Applying Behavioural Science in Tax Administration – A Summary of Lessons Learned

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The authors are Seán Kennedy, Statistics & Economic Research Branch (skennedy@revenue.ie), Rachel O'Carroll, Research, Analytics & Information Management Branch (rocarr01@revenue.ie), Martina Shirran, Statistics & Economic Research Branch (mshirran@revenue.ie) and Keith Walsh, Statistics & Economic Research Branch (keithw@revenue.ie) of the Office of the Revenue Commissioners. Seán Kennedy, Martina Shirran and Keith Walsh are also members of the Irish Government Economic & Evaluation Service ("IGEES"). Any opinions expressed in this paper are the views of the authors and do not necessarily reflect the views of the Office of the Revenue Commissioners or IGEES. The authors alone are responsible for the conclusions.

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Applying Behavioural Science in Tax Administration

Audit
and other
risk management
interventions

Can be
- Expensive
- Time consuming

Targeted treatments using
Behavioural Science

In certain situations
- Cost-effective
- Complementary

Categories of approaches
and
Estimate of effectiveness

Deterrence	Personalisation	Simplification and Salience	Social Norms
+8.0%	+4.0%	+3.3%	−1.6%

Executive Summary

This paper summarises lessons from 20 Randomised Control Trials (RCTs) conducted by Revenue over the past 6 years. Revenue was the first Government Department or Office in Ireland to implement RCTs to test the application of behavioural research. These trials have helped to build up a comprehensive picture of taxpayer behaviour in Ireland.

While audit and other risk management interventions are effective compliance tools, they can be expensive and time consuming for both Revenue and taxpayers. Targeted treatments using behavioural science can be a complementary and cost-effective tool to improve compliance. A summary of key findings across four behavioural insights is below.
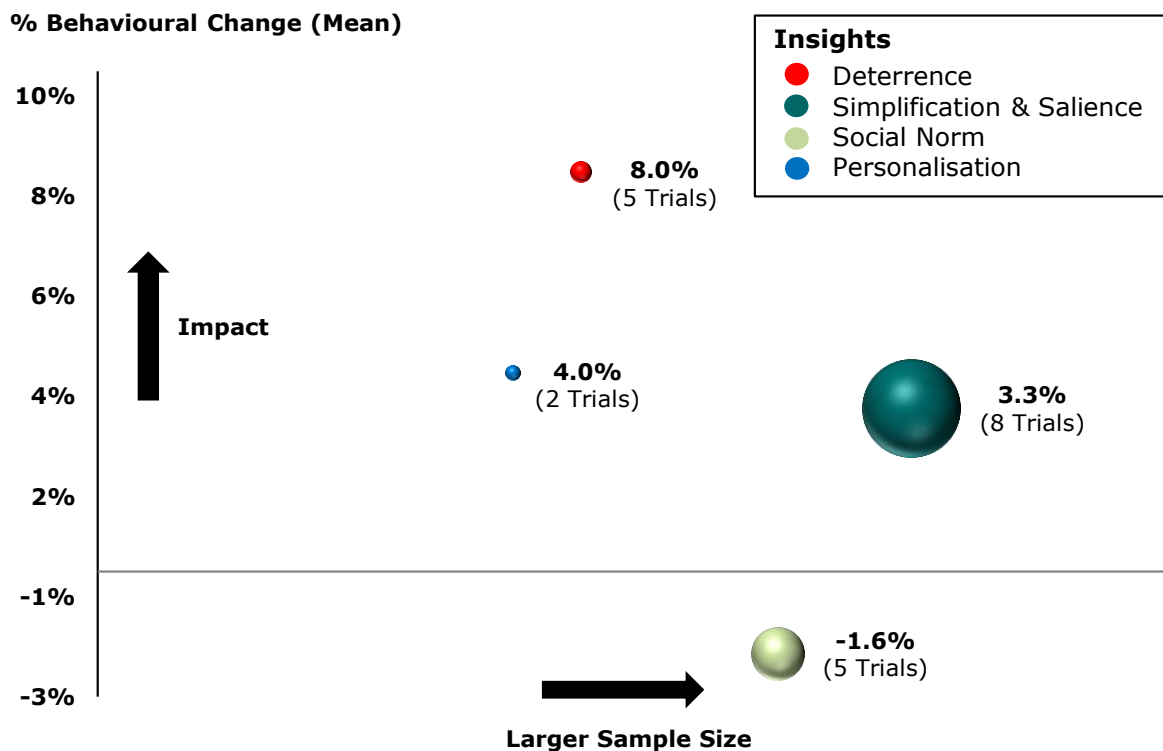
- **Deterrence:** Deterrence strategies (e.g., highlighting possible sanctions) dissuade taxpayers from non-compliant behaviour. The research confirms that deterrent effects significantly improve taxpayer compliance, particularly when combined with other insights. They impact different taxpayer segments differently.
- **Simplification and Salience:** Compliance or other behaviours can be enhanced through simpler presentation of information and by drawing attention to key details. For tax administrations, this may involve highlighting the third-party information held, for example through correspondence or the pre-filling of tax returns. Information in any communications should be presented in the most clear and simple way possible, including bolding and centred text.
- **Personalisation:** International research has shown the potential of more personalised correspondence, which is increasingly becoming a possibility given technological advancements. Revenue trials confirm that personalisation leads to greater and quicker engagement, especially when multiple elements of personalisation are applied.
- **Social Norms:** The behaviour of others can influence an individual's choices. Revenue research finds that social norms are generally not effective at influencing behaviour. However, there is limited evidence indicating that these may improve taxpayer compliance when combined with other insights.

According to a meta-analysis, which weights the result of 20 trials by sample size, the most effective insights tend to be deterrence (+8.0% improvement in targeted behaviour), personalisation (+4.0%) simplification and salience (+3.3%) and social norms (-1.6%). The wording and design of communications can affect taxpayer compliance. Even seemingly insignificant changes to correspondence can significantly change behaviour. While these lessons have mainly been learned from letters, they should be considered in any Revenue communication with taxpayers.

Behavioural Change (Vertical Axis) & Trial Size (Bubble Size)

A: Key Findings, by Insight

% Behavioural Change (Mean)

Insights
- 🔴 Deterrence
- 🟢 Simplification & Salience
- 🟡 Social Norm
- 🔵 Personalisation

10%

8% — **8.0%** (5 Trials)

6%

↑ **Impact**

4% — **4.0%** (2 Trials) — **3.3%** (8 Trials)

2%

-1%

-3% — **-1.6%** (5 Trials)

→ **Larger Sample Size**

B: Key Findings, by Trial

% Behavioural Change (Mean)

Insights
- 🔴 Deterrence
- 🟢 Simplification & Salience
- 🟡 Social Norm
- 🔵 Personalisation

35% — (19) 35.0%

30%

25%

↑ **Impact**

23% — (18) 23.1%

20%

15% — (17) 17.0%

10% — (4) 10.5%

5% — (8) 6.9% — (13) 5.0% — (20) 6.1% — (10) 6.2%

(16) 2.0% — (1) 1.0% — (5) 0.3% — (9) 2.6%

0% — (7) -1.1% — (12) -1.3%

-5% — (15) -4.0% — (14) -2.0% — (11) -4.3%

-10%

→ **Larger Sample Size**

1 Introduction

Audits and other traditional compliance interventions are effective tools for tax administrations but they are also expensive and resource intensive for both Revenue and taxpayers. Targeted treatments using behavioural science represent a cost-effective and complementary tool to improve compliance in certain situations.

This paper focuses on summarising the lessons learned from a series of projects testing the application of behavioural insights to improve taxpayer compliance in Revenue, primarily applied to Revenue's communications with taxpayers. As well as the act of making contact, the wording, design and tone of the letters are important for influencing compliance behaviour. Even seemingly small and insignificant changes to correspondence can have significant impacts on engagement and compliance.

As noted by DPER (2014), a key objective of the Government's *Public Service Reform Plan* 2014-2016 is to make it "easier for the citizen to engage with the State, to obtain their entitlements and to understand their obligations". Revenue's Statement of Strategy 2017-2019 outlines a similar commitment: "We will place particular emphasis on making it as easy as possible for taxpayers to be voluntarily compliant. We will prioritise the provision of online and self service facilities so that taxpayers can manage their interaction with us in a cost effective way. We will also prioritise preventive measures including system redesign to minimise the scope for error and omission".

Behavioural science is one way to better understand the interaction of the State with its citizens. According to the OECD (2017), "behavioural insights…have taken root in many ways across many countries around the world an across a wide range of sectors and policy areas". Behavioural economics helps tax administrations to understand the determinants of taxpayer behaviour and improve customer engagement.

Given the low cost of altering communications, behavioural treatments represent a complementary approach to contributing to voluntary compliance and the efficiency of tax administration. This paper demonstrates how this has been applied and summarises the lessons learned – these have direct application to Revenue staff engaging with taxpayers and potentially also for other areas of Government and tax administration internationally.

Section 2 presents the approach used in Revenue projects, the following Sections review the application of behavioural insights under different headings and Section 7 concludes with lessons learned.

2 Using Evidence to Understand Behaviour

At the core of applying insights from behavioural research is the principle that any application should be tested in an evidence-based setting that allows its impact to be accurately measured and evaluated.

The ideal standard to test a new approach is a Randomised Controlled Trial (RCT). RCTs are an experimental evaluation method, widely used in science and clinical trials. Importantly, RCTs use a counterfactual control group, providing a point of comparison for what might otherwise have happened had the change not been implemented. The findings from Revenue's testing of behavioural insights, and the lessons learned, are from RCT-based evaluations in nearly all cases.

In a Revenue context, taxpayers are typically randomly assigned to some treatment group, which might for example receive a shortened letter, and a control group, which might receive a standard Revenue letter. The groups are then compared over a period on a specific and pre-defined outcome measure, such as the percentage filing a tax return, to test whether the groups' outcomes are different on average. Provided the sample size is sufficiently large, randomisation ensures that the two groups are comparable in every respect except that one received a particular treatment while the other did not. This means that any difference in outcomes is attributable to the treatment, and not to any other influencing factors.

In their simplest form, conducting RCTs is straightforward and they also have the benefit of being easily explained and measured. However, in practice, there are often logistical challenges that present pitfalls. The Appendix provides, based on Revenue's experience, design-related issues worth considering.

The findings from these RCTs are discussed further in the remaining sections of the paper. These are categorised under the headings Deterrence, Simplification & Salience, Personalisation and Social Norms. In many of the RCTs there are overlaps between these categories and combinations are used.

Figures 1 and 2 summarise the results by insight and trial respectively. They show the magnitude of the behavioural change for the outcome measure (vertical axis) and the relative sample size (size of bubble). The log of sample size (horizontal axis) is used to present a better graphical representation of the large size differences across trials.

Outcome measures differ by trial; they range from filing a tax return, paying arrears, claiming medical expenses online or responding to a survey. In Figure 2, the trials are numbered and correspond to the trials in Table 1. Table 1 presents the name, year, sample size, outcome measure and main finding for each trial. Larger sample sizes in more recent years have allowed for stronger claims about the underlying drivers of different compliance behaviours.

The robustness that can be attached to a trial depends importantly on its sample size. For this reason, a meta-analysis is conducted to produce an overall estimate of the effectiveness of each insight by grouping trials and weighting by sample size.

Two methodological points are important in interpreting the meta-analysis. First, the percentage uplift refers to the percentage point difference, that is, the result for the treatment group minus the result for the control group. Second, trial size is calculated by combining the effective treatment and control groups. While this method is useful to compare trials of differing designs, it is imperfect in part because not all trials split the control and treatment groups proportionally. For example, both the medical expenses and license renewal trials have total sample sizes of roughly 8,000 but the former has equally split groups (~4,300 control and ~4,300 treatment) while the latter does not (~7800 control and ~400 treatment).

According to the results of the meta-analysis, deterrence insights are most effective (+8.0% behavioural change in outcome measure) followed by personalisation (+4.0%), simplification and salience (3.3%) and then social norms (-1.6%). Social norms with localisation are least effective (-3.2%).[1] When the large but non-random Non-Filers 2015 project is excluded, the effect of simplification is much smaller (0.74%). However, the Non-Filers 2014 project is likely sufficiently large (~2,400) to conclude that simplification and salience combined can be somewhat effective (+5.0%).

Overall, the research shows that the most effective insights to influence taxpayer compliance tend to be deterrence and personalisation rather than simplification and social norms. Based on the sample sizes, there is greater evidence to support the findings related to simplification and social norms.

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[1] Results in brackets relate to percentage point differences.

Figure 1: Summary Results, by Insight

% Behavioural Change (Mean)

Figure 2: Summary Results, by Trial

% Behavioural Change (Mean)
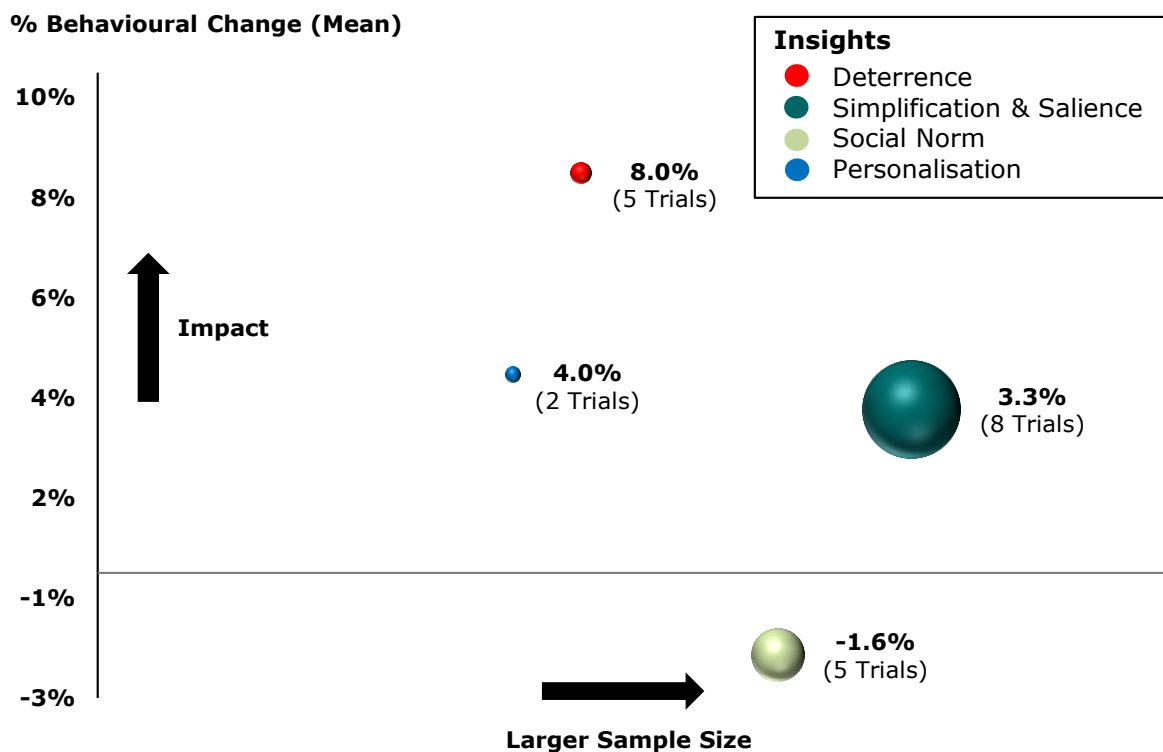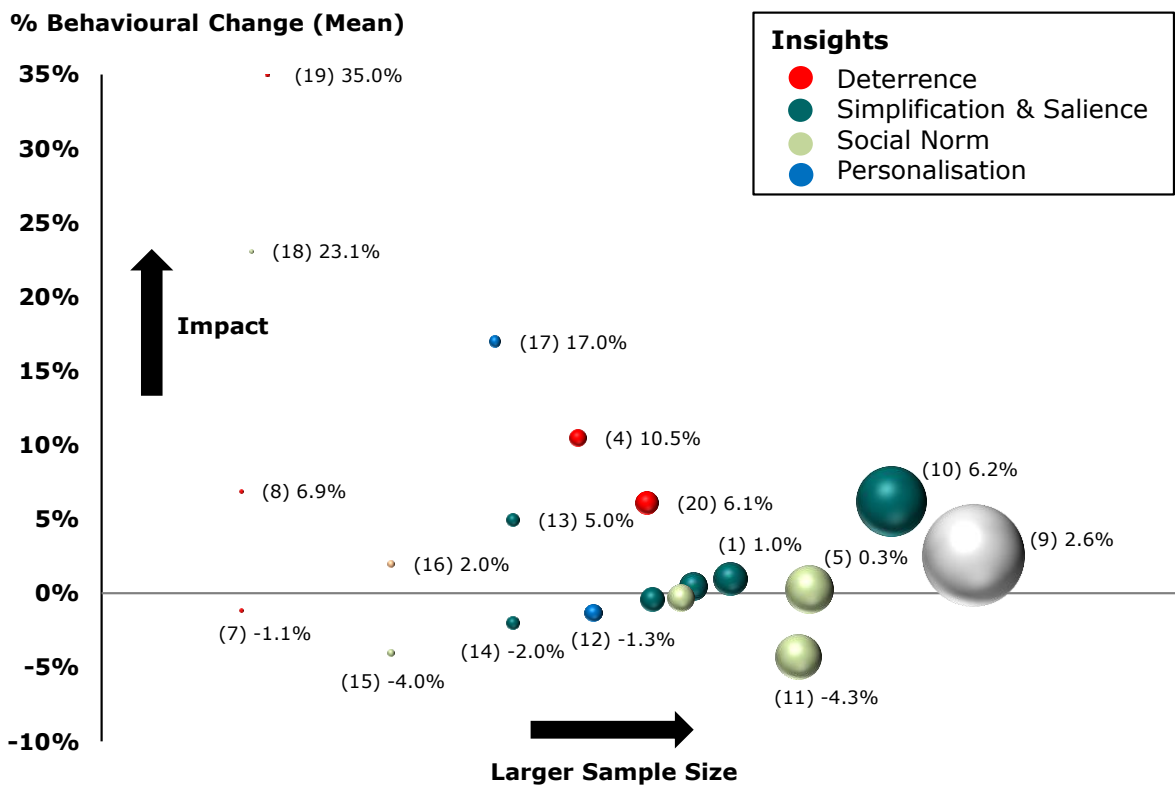

Source & Notes: Authors' analysis; Trial numbers correspond to Table 1; control and treatment groups are combined for purposes of sample size estimates; Trial 9 (highlighted grey) is large but non-random.

Table 1: Summary of Trials

1	2017	Medical Expenses	G1(8.8k) G2(8.8k)	Claiming Online	Information, all ages *(increase)*	1.0%
2	2017	Medical Expenses	G3(6.3k) G4(6.3k)	Claiming Online	Information (Pre-Pop), <60 years *(no effect)*	0.5%
3	2017	Medical Expenses	G5(4.3k) G6(4.3k)	Claiming Online	Information (Pre-Pop), >60 years *(no effect)*	-0.4%
4	2017	Debt Management	C(1.9k) T(2.5k)	Filing VAT return	Deterrence with Information *(increase)*	10.5%
5	2017	Entitlement Reminder	G1(68.5k) G2(68.5k)	Ingredient Change	Social Norm with Information *(no effect)*	0.3%
6	2016	Localised Social Norm	G1(3.2k) G2(3.7k) G3(4.3k)	Filing Income Tax Return	Social norm with localisation *(no effect/decrease)*	-0.3%
7	2015	CAT Non-Filers	C(145) G1(75)	Filing CAT return	Deterrence *(no effect)*	-1.1%
8	2015	CAT Non-Filers	C(145) G2(75)	Filing CAT return	Deterrence with personalisation *(increase)*	6.9%
9	2015	Income Tax Non-Filers	C(79k) G1(86k)	Filing Income Tax Return	Simplification *(increase)*	2.6%
10	2015	Income Tax Non-Filers	C(28.6k) G1(48.7k)	Filing Income Tax Return	Simplification & Information *(increase)*	6.2%
11	2015	Income Tax Non-Filers	C(28.6k) G2(4.4k)	Filing Income Tax Return	Social norm with localisation *(decrease)*	-4.3%
12	2015	Personal Salutation	C(4.5k) G1 (500)	Survey Response	Personalisation *(no effect)*	-1.3%
13	2014	Income Tax Non-Filers	C(1,450) G2(942)	Filing Income Tax Return	Simplification & Information *(increase)*	5.0%
14	2014	Income Tax Non-Filers	C(1,450) G1(940)	Filing Income Tax Return	Information *(no effect)*	-2.0%
15	2013	Outstanding Debt	C(426) G1(354)	Payment of Arrears	Social norm *(no effect)*	-4.0%
16	2013	Outstanding Debt	G2(425) G3(425)	Payment of Arrears	Social norm with localisation *(increase)*	2.0%
17	2013	Post-it Note	C(1.7K) G1 (300)	Survey Response	Personalisation *(increase)*	17.0%
18	2013	Pre-Population	C(145) G1(145)	Tax declared on Form 11 return	Information *(small increase/no effect)*	23.1%
19	2011	Debt Arrears	C(500) G1(500)	Payment of Arrears	Deterrence & social norm *(increase)*	35.0%
20	2011	License Renewal	C(7.8K) G1(399)	Renew Publican License	Deterrence & social norm *(increase)*	6.1%

Source: Authors' analysis; The sum of group sample sizes do not always reflect the total sample size for various reasons. For example, the entitlement reminder was conducted on a ~36,490 subgroup of the overall 137,000.

3 Deterrence

3.1   Introduction

The purpose of deterrence strategies for tax administrations is to dissuade taxpayers from non-compliant behaviour. Deterrence strategies include audits and other interventions, penalties, audit probabilities and the risk of detection.

Although deterrence effects should positively influence taxpayer compliance (Slemrod, 2007), the empirical evidence to date has been mixed. Communication of the deterrent plays a key role, if for example a taxpayer is reassured that most taxpayers are honest this may reinforce the associated social norm to remain compliant (OECD, 2010). Wenzel (2004) finds that when norms in favour of compliance are strong, deterrence effects are small, but they can become significantly more important when norms are weak.

Overall, the international research literature suggests that deterrence is an important driver for behaviour but works differently in different contexts and may best be used as a tool for supporting existing norms in favour of compliance.

The evidence from Ireland is similar. The Revenue Survey of Small to Medium sized Enterprises (SMEs) in 2013 asked respondents to rate the influence of various sanctions on compliance. According to the results, concern of having to pay interest charges is reported as having the greatest degree of influence by far (59% report highest influence) followed by a concern of audit (28% report highest influence).

Analysis undertaken to follow the compliance behaviour of taxpayers audited as part of Revenue's Random Audit Programme suggests that taxpayers who are non-compliant may persist in their non-compliance post-audit. A related analysis of taxpayer perceptions, matching SME survey respondents with their audit history, indicates that SME taxpayers who had previously been audited have a perceived higher risk of audit for a period of three years but at the same time become less concerned with civic responsibilities such as doing the right thing.

3.2   Findings

Revenue has conducted a number of RCTs where correspondence with taxpayers is revised to emphasise a deterrent. This section briefly summaries the objective, methodology and result of each trial.

In 2011, a revised wording of publican license renewals was developed to include deterrence (possible sanctions that may follow failure to comply) and social norms (the majority meet their obligations). 400 publicans were randomly assigned to receive the revised letters. Overall, as shown in Figure 3A, on the renewal date of 1st October, one month after the issue of the letters, 35.5% of publicans in the treatment group had renewed compared to 29.4% in the control group. This difference persists with 97% of publicans in the treatment group renewing by the end of the licensing year compared to 89% in the control group.

In 2011, revised letters were issued to taxpayers with outstanding debt to test the potential deterrent effect on managing arrears. A sample of 1,000 cases, both Income Tax (IT) and Value Added Tax (VAT), were randomly assigned to receive either a 'hard' letter emphasising deterrent aspects of non-compliance (focus on the sanctions for failure to comply) or a 'soft' letter encouraging taxpayers to comply (focus on majority of taxpayers have complied). Compliance in this case refers to contacting Revenue to pay or to arrange to pay the arrears due.

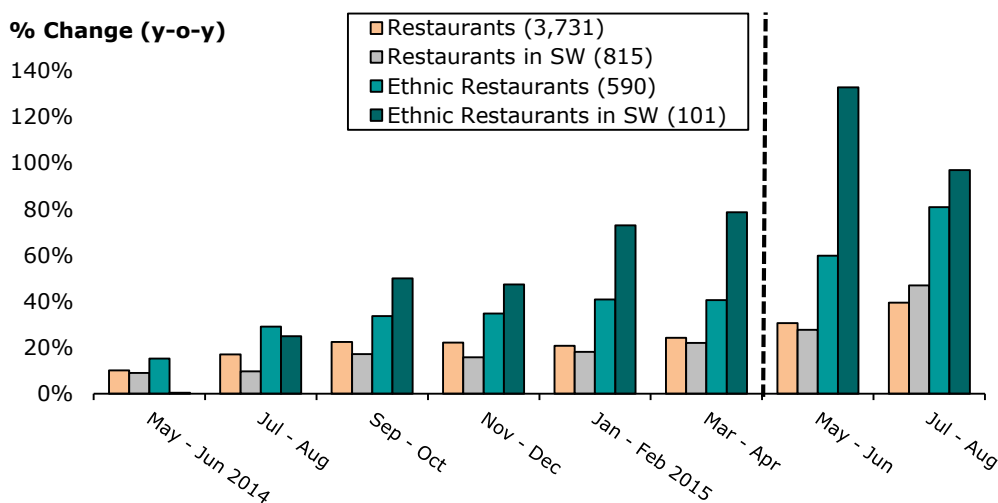## Figure 3: Deterrence Trials (Selected)

A: Excise License Renewals

% Renewing Excise License
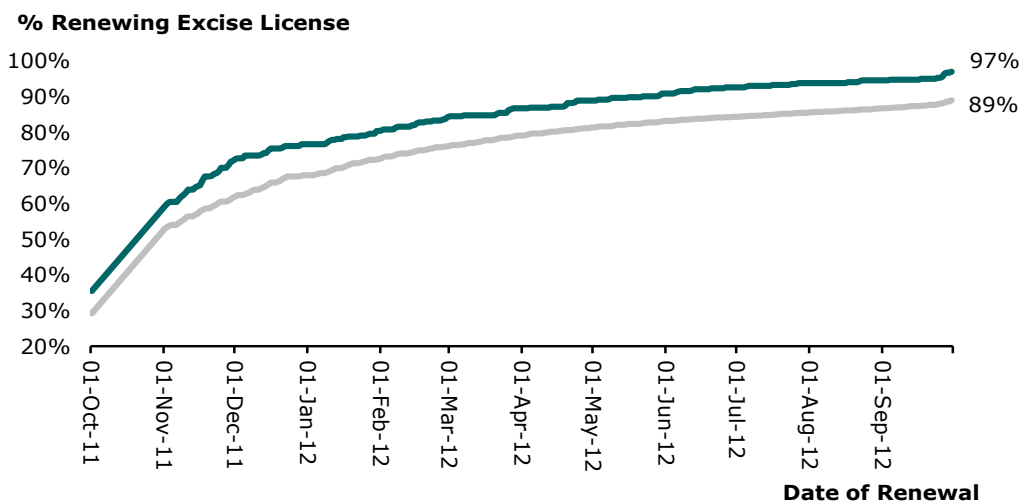
B: Outstanding Debt (VAT Cases)
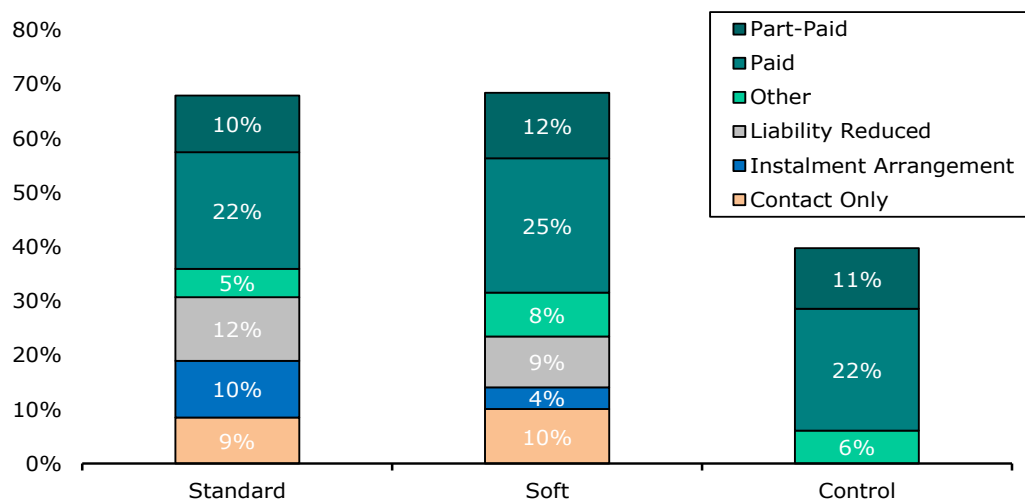
C: VAT from Restaurants, Post-Audit

% Change (y-o-y)

Source: Authors' analysis of Revenue data.

Compared to a control group, the letters increased contact with Revenue. For VAT cases there was an approximate 25% increase for both letters (65%) compared to the control (40%), while for IT cases the uplift for the control, soft and hard letters was 36%, 50% and 65% respectively.[2] The results for VAT cases are illustrated in Figure 3B.

A further finding (beyond arranging for repayment of arrears) is that harder letter recipients are more likely to contact Revenue, while the softer letter prompted more cases to make payments without contacting the Collector General's (CG) in advance.

In 2015, revised letters were issued to non-filing Capital Acquisitions Tax (CAT) taxpayers to test the impact on filing behaviour. A total sample of 295 CAT non-filers was randomly assigned to receive a control letter (a standard Revenue demand letter), a 'hard' letter (focus on Revenue policy to prosecute those who do not submit returns) and a 'hard personalised' letter (same as hard letter but with a personal salutation, e.g., 'Dear Mr. Bloggs'). Three months post-issue, the filing rate for the control, hard and personalised hard letters were 11.7%, 10.6% and 18.6%. A further finding is that CAT non-filers are about 40% more likely to respond if they are domestically based.

There is also some evidence to suggest that the soft letter is proportionately more effective among older age groups while the hard personalised letter is more effective among younger age cohorts. This may suggest that the taxpayer's age and location could be factors worth considering in Revenue's policy on CAT.

In 2016, a trial was conducted to assess the impact of compliance interventions on Tier 5 businesses.[3] From cases late filing their VAT returns, 1,852 were randomly assigned to receive a 'soft' letter reminding them of their obligations to file and 2,481 were randomly assigned to a standard letter including an estimate of tax owed. Response rates across these groups, in terms of percentage of taxpayers who had filed by Due Month+3, were 54.2% and 64.7% respectively. These results show that when reminding taxpayers to file, a directed letter including an estimate of liability has more impact on taxpayer behaviour, while the less direct approach of the soft letter is not as impactful. Now all VAT filers in Tier 5 receive the standard letter including the estimate if they are late filing their return.

While the focus of this paper is on behavioural science using RCTs, it is also possible to investigate the relationship between deterrence and compliance using semi- or non-experimental methods such as observational studies and surveys.

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[2] The differences in outcomes between the RCT applied to IT and VAT arrears cases may reflect the differing use of tax agents or advisors for these taxheads. However, this cannot be deduced from the RCT results.
[3] Tier 5 businesses are those paying less than €6,000 in a year.

For example, following the RCT evaluating revised licence renewal letters to publicans in 2011, all licence holders were issued with the revised letter in 2012. The renewal rate increased from 29% on 1 October 2011 (for the control group in the 2011 RCT) to 38% on 1 October 2012. While there was no control group for the 2012 letters (all cases received the revised letter), it is reasonable to assume that a significant portion of the increased renewal rate was due to the change in letter.

Revenue examined the indirect compliance impact of Revenue's audit activities. Following targeted audits in the ethnic restaurant sector in Clare in June 2015, analysis was conducted of the average VAT sales and purchases in the sector before and after the audits. Based on the analysis, there is strong evidence to suggest an increase in VAT compliance in the sector in the South West (SW) Region immediately after audits were conducted. As shown in Figure 3C, ethnic restaurants in SW Region report average increases in net VAT payments of 133% in June 2015 (on June 2014) and 97% in August 2015 (on August 2014), compared to 31% and 40% for restaurants nationwide.

3.3   Lessons

Overall, the research indicates that deterrence effects generally tend to increase taxpayer compliance. Deterrence strategies appear more effective when combined with other insights and may impact different segments differently.

In terms of the experimental evidence, the license renewal and outstanding debt projects show that a combination of deterrence with social norms can significantly improve compliance. The CAT filing compliance RCT provides a further interesting case because the deterrent effect alone does not materially impact filing behaviour until it is combined with personalisation. These findings highlight the importance of interacting deterrence strategies with other insights, as suggested by the aforementioned OECD research. A further important finding is that 'hard' letters consistently produce significantly higher levels of compliance compared to 'soft' or control letters.

The experimental evidence also finds that behavioural responses vary substantially across segments of the taxpayer population. For example, Income Tax payers appear less responsive to soft letters than VAT taxpayers, perhaps due to the influence of agents on IT taxpayers. For filing compliance, older taxpayers appear more responsive to soft letters compared to younger taxpayers. It is possible that different responses across taxpayer segments may be biasing aggregate findings but it is not possible to disentangle these effects without more research and larger sample sizes. The deterrence trials have been somewhat smaller in scale and the findings should be considered in this context.

The observational studies highlight that different deterrents, the direct and indirect impact of audits, can have different affects. Higher perceived risk of audit does not necessarily translate into improved compliance. The survey results, which are based on self-reported responses, appear to show that civic responsibility such as 'doing the right thing' plays a more significant role in influencing behaviour than sanctions such as 'having to pay interest' and 'the possibility of audit'.

As mentioned, it may be that the interaction deterrence with other insights that is important. Other factors are considered further in the following sections.

4 Simplification and Salience

4.1   Introduction

Compliance can be improved through better and simpler presentation of information and by drawing attention to key facts. These are two distinct behavioural insights, they have been applied in the same RCTs and so are taken together for the purposes of this paper.

A UK Behavioural Insights Team (BIT) report (2012) notes "there is much evidence that the way in which information is presented affects our responses". For tax administrations, this often involves highlighting key information. For example, Revenue has tested the impact of presenting third-party information (TPI), which can be done through correspondence or pre-filling of tax returns.[4] The idea is to emphasise that the information position of the tax administration allows it to detect most forms of evasion in the long run (OECD, 2010). Simplification in tax administration generally involves using plain, simple and straightforward language through direct correspondence and in designing tax forms. As noted by aforementioned BIT report, "there is a great deal of evidence that presenting information in simpler and more salient ways can encourage compliance".

4.2   Findings

Revenue has conducted a number of RCTs where the correspondence was either simplified with shorter or more straightforward language or revised (to make the taxpayer aware of certain information known to Revenue) accompanied by a suggested compliant course of action. This section briefly summaries the objective, methodology and results of each trial.

In 2014 and 2015, Revenue conducted separate Income Tax non-filer projects to evaluate the impact of tailored letters on the proportions who file a late return. Previous policy was to issue automated reminder letters to all non-filers.

For the 2014 project, 1,450 non-filers were randomly assigned to receive the standard bulk issue letter, 940 the same letter with an additional line indicating Revenue was in receipt of TPI suggesting they were actively trading (so likely required to file)[5] and 942 to a simplified version of the TPI letter, which was shorter and had more straightforward language. As shown in Figure 4A, the main finding was that simplified letters with TPI lead to an uplift of 17% in filing compared to the current letter (30% compared to 25%).

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[4] Alternatively, this type of presentation of information in a more salient manner could also be considered as another form of deterrence.
[5] E.g., if VRT records indicate that the individual has purchased a commercial vehicle in the year in question.

Following these 2014 findings, a simplified letter was issued all Income Tax non-filers in 2015. A further large but non-random trial was conducted on these simplified letters where 28,630 were assigned to receive the new standard letter and 48,708 to the same letters with TPI. Compared to simplified letters with no TPI, the evidence suggests that simplified TPI letters lead to significant increases in filing compliance.

The isolated impact of simplification can be obtained by comparing total filing for 2014 (approximately 79,000 non-filers who did not receive simplified letters) with 2015 (approximately 86,000 who did receive simplified letters). Measuring over the same number of days in both years, the results show that filing compliance is significantly and consistently higher in 2015 by approximately 3%. This represents 2,000 additional filers or €2.8m in additional Income Tax receipts (on the assumption that the cases would not otherwise have filed returns).

In September 2013, a project was conducted to test the compliance benefits from pre-population of tax returns. To make Revenue's information holdings clear to the taxpayer, the amount and source of the TPI (for example, interest income from a particular bank account) was provided to taxpayers in advance of the Form 11 return deadline. Two groups of 500 taxpayers receiving interest and agricultural payments were each randomly assigned to receive no letter, a letter with the source of TPI held by Revenue or a letter with the source and an amount.
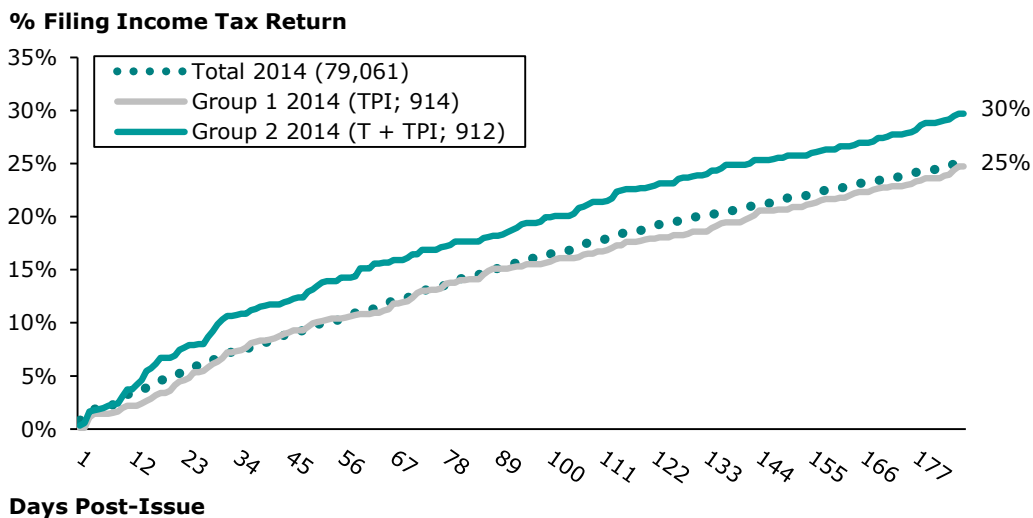
In the case of interest income payments, the letters do not significantly affect the proportions filing but do have a positive and significant impact on the proportions declaring interest income. Reporting accuracy, where accuracy is defined as close to the TPI amount, is also improved.[6] However, in the case of agricultural payments, no significant behavioural change is detected. The combined findings suggest an impact on reporting compliance in some cases but not others and are therefore mixed overall.

Presenting the general source of the information (e.g., the financial institution(s) for an interest payment) has a similar effect to presenting both the source and the monetary amount. Presenting the amount significantly increases the percentage reporting closer to that amount, highlighting the importance of accuracy in the data used.
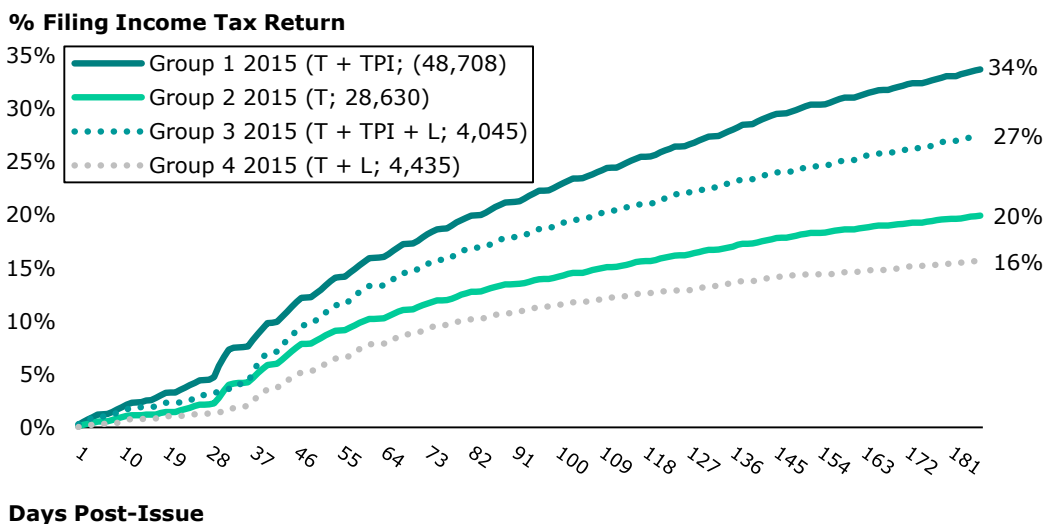
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[6] The proportion reporting with a margin of plus or minus 5% of the TPI amount is higher for groups who received TPI letters.

Figure 4: Information Trials (Selected)

A: Non-Filers 2014 – % Filing

% Filing Income Tax Return

Legend:
- Total 2014 (79,061)
- Group 1 2014 (TPI; 914)
- Group 2 2014 (T + TPI; 912)

Values at end: 30%, 25%

Days Post-Issue

B: Non-Filers 2015 – % Filing

% Filing Income Tax Return

Legend:
- Group 1 2015 (T + TPI; (48,708)
- Group 2 2015 (T; 28,630)
- Group 3 2015 (T + TPI + L; 4,045)
- Group 4 2015 (T + L; 4,435)

Values at end: 34%, 27%, 20%, 16%

Days Post-Issue

C: Pre-Population – % Filing & Reporting Income

% Form 11 Tax Forms Returned

- Control (152): 97.4%
- Treatment I (137): 96.4%
- Treatment II (137): 96.4%

% Report Income

- Control (97): 63.8%
- Treatment I (117): 85.4%
- Treatment II (119): 86.9%
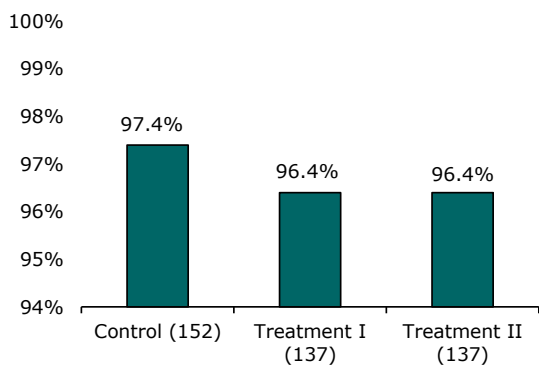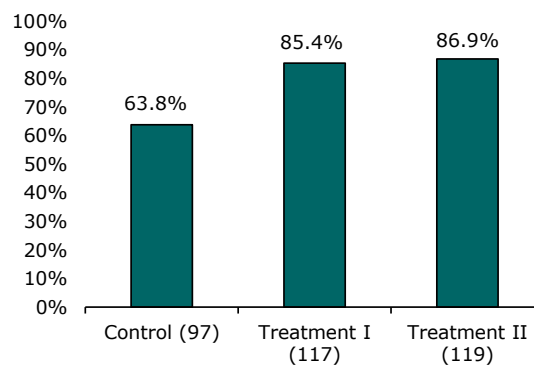
Source: Authors' analysis of Revenue data.

4.3   Lessons

The research shows that simplification improves taxpayer compliance and that the effect can be further enhanced with TPI where taxpayers are informed of information holdings. A general finding is that simplification and presentation of information may have the greatest compliance impact when interacted together.

Simplification alone has a strong, significant and consistent impact on filing compliance. However, TPI does not appear to be effective in the absence of simplification. Similarly, in the case of the pre-population study, it might tentatively be concluded (due to small sample size and mixed results) that TPI has a weak, if any, impact on reporting compliance and its accuracy.

The findings show that the impact on compliance of simplified letters becomes significant when combined with TPI, which is important because it means that simplification is not the sole driver of the interaction. Rather, the combination of simplification and TPI are helping to produce the observed improvement in compliance.

5   Personalisation

5.1   Introduction

Most correspondence from tax administrations to the public is mass-mailed and generic. Behavioural research has shown the potential of more personalised correspondence, which is increasingly possible given technological advancement. In a research paper from the US, Garner (2005) finds a 36% response rate among those sent a letter and survey only (control group) compared with a 76% response among those who also received a handwritten post-it note requesting completion of the survey (treatment group).
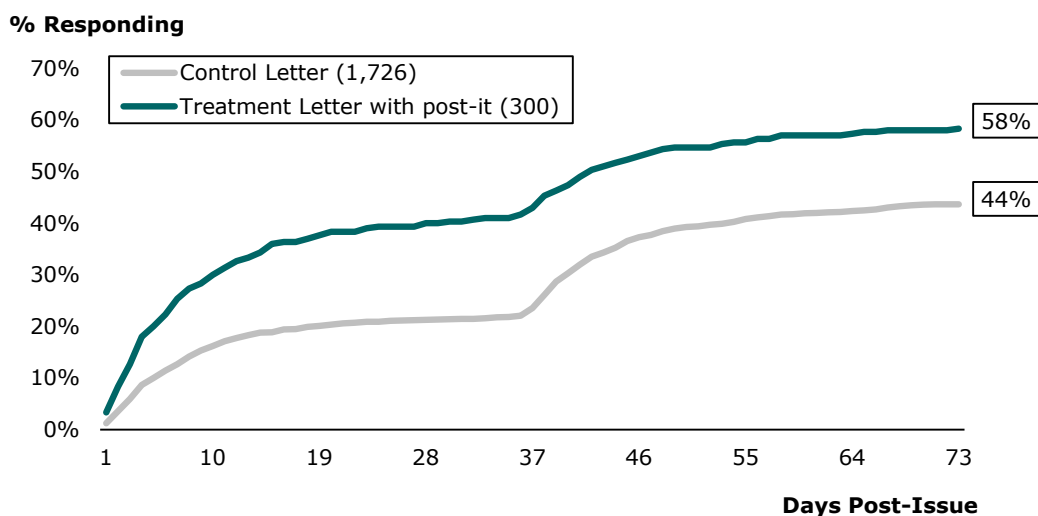
5.2   Findings

As part of Revenue's SME Survey (2013), an RCT was conducted to test the impact of personalisation on survey responses. From a survey of 2,000 taxpayers, 300 (15%) were randomly assigned to receive a personalised handwritten post-it note attached to the cover letter requesting survey completion. The remaining 1,700 taxpayers received a standard cover letter with no note. As shown in Figure 5A, after the first 15 days, the response rate was 36.0% in the treatment group compared with 19.2% in the control group, an effective increase of 88%. The inclusion of a personalised note caused responses rates to almost double. The results also show that timing mattered – the effectiveness of the personalised note on response rates was higher in the days immediately following the letter issue and declined gradually thereafter. These finding have been shown to hold (econometrically) for different size SMEs and across different sectors, regions and types (Figure 5B) and are robust to specification. Post-it note personalisation is associated with a 14 to 15 percentage point increase in response rates.

As part of a recent PAYE survey (2015), a similar RCT was conducted to test personalisation on response rates. However, unlike the post-it note which included multiple elements of personalisation (yellow post-it, handwritten, personal salutation, thanked respondent, signed by Revenue official), only a personalised salutation was used (e.g., 'Dear Mr. Bloggs' instead of 'Dear Customer'). 500 PAYE taxpayers were assigned to the treatment group to receive the personalised salutation and the remaining 4,500 received the standard salutation. Based on the analysis, no difference in response rates is observed among PAYE taxpayers arising from the personalised salutations (Figure 5C).

In the aforementioned CAT study (2015), the filing rate after three months was 18.6% for the 'hard' personalised letter (e.g., 'Dear Mr. Bloggs') compared to 11.7% and 10.6% for the standard letter and hard letter only. The result highlights that the deterrent effect alone does not materially impact filing behaviour until it is combined with personalisation.

Figure 5: Personalisation Trials (Selected)

A: SME Survey 2013 – Response Rate

% Responding

- Control Letter (1,726)
- Treatment Letter with post-it (300)

58%

44%

Days Post-Issue

B. Econometric Estimates of the Effect of Post-it Notes on Survey Responses

	All Responses				Responses within 4 Weeks		
	OLS (1)	OLS (2)	Logit (3)	Probit (4)	Logit (1)	Probit (2)	OLS (3)
Received Post-it	0.147***	0.139***	0.139***	0.139***	0.175***	0.176***	0.176***
Standard Errors	(0.0309)	(0.0314)	(0.0312)	(0.0312)	(0.0298)	(0.0298)	(0.0298)
Controls	No	Yes	Yes	Yes	Yes	Yes	Yes
Sample size	2,013	2,013	2,013	2,013	2,005	2,013	2,005

C: PAYE Survey 2015 – Response Rate

% Responding

- All Responses (1,345)
- Personalised Postal (111)

23.5%

22.2%

Days Post-Issue
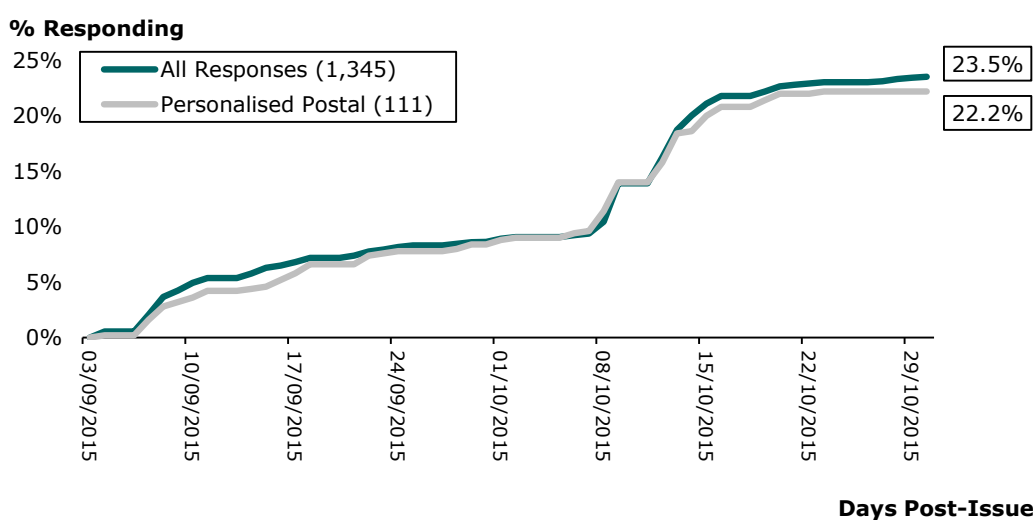
Source: Authors' analysis of Revenue data; Significance of P: ***p<.001 Controls refer to SME size, sector, region and taxpayer type. Sample size smaller due to dropping of telecommunications sector in the regressions.

5.3   Lessons

According to the research, personalised correspondence can lead to greater and timelier engagement. Multiple elements of personalisation should be applied where possible.

The evidence suggests that personalisation leads to quicker responses, which is consistent with international findings. It may be that the personalisation leads to greater taxpayer engagement more generally but further research is required to test this explicitly.

The impact of personalisation on responses differs sharply between the PAYE and SME surveys. One possibility is that PAYE and SME taxpayers respond differently to personalisation. Perhaps a more likely explanation is that a combination of personalised elements increases engagement whereas a single element, such as a personal salutation, does not have the same impact.

These findings may also have more general application. Personalisation appears to have significant behavioural influence on taxpayers. While personalising every outgoing letter is impractical, it may be useful in achieving higher responses in targeted cases.

6 Social Norms

6.1   Introduction

There is now a significant body of international evidence showing that people seek to conform to social norms and that the behaviour of others strongly influences an individual's choices (OECD, 2017; 2010).

From a tax administration perspective, a perception that the majority are compliant may make people less willing to evade taxes themselves. If, however, people believe that non-compliance is more prevalent than it is in practice, correcting misperceptions may help reinforce compliance (Walsh, 2012).

Furthermore, peers may exert greater influence than those more distant to the individual (BIT, 2014). In a tax context, Wenzel (2005) shows that perceived social norms can affect tax compliance if respondents identify with the group, particularly when combined with geographic specificity (Hallsworth, 2017).

6.2   Findings

Revenue has conducted a number of RCTs where social norms were included as part of the correspondence with the taxpayer. This section briefly summaries the objectives, methodology and results of each trial.

In the aforementioned publican license renewals and outstanding debt projects (2011), social norms (the majority meet their obligations) were combined with deterrence. In both cases, compliance improved. In the former project, 97% of publicans in the treatment group renewed by the end of the licensing year compared to 89% in the control group. In the latter, while the harder letter caused more taxpayers to contact Revenue, the softer letter prompted more cases to make payments without contacting in advance.

In addition to standard social norm letters, a number of RCTs were also conducted combining social norms with geographic specificity, drawing from trials in the literature (Hallsworth, 2017).

In 2013, Revenue conducted a project to test whether including social norms in final demand letters could encourage taxpayers to pay their taxes more quickly: 426 were assigned to a control group to receive no correspondence, 354 to receive a standard final demand letter, 425 to receive the same standard letter with a social norm (the majority in Ireland file a return) and 425 to a localised social norm letter (the majority in your county

file a return). The proportions paying in full for the control, standard, social and localised social letters were 37%, 47%, 43% and 49% respectively. These results indicate that the general social norm letter decreases compliance. However, when the social norm is combined with geographic specificity, compliance increases.

In 2015, as part of the non-filers project, 4,435 taxpayers were randomly assigned to receive shortened localised letters, indicating that 9 in 10 taxpayers had filed in their local area. Another 4,045 were randomly assigned to receive the same letters but which also included TPI (suggesting Revenue was in receipt of information which obliged them to file). Compared to standard letters, the results showed that both localised letters have, on average, significantly lower filing rates, regardless of whether third party information is included or not.

In January 2016, Revenue conducted further research to test the impact of a localised social norm letter on filing compliance. Non-filers in Donegal, Meath and Limerick were randomly assigned to receive either the standard or a localised letter, where the latter correspondence indicated that the majority in the particular county had already filed. In total, 11,246 letters were issued, of which 5,622 (50%) were localised. The main results indicate that social norms combined with geographic specificity do not significantly impact on filing compliance for any of the counties tested. Further, no evidence is found to suggest that localised letters cause faster filing.

In April 2016, Revenue wrote to taxpayers who had previously claimed medical expenses using a paper MED1 form advising them of the benefits of claiming these expenses online. The letters were sent to three taxpayer groups: those registered for PAYE online services[7]; those unregistered and under 60 years old; and those unregistered and over 60. Each group was randomly split in half to receive an informational or social norm letter. For example, 8,821 were randomly assigned to receive an informational (pre-population) letter indicating that 'you may want to consider using the online Form 12... as it is pre-populated with information already available to Revenue which makes it easier for you to complete'. 8,833 were randomly assigned to receive a social norm letter noting 'to date this year, over 70% of health expenses were claimed online'.

According to the results, the informational (pre-population) and social norm groups online claim rates were 7.2% and 6.2% respectively (for the group of taxpayers registered for online services). Online claims using eForm12 for the same groups were 40% and 32% respectively. Overall, the results suggest that highlighting pre-population of online forms

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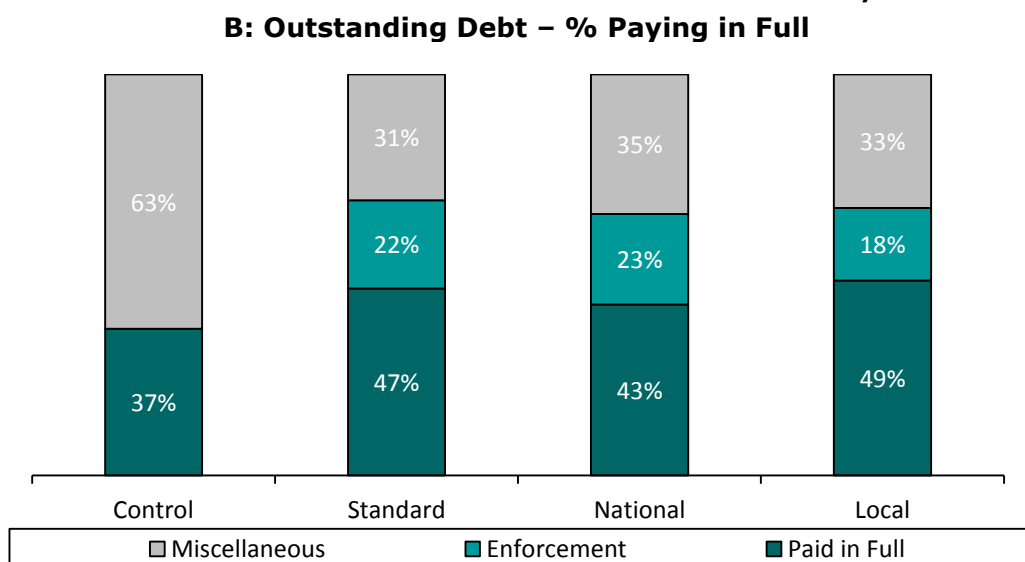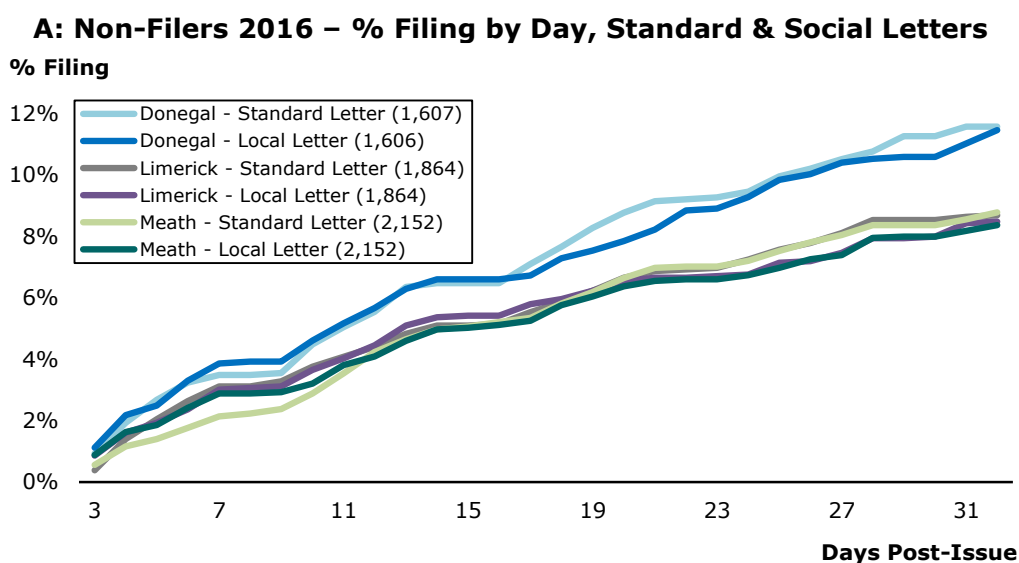[7] PAYE online services refers to both PAYE anytime and myAccount here.

could influence taxpayers, especially who have already shown a predisposition to interacting with online services. The social norm message did not increase the online claim rate in this case so may not work so well in customer service orientated mailings.

In October 2016, Revenue sent a reminder to claim tax credits to 137,000 PAYE taxpayers who were paying tax and employed but had claimed no credits or reliefs, or had no review of their taxes, for over four years. The taxpayers were mailed in three tranches and a behavioural experiment which involved changing the headline of the letter was carried out in the final mailing.

This group of 36,490 were randomly split in half, each to receive alternative headlines.[8] The first group received an informational headline - 'claim your tax credits and other entitlements'. The second group received a social norm headline - 'since 2012 Revenue has provided refunds to 1.2 million PAYE taxpayers'. According to the results, the social norm and information letters resulted in an ingredient rate change of 6.1% and 5.8% respectively, which is not statistically significant. Consequently, the inclusion of an additional headline containing a social norm message did not significantly influence taxpayers beyond the informational letters. This echoes the findings in the medical expenses online diversion mailing where a social norm message was found not to be influential in a customer service mailing.

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[8] The taxpayers were mailed in three tranches and a behavioural experiment which involved changing the headline of the letter was carried out in the final mailing.

Figure 6: Social Norm Trials (Selected)

A: Non-Filers 2016 – % Filing by Day, Standard & Social Letters

% Filing

Legend:
- Donegal - Standard Letter (1,607)
- Donegal - Local Letter (1,606)
- Limerick - Standard Letter (1,864)
- Limerick - Local Letter (1,864)
- Meath - Standard Letter (2,152)
- Meath - Local Letter (2,152)

Days Post-Issue

B: Outstanding Debt – % Paying in Full

	Control	Standard	National	Local
Miscellaneous	63%	31%	35%	33%
Enforcement		22%	23%	18%
Paid in Full	37%	47%	43%	49%

Legend: ☐ Miscellaneous ☐ Enforcement ☐ Paid in Full

C: Claiming Medical Expenses

Group & Letter Type	Number of Taxpayers	% claiming medical expenses online	% claiming online using eForm12
Group 1: Registered for Online Services			
Information	8,821	7.2%*	40%*
Social Norm	8,833	6.2%*	32%*
Group 2: Not Registered and <60			
Information	6,281	5.1%	38%
Social Norm	6,305	4.6%	35%
Group 3: Not Registered and 60+			
Information	4,340	3.2%	58%
Social Norm	4,310	3.6%	47%

Note: *statistically significant results. Difference between % using eForm 12 in group 3 appears large but is not statistically significant due to low volume of taxpayers who claimed medical expenses.
Source: Authors' analysis of Revenue data.

6.3   Lessons

Overall, Revenue research suggests that social norms do not significantly influence taxpayer behaviour in Ireland.

Some limited evidence indicates that social norms may increase taxpayer compliance, rather than customer service orientated behaviours, possibly when combined with other norms, such as deterrence. However, the results for social norms on their own are not strong or consistent across different trials, as expected based on the literature.

The social norms with geographic specificity trials comprehensively demonstrate that localised social norm letters are not effective at improving filing compliance. However, there is evidence to suggest that they may be effective at improving other types of compliance, such as payment compliance. Reporting compliance may be worth testing separately. Similar trials in the UK have shown that localised social norms significantly increase compliance, which may suggest that Irish and UK taxpayers respond differently to social norms.

7 Summarising Lessons Learned

Revenue research shows that the wording, design and tone of communications are important for influencing compliance behaviour. Even seemingly small and insignificant changes to correspondence can significantly changes behaviour. While these lessons have been learned primarily from letters, they can, and should, be considered in any Revenue communication with taxpayers including through electronic channels.

Understanding what does not affect compliance behaviour is as important as understanding what does. Continuing to conduct behavioural evaluations is essential to adding to Revenue's knowledge of the underlying drivers of taxpayer behaviour.

The key lessons learned Revenue behavioural evaluations are as follows:

Deterrence: The purpose of deterrence strategies for tax administrations is to dissuade taxpayers from non-compliant behaviour. Revenue research confirms that deterrent effects tend to increase taxpayer compliance, particularly when combined with other insights and may impact different segments differently. The CAT filing compliance trial provides an interesting case because the deterrent effect does not materially impact filing behaviour until it is combined with personalisation. The findings highlight the importance of interacting deterrence strategies with other insights, as suggested by the aforementioned OECD research. The evidence also suggests that behavioural responses vary substantially across segments of the taxpayer population and that further research could investigate the impact on these segments in greater detail.

Simplification and Salience: Compliance can be improved through better presentation of information, by drawing attention to key information and through simplification. As noted by the UK Behavioural Insights Team "there is much evidence that the way in which information is presented affects our responses". For tax administrations, this often involves highlighting the TPI held, which can be through direct correspondence or through the pre-filling of tax returns.

Revenue trials show that simplification improves taxpayer compliance and that the effect is further enhanced with TPI where taxpayers are informed of information holdings. A further finding is that simplification and presentation of information may have the greatest compliance impact when interacted together. Simplification alone has an important and consistent impact on filing compliance. The same is not true of TPI alone, which does not appear to significantly affect filing compliance. However, simplified letters have an even

greater impact when combined with TPI so it may be the interaction of the two that matters. Based on the findings, information on all Revenue correspondence should be presented in the most clear and simple way possible. There is also evidence to suggest that placing such new information in bold and centred elicits greater effects.

Personalisation: Most correspondence from tax administrations to the public is mass-mailed and generic. Recent behavioural research has shown the potential of more personalised correspondence, which is increasingly a possibility given recent technological advancement. Revenue evaluations show that personalised correspondence can lead to significantly greater engagement, particularly when multiple elements of personalisation are applied. Personalisation also causes quicker responses, consistent with findings from the international research literature.

Social Norms: There is now a significant body of international evidence showing that people seek to conform to social norms and that the behaviour of others strongly influences an individual's choices (OECD, 2017 and 2010). A perception that the majority are compliant may make people less willing to evade taxes themselves. If, however, people believe that non-compliance is more prevalent than it is in practice, correcting misperceptions may help reinforce compliance. Revenue trials combining social norms with geographic specificity, drawing from literature, demonstrate that localised social norm letters are not effective at improving filing compliance. Furthermore, customer orientated trials have comprehensively demonstrated that social norms do not appear to be effective in changing behaviour. However, there is evidence to suggest that they may be effective at improving other types of compliance, such as payment compliance.

According to a meta-analysis, which weights results by sample size, the most effective norms are deterrence (+8.0%) personalisation (+4.0%) simplification and salience (+3.3%) followed by social norms (-1.6%). However, as shown in the paper, it is often the interaction of the different norms that leads to the most significant impacts. Overall, the research shows that the most effective norms to influence taxpayer compliance tend to be deterrence and personalisation rather than simplification and social norms.

Appendix – Lessons Learned in RCT Design

In their simplest form, conducting Randomised Controlled Trials (RCTs) is straightforward and they also have the benefit of being easily explained and measured. However, in practice, there are often logistical challenges that present pitfalls. Ethical considerations are paramount to ensure all taxpayers are always treated fairly and equally.

Based on Revenue's experience to date, a number of design issues are worth considering:

❑ **Robust Random Sampling and Large Sample Size:** The combination of large sample size with randomisation allows RCTs to investigate the causal impact of an intervention or customer engagement – e.g., whether focused letters cause non-filers to engage with Revenue. It is straightforward to randomly allocate taxpayers into treatment and control groups using commonly available software.

❑ **Balanced Characteristics between Groups:** The central reason for randomisation and large samples is to ensure that groups are evenly balanced with respect to the distribution of their characteristics (including those characteristics that cannot be observed, for example certain attributes such as socio-economic status). For example, if for some reason younger taxpayers were less likely to engage with Revenue, and one group had younger taxpayers, then any difference observed between the groups after the experiment could be attributable to the group characteristics and not necessarily due to a focused letter. One way to resolve this is to compare the balance of observable characteristics (for example age, region, sector, gender, tax and incomes etc) in the treatment and control groups.

❑ **Defining the Outcome at the Outset:** It is important to define exactly how the outcome variable (usually some form of engagement with Revenue) will be measured at the outset. For example, is any engagement an outcome? Or is it only if they file a return? With respect to timing, is there a decided cut-off for the outcome measure (how long do the taxpayers have to engage to be considered compliant?).

Once the RCT is conducted and the data examined, the proportional difference between the treatment and control groups is the central result of interest to see if the treatment has directly improved the customer response rate. However, it is worth noting that further analytical methods are possible and can add-value to the results including the following:

❑ **Testing for Statistical Significance:** Any observed difference should be tested for statistical significance to rule out the possibility of an effect which could be due to random sampling error.

❑ **Subgroup and Multivariate Analysis:** If a difference is observed for different letter groups, it's possible that a subgroup of the treatment group is driving that difference

or that the effect is concentrated among taxpayers in subgroups. For example, it could be that taxpayers with say higher incomes, or from a particular area, are on average driving the result. There are at least three ways to deal with this. First, it's possible to compare the average differences across subgroups. Second, further statistical tests such as multivariate regression modelling and analysis of variance could be researched. This would allow other factors to be held constant, giving a more precise way to quantify the direct causal effect of the letters. Third, the data could be split into a training and validation set prior to analysis, use the training set to develop ideas (or models) on which subgroups show the greatest response, use the validation set to test these ideas

There are some potential risks in conducting RCTs which are highlighted as follows:

- **Incomplete Information:** In a small number of cases, tax administration data may be incorrect or incomplete. If such information is presented to a taxpayer as part of an RCT, it may undermine the taxpayer's view of Revenue. Furthermore, there is a possible risk that Revenue may reveal the existence of some non-compliant behaviour and this could encourage further such behaviour.

- **Perceived Manipulation:** There is a concern that if taxpayers feel like they are being deliberately influenced, they may behave or react differently to the suggested action of the tax administration.

- **Decay:** There is evidence that the effects of some behavioural research are short term. For example, third-party information may work well initially but its impact may reduce over time when used on the same taxpayers (i.e., the novelty wears off or there is regression to the mean). This also presents an important question for the value of behavioural science in the future more generally.

- **"File Drawer Problem":** there is a tendency for biases to exist in publication, in that studies with larger or more positive results are more likely to be published than those with negative or inconclusive results (which may be equally valid and useful).

- **Contamination:** If, for example, taxpayers in the control group heard that those in the treatment group had received letters with third party information about them then they too might change their own behaviour thus contaminating the control group. A related risk is that tax agents representing the same taxpayers may be in both the control and treatment groups, which may lead to contamination.

- **Under-powered trials:** There may be conclusions the robustness of which are not supported by the sample or other design limitations.

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