



# Improved compliance with the Deferred GST Scheme

June 2018

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## Research team

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The trial was pre-registered on the BETA website and the American Economic Association registry:

<https://www.pmc.gov.au/domestic-policy/behavioural-economics/making-it-less-taxing-better-compliance-deferred-gst>

<https://www.socialscienceregistry.org/trials/2201>

<https://www.socialscienceregistry.org/trials/2209/history/17464>

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# Executive Summary

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The Australian Taxation Office is the Australian Government's principal revenue collection agency and administers Australia's tax system and significant aspects of Australia's superannuation system. It administers legislation governing tax, superannuation and the Australian Business Register and supports the delivery of government benefits to the community. Improving tax compliance is a major policy goal as non-compliance can reduce the overall tax base, increase the costs of administration and lead to an uneven playing field for businesses doing the right thing.

As part of the legislation the Deferred Goods and Services Tax (DGST) Scheme allows businesses to defer the payment of GST on taxable importations into Australia. This helps businesses manage their cash flow. Cash flow is important for businesses because it helps them meet everyday business needs and avoid taking on more debt. This means there is a strong driver for businesses to be on the Scheme. Participation in the Scheme allows 13,000 businesses to defer payment of \$26 billion in GST annually.

To be on the Scheme, businesses must comply with requirements including digital lodgment of monthly activity statements and being up to date on all lodgments and payments due to the ATO. At any one time about one in three businesses do not comply. The ATO can revoke access to the Scheme if a business does not fully comply, which negatively affects cash flow and means the business will need to reapply to be reinstated.

BETA partnered with the ATO to test behaviourally informed methods of communication (variations on emails) aimed at improving compliance among businesses in the Scheme. We ran two separate randomised controlled trials to test the effectiveness of these emails.

The first trial evaluated the impact of sending a 'cooperative' or 'direct' toned reminder email to existing businesses who were found to be non-compliant with the Scheme. The aim was to encourage self-compliance, educate businesses on their tax obligations and reduce recurrent non-compliance. Both emails improved compliance rates but variations in the tone of the reminders did not affect the compliance rate.

The second trial tested the effectiveness of sending a welcome email to new businesses who had just registered on the Scheme. The aim of the email was to educate the businesses from the first point of contact to promote good compliance behaviours and engagement with the ATO. The email contained a planning prompt recommending businesses set up a monthly calendar reminder about their DGST obligations. It did not improve compliance.

# Why?

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Participation in the Scheme allows 13,000 businesses to defer payment of \$26 billion in GST annually. At any one time about one in three businesses are not compliant with the Scheme requirements. Increased compliance can help businesses by ensuring they are not revoked from the Scheme and also helps the Government from a tax revenue perspective.

To be eligible to participate in the Scheme, businesses must:

- have an Australian Business Number;
- be registered for GST;
- lodge activity statements online;
- lodge activity statements monthly; and
- make activity statement payments electronically.

To continue to participate in the Scheme, businesses must:

- lodge and pay business activity statements online;
- lodge on time; and
- keep up to date with payments.

Lodging on time and keeping up to date with payments includes all tax related obligations (e.g. income tax and Fringe Benefits Tax), not just GST obligations.

If businesses do not fully comply with these requirements, the ATO can revoke access to the Scheme. If access is revoked, businesses need to reapply to re-join the Scheme.

To further enhance compliance with the DGST Scheme, BETA partnered with the ATO to design and test more effective behaviourally informed methods of communications aimed at encouraging businesses in the Scheme to remain compliant.

# What?

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## What we did for this study

### Behavioural analysis

BETA and the ATO designed an approach to prompt businesses to meet their obligations under the DGST scheme.

Throughout this report, we use the phrase ‘business managers’ to refer to the individuals responsible for ensuring a business meets its tax obligations.

#### Box 1: Common factors affecting business tax behaviour

**Cognitive overload** – we tend to become overwhelmed by large amounts of information. Cognitive overload may lead us to forget things and delay decisions, due to having too many competing tasks.

**Present bias** – we sometimes take short-term actions that do not align with our long-term interests. This is linked with procrastination, which can occur because we often put off decisions, even those in our best interests.

**Loss aversion** – we tend to feel losses more acutely than equivalent gains. Giving up money you already hold can feel like a painful loss.



## **Cognitive overload**

Running a business is no small feat. Business managers must understand and comply with a range of laws and regulations, at both the State and Commonwealth level. In the face of competing demands, and the volume of decisions and information, business managers may become overwhelmed. Simplifying communications about DGST and bringing the issue to business managers' attention may help. Salient communications emphasise key messages upfront, draw attention to the most relevant information and clearly set out required actions.

A study conducted by the World Bank and the UK Behavioural Insights Team (BIT) seeking to encourage on-time tax reporting tested the impact of standard and simple behaviourally informed tax reminder emails in Poland. The behaviourally informed email made use of simplification – it included a 'milder tone' and clear and easy suggested actions to settle tax liabilities. The behaviourally informed email was significantly more effective, increasing the average amount paid by around US\$40 and payment rates by 17 per cent (Hernandez et al., 2017).<sup>1</sup>

## **Present bias**

Present bias might cause business managers to focus on their business demands and put off meeting tax obligations, particularly because tasks related to tax and financial issues are often seen as unpleasant (Benzarti, 2015).

One well-established tool to address present bias is the use of commitment devices and planning prompts. Commitment devices have been tested in a broad range of contexts. For example, Lusardi et al. (2009) designed a planning aid to help people implement their own savings plan. The planning aid was multi-pronged and included encouraging individuals to set aside specific time to enrol; setting out some simple steps to enrol, including expected time for completing each step; and providing tips on what to do if individuals were stuck. The planning aid increased enrolment in an employer-sponsored savings plan by around 20 percentage points for new employees (within 60 days of starting).

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<sup>1</sup> The control group paid an average of PLN1,146 in tax, the treatment group paid an average of PLN1,316 in tax. PLN is the Polish currency, the Zloty. Exchange rate as at February 2016, based on publication date of draft World Bank report.

## Loss aversion

Loss aversion may be another factor driving non-compliant behaviour. It is easy for business managers to inadvertently consider the full value of imported goods as ‘theirs’, despite the fact the GST component of the goods is collected on behalf of the government. The thought of having to give up these GST payments could be painful for a business manager trying to manage cash flow.

A UK study found many business managers had feelings of ownership when it came to collecting and lodging value added taxes (VAT – equivalent to Australia’s GST) ([Adams and Webley](#), 2001). A majority of small businesses considered themselves the ‘owners’ of VAT and not mere collectors on behalf of government.

Loss aversion can also be used to nudge businesses in the right direction. Access to the Scheme is not guaranteed, and businesses can lose access if they fail to lodge on time or do not comply with their other obligations. Emphasising the advantages of the Scheme – and the loss of flexibility from being cut off – could have an impact on business compliance.

## The trials

We ran two trials to test whether we could increase compliance with the Scheme. In the first trial, we sent emails to existing non-compliant businesses. In the second trial we sent emails to businesses newly registered with the Scheme. The emails were different in each trial (see **Appendix 1**).

### Box 2: What is a randomised controlled trial?

An RCT is the best way of telling if a policy is working. RCTs work by randomly assigning individuals into different groups – usually one or more ‘treatment’ groups participate in the new intervention, and a ‘control’ group does not. The differences in outcomes across the groups are then compared. RCTs are considered the ‘gold standard’ for assessing causal impacts because an RCT determines the impact of an intervention or treatment compared to the status quo.

## **Trial 1: Existing businesses trial**

In the trial for existing non-compliant businesses, we designed two emails:

- The 'cooperative' (softer) email contained a reminder with a simple and clear action, designed to help business managers overcome cognitive overload and present bias. This email stressed the benefits of the Scheme and the cost of having access to the Scheme revoked. By including next month's due date for their activity statement, businesses were prompted to plan for the future.
- The 'direct' (harder) email stressed the commitment and obligations incumbent on businesses accessing the Scheme. The direct email emphasised the cost of having access to the Scheme revoked in stronger terms than the cooperative email.

We then tested the emails with 1,286 businesses who had been non-compliant for more than 14 days before the start of the trial. There were 1,279 businesses in the analysis sample (seven businesses were excluded as they exited the Scheme before the end of the trial).

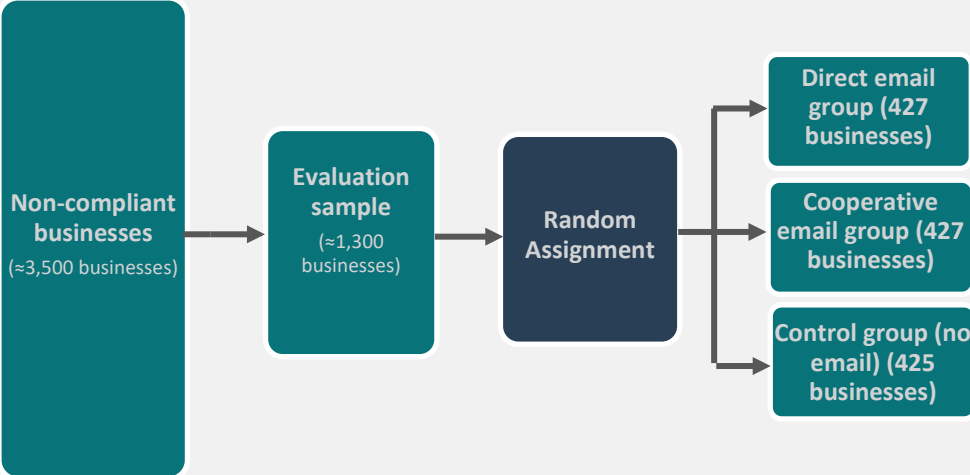
We randomly allocated businesses evenly into three groups:

- 427 in the direct email group (first treatment group)
- 427 in the cooperative email group (second treatment group)
- 425 in the no email group (control group)

If taxpayers self-complied they received a thank you email and if they remained non-compliant they received a revocation email.

We were interested in the proportion of DGST businesses becoming compliant after 14 and 21 days, the payment received by the ATO over a 21-day period, and the number of phone calls to the ATO. We also performed exploratory analysis about the time taken for businesses to comply.

**Figure 1: Trial 1 Design for existing businesses**



## Trial 2: New businesses trial

We designed an email to help businesses overcome cognitive load and present bias. It made key information salient, including simplified eligibility requirements and a planning prompt suggesting business managers place a monthly reminder in their calendar to fulfil any outstanding tax obligations.

The new businesses trial consisted of 332 businesses either new to the Scheme or applying to re-join the Scheme. About 70 per cent were in the Scheme for the first time and 29 per cent had been in the Scheme previously. On day one of the trial, 20 per cent of businesses in the treatment group were technically non-compliant, while 17 per cent of businesses in the control group were non-compliant. Businesses may be non-compliant when first joining the Scheme for a number of reasons including:

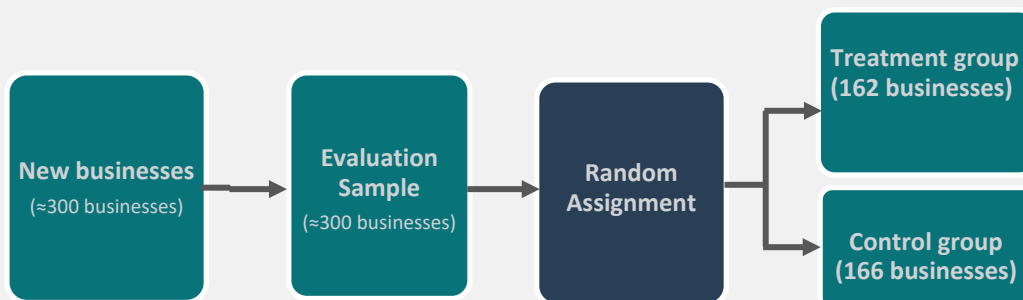
- outstanding lodgment (e.g. lodgment is under review due to an error on the form);
- payment or lodgment is made, however the system may take a few days to update; or
- payment arrangement is confirmed for an outstanding debt, however the system may take a couple of days to update.

There were 328 businesses in the analysis sample as four businesses left the DGST Scheme before the end of the trial. Businesses were randomly allocated into a treatment and control group with:

- 162 in the treatment group – received both the standard registration letter and the planning prompt email; and
- 166 in the control group – received the standard registration letter (existing process).

We tested for the proportion of businesses that remained compliant over 30 days and 60 days, and payment received over 60 days.

**Figure 2: Trial 2 Design for new businesses**



# Results: Existing businesses trial

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**Both emails improved rates of compliance, but did not have a statistically significant effect on payments.**

## Did emails improve compliance?

To comply with the DGST Scheme, businesses need to meet all of their tax obligations. The emails referred to the DGST Scheme, but the outcome we observed was much broader.

Both emails led to improved compliance when compared to the no email group (control). These differences were statistically significant at the standard level ( $p < 0.05$ )<sup>2</sup>. After 14 days, compliance increased by 14 percentage points for the direct email group (40 per cent compliant) and by 13 percentage points for the cooperative email group (39 per cent compliant), compared to the no email group (26 per cent compliant) (Figure 3 and Table 3.2, Appendix 3).

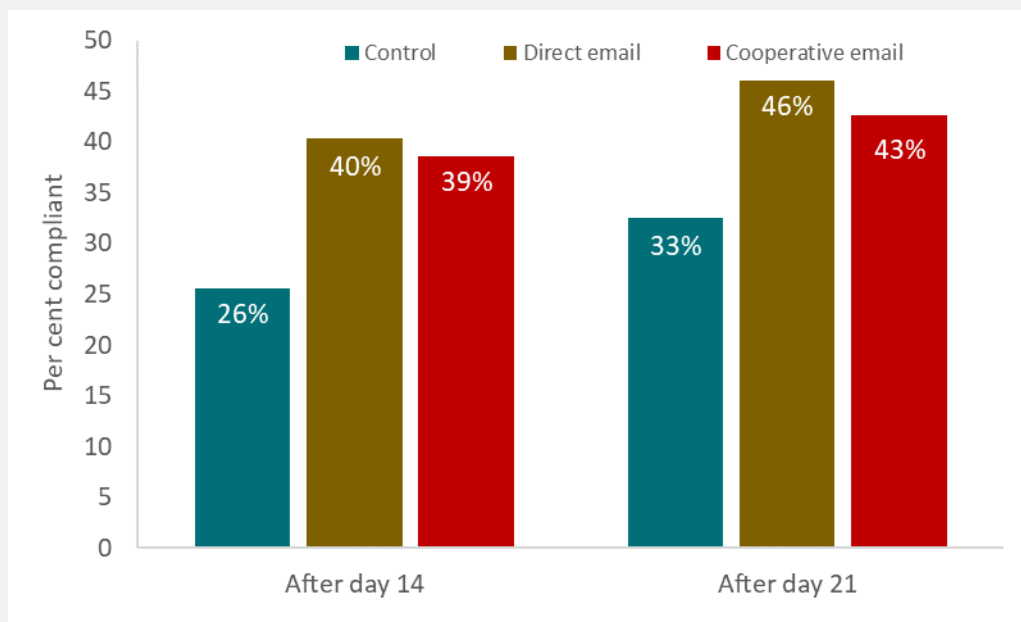
The findings after 21 days were similar. Compliance increased by 13 percentage points for the direct email group (46 per cent compliant) and 10 percentage points for the cooperative email group (43 per cent compliant), compared to the no email group (33 per cent compliant) (Figure 3 and Table 3.2, Appendix 3).

While both emails led to improved compliance, the differences in compliance between the direct email group and the cooperative email group were not statistically significant at the standard level ( $p < 0.05$ ) at either time point (i.e. after 14 days and after 21 days).

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<sup>2</sup> We are aware there is a lively academic debate about the merits of testing for 'statistical significance', the appropriateness of conventional thresholds such as  $p < 0.05$  (or any thresholds at all), and even the use of p-values generally. See, in particular, 'The American Statistical Association Statement on Statistical Significance and P-Values' (Wassertein and Lazar 2016).

**Figure 3: The proportion of existing businesses compliant after day 14 and day 21**

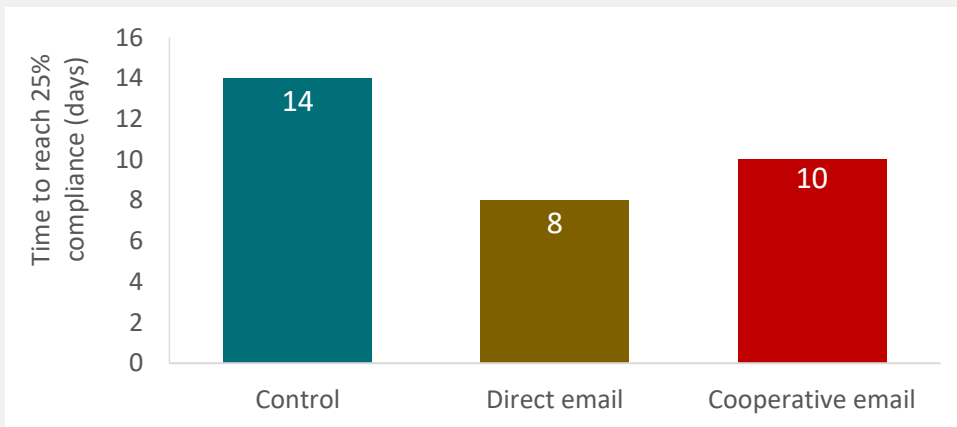


### Did emails prompt faster compliance?

To assess whether emails led to faster compliance, we compared the time it took for one quarter of businesses (or 25 per cent) to become compliant across the three treatment arms. We could not analyse the median time to comply because less than 50 per cent of businesses had complied at the end of the trial. We chose a 25 per cent threshold simply because it is a convenient way to illustrate the speed of compliance. Both emails increased the speed of compliance compared to the no email group (control). As seen in Figure 4, the time taken for one quarter of businesses to comply was 14 days in the no email group (control), compared to eight days in the direct email group and 10 days in the cooperative email group.<sup>3</sup>

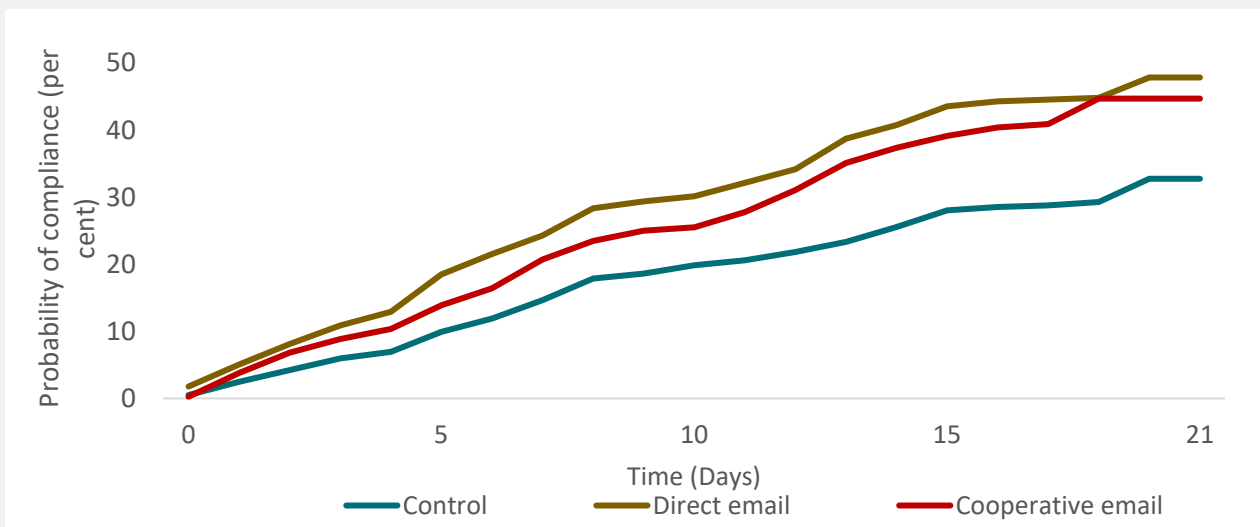
<sup>3</sup> These figures are derived from a slightly reduced analysis sample – 1,194, down from 1,279 – because we excluded businesses that had multiple changes to their compliance status over the 21 day period.

**Figure 4: Number of days for 25 per cent of businesses to be compliant**



Another way to assess the speed of compliance is to look at the proportion of compliant businesses over time. Figure 5 shows both emails increased the proportion of compliant businesses over time. For more details, see Table 3.4 in Appendix 3.

**Figure 5: Impact of the emails on time to comply**



### Did emails increase payments?

We analysed changes in payment behaviour of businesses. The level of payments is not directly related to compliance. Businesses can have large debts and make large payments, but remain non-compliant. Conversely, businesses can make small payments and become compliant. It depends on the amount owed. Payments capture all tax liabilities, not just GST.



Although in the pre-analysis plan,<sup>4</sup> we specified we would look at the average payment, we instead focussed on the median payment.<sup>5</sup> Median payments were higher for both email groups. The median payment was \$4,561 in the direct email group and \$3,158 in the cooperative email group, while the median payment in the no email group (control) was \$2,000. These differences are not statistically significant at the conventional threshold (Table 3.5, Appendix 3).

### **Did emails have an effect on incoming calls from clients?**

Over the 21-day period, about 76 per cent of businesses made no contact with the ATO, 14 per cent only made a single call, and a small number made up to 10 calls. Businesses in both email groups increased interaction with the ATO compared to the no email group (control). The call rate (whether or not the businesses called) increased by 17 percentage points in the direct email group and 10 percentage points in the cooperative email group (Table 3.8, Appendix 3). This data represent all calls businesses made to the ATO, not just calls related to the DGST Scheme. We also analysed compliance rates by whether the businesses contacted the ATO (Table 3.9, Appendix 3).

There are two views on whether an increase in incoming calls is positive. Increased calls can indicate higher levels of engagement but they can also indicate a need for further explanation due to the information sent being unclear. We cannot determine which is the case in this trial.

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<sup>4</sup> A pre-analysis plan sets out how a researcher is going to analyse the data and is prepared before the researcher sees the data (and ideally, before data collection begins). This avoids the problem of data mining and publication bias.

<sup>5</sup> A median is the middle value, with exactly half of the sample above and below this number. We chose the median for this analysis because it is less influenced by extreme values. This is important because we did not match businesses on the amount they owed, and two businesses in the no email group (control) made very large payments. In part due to the payments by these two businesses, the no email group (control) paid a total of \$57.7 million while businesses in the direct email group paid \$30.4 million and businesses in the cooperative email group paid \$35.7 million. For more information on payments made and client account balances, see Table 3.6 and Table 3.7 in Appendix 3.

# Results: New businesses trial

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**The emails to new businesses did not improve compliance or increase payments.**

## **Did emails improve compliance?**

The emails to new business did not improve compliance. The proportion of businesses who remained compliant was similar in the two groups. In the treatment group, 18 per cent of businesses were compliant for all 60 days compared with 19 per cent in the control group (Table 4.2, Appendix 4). On average, over the 60-day period, businesses in the treatment group were compliant for 67 per cent of days compared to 68 per cent of days for the control group.

## **Did emails increase payments?**

The median payment made was similar in the treatment and control groups (Table 4.3, Appendix 4).

## **Did emails have an effect on incoming calls from clients?**

The rate of calls (number of calls over the 60-day period) was similar in the treatment and the control groups (Table 4.4, Appendix 4). Over the 60-day period, the number of calls made to the ATO ranged from 0 to 10 (mean= 0.8, median=0). 63 per cent did not make any calls and 19 per cent made a single call.

# Limitations

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The existing businesses trial examined the effect of cooperative and direct emails on compliance after 14 and 21 days but it did not examine the effect on long-term compliance (e.g. after several months). However, as the ATO will send emails regularly to non-compliant businesses, the short-term impact is more relevant. A separate potential question for future research is whether the emails continue to be effective after they have been sent multiple times to persistently non-compliant businesses.

For new businesses, we tested one approach to help them remain compliant by suggesting they add a calendar reminder. As mentioned earlier, businesses have multiple obligations and payments to be made and the approach we tested may not have helped them to effectively address their cognitive overload. Future research could examine other approaches to encourage compliance among new businesses to the DGST Scheme such as setting up a system where businesses could sign up for a monthly alert from the ATO on the day or a few days before the payment is due.

# Discussion and Conclusion

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Our existing businesses trial demonstrates the ATO can improve compliance with the DGST Scheme by sending clear and simple reminder emails to non-compliant businesses. After receiving an email, more businesses became compliant and became compliant faster.

This improves the integrity of the DGST Scheme by ensuring businesses meet tax obligations. Compliance also benefits businesses who remain eligible to defer GST payments, helping businesses to manage their cash flow.

It did not matter if business managers received a cooperative email designed to overcome cognitive overload and present bias, or a direct email emphasising the ramifications of being removed from the Scheme. The reminder function is likely what worked in improving compliance.

We cannot conclude as confidently that the emails to existing businesses increased payments. The effect on median payments was material and in the right direction, but was not statistically significant, meaning it could just be a chance finding. Emails were designed to increase compliance rather than payment size, and payment size is not directly related to compliance.

It is possible emails prompted businesses to pay only GST, even though the DGST Scheme also requires the payment of other debts.

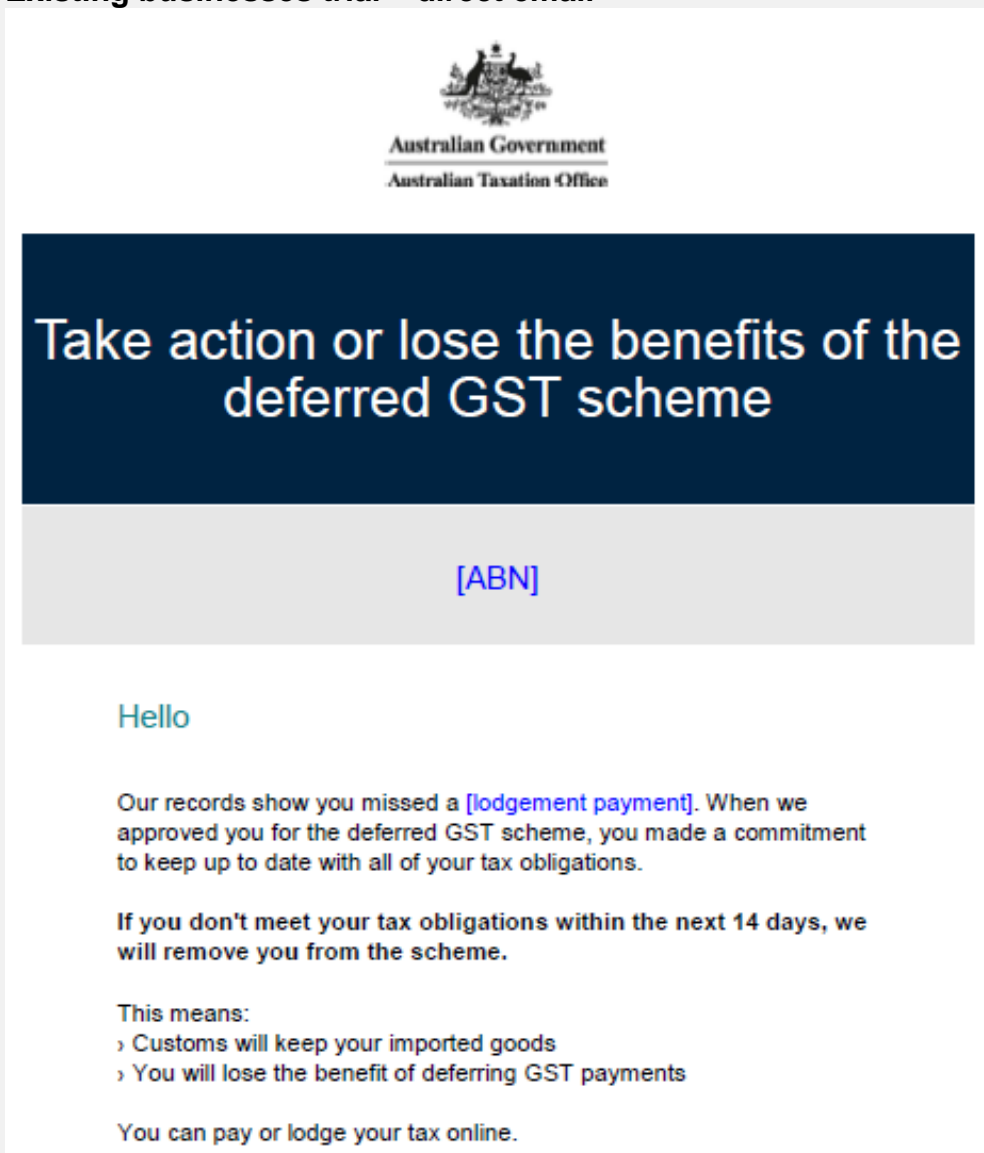
In the new businesses trial, an email recommending businesses set monthly calendar reminders was ineffective in increasing the number of businesses who remained compliant. It is easier to demonstrate an effect when interventions aim to move businesses from non-compliant to compliant, rather than increasing the number who remain compliant.

# Appendices

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## Appendix 1 – Interventions

### Existing businesses trial – direct email



The screenshot shows an email header with the Australian Government and Australian Taxation Office logos. The main subject line reads "Take action or lose the benefits of the deferred GST scheme". Below this, the recipient's ABN is shown in brackets. The body of the email starts with "Hello" and explains that the recipient has missed a lodgement payment, which could result in being removed from the deferred GST scheme if not resolved within 14 days. It lists consequences: Customs will keep imported goods and the benefit of deferring GST payments will be lost. It concludes by stating that taxes can be paid or lodged online.

Australian Government  
Australian Taxation Office

## Take action or lose the benefits of the deferred GST scheme

[ABN]

Hello

Our records show you missed a [\[lodgement payment\]](#). When we approved you for the deferred GST scheme, you made a commitment to keep up to date with all of your tax obligations.

**If you don't meet your tax obligations within the next 14 days, we will remove you from the scheme.**

This means:

- › Customs will keep your imported goods
- › You will lose the benefit of deferring GST payments

You can pay or lodge your tax online.

## Existing businesses trial – cooperative email



# How to pay and stay in the deferred GST scheme

[ABN]

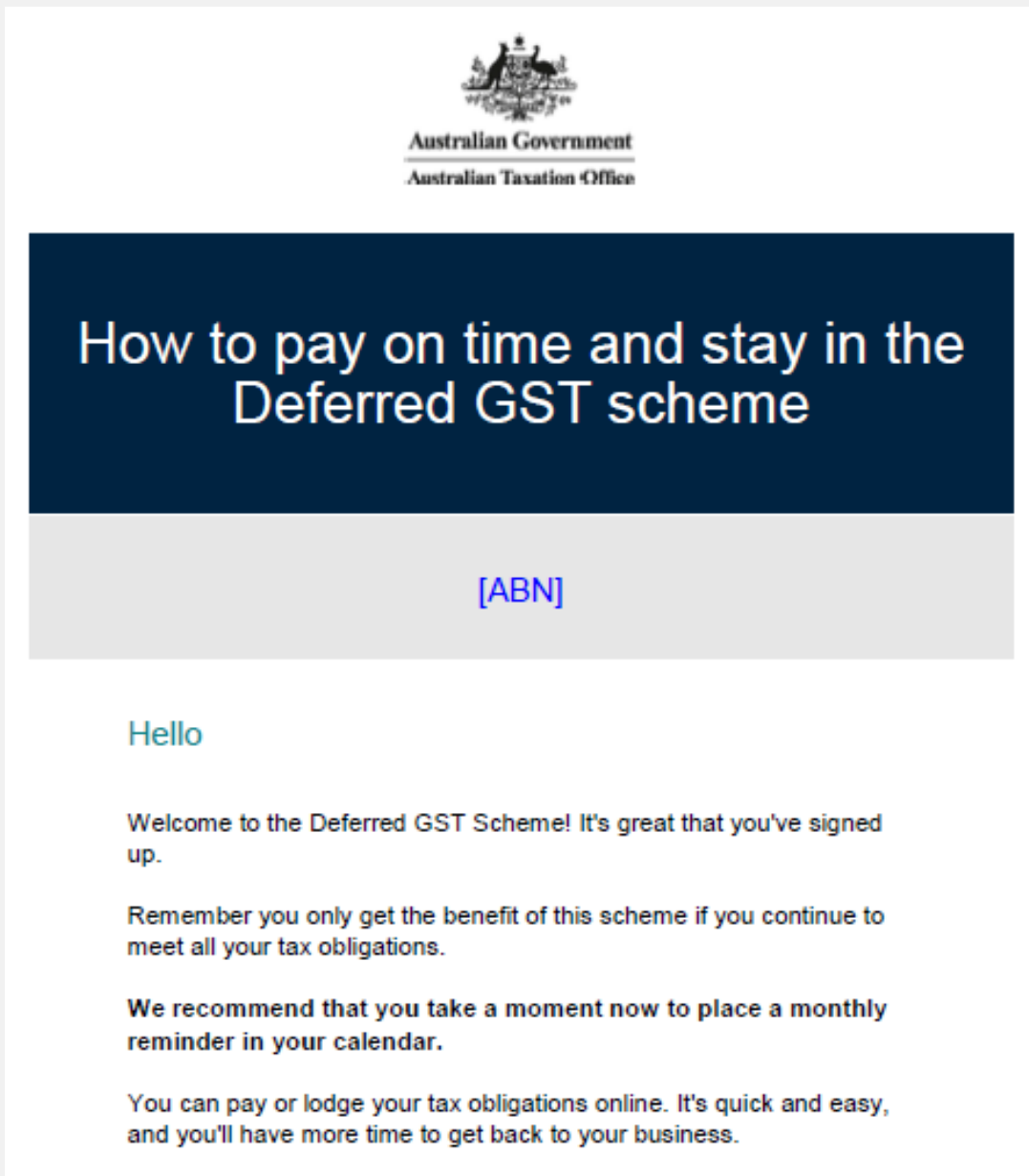
Hello

We know you're busy and we only email you when we have to. However, our records show you missed a [lodgement payment] that was due recently.

To continue to benefit from deferring your GST, make sure all of your tax obligations are up to date by [DD Month CCYY]. If you don't, you'll no longer be part of the scheme, Customs will retain your goods until you pay the GST, and you'll have to register for the scheme all over again.

You can pay or lodge your tax obligations online. It's quick and easy - and you have more time to get back to your business. Next month's payment and lodgement is due on 21 [month].

## New businesses trial – planning prompt email



## Appendix 2 – The technical details

### Existing businesses trial

We identified non-compliant businesses but excluded them from our study if they were:

- part of a GST group (two or more entities operating as a single business for GST purposes);
- case managed during evaluation;
- being monitored by other areas of the ATO;
- non-compliant for less than 14 days (businesses are given 14 days to respond but the ATO generally only acts after 21 days); or
- non-compliant as a result of an incorrect lodgment channel or cycle.

Eligible businesses were enrolled in four ‘batches’ over approximately two months and randomisation was repeated for each batch. Eligible businesses were matched into triplets exhibiting similar characteristics based on the number of days they were non-compliant in the month before the trial. A computer algorithm then performed the randomisation so one business from each triplet was assigned to each group. We did not match by business segment as size of the business was not related to whether or not a business was compliant in analyses undertaken with baseline data when the trial was being designed.

The final analysis sample size was 1,279 businesses. We undertook intention-to-treat analysis, that is, analysis was undertaken by random assignment to the three groups even if, for example, emails bounced back. We excluded seven businesses for whom we did not have outcome data because they exited the Scheme before the end of the trial.

For the outcome measuring the proportion of businesses who became compliant, assuming  $\alpha = 0.05$  and power = 0.8, the study was powered to detect a 10 per cent increase in compliance.

Businesses were non-compliant on a particular day if they met one or more of these conditions:

- debt exceeding payment arrangements;
- active insolvency;
- not lodging monthly;
- not lodging via online portal;
- overdue Business Activity Statement (BAS);
- overdue Fringe Benefits Tax (FBT) returns;
- overdue Income Tax Returns (ITR).



The outcome variables for this trial were point in time compliance after day 14 (i.e. compliance on a particular day, day 15), point in time compliance after day 21 (at day 22), total payment made over the 21-day period, number of calls to the ATO and the difference in client account balance at the start and end of the trial.

## **New businesses trial**

Businesses were allocated to either the treatment or control group using a simple randomisation process based on the final digit of their Australian Business Number. The randomisation process was repeated for each new business that signed onto the Scheme over a three month period. The final sample was 332 businesses but four exited the Scheme before the end of the trial. As with the existing businesses trial, we undertook intention-to-treat analysis.

For the outcome measuring the proportion of businesses that remained compliant, assuming an initial compliance rate of 75 per cent,  $\alpha = 0.05$  and power = 0.8, the study was powered to detect a 12.5 percentage point increase in compliance.

The emails were sent out in 12 batches (over 12 weeks) as new businesses joined the Scheme. To ensure consistency in measurement, businesses were monitored for exactly two months from receipt of either just the standard registration letter or the letter and the planning prompt email.

The outcome variables for this trial were compliance for 30 days (mid-point of the follow-up period) and compliance for all 60 days of the trial. We also examined proportion of days compliant over the 30-day and 60-day period.

For some analyses (e.g. the number of days it took existing businesses to become compliant and whether businesses were compliant for all 60 days for new businesses), we needed compliance data for each calendar day. Compliance data was not available on weekends or public holidays and there were also a few days when it was unavailable due to system outages. For missing days, we used data from the last day for which compliance data was available (e.g. for weekends, we assigned compliance data from Fridays). We could have taken other approaches for missing data (e.g. assigned missing data with data from the next available day) but we expect there would have been little difference in findings irrespective of the approach used for missing data.

### Appendix 3 – Key statistical tables from the existing businesses trial

**Table 3.1 – Baseline characteristics of non-compliant businesses**

Characteristics		Direct email	Cooperative email	Combined email (direct + cooperative)	Control
Total sample size		427	427	854	425
Number of days non-compliant one month before the trial	mean (standard deviation)	15.9 (3.4)	15.9 (3.4)	15.9 (3.4)	15.9 (3.4)
Small to Medium Segment	N (%)	258 (60.4)	255 (59.7)	513(60.1)	259 (60.9)
Micro Segment	N (%)	145 (34.0)	153 (35.8)	298 (34.9)	141 (33.2)
Large and other Segment	N (%)	24 (5.6)	19 (4.5)	43 (5.0)	25 (5.9)

**Table 3.2 – Compliance after day 14 and day 21: linear regression**

	% compliant	Difference from Control (95% confidence interval)	p-value	Difference from direct email (95% confidence interval)	p-value <sup>6</sup>
<b>After day 14</b>					
Control	25.6				
Direct email	40.4	14.9 (8.7 to 21.0)	< 0.001		
Cooperative email	38.6	13.0 (6.9 to 19.2)	< 0.001	-1.8 (-8.0 to 4.3)	0.56
Any email (direct + cooperative)	39.5	13.9 (8.6 to 19.3)	< 0.001		
<b>After day 21</b>					
Control	32.5				
Direct email	46.1	13.5 (7.2 to 19.9)	< 0.001		
Cooperative email	42.6	10.1 (3.7 to 16.4)	0.002	-3.5 (-9.8 to 2.9)	0.28
Any email (direct + cooperative)	44.3	11.8 (6.3 to 17.3)	< 0.001		

Note: Results presented are from linear regression models and dummy variables for each triplet were included in the models. The cooperative and direct email groups were compared to the control group separately and then jointly (any email). The cooperative email group was also compared to the direct email group. This analysis was also run as a logistic regression with the same results for marginal effects (see Table 3.3).

<sup>6</sup> A p-value evaluates how well the data from the study supports the argument that there is no difference between experimental groups (also called the null hypothesis). This means the p-value is the probability of obtaining an effect at least as extreme as the finding in the study assuming the null hypothesis is true.

**Table 3.3 – Compliance after day 14 and day 21: logistic regression**

	Odds ratio	Standard error	p-value
After day 14			
Direct email compared to control	2.00	0.297	< 0.001
Cooperative email compared to control	1.85	0.276	< 0.001
Any email (direct + cooperative) compared to control	1.92	0.253	< 0.001
After day 21			
Direct email compared to control	1.78	0.253	< 0.001
Cooperative email compared to control	1.54	0.220	0.002
Any email (direct + cooperative) compared to control	1.66	0.206	< 0.001

Note: Dummy variables for each triplet were not included in these models. This is because for some triplets, all businesses could be either compliant or non-compliant. In such a scenario, the coefficient would be infinite and the model could not be fitted. The average marginal effects from this model was exactly the same as that from the linear regression model reported in Table 3.2. To make a direct comparison, odds ratios must first be converted to average marginal effects.

Table 3.4 presents estimates from Kaplan–Meier failure curves, obtained from survival analysis. Survival analysis is a statistical technique to investigate the time for an event of interest to occur. In this case, the event of interest is a business becoming compliant. These analyses excluded those with multiple changes to compliance status such as becoming compliant and then non-compliant again during the trial period. This led to the analysis sample size of 1,194 businesses. The probability of compliance is the probability the business becomes compliant after the specified time (e.g. between day 2 and day 3).

**Table 3.4 – Time-to-comply: survival analysis**

<b>DAYS</b>	<b>0</b>	<b>2</b>	<b>5</b>	<b>8</b>	<b>11</b>	<b>14</b>	<b>17</b>	<b>20</b>
<b>CONTROL (NO EMAIL)</b>								
Number of businesses still non-compliant	403	393	375	344	323	309	288	285
Probability of compliance (%)	0	4.2 (2.6-6.7)	9.9 (7.4-13.3)	17.9 (14.5-22.0)	20.6 (17.0-24.9)	25.6 (21.6-30.1)	28.8 (24.6-33.5)	32.8 (28.4-37.6)
<b>DIRECT EMAIL</b>								
Number of businesses still non-compliant	395	375	344	299	276	242	220	218
Probability of compliance (%)	0	8.1 (5.8-11.3)	18.5 (15.0-22.7)	28.4 (24.2-33.1)	32.2 (27.8-37.0)	40.8 (36.1-45.8)	44.6 (39.8-49.6)	47.9 (43.1-52.9)
<b>COOPERATIVE EMAIL</b>								
Number of businesses still non-compliant	396	381	355	314	295	257	236	234
Probability of compliance (%)	0	6.8 (4.7-9.8)	13.9 (10.8-17.7)	23.5 (19.6-28.0)	27.8 (23.6-32.5)	37.4 (32.8-42.3)	40.9 (36.3-45.9)	44.7 (40.0-49.7)
<b>ANY EMAIL</b>								
Number of businesses still non-compliant	791	756	699	613	571	499	456	452
Probability of compliance (%)	0	7.5 (5.8- 9.5)	16.2 (13.8- 18.9)	25.9 (23.0- 29.1)	30.0 (26.9- 33.3)	39.1 (35.8-42.6)	42.7 (39.4- 46.3)	46.3 (42.9- 49.8)

Note: There were statistically significant differences in Kaplan-Meier curves between the three groups (Chi-square = 20.47 on 2 df,  $p < 0.0001$ ) as well as between the control and any email (direct + cooperative) (Chi-square = 19.76 on 1 df,  $p < 0.0001$ ). Businesses complied faster in the direct email group compared with the cooperative email group, but this difference was not statistically significant (Chi-square = 0.62 on 1 df,  $p = 0.43$ ). Data for Day 17 for the control group are from Day 18 as no businesses from the control group became compliant on Day 17 so estimates were not produced for Day 17.

**Table 3.5 – Median payment made: quantile regression**

	Median amount paid (\$)	Difference from Control (95% confidence interval)	p-value	Difference from direct email (95% confidence interval)	p-value
Control	2,000				
Direct email	4,561	2,561 (-2,083 to 7,205)	0.28		
Cooperative email	3,158	1,158 (-3,486 to 5,801)	0.63	-1,403 (-6,042 to 3,235)	0.55
Any email (direct + cooperative)	4,000	2,093 (-2,107 to 6,106)	0.34		

Note: Results presented are from median regressions and the dummy variables for triplets were not included. The cooperative and direct email groups were compared to control group separately and then jointly (any email). The cooperative email group was also compared to the direct email group.

**Table 3.6 – Average payment made**

	Average amount paid (\$)	Difference from Control (95% confidence interval)	p-value	Difference from direct email (95% confidence interval)	p-value
Control	135,846				
Direct email	70,936	-64,910 (-129,721 to -100)	0.05		
Cooperative email	84,004	-51,842 (-116,641 to 12,958)	0.12	13,069 (-51,649 to 77,786)	0.69
Any email (direct + cooperative)	77,471	-58,374 (-114,499 to -2248)	0.04		

Note: Results presented are from linear regression and the dummy variables for triplets were included. The model overall was not statistically significant. The cooperative and direct email groups were compared to control group separately and then jointly (any email). The cooperative email group was then compared to the direct email group.

**Table 3.7 – Average difference in client account balance (cac) (original balance minus final balance)**

	Average CAC difference (\$)	Difference from Control (95% confidence interval)	p-value	Difference from direct email (95% confidence interval)	p-value
Control	3544				
Direct email	12,444	8,900 (-30,775 to 48,575)	0.66		
Cooperative email	9992	6,448 (-33,220 to 46,116)	0.75	-2452 (-42,070 to 37,166)	0.90
Any email (direct + cooperative)	11,218	7674 (-26,683 to 42,030)	0.66		

Note: Results presented are from linear regression and the dummy variables for triplets were included. The model overall was not statistically significant. The cooperative and direct email groups were compared to the control group separately and then jointly (any email). The cooperative email group was then compared to the direct email group.

**Table 3.8 – Calls to the ATO – whether or not a call was made**

	% called	Difference from Control (95% confidence interval)	p-value	Difference from direct email (95% confidence interval)	p-value
Control	14.8				
Direct email	31.9	17.0 (11.4 to 22.7)	< 0.001		
Cooperative email	24.8	10.0 (4.3 to 15.7)	0.001	-7.0 (-12.7 to -1.4)	0.02
Any email (direct + cooperative)	28.3	13.5 (8.6 to 18.4)	< 0.001		

Note: Results presented are from a linear model and triplet variable was not included. The cooperative and direct email groups were compared to the control group separately and then jointly (any email). The cooperative email group was then compared to the direct email group. This analysis was also run as a logistic regression with the same results for margins.

**Table 3.9 – Compliance after day 21 – population divided by whether they called the ATO**

	<b>% compliant</b>	<b>Difference from Control (95% confidence interval)</b>	<b>p-value</b>	<b>Difference from direct email (95% confidence interval)</b>	<b>p-value</b>
<b>Did not call the ATO (sample size= 974)</b>					
Control	31.1				
Direct email	41.1	10.0 (2.5 to 17.4)	0.01		
Cooperative email	36.4	5.3 (-2.0 to 12.5)	0.16	-4.7 (-12.4 to 3.0)	0.23
Any email (direct + cooperative)	38.6	7.5 (1.2 to 13.8)	0.02		
<b>Called the ATO (sample size= 305)</b>					
Control	40.5				
Direct email	54.7	14.2 (-4.4 to 32.7)	0.13		
Cooperative email	64.3	23.7 (4.5 to 42.9)	0.02	9.6 (-5.8 to 25.0)	0.22
Any email (direct + cooperative)	58.9	18.5 (1.2 to 35.7)	0.04		

Note: Results presented are from linear models and triplet variable was included. The cooperative and direct email groups were compared to the control group separately and then jointly (any email). The cooperative email group was then compared to the direct email group. The overall model for those who called the ATO was not statistically significant.



## Appendix 4 – Key statistical tables from the new businesses trial

**Table 4.1 – Baseline characteristics**

Characteristics		Treatment	Control
Total sample size		162	166
Compliant at Day 1	N (%)	130 (80.3)	138 (83.1)
First time to the Scheme	N (%)	112 (70.4)	110 (68.8)
Small to Medium Segment	N (%)	60 (37.0)	82 (49.4)
Micro Segment	N (%)	89 (54.9)	75 (45.2)
Large and other	N (%)	13 (8.0)	9 (5.4)

**Table 4.2 –compliance**

Outcome Measure	Control % (N)	Treatment (Planning Prompt) % (N)	Percentage point difference: Treatment vs Control (p value)
Proportion compliant for first 30 days	34.9 (n=58)	32.1 (n=52)	2.90 (p=0.59)
Proportion compliant for all 60 days	18.7 (n=31)	17.9 (n=29)	2.9 (p=0.86)

Outcome Measure	Control –average % compliance (95% confidence interval)	Treatment -average % compliance (95% confidence interval)	Treatment vs Control (p value)
Proportion of days compliant over 30 days	72.1 (66.9 to 77.3)	67.7 (62.4 to 73.0)	p=0.24
Proportion of days compliant over 60 days	67.6 (63.1 to 72.1)	66.6 (62.1 to 71.2)	p=0.76

**Table 4.3 – Median payment made – quantile regression**

	<b>Median payment \$</b>	<b>Difference from control group (95% confidence interval)</b>	<b>p-value</b>
Control	9,938	Control group	
Prompt email (treatment)	10,481	543 (-18,403 to 19,489)	0.96

Note: Results presented are from the quantile regression model.

**Table 4.4 – calls to the ATO – whether or not a call was made**

	<b>% called</b>	<b>Difference from control (95% confidence interval)</b>	<b>p-value</b>
Control	34.9		
Prompt email (treatment)	38.3	3.4 (-7.2 to 13.8)	0.53

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