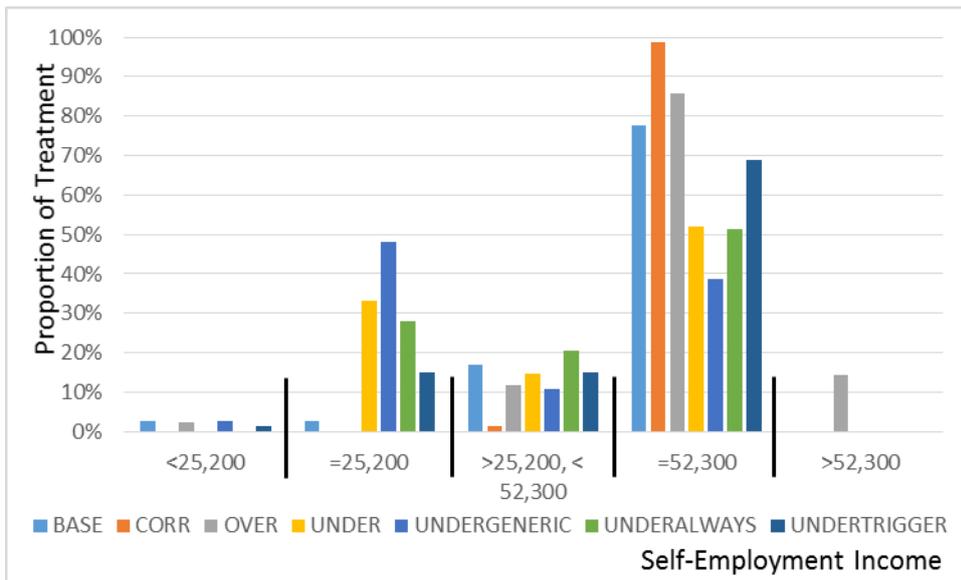


Figure 4: Histogram of reported values for self-employment income by treatment

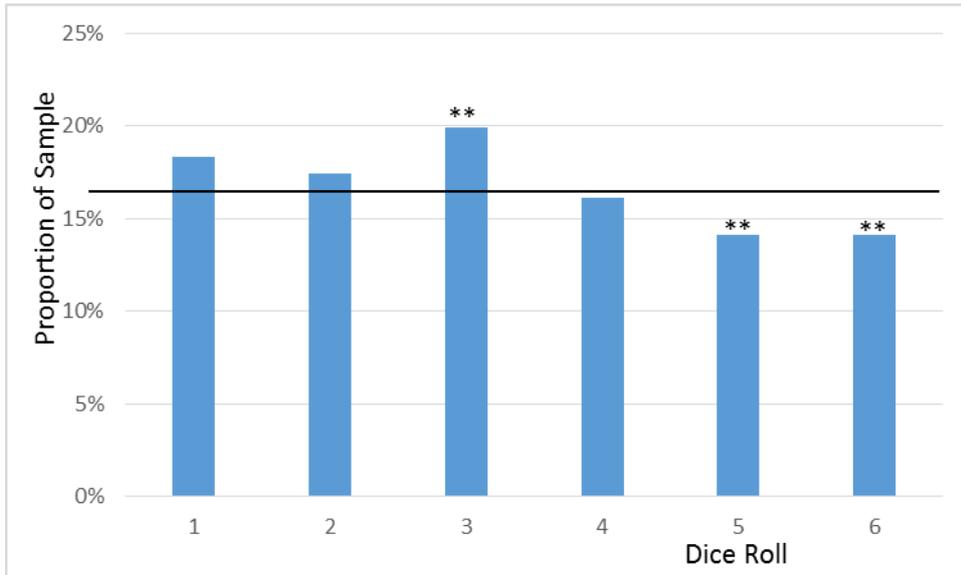


Figure 5: Proportions of sample and their implied dice rolls from the declared values for property expenses. Note: \*\*, \* indicate a significant difference at the 5%, 10% level from theoretical prediction of 1/6 using a binomial test.

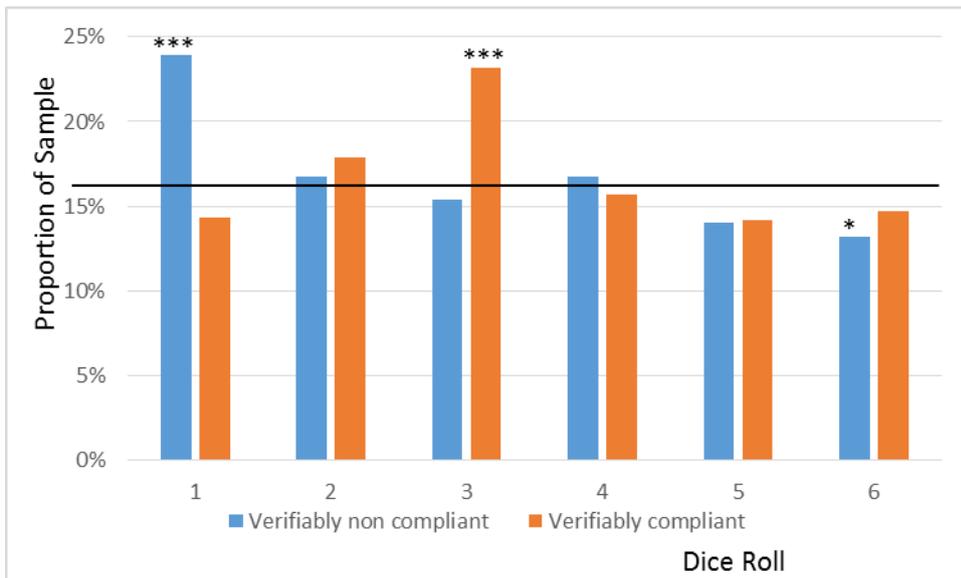


Figure 6: Proportions of sample and their implied dice rolls from the declared values for property expenses separated by those who were verifiably compliant on the other fields in the tax form and those who were not. Note: \*\*\*, \*\*, \* indicate a significant difference at the 1%, 5%, 10% level respectively from theoretical prediction of 1/6 using a binomial test.

## Appendix

Model	T1	T2	L1	L2
Estimator	Tobit	Tobit	Logit	Logit
DV	VRatio	VRatio	VCompliant	VCompliant
Constant	1.199*** (0.055)	1.205*** (0.112)	0.898*** (0.253)	1.482** (0.597)
CORR	0.118 (0.076)	0.124 (0.077)	0.371 (0.368)	0.473 (0.400)
OVER	-0.081 (0.082)	-0.041 (0.082)	-0.205 (0.397)	-0.187 (0.432)
UNDER	-0.270*** (0.069)	-0.273*** (0.069)	-1.022*** (0.337)	-1.090*** (0.363)
UNDERGENERIC	-0.393*** (0.069)	-0.402*** (0.070)	-1.714*** (0.356)	-1.842*** (0.387)
UNDERALWAYS	-0.222*** (0.072)	-0.205*** (0.073)	-0.594*** (0.347)	-0.948** (0.386)
UNDERTRIGGER	-0.123* (0.072)	-0.132* (0.071)	0.8979* (0.253)	-0.673* (0.373)
Male		-0.027 (0.038)		-0.144 (0.207)
Taxes		-0.044*** (0.008)		-0.286*** (0.050)
Semp		0.052 (0.043)		0.215 (0.232)
Income		0.015 (0.010)		0.046 (0.054)
Age		0.001 (0.002)		-0.001 (0.009)
Sigma	0.367 (0.020)	0.351 (0.019)		
N	503	499	503	499
Pseudo R2	0.122	0.186	0.07	0.14
LL	-258.7	-237.9	-318.4	-294.5

Table A1: Regression results determinants of compliance. Notes: VRatio is the ratio of verifiable liability declared to total verifiable liability given in the profile. VCompliant is a dummy variable which equals one if subject's VRatio = 1 and zero otherwise. Male = 1 if subject j reported being a male and 0 otherwise; Taxes = value from 1 to 10 in response to the question "Do you think cheating on taxes if you have a chance is justifiable? Please state 1 if it is never justifiable, 10 if it is always justifiable or a value in between"; Semp = 1 if subject stated being self-employed and 0 otherwise; Income equals subject j's stated annual income; Age is subject's self-reported age. Models T1 and L1 report results from regressions using only the treatments as dummy variables. Models T2 and L2 add a number of further variables for personal characteristics reported in the post experimental questionnaire.

<b>Treatment</b>	<b>Number Invited</b>	<b>Number Completed</b>	<b>Number Valid</b>
BASE	105	80	76
CORR	109	88	82
OVER	109	83	48
UNDER	109	82	81
UNDERGENERIC	109	77	75
UNDERALWAYS	109	69	68
UNDERTRIGGER	109	75	73

Table A2: Participant data. Notes: Number Invited is the number of subjects invited to take part. Number Completed gives the number of subjects completing the treatment. Number Valid gives the number of subjects who filed a tax return with a verifiable compliance ratio less than or equal to 1).

## ***Instructions***

The following are screenshots of the instructions

### Instructions

#### Introduction

Welcome to our experiment. Please read these instructions carefully, as part of your payment will depend on the decisions you will make.

This is not a test, and there are no right or wrong ways to make your choices in this task.

In this experiment, you will take the role of a self-employed individual.

Your task in this experiment is to complete your annual tax return, and file it to an experimental tax authority. To do so, you will have to decide how much income and expenses to report, and thereby the amount of tax you choose to pay.

#### The task

You will be given a profile which breaks down all your sources of income and some of your expenses. One expense will not be given in the profile. You will generate this expense using a 6-sided dice. All items in your profile will be denominated in Experimental Currency Units (ECU). For each 1,000 ECU you accumulate, you will earn £0.50.

You will then need to complete a tax return, and declare to the experimental tax authority how much you have earned and how much you have spent.

**You may find parts of your tax form have already been filled out by the experimental tax authority. The pre-filled values are estimates by the experimental tax authority of the values in your profile. These entries may not always be accurate. You can change the entries that are pre-filled if you wish to do so.**

You will pay 40% in tax on the amount of income you declared minus whatever expenses you also declared. This will be calculated for you by the tax return.

After you finish your tax declaration, the experimental tax authority will decide whether to check your declaration.

**The experimental tax authority will not know the contents of your profile. It can only find out the contents of your profile if your tax form is audited.**

The decision of the experimental tax authority to check your tax return will depend on the values you enter. The chances of being audited depend on the tax liability (i.e. income-expenses) that you declare. The higher the tax liability you declare, the lower the probability that your return is checked will be. However, the chances that your return will be checked will never be higher than 10% (i.e. a 1-in-10 chance that the chosen profile is audited).

If you are audited, the experimental tax authority will access the information in your profile. The tax authority will know the actual values of income and expenses in your profile, except for any generated by your dice roll which cannot be audited. It will compare the amount you have declared with its own calculations.

If the audit determines you have under-declared your tax, you will pay the extra amount owed plus a fine. The fine will be 50% of the amount you under-declared by. That is, you have to pay an additional 5 ECU for every 10 ECU of unpaid tax.

If the tax authority made any mistakes when it pre-filled the tax return and you did not correct these, then these mistakes will also be discovered and the normal penalty applied.

In the following screen we will go through an example.

Figure A1: Page 1 of experimental instructions

## Instructions - 2

### Example

Let's assume your actual income and expenses for the year are as follows:

Income	40,000
Expenses	2,000

The table below shows a few hypothetical examples of how you may choose to complete your tax return to the fictitious tax authority. For each example, the rows **Declared Income** and **Declared Expenses** reflect actual filing choices available to you.

- In example 1, you declared a different income to your earned income, but declared the same expenses as your incurred expenses.
- In example 2, you declared the same income to your earned income, but declared different expenses to your incurred expenses.
- In example 3, you declared the same income to your earned income, and declared the same expenses as your incurred expenses.

The bottom line in the table shows the final payment you're left with, depending on whether you're randomly selected for an audit or not.

	Example 1 (Under-declare income)		Example 2 (Over-declare expense)		Example 3 (Declare both accurately)
Income	40,000		40,000		40,000
<b>Declared Income</b>	<b>20,000</b>		<b>40,000</b>		<b>40,000</b>
Expenses	2,000		2,000		2,000
<b>Declared Expenses</b>	<b>2,000</b>		<b>4,000</b>		<b>2,000</b>
Taxable Income	18,000		36,000		38,000
Tax Due	7,200		14,400		15,200
Return Audited?	No	Yes	No	Yes	Yes or No
Additional Tax Payable	0	8,000	0	800	0
Penalty Payable	0	4,000	0	400	0
Payment (ECU)	32,800	20,800	25,600	24,400	24,800
Payment (£)	16.40	10.40	12.80	12.20	12.40

Your payment from taking part in this experiment therefore partly depends on how many ECUs you earn: this will be your income minus the tax you pay to the fictitious tax authority. The more ECUs you accumulate, the more you will earn. For every 1,000 ECU you accumulate, you will earn £0.50. At the end of the experiment your earnings will be converted into Pounds and paid to you.

Figure A2: Page 2 of experimental instructions

## Instructions - 3

### Summary

- You will be given a profile that includes different sources of income and expenses.
  - Your profile will include all of your sources of income.
  - Your profile will only include some of your expenses. One other will be generated by you using a 6-sided dice.
- You will be asked to complete a tax return.
  - You will pay 40% tax on your declared income after your declared expenses have been deducted.
  - The payoff will be based on the income shown in your profile minus any tax or penalty payments.
- You may find fields of your tax return might have already been filled out by the experimental tax authority:
  - Any pre-filled value is an estimate by the experimental tax authority of the field's true value in that profile
  - You can change the entries that are pre-filled if you wish to do so.
- The more income you declare, the more tax you will pay
- The more expenses you declare, the less tax you will pay
- Your payment for the experiment will be based on:
  - The profile's income and expenses
  - Your tax return for that profile and
  - Whether or not your return was selected for checking by the computer (with a maximum 1-in-10 chance).
- If your tax return is not checked, your payment will be your income minus tax
- If your tax return is checked, your payment will be:
  - Your income minus tax if the experimental tax authority finds no discrepancies; or
  - Your income minus tax plus a fine if the experimental tax authority finds discrepancies.

You will first carry out a practice round to help you further understand the format of the experiment. The values you enter in the practice round will not affect your end payment from the experiment.

Figure A3: Page 3 of experimental instructions

## Experimental Screenshots

The following are screenshots of the various treatments

### Experiment

Your income for the experiment and the associated expenses are as follows:

	Income		Expenses	
Self Employment	Income from contract with local authority	25,200	Cost of travel to work	2,500
	Income from work done for ACS Ltd	27,100		
<b>Self Employment Total</b>		<b>52,300</b>		
Property	Revenue from letting a flat	20,000	Costs of estate agent and legal fees for letting of flat	Please enter 2000 times the roll of a dice

Declaring a higher income than your profile's income will not mean that you are paid more – it will only affect the tax that you pay. Just as if someone mistakenly overstated their income on a tax form, it would increase their tax bill.

What income and expenses will you choose to declare to the tax authority? Please enter your choices here:

Your Tax Declaration	
Total Self Employment Income	<input type="text"/>
Self Employment Expenses	<input type="text"/>
Property Income	<input type="text"/>
Property Expenses	<input type="text"/>

Figure A4: BASE treatment (no pre-population)

## Experiment

Your income for the experiment and the associated expenses are as follows:

	Income		Expenses	
Self Employment	Income from contract with local authority	25,200	Cost of travel to work	2,500
	Income from work done for ACS Ltd	27,100		
<b>Self Employment Total</b>		<b>52,300</b>		
Property	Revenue from letting a flat	20,000	Costs of estate agent and legal fees for letting of flat	Please enter 2000 times the roll of a dice

Declaring a higher income than your profile's income will not mean that you are paid more – it will only affect the tax that you pay. Just as if someone mistakenly overstated their income on a tax form, it would increase their tax bill.

What income and expenses will you choose to declare to the tax authority? Please enter your choices here:

Your Tax Declaration	
Information in tax authority database	25,200 and 27,100
Total Self Employment Income	<input type="text" value="52,300"/>
Self Employment Expenses	<input type="text"/>
Property Income	<input type="text"/>
Property Expenses	<input type="text"/>

Figure A5: CORR treatment (correct pre-population)

## Experiment

Your income for the experiment and the associated expenses are as follows:

	Income		Expenses	
Self Employment	Income from contract with local authority	25,200	Cost of travel to work	2,500
	Income from work done for ACS Ltd	27,100		
<b>Self Employment Total</b>		<b>52,300</b>		
Property	Revenue from letting a flat	20,000	Costs of estate agent and legal fees for letting of flat	Please enter 2000 times the roll of a dice

Declaring a higher income than your profile's income will not mean that you are paid more – it will only affect the tax that you pay. Just as if someone mistakenly overstated their income on a tax form, it would increase their tax bill.

What income and expenses will you choose to declare to the tax authority? Please enter your choices here:

Your Tax Declaration	
Information in tax authority database	25,200
Total Self Employment Income	<input type="text" value="25,200"/>
Self Employment Expenses	<input type="text"/>
Property Income	<input type="text"/>
Property Expenses	<input type="text"/>

Figure A6: UNDER treatment (pre-population with value below true value in profile)

## Experiment

Your income for the experiment and the associated expenses are as follows:

	Income		Expenses	
Self Employment	Income from contract with local authority	25,200	Cost of travel to work	2,500
	Income from work done for ACS Ltd	27,100		
<b>Self Employment Total</b>		<b>52,300</b>		
Property	Revenue from letting a flat	20,000	Costs of estate agent and legal fees for letting of flat	Please enter 2000 times the roll of a dice

Declaring a higher income than your profile's income will not mean that you are paid more – it will only affect the tax that you pay. Just as if someone mistakenly overstated their income on a tax form, it would increase their tax bill.

To change a pre-filled entry, please click on the check box next to the field.

What income and expenses will you choose to declare to the tax authority? Please enter your choices here:

Your Tax Declaration		
Information in tax authority database	25,200	
Total Self Employment Income	<input type="text" value="25,200"/>	<input checked="" type="checkbox"/>
Self Employment Expenses	<input type="text"/>	
Property Income	<input type="text"/>	
Property Expenses	<input type="text"/>	

Figure A7: UNDERGENERIC treatment (under pre-population with lock)

## Experiment

Your income for the experiment and the associated expenses are as follows:

	Income		Expenses	
Self Employment	Income from contract with local authority	25,200	Cost of travel to work	2,500
	Income from work done for ACS Ltd	27,100		
<b>Self Employment Total</b>		<b>52,300</b>		
Property	Revenue from letting a flat	20,000	Costs of estate agent and legal fees for letting of flat	Please enter 2000 times the roll of a dice

Declaring a higher income than your profile's income will not mean that you are paid more – it will only affect the tax that you pay. Just as if someone mistakenly overstated their income on a tax form, it would increase their tax bill.

What income and expenses will you choose to declare to the tax authority? Please enter your choices here:

Your Tax Declaration	
Information in tax authority database	25,200
Total Self Employment Income	<input type="text" value="25,200"/>
Most people in your circumstances enter an income value of more than 40,000. Values below this amount are more likely to be audited. Click the tickbox to confirm you wish to proceed.	<input type="checkbox"/>
Self Employment Expenses	<input type="text" value="2,500"/>
Property Income	<input type="text" value="20,000"/>
Property Expenses	<input type="text" value="12,000"/>

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Figure A8: UNDERTRIGGER treatment (message only displayed after a self-employment income value less than 40,000 entered)

## Main Calculation

Based on the details you entered, your tax calculation is as follows:

<b>Income</b>	<b>Value</b>	<b>Tax Payable</b>
Employment Income	52,300	20,920
Property Income	20,000	8,000
<b>Total Taxable Income</b>	<b>72,300</b>	<b>28,920</b>
<b>Expenses</b>	<b>Value</b>	<b>Tax Relief</b>
Self Employment Cost of Goods	2,500	1,000
Self Employment Other Business Expenses	0	0
Property Expenses	12,000	4,800
<b>Total Expenses</b>	<b>14,500</b>	<b>5,800</b>
<b>Tax Payable</b>		<b>23,120</b>

You may now return and re-adjust your tax form or proceed to the end.

[Re-enter Tax](#) [Next](#)

Figure A9: Tax calculation page