

Working Paper 6

**Evaluation of the Government's December 2004 Announcement  
Warning that Anti-Avoidance Legislation in respect of  
Remuneration-based Avoidance Schemes could be back-dated:**

**HMRC KAI: Personal Tax**

## Summary

- This report presents the results of an evaluation of the impact of the Government's 2<sup>nd</sup> December 2004 anti-avoidance announcement. The crux of this announcement was that in the future, remuneration-based avoidance schemes would be closed down with retrospective effect, i.e. any new legislation to combat IT and NICs avoidance would be effective from the date of the announcement.
- The aim of this announcement was to cause a permanent change in avoidance behaviour, bringing an end to remuneration-based avoidance.
- The evaluation comprises two main elements, both examining changes in avoidance behaviour in the 2004/05 and 2005/06 post-announcement years:
  - i) An analysis of individual tax payer data using econometric techniques (Difference-in-Differences) to estimate if there has been an increase in the total amount of tax paid as a proportion of their total income (their effective tax rate) or a change in the remuneration packages of avoiders that indicates a change in avoidance behaviour.
  - ii) A detailed analysis of a small sample of 50 tax payers' tax-returns, examining the type of avoidance schemes that were in use before and after the announcement.
- This is not an evaluation of the whole 2004 announcement. Some of the forecast yield was expected to come from retrospective payments and HMRC investigation settlements. This part of the yield is not evaluated by this working paper because complete information to do so is not yet available.
- The evaluation, by focusing on employer-provided avoidance schemes, finds robust evidence that the anti-avoidance legislation has already raised additional revenue of £110 million in 2004-05 and £210 million in 2005-06,.
- The final revenue collected for these years is likely to be even higher as the Government will also receive revenue from the closure of third-party avoidance schemes. These schemes are covered by the legislation, but could not be considered by this evaluation without biasing the econometric results.
- There is also evidence of a reduction in avoidance that preceded the anti-avoidance announcement in 2003/04. This shows that the reduction in avoidance behaviour found after December 2004 cannot be solely attributed to the anti-avoidance announcement. However, we consider that the anti-avoidance announcement has been key in sustaining and reinforcing previous changes in avoidance behaviour. It is very likely that without the possibility of retrospectively implemented legislation, individuals would have sought out further avoidance opportunities in 2004/05 and 2005/06 and earlier improvements in avoidance behaviour would have been lost.
- In 2004/05 the evidence suggests that the majority of the policy impact in the first (partial) year after the announcement operated through a reduction in avoidance using dividend-based schemes. For this group, we saw a large (and statistically significant) 5.6 percentage point increase in their effective tax rate.
- In 2005/06 the evidence suggests that the effect of the policy on users of dividend-based schemes continued at a similar level. However the effect also widened to include other avoidance activity. The overall effect was that the wider target group saw a large (and statistically significant) 2.8 percentage point increase in their effective tax rate.
- This internal HMRC evaluation is a contribution to HMRC's evidence-based policy-making, and has been supported by external advice from the Centre for Employment Research at Westminster Business School. Their commentary on the evaluation (Box 1) makes clear that they have a high level of confidence in the results and policy recommendations arising from this report.

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## Section 1: Policy Context & Evaluation Objective

### 1.1 The Anti-Avoidance Announcement

- 1.1.1 This section describes the anti-avoidance measure which is the subject of this evaluation; the Government's December 2004 anti-avoidance announcement, made at Pre-Budget Report 2004 (PBR 2004).
- 1.1.2 Prior to PBR 2004, the norm for anti-avoidance legislation was that measures had prospective effect. In other words, if an avoidance scheme was implemented before the announcement of legislation to counter it, that scheme would not be affected by the anti-avoidance measure. In order to stop the exploitation of this scenario by employers seeking to shelter payments to their employees from Income tax (IT) and National Insurance (NICs) the Government gave notice of its intention to take decisive action alongside PBR 2004.
- 1.1.3 The crux of the PBR 2004 announcement was that in the future, remuneration-based avoidance schemes would be closed down with retrospective effect, i.e. any new legislation to combat IT and NICS avoidance would be made effective from the date of the announcement, 2 December 2004.
- 1.1.4 It was estimated for PBR 2004 that the implementation of this anti-avoidance measure would raise additional revenue of £200 million in 2004/05 and then £500 million a year for the remainder of the forecast period.
- 1.1.5 This announcement was part of a series of measures aimed at permanently bringing an end to remuneration-based avoidance. This began with the trailing of the disclosures regime at Budget 2004 and implementation August 2004; this meant that firms that develop tax avoidance schemes (either financial market based schemes or employment products) were now required to inform HMRC of those schemes, including details of how the scheme operates. Following the anti-avoidance announcement in December, supporting legislation was introduced in Finance Act (No 2) 2005. Furthermore, in Budget 2006 tax legislation to counter post 2 December 2004 schemes was introduced, and the NICs Act 2006 enacted a power to obtain NICs retrospectively and used it in relation to the tax changes that were included in Finance Act 2005.
- 1.1.6 Although each of these measures may have some impact on avoidance behaviour, the main subject of our evaluation is the anti-avoidance announcement of 2 December 2004. Since the announcement made it clear that subsequent legislation would be backdated to the date of the announcement, if the announcement was viewed as credible by tax payers and the tax planning industry then avoidance behaviour should have changed permanently from this date.
- 1.1.7 To understand this intended effect of this announcement on avoidance behaviour we set out the basic economic rationale for avoidance; one would rationally expect individuals to exploit remuneration-based avoidance products until the net benefit of doing so (tax saving) is just equal to the cost of avoidance (the risk and cost of the scheme, penalty and reputation costs if caught). The aim of the announcement was to raise the cost of avoidance such that the individual would be liable to pay the tax that would have been due had the scheme been illegal from 2 December 2004.
- 1.1.8 The effectiveness of this in raising the cost of avoidance initially depends on the behavioural response to this increased cost, there are three behavioural responses of interest to consider:
- *Short-term deferral of annual and performance bonuses:* Given that the announcement was made at the time when most companies are paying annual

bonuses, the initial reaction that one might have expected was for taxpayers to defer the payment of bonuses until further information was available.

- *Shifting of avoidance behaviour*: There are still opportunities for mitigating tax paid that will not be covered by the announcement and some individuals may shift their behaviour to exploiting these, although possibly at increased cost and effort.
- *Real economic responses*: if the announcement has been effective in deterring avoidance then real economic behaviour such as labour supply responses to higher effective tax rates may become more sensitive to taxation than previously. Thus, over time, if the announcement has been successful at reducing overall tax avoidance, this may manifest in a more direct response from taxpayers, i.e. in reduced labour supply or work effort as the after-tax return to work is lower or possibly increased labour supply to maintain previous after-tax income levels, depending on which effect dominates.

1.1.9 Whether these responses are observed may to some extent depend on the credibility with which the announcement is viewed by the tax planning industry, and taxpayers more generally. These factors will impact on the findings of our evaluation.

1.1.10 With specific reference to the shifting of avoidance behaviour, it is important to note that some reductions in tax payable may be legitimate tax planning activities. For example, many employers may pay their employees through benefits in kind such as company cars which can offer considerable NICs savings. Furthermore, tax reliefs are often employed by government to incentivise certain behaviours like pension saving. Although some legitimate activities may be open to abuse, we must be aware that some shifting of behaviour may in fact be into tax planning rather than tax avoidance activity.

## 1.2 Evaluation Objective

1.2.1 At the time of the announcement, Ministers gave a very strong commitment to evaluating the success of this measure over time.

1.2.2 Broadly, success is defined by the announcement achieving its aims in making a positive change to individuals' avoidance behaviour and attitudes to avoidance and also in raising the forecast revenue. To evaluate this success, four main elements to the evaluation were planned:

- i. An analysis of aggregate tax receipts directly attributable to the anti-avoidance announcement and related legislation.
- ii. A quantitative evaluation of taxpayer data covering the period before and after the 2 December 2004 announcement and encompassing Self Assessment and NICs information.
- iii. An assessment of a small sample of taxpayers examining changes in avoidance behaviour.
- iv. A qualitative study of taxpayer responses to the announcement explore if there has been a shift in attitudes to avoidance products since it was made.

1.2.3 In relation to the first element, in June 2005 a preliminary analysis based on PAYE receipts flows (in aggregate, as well as on sub-samples of 'known avoiders' and 'financial sector employers') was undertaken. While the anecdotal evidence was quite supportive of a positive effect of the announcement on avoidance schemes, it was not possible to discern any robust patterns in the receipts data alone. Furthermore, examination the Office of National Statistics Bonus Timing matrix for December 2004 – April 2005 (which compares the timing and level of bonuses to the previous year) also found no substantive evidence of the announcement having an immediate effect in delaying bonus payments. Due to the difficulty of obtaining robust results using aggregate data, this analysis has not been repeated for later periods here.

- 1.2.4 Similarly, the qualitative study of taxpayer responses to the announcement has not been pursued. This was planned to comprise interviewing tax promoters, key decision-makers in large firms, taxpayers affected and a sample of smaller firms known to have engaged in avoidance in the past. After internal consultation it was decided not to pursue this due to the sensitivity of this issue which might cause substantial risk of non-response or biased responses from such interviews.
- 1.2.5 As such, this paper focuses on the second and third elements to the planned evaluation. Taking this dual approach strengthens the evidence base and allows us to draw robust conclusions based on a quantitative analysis of individual tax payer data and also by examining a small sample of taxpayers and looking at more detailed aspects of avoidance behaviour.
- 1.2.6 This paper presents the evaluation methodology and the results of these two elements of the evaluation. Both elements have been carried out internally by HMRC. The quantitative element analysing individual taxpayer data has also benefited from external academic support from Westminster Business School who have been able to quality-assure the evaluation results (see Box 1). The individual tax payer analysis is covered in section 2 and the small sample analysis is covered in section 3. Interim conclusions are made at the ends of sections 2 and 3 and drawing from both elements, final conclusions are drawn in section 4.

### 1.3 Evaluation Context

- 1.3.1 Before turning to the two main elements of the evaluation this section briefly covers what we know about the context of the anti-avoidance announcement in terms of growth in bonus payments in the post-announcement period. As we know, the anti-avoidance announcement targeted remuneration-based avoidance, in particular targeting avoidance on bonus payments.
- 1.3.2 Bonus payments are a major influence on pay growth as measured by the Average Earnings Index (AEI) calculated by the Office for National Statistics (ONS). Through examining the impact of bonuses on the AEI it is apparent that the majority of large bonuses are generally paid in the period December to April each year, mainly, but not exclusively, in the financial services sector.
- 1.3.3 Using the AEI annual growth rate, the ONS can calculate the level of bonuses in the economy. Applying this technique to the latest data, bonuses in the period December 2006 to April 2007 are approximately £3 billion higher than in the same period a year earlier (ONS, 2007). The ONS publishes this calculation each year, the table below summarises the annual increases:

<b>Table 1: Growth in Bonuses</b>	Increase on same period a year earlier (£ Billion)
Dec 2003 - March 2004	1.5
Dec 2004 - March 2005	1
Dec 2005 - March 2006	3
Dec 2006 - March 2007	3

- 1.3.4 This means that, cumulatively, bonuses have increased by £4 billion in the post announcement years 2004/05 and 2005/06 compared to the pre-announcement year 2003/04. If the 'proper' amount of tax is being paid on these bonuses (i.e. they are taxed as employment income) these increases could represent large increases in tax revenues. As such, this continued growth in bonuses highlights the importance of tackling remuneration-based avoidance and establishing the success of policies aimed to do this.

## Section 2: Analysing Individual Taxpayer Data

### 2.1 Evaluation Approach

- 2.1.1 The aim of this element of the evaluation is to use individual taxpayer data to identify the change in avoidance behaviour that has occurred as a result of the December 2004 anti-avoidance announcement and then quantify the revenue effects of this change.
- 2.1.2 As individuals stop avoiding and start paying the 'proper' rate of tax on their income we would expect the total amount of tax they pay as a proportion of their total income (their effective tax rate) to increase and for their remuneration package to change such that they receive less payment in forms of income conducive to avoidance, such as dividends income, and a greater amount through conventional income streams such as employment income.
- 2.1.3 For example, much of the avoidance targeted by the announcement is likely to have operated through disguising employment income as dividend income. This type of scheme avoids paying both employer NICs (at 12.8%) and employee NICs (at 1% above the upper earnings limit) and reduces the rate of income tax from 40% to 25%. Overall, this could reduce the marginal rate of tax on this income from 54% to just 25%. If the announcement were successful in stopping this type of avoidance and income was paid through the proper employment income stream then this could result in substantial increases in tax payments as a proportion of total income translating to higher overall effective tax rates. We can also expect to see substantial shifts in employment and dividend income as a proportion of total income.
- 2.1.4 It is impossible to generalise how much we would expect to see effective tax rates increase as this depends on the total amount of income that has switched from avoidance to legitimate streams, what the difference is between the avoidance rate and the legitimate rate and furthermore what proportion this is of their total income. However, given the substantial amount of tax that can potentially be avoided through a scheme that disguises employment income as dividends, we can expect to be able to find some discernible effect if behaviour has changed in this way.
- 2.1.5 As such, this element of the evaluation applies econometric estimation techniques<sup>1</sup> to individual-level data to estimate the changes in the composition of income away from components associated with avoidance (e.g. dividend income) to more conventional employment income, and the change in the effective tax rates of these individuals which can be attributed to the anti-avoidance announcement. These estimated changes in tax rates and income ratios are then used to try to quantify the revenue effect of the anti-avoidance announcement.

### 2.2 Data

- 2.2.1 Tax avoidance covered by the anti-avoidance announcement encompasses both income tax and NICs. To gauge the impact of the announcement it is important to evaluate the impact on both income tax and NICs. This is especially the case as much of the avoidance targeted by the announcement is likely to have operated through disguising employment income as dividend income (as described above) which avoids all employer and employee NICs payments. So if the announcement has been successful we may expect to see a large effect in increased NICs payments as well as in income tax payments.

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<sup>1</sup> Estimation is carried using regression methodology

- 2.2.2 To achieve this, details of individuals' NICs payments from their end of year summaries (a 1% sample of P14s) were matched anonymously using tax payer references to Self Assessment (SA) returns for employees. As all observations include an SA return this ensures the sample selected is made up of the individuals we are most interested in; high earning employees, often with multiple sources of income. As the 100% SA data was matched to the 1% P14s sample, the final sample is a 1% sample of the population of interest, employees who return SA forms.
- 2.2.3 The data covers financial years 2001/02 to 2005/06. Although the anti-avoidance announcement was made in December 2004, the financial year 2004/05 qualifies as a post-announcement year since the annual bonus period is December-April so we can expect to see early changes in remuneration-based avoidance behaviour in the 2004/05 bonus round following the announcement.
- 2.2.4 After data cleaning<sup>2</sup> there were 30,000 observations in each year and just over 150,000 observations altogether. These observations are from 54,778 different individuals, not every individual has an observation in each year.
- 2.2.5 As outlined above we are interested in examining the effect of the anti-avoidance announcement on six variables of interest calculated using the data sample (a table of summary statistics may be found in Technical Appendix A: Data Descriptives);
- The effective tax rate (IT after tax credits + employer NICs + employee NICs / Total income)
  - Ratio of dividend income to total income
  - Ratio of employment income to total income
  - The three separate components of the effective tax rate:
    - IT after tax credits/total income
    - Employer NICs/total income
    - Employee NICs/total income.
- 2.2.6 In addition to tax variables the data also includes individuals' age and gender, their postcodes and their employers' postcodes and the industry of their employment (the Standard Industrial Classification). These are all useful variables to use in the analysis as variables that may impact on the tax and income ratios of interest in (known as control variables).
- 2.2.7 The data has been enhanced by matching to other data sources. By matching to the tax enquiries database we can identify if an individual has been subject to an enquiry into one or more of their tax returns and when the enquiry was opened. This could be important for the evaluation as an enquiry could impact on an individuals' avoidance behaviour independently of the anti-avoidance announcement and the enquiry flag will allow us account for this effect in the analysis.

### 2.3 The Difference-in-Differences Methodology

- 2.3.1 Evaluating the effect of the anti-avoidance announcement on taxpayer effective tax rates and the composition of taxable income is essentially the problem of programme evaluation. In evaluating the effect of a programme on a particular group we need to isolate the effect of the treatment, in this case the announcement that remuneration-based avoidance schemes would be retrospectively closed down, on the outcome of interest, for instance the effective tax rates. This is ideally achieved by comparing the observed outcome for the treatment group to what the outcome would have been had the treatment not been applied (known as the counterfactual). The problem is that this

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<sup>2</sup>This included removing inconsistent values, individuals with pension income only, and making adjustments for the 2004/05 change in Self Assessment filing rules so the sample population was consistent in each year.



counterfactual is never observed; we do not observe the outcome for the treatment group had the treatment not been applied.

- 2.3.2 This kind of evaluation problem is most commonly overcome by comparing the differences in average outcomes between the treatment group (the group affected by the policy) and a comparable group not affected by the announcement (the control group) at least one relevant point both before and after treatment (the date of the announcement). This allows us to estimate the effect of the treatment on the outcome for the group of interest. This is the method of ‘Difference-in-Differences’ (D-i-D) i.e. the difference in the difference of average outcomes for control & treatment groups before and after the treatment. The basic difference-in-differences methodology is illustrated in Figure 1 below.

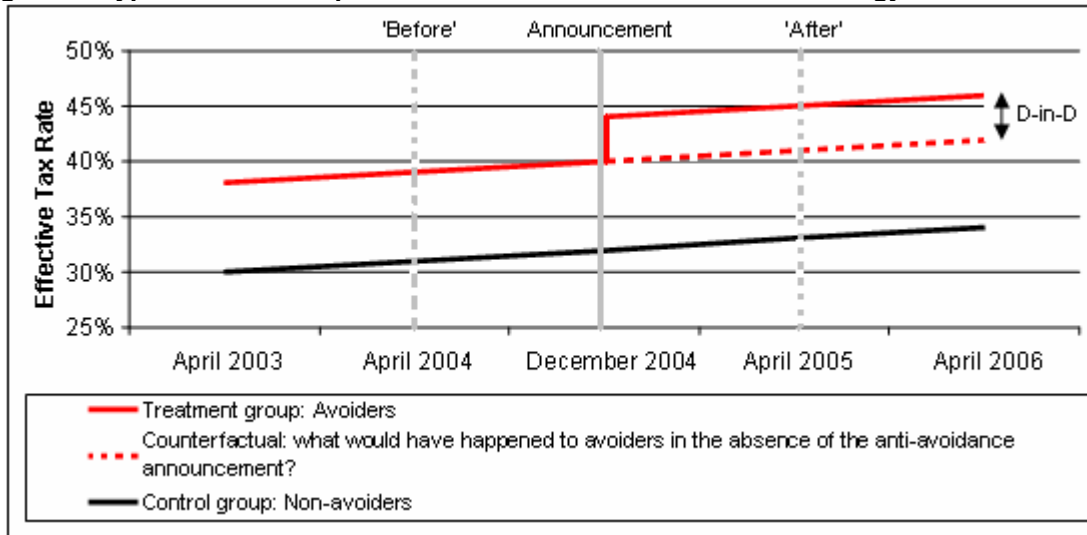
**Figure 1: D-i-D methodology**

	Average value Before Treatment	Average value After Treatment	Difference <i>Within Groups Over time</i> :
Treatment Group	Before <sub>Treatment</sub>	After <sub>Treatment</sub>	After <sub>Treatment</sub> - Before <sub>Treatment</sub>
Control Group	Before <sub>Control</sub>	After <sub>Control</sub>	After <sub>Control</sub> - Before <sub>Control</sub>
<b>Difference-in-Differences Estimate: (Difference <i>Between Treatment and Control Groups over time</i>)</b>			<b>(After<sub>Treatment</sub> - Before<sub>Treatment</sub>) - (After<sub>Control</sub> - Before<sub>Control</sub>)</b>

- 2.3.3 D-i-D estimates the effect of a policy (the treatment effect) by removing the hidden individual effects and common trends over time between the control and treatment groups. The crucial assumption for D-i-D to be an accurate estimator is that the average change in the outcome is presumed to be the same for both the control and the treatment group if the treatment had not been applied; there must be common time effects across groups. This is the sense in which the treatment and control group must be comparable; had the treatment not been applied then the trends in the variable of interest for each of the two groups would have been the same.
- 2.3.4 The D-i-D methodology is illustrated graphically in Figure 2 below. This is a hypothetical example illustrating the evaluation problem of interest here. The black line illustrates the average effective tax rate for the control group, non-avoiders, and the red line illustrates the average effective tax rate for avoiders.
- 2.3.5 We assume that the avoiders have a higher effective tax rate as we know from our data that on average they are higher earners and despite some level of avoidance, on average they still have a higher effective tax rate than the general non-avoider sample due to the progressive nature of the tax system. We assume that both lines slope slightly upwards due to average effective tax rates increasing slightly each year due to earnings growth and fiscal drag with individuals moving up into higher tax brackets (this is for illustrative purposes only).
- 2.3.6 Crucially, in this example we see that before the announcement (marked with a solid grey line) the trends in the average effective tax rates of the treatment and control group increase by the same amount in each year, they have *common time trends* and the lines are parallel. After the announcement, the avoider group change their behaviour and we see a step-change with their average effective tax rates increasing. To measure this change we would ideally like to compare this change to the counterfactual (dashed red line), what would have happened to the effective tax rate of avoiders had the announcement not been made.

2.3.7 Since this counterfactual is not available, we use the behaviour of a group unaffected by the announcement, the control group of non-avoiders, as a comparison. As we know that the time trends for the treatment and control group were similar before the announcement and we are confident that announcement is the only thing that has caused these time trends to differ, using this group as a control group in the differences-in-differences methodology should give a true estimate of the impact of the announcement on the avoiders' average effective tax rates. In this hypothetical example we are satisfied that the control and treatment group are comparable.

**Figure 2: Hypothetical Example of Difference-in-Differences Methodology**



2.3.8 As shown above, to actually calculate the difference-in-differences estimate we need to observe the average value of the effective tax rate for the treatment and control group in at least one period before and after the announcement. These points are illustrated by the grey dashed lines in Figure 2 above. Figure 3 shows how we use these figures to calculate the differences-in-differences estimate.

2.3.9 First we take the difference in the average effective tax rate before and after the announcement for each of the two groups; the difference is a 6 percentage point increase for the treatment group and a 2 percentage point increase for the control group. We then take the difference in effective tax rates over time *between* the control and treatment group and we see that the change in effective tax rates due to the announcement is estimated to be 4 percentage points in this hypothetical example. Given our assumptions about the common time trends shared by the treatment and control group in the absence of a policy change, in this hypothetical example, we can be confident that the two groups are comparable and that this is a true effect of the anti avoidance announcement.

**Figure 3: Hypothetical example of calculating a Difference-in-Differences estimate**

	Average ETR Before Treatment (April 2004)	Average ETR After Treatment (April 2005)	Difference <i>Within Groups Over time</i> :
Treatment Group: Avoiders	39%	45%	6 percentage points
Control Group: Non-Avoiders	31%	33%	2 percentage points
<b>Difference-in-Differences Estimate: (Difference <i>Between Treatment and Control Groups over time</i>)</b>			<b><u>4 percentage points</u></b>

2.3.10 Although D-i-D is a powerful methodology, it is important to note that with the annual data available it is difficult to identify changes exclusively attributable to the anti-avoidance announcement. For example, disclosure rules relating to the use of avoidance schemes came into effect in August 2004, prior to the announcement in December 2004. It is possible these disclosure rules may have had some effect in discouraging avoidance; however given the annual nature of the data, it is impossible to disentangle this effect from that of the announcement. Furthermore, the announcement is one anti-avoidance measure in a long line of more targeted measures - this part of the evaluation will pick up the combined effect of all measures that may change the effective tax rate over this period.

## 2.4 Defining the Treatment Group

- 2.4.1 Often with a policy change or programme evaluation the treatment group is well defined as individuals that actually participated in a programme or were directly identified by the policy change - for example the New Deal - and the problem is finding a comparable control group. However, in this evaluation the problem is unusual in that the treatment group is potentially all taxpayers as we do not know who was previously using avoidance products as this behaviour is essentially hidden<sup>3</sup>. Although we cannot identify an exact treatment group, by utilising our institutional knowledge we have been able to construct an approximate treatment group.
- 2.4.2 It is important to note that where a treatment group is not explicitly identified through their assignment to a programme for example, the identification of an 'approximate' treatment group will inevitably introduce additional uncertainty to the estimation.
- 2.4.3 To overcome this difficulty, Chapel Wharf Complex Personal Tax Team (CPTT) provided a list of PAYE references used by companies who were known to provide their employees with remuneration-based avoidance schemes. This list has been matched to the tax data to identify a group of individuals in each year who were paid under these PAYE references and were therefore likely to be using avoidance schemes provided by their employer. Although this only provides an indication of employer-based avoidance this was a big area of avoidance targeted by the announcement as often the tax savings were very large in terms of employer NICs as well as employee NICs and income tax savings, making schemes very attractive to employers.
- 2.4.4 The list of individuals matched to the avoiding PAYE references were labelled as 'avoiders' and since this provided the clearest indication of a treatment group for the effects of the anti-avoidance announcement this was used as our base treatment group.

<sup>3</sup> Using avoidance product disclosures data to identify avoiders was attempted but was unsuccessful in our sample.

- 2.4.5 In addition to this list of known avoiders we used our institutional knowledge to refine the treatment group. For instance, we know that avoidance frequently occurs in occupations where individuals may be paid large annual bonuses linked to their performance such as in finance, and hence avoiders will also be concentrated in large financial centres such as London. Furthermore many remuneration-based avoidance schemes operate through dividends payments, so individuals targeted by the announcement may be additionally identified as receiving dividend payments<sup>4</sup>.
- 2.4.6 Examining how the avoiders group interacted with the other known characteristics of our treatment group led to a refinement of the treatment group to individuals who are avoiders and have positive dividend income; 'positive dividend avoiders'<sup>5</sup>. This was found to be the most informative refinement of the base avoider group for identifying the specific incidence of the impact of the announcement on the treatment group. Indeed, what we know about the operation of avoidance schemes through disguised dividends income suggests that it is sensible to separately identify the effect of the announcement on this group of avoiders with positive dividend income as their avoidance behaviour and effective tax rates may change in a different way to general avoiders without dividends income. The number of individuals in the main treatment group 'avoiders' and sub-group 'positive dividend avoiders' is illustrated below in Table 2.

**Table 2: Refining the Treatment, number of individuals in each group**

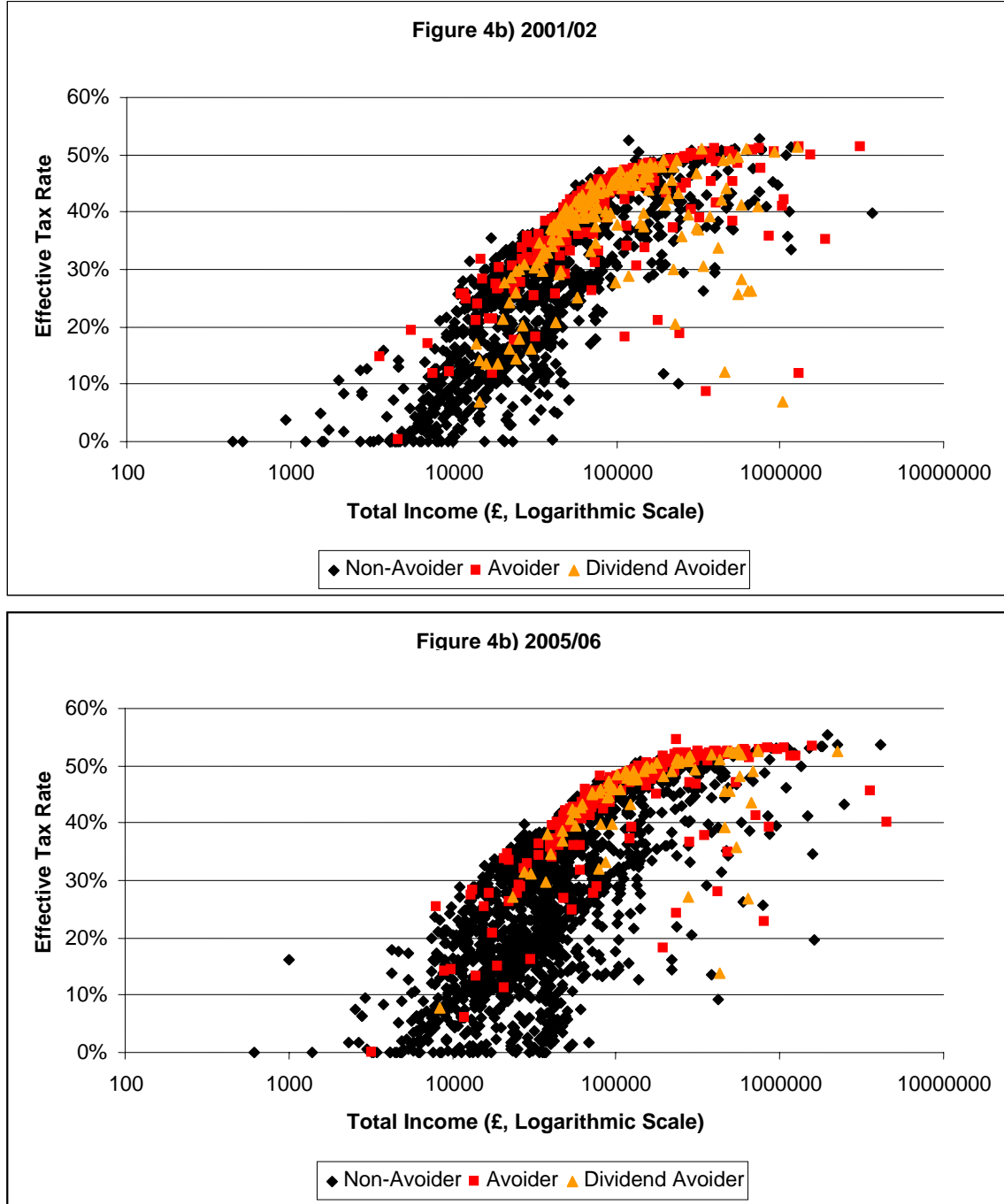
Treatment Group	2001/02	2002/03	2003/04	2004/05	2005/06
'Avoiders':	414	432	397	313	321
'Avoiders' who also have positive dividend income:	162	159	137	84	80

- 2.4.7 As stated above, it is important that the outcomes for the control and treatment are affected in the same way by macroeconomic trends such that the common time trends assumption holds. To strengthen this assumption a further methodological refinement was made by only selecting individuals employed in the financial sector for the analysis. This improved the methodology as it meant that both the control and treatment group were individuals employed in the financial sector and they would most likely experience similar time trends in their outcomes of interest had the announcement not been made. This restriction cut the sample to 4,483 individuals and 10,472 observations.
- 2.4.8 The two figures below scatter-plot total income and the effective tax rate of individuals in the financial sector (the sample used for analysis) for the earliest year in the sample, 2001/02 and the latest year, 2005/06. Points that represent the avoider group are highlighted in red and points that represent the positive dividend avoider sub-group are highlighted in orange.

<sup>4</sup> Note that we do not use the amount of dividends income; the dividends indicator equals zero or one, equalling 1 if the individuals is paid some dividends income.

<sup>5</sup> Note that we do not use the amount of dividends income; the dividends indicator equals zero or one, equalling 1 if the individuals is paid some dividends income.

**Figure 4: Total Income and Effective Tax Rates for non-avoiders, avoiders and positive dividend avoiders (financial sector only)**



2.4.9 In both 2001/02 and 2005/06, the two figures show that although there is a broad pattern that is in keeping with the most common tax schedule for employment income, there is still some considerable dispersion of effective tax rates at each income level. Some of this will be a result of legitimate reliefs and tax planning activities or legitimate income payments through less heavily taxed income streams. However, some reduced effective tax rates will be due to individuals using avoidance schemes. This dispersion highlights the difficulty in this analysis of finding changes in effective tax rates which can be

attributed to changes in avoidance behaviour as a result of the anti-avoidance announcement.

- 2.4.10 Despite this, comparing the pattern for avoiders and the positive dividend avoider sub-group between the two years does offer some insight. In 2001/02 the effective tax rates for avoiders and non-avoiders appear to be more dispersed away from the highest point of the scatter diagram at each income level (the 'frontier'). However, in 2005/06 the effective tax rates for avoiders and positive dividend avoiders appear to be more tightly clustered around the frontier – paying the highest tax rates in the sample at each income level. While there are still some individuals with an effective tax rate well below the frontier, there appears to be a change in the avoider groups from 2001/02 to 2005/06 that suggests an increase in effective tax rates, perhaps reflecting a change in avoidance behaviour.
- 2.4.11 Figure 4 above shows that in both years most avoiders appear to be in the upper range of the income distribution and hence have higher effective tax rates due to the progressive nature of the tax schedule. We might expect this as engaging in avoidance activities is not costless (in terms of effort and purchasing avoidance schemes) and so may only be worthwhile for higher earners who stand to avoid a greater amount of tax. Table 3 below further highlights this by showing the average (mean) effective tax rates for the non-avoider and avoider groups in each year. The post-announcement years are shaded in grey.

**Table 3: Average effective tax rates by avoiders or non-avoiders**

Year	Average (Mean) Effective Tax Rate		
	Non-Avoider	Avoider	Positive-Dividend Avoider
2001/02	30.6%	39.0%	37.7%
2002/03	31.1%	40.2%	38.8%
2003/04	30.4%	42.3%	42.4%
2004/05	30.8%	43.3%	44.4%
2005/06	28.9%	44.0%	44.4%

- 2.4.12 The effective tax rate for the non-avoider group appears to be fairly constant over all 5 years, within about a 1 percentage point range of 30%. However both the avoider and positive dividend avoider sub-group show a step-change in increasing effective tax rate, first in 2003/04 but then increasing again in the post announcement years.
- 2.4.13 Although section 2.3 showed that we could calculate the difference-in-differences estimate of the effect of the announcement simply by using mean effective tax rates before and after the announcement for the avoider and non-avoider group as shown in Table 3 above, we do not obtain our results in this way. Instead we use an econometric estimation methodology (ordinary least squares regression) to obtain the difference-in-differences estimate. This offers several advantages over simple arithmetic:
- i. it easy to obtain the statistical significance of estimates;
  - ii. we are able to develop the econometric model to estimate the impact of the announcement on the main treatment group avoiders and the additional effect of also being in the positive dividend avoider group;
  - iii. we are able to include additional variables that may impact on the tax rates and tax ratios (control variables).
- 2.4.14 A full exposition of the econometric methodology employed is given in 'Technical Appendix B: The Econometric Model'.

## 2.5 Results

2.5.1 This section provides an overview of the results obtained from estimating the effect of the announcement on avoiders and the positive dividends avoider sub-group. These results were obtained by estimating our econometric model using ordinary least squares regression. The full results tables are reported in the Technical Appendix C.

2.5.2 The results are presented first for the average change in effective tax rates and income ratios over both post-announcement years, 2004/05 and 2005/06 and then for each of the years separately to explore how the impact of the announcement developed over the two post announcement years. In each case the results are given for the estimated change in the overall effective tax rate and then for the component of parts of this comprising the employer and employee NICs rates and the Income tax rate. The results are then given for the change in the proportion of income paid as employment and dividend income. In each case the estimate represents the average change in these rates and ratios for the group in question.

### 2.5.3 Average Treatment Effect in Both Post-announcement Years

2.5.4 First we consider the results for estimating the change in ratios in both post-announcement years, 2004/05 and 2005/06. This means that the treatment effect estimated will be the average (mean) effect for these two years. The full regression results for this analysis are shown in Appendix C, Table C1. The regression numbers in brackets refer to the column headings of this table.

2.5.5 Averaged over both post-announcement years, the estimated effect of the announcement on the positive dividends avoider sub-group is much larger than for the avoider group. The ETR increases by an average of 5.5 percentage points in each post-announcement year for the positive dividend avoider sub-group, whereas for the general avoider group the impact on the ETR is smaller, only increasing by 1.6 percentage points in each year (Regression no. 4).

2.5.6 The bigger treatment effect for the sub group might be anticipated as we observed that many avoidance schemes operated through dividends payments as they could make very large tax savings, reducing the marginal tax rate from 54% on employment income to just 25% on dividends income. If the announcement has been successful in reducing the use of these schemes then the positive dividends avoider treatment group will face large rises in their ETR as we find in our results. The effect for general avoiders in other types of schemes seems slightly smaller; this may be as they were making smaller tax savings before the announcement.

2.5.7 We then estimated the effect of the announcement on the component parts of the ETR: income tax, employee NICs and employer NICs. For the avoider group, the 1.7 percentage point increase in income tax rates (Regression no. 5) is in fact greater than the 1.6 percentage point increase in the total ETR. This reveals that the avoider treatment effects for employee NICs is negative at 0.3 percentage points (Regression no. 6) and very small and statistically insignificant for employer NICs (0.2 percentage points, Regression no. 7). This highlights the possibility that many of these individuals may be engaging in tax planning to make use of legitimate means to mitigate their NICs tax bill in the post-announcement years, for example through payments in benefits-in-kind such as company cars or tax relief to incentivise pension contributions.

2.5.8 For the sub-group effects on the positive-dividend avoider group, a substantial increase in ETR is from the increase in income tax rates (accounting for just under half of the ETR increase, Regression no. 5), but the employer and employee NICs combined account for over half of the of the total increase in ETR (Regression no. 6 and 7). Again, this reflects

the fact that dividends-based avoidance schemes avoid all employer and employee NICs so when these schemes are abandoned as result of the announcement we can expect to see a much larger increase in the NICs rate for these positive-dividend avoider individuals on average.

- 2.5.9 We also examine the impact of the announcement on the proportions of employment income and dividend income. We would hope to see the effect of the announcement on the treatment groups by reducing the proportion of income they receive through income streams associated with avoidance (such a dividends) and increasing the proportion of income received through more legitimate streams (employment income). This effect is not observed for the general avoider treatment group. However, corroborating the pattern of the rest of our findings above, the positive dividends avoider sub group finds a very significant treatment effect on both employment and dividend income, with a large proportion of income shifting out of dividend on average (-12 percentage points, Regression no. 8) and shifting into conventional employment income (15 percentage points, Regression No. 9). This is what we would anticipate as avoidance through dividend-based vehicles is reduced. The greater increase in employment income (3 percentage points bigger than the decrease in dividends income) suggests that there are other streams of income possibly being converted into employment income also.
- 2.5.10 These results are encouraging, showing strong average treatment effect of the policy over the two post-announcement years; however this tells us nothing about the distribution of the effect between the two post-years. This is explored below

#### **2.5.11 The 2004/05 Post-announcement Year**

- 2.5.12 This section looks at the estimated effect of the announcement in the post announcement year 2004/05 only; this is simply achieved by excluding the 2005/06 year from the analysis. The full regression results for this analysis are shown in Appendix C, Table C2. The regression numbers in brackets refer to the column headings of this table.
- 2.5.13 The results for the impact of the announcement on the ETR of the treatment group in 2004/05 show some important differences to the average results above. The general avoider treatment effect is much smaller when it is estimated alone (Regression nos. 10-11) and when the positive dividend avoider group is also included, the general avoider effect is not statistically significantly different from zero – in other words the announcement has no effect on the general avoider group in 2004/05 (Regression nos. 12-13).
- 2.5.14 This strongly indicates that the majority of the policy impact in the first (partial) post-announcement year operated through a reduction in avoidance in dividends-based schemes. The overall effect on ETR for the positive-dividends avoider group is strong, showing a 5.6 percentage point increase in the ETR (Regression no.13).
- 2.5.15 The total change in ETR is broken down between the component parts of the ETR for 2004/05, just under half the effect is from increased income tax rates and 40% of the effect is from increases employer NICs rates and the remainder from increases in employee NICs (Regression nos. 13-15). The treatment effect on the composition of income is also strong for the dividends-avoider group with an average 11 percentage point decrease in the portion of income paid in dividends (Regression no. 16) and increase in employment income by 14 percentage points (Regression no.17).

#### **2.5.16 The 2005/06 Post-announcement Year**

- 2.5.17 This section looks at the estimated effect of the announcement in the post-announcement year 2005/06 only; this is simply achieved by excluding the 2004/05 year from the



- analysis. It is important to note that these results give the total change in the tax rates and income ratios from the pre-announcement years to 2005/06, not the incremental effect from 2004/05. The full regression results for this analysis are shown in Appendix C, Table C3. The regression numbers in brackets refer to the column headings of this table.
- 2.5.18 For the second announcement year the emphasis of the treatment effect is slightly different. Although the treatment effect on ETR for the positive-dividend avoider sub-group is still stronger than for the general avoider group, the general avoider treatment effect is much larger in 2005/06 than in 2004/05 (Regression nos. 19-22). We estimate that on average the avoider group has a 2.8 percentage point increase in ETR as an effect of the announcement in 2005/06 (Regression no. 22). The total effect on the positive dividend avoider sub group is 5.5 percentage points, sustaining most of the treatment effect found in 2004/05 (Regression no. 22). Both the avoider and sub-group positive-dividend avoider treatment effect are highly statistically significant.
- 2.5.19 These results suggest that while the anti-avoidance announcement sustains the effect of increasing the ETR of avoiders with positive dividend income in 2005/06, the impact of the announcement has also increased in magnitude for other kinds of avoiders in the second post-announcement year. This could reflect a 'wait and see response' to the announcement in 2004/05 as they judge the credibility of the announcement. This could possibly be as non-dividends based avoidance schemes may be harder to detect and so these individuals delayed their response, or because avoidance through dividends had been targeted by previous anti-avoidance measures so the cumulative effect on causing this group to change their behaviour was much larger in the first year.
- 2.5.20 As before, decomposing the effect of the effective tax rate shows much the same pattern as seen in the previous year for the positive dividend avoider group, over half the increase in effective tax rates comprises increases in employee and employer NICs (Regression nos. 24-25). Similarly, the effect of the announcement on the proportion of employment and dividends income for the positive dividend avoider group is similar to that seen in 2004/05 (Regression nos. 26-27).
- 2.5.21 For the general avoider group, the change in effective tax rates is dominated by a change in the Income tax rate, accounting for 95% of the increase in tax rates (Regression no. 23). The estimated change in employer and employee NICs for the general avoider groups are much smaller and are less reliable estimates, again for employee NICs we find a slightly negative change of -0.3 percentage points and for employer NICs a 0.46 percentage point increase (Regression nos. 24-25). The employee NICs estimate is only just significant at the 5% level and the employer NICs estimate is just insignificant at the 5% level (i.e. we cannot be confident that the true effect is not zero). These results suggest that the change in the avoidance behaviour of the general avoiders has been concentrated in increased income tax payments, either these individuals were not previously engaging in NICs avoidance or NICs avoidance is ongoing for this group.
- 2.5.22 Table 4 below summarises the main results for the 2004/05 and 2005/06 post-announcement years.

**Table 4: Summary of estimated changes in tax rates and income proportions**

Estimated Percentage point increase in:	2004/05		2005/06	
	Avoider	Positive Dividends Avoider Sub-group	Avoider	Positive Dividends Avoider Sub-group
Effective tax rate	0	5.6%	2.8%	5.5%
- Income Tax rate	0	2.6%*	2.7%	2.5%
- Employee NICs Rate	0	0.7%	-0.3%*	0.8%
- Employer NICs Rate	0	2.3%	0.5%**	2.3%
Proportion of Dividend Income	3.4%	-11.4%	3.5%	-12.4%
Proportion of Employment Income	-4.2%	14.3%	0	15.1%

*NB: All statistically significant at 1% except those marked with a \* which are only significant at the 5% level and \*\* which are only significant at the 10% level*

## 2.6 Pre-Announcement Policy Effects

- 2.6.1 The results above find some strong effects of the announcement on the effective tax rates and income ratios of avoiders and avoiders with positive dividend income. While this is promising, these effects can only be attributed to the anti-avoidance announcement if the common time trends assumption holds; if the avoider and non-avoider group are comparable. To test this assumption we need to check that there were no pre-existing differences between the avoider and non-avoider group that may cause their behaviour to differ independently of the anti-avoidance announcement. If this assumption does not hold then the D-i-D methodology will not find the true effect of the announcement on the avoiders, it could also be finding the effect of other policies.
- 2.6.2 One simple way of testing this is by conducting a 'pre-programme' test. This is done by testing for a policy effect on years prior to the announcement. If the common time trends assumption holds then we should not find any difference between the trends of the avoider and non-avoider group in these years. As we have five years of data we conduct two pre-programme tests, one testing for an effect in 2002/03 and one testing for an effect in 2003/04. In both tests the actual post treatment years 2004/05 and 2005/06 are dropped from the analysis. The results of the tests are shown in 'Appendix D: Pre-Programme Test Results'.
- 2.6.3 The results for the 2002/03 test (Table D1) find that all the tax rate treatment effects are zero (statistically insignificant), so for this year the common time trends assumption holds; there are no differences in the trends for the treatment and control group.
- 2.6.4 The results for the 2003/04 test are more concerning (Table D2), we find a treatment effect for the positive dividends avoider group increasing the ETR by 4.96 percentage points (and this is statistically significant, Regression no. 37). Decomposing this effect we see that over 60% of this effect is made up of increases in NICs (Regression nos. 39-40). This, and the incidence of the treatment only on the positive dividend avoider group with (no effect is found on avoiders only), suggests this is a change in dividends-based avoidance behaviour that precedes the announcement.
- 2.6.5 Examining policy changes around this time, we see in Pre Budget Report 2002 (November) an anti-avoidance measure to stop the abuse of Employee Benefit Trusts was introduced and forecast to raise £135million in 2002/03 and £315 million in 2003/4, increasing again to £425 million in 2004/05. This avoidance scheme often operated through dividends and although it does not appear to have had an effect in 2002, we may well be picking this up in the 2003/04 pre-programme test where the treatment is

concentrated in the positive dividends avoider group and in the NICs rates. The effect picked up is not as large as was forecast (the estimated revenue effect is £122 million see section 2.8 below), but there is still a pre-announcement effect found and this is a cause for concern regarding the strength of the common time trends assumption and reliability of the main regression results for the anti-avoidance announcement.

## 2.7 Modelling the Pre-announcement Differences

- 2.7.1 The failure of the pre-announcement test in 2003/04 leads us to explore using a 'random growth model'. This model allows us to model the differential pre-announcement trends for the treatment and control group and any impact they might have in the post-announcement years and then see if the announcement treatment effect still holds.
- 2.7.2 The technical details of this approach may be found in 'Technical Appendix E: The Random Growth Model' and the results are presented in 'Technical Appendix F: Random Growth Model Results'. The random growth model is tested for the two post-announcement years separately, the results for 2004/05 are shown in Table F1 and the results for 2005/06 are shown in Table F2.
- 2.7.3 Results for 2004/05 and 2005/06 both find relatively large increasing time trends in effective tax rates beginning in 2003/04 for avoiders and positive dividend avoiders, but no additional effects for either the avoider or positive dividend avoider group in 2004/05 or 2005/06. This means that once the time trend starting in 2003/04 has been accounted for, there are no additional statistically significant increases in the effective tax rate for these groups in 2004/05 or 2005/06.
- 2.7.4 Although this model finds that there are no additional effects in either of the post announcement years, the time trend starting in 2003/04 for both the avoiders and positive dividend avoiders is substantial, approximately a 2 percentage point increase for avoiders and a 5 percentage point increase for positive dividends avoiders. This suggests that although the effective tax rates of the treatment and control groups first started increasing in 2003/04 (possibly in response to measures like the Employee Benefit Trusts as described above), this increase has been sustained in the post-announcement period and possibly increased in these later years as our results in Section 2.3 suggest.
- 2.7.5 Since the motivation behind the anti-avoidance announcement was that previous anti-avoidance measures had only a temporary effect, it is possible that if the announcement had not been made in December 2004, the continued impact of previous anti-avoidance measures would not be observed as individuals would find alternative avoidance schemes and the impact on increased effective tax rates would disappear. Hence, mindful of the impact of previous anti-avoidance measures, we can potentially attribute the full treatment effects discussed in the results Section 2.3 to the effect of the announcement in sustaining and potentially increasing previous trends.
- 2.7.6 As such, the results of the random growth model find a pattern of treatment effects for the anti-avoidance announcement in the differential time trend that is consistent with a cautious interpretation of the main results in Section 2.3. We can use the treatment effects of the main results but we must be aware that pre-existing policies may also impact on these results – the increase in effective tax rates is partially continuing the pre-existing trends – they are not just the result of the anti-avoidance announcement.
- 2.7.7 Whilst the pre-announcement test and random growth model add to our understanding of our results and the possible impact of pre-existing anti-avoidance policies, we can still have confidence in original results described in Section 2.3. As such we explore the revenue implications of these results below.

**Box 1: The Westminster Business School (WBS) Commentary on Evaluation**

- Staff from WBS have provided support in the development of this internal HMRC evaluation. At the Centre for Employment Research (CER) at WBS there is extensive experience of this type of evaluation, mainly applied in the study of labour markets and education. The difference-in-difference methodology has formed the basis for analysis, attempting to get a handle on the extent to which the December 2004 anti-avoidance announcement changed avoidance behaviour for those who we would expect to have been affected.
- Essentially, CER staff have provided 'at elbow' support in the development of STATA coding and application; together with regular review and comment on emerging findings. More specifically the support has taken the form of 6 one-to-one on-site sessions, with flexibility in the timing and form of such support. Together with this hands-on support, regular advice on the overall methodological direction and the underpinning econometric theory has also been provided; ultimately to ensure that the analysis is of the required quality standard.
- The support delivered in this way has allowed HMRC to build capacity to carry out further evaluations of this nature by embedding the required skills and abilities. The first stage of the project with HMRC involved a review of the work-to-date on the evaluation and verification/improvement upon such; the improved and refined approaches were then applied to new data and final support through comment, as the report has been written up.
- As is underlined in various parts of the report the nature of statistical analysis is such that one must always interpret the estimated results with some care. However, the methodological approaches used have addressed a number of challenges that arise with the application of DiD.
- More specifically, a crucial assumption of DiD is that there is a 'common trend' of comparison and treatment groups that reflects the assumption that, in the absence of a treatment, both groups would have experienced the same outcome. The plausibility of this assumption was thoroughly tested by applying pre-programme tests in the spirit of Heckman/Hotz (1987). In such tests, a difference-in-difference model estimates the treatment outcomes for two periods predating the treatment. If both groups were affected equally by general economic conditions, the estimates of the pre-programme tests must be insignificant. This study tackled this problem by extending the DiD model to a random growth model as suggested in Heckman/Hotz (1987).
- The methods used to limit the extent of any such limitations mean that we can have a high level of confidence in the results and policy recommendations arising from this report. Mainly that there is evidence of a reduction in avoidance behaviour after the anti-avoidance announcement and whilst there are issues of whether this can be fully attributed to the particular treatment, there is a general decline in avoidance behaviour over the period, which the announcement seems to have contributed to.

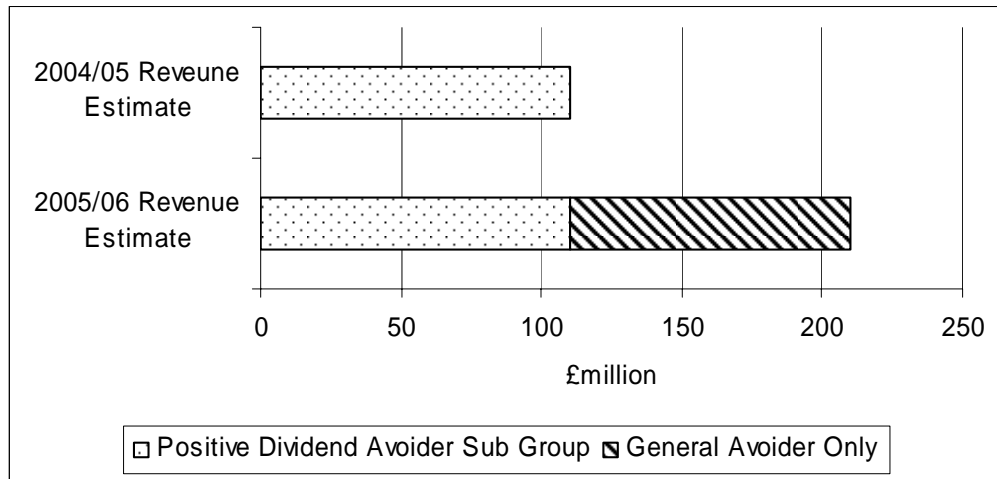
**2.8 Interpreting the Results: Revenue Impacts**

- 2.8.1 This section explores translating the estimated impact of the anti-avoidance announcement on the tax rates of avoiding individuals to revenue estimates.
- 2.8.2 For the tax rates this is done by multiplying the percentage point change in tax rates by the total income in the treatment group. This gives the estimated additional amount of tax paid by this group in the sample as a result of the announcement. This is then

grossed-up for the whole population by a factor of 100 as we are working with a 1% sample. A full explanation of how the revenue effects are calculated is provided in 'Technical Appendix G: Calculating Revenue Effects'

- 2.8.3 The following concentrates on the separate estimated effects for 2004/05 and 2005/06 as these allow us to calculate the separate revenue effects in each year. Tables G1 and G2 in Technical Appendix G show how these revenue effects are calculated.
- 2.8.4 Since the change in effective tax rates for the general avoider group is effectively zero in 2004/05, we focus on the sub-group revenue effects for positive dividend avoiders in this year.
- 2.8.5 In 2004/05 we estimate that the announcement has raised the ETR for the positive-dividend avoider group by approximately 5.6 percentage points on average, translating to an estimated grossed-up revenue effect of approximately £110 million, and we can be 95% sure that this falls within the revenue range of £150 million to £65 million (this is the 95% confidence interval for the central estimate in which we can be 95% sure the true revenue effect falls).
- 2.8.6 For 2005/06 the general avoider treatment effect provides the main revenue estimate; the sub-group effect provides the revenue estimate for this group *within* the avoider revenue since the total income of these individuals is already included in the total income of all avoiders.
- 2.8.7 In 2005/06 we estimate that the announcement has raised ETR for the avoider group by approximately 2.8 percentage points, translating to an estimated revenue effect of approximately £210 million, and we can be 95% sure that this falls within the revenue range of £315 million to £100 million. We estimate that the positive-dividend avoiders faced increased effective tax rates of 5.5 percentage points on average and accounted for just over half (£110 million) of the central estimate for revenue raised by the announcement in 2005/06.
- 2.8.8 Figure 5 below compares the central revenue estimates in each year and the specific impact of the announcement on avoiders and avoiders with positive dividend income. This illustrates that the anti-avoidance announcement seems to take effect in two stages over the post announcement-period.

**Figure 5: Estimated Revenue Impact**

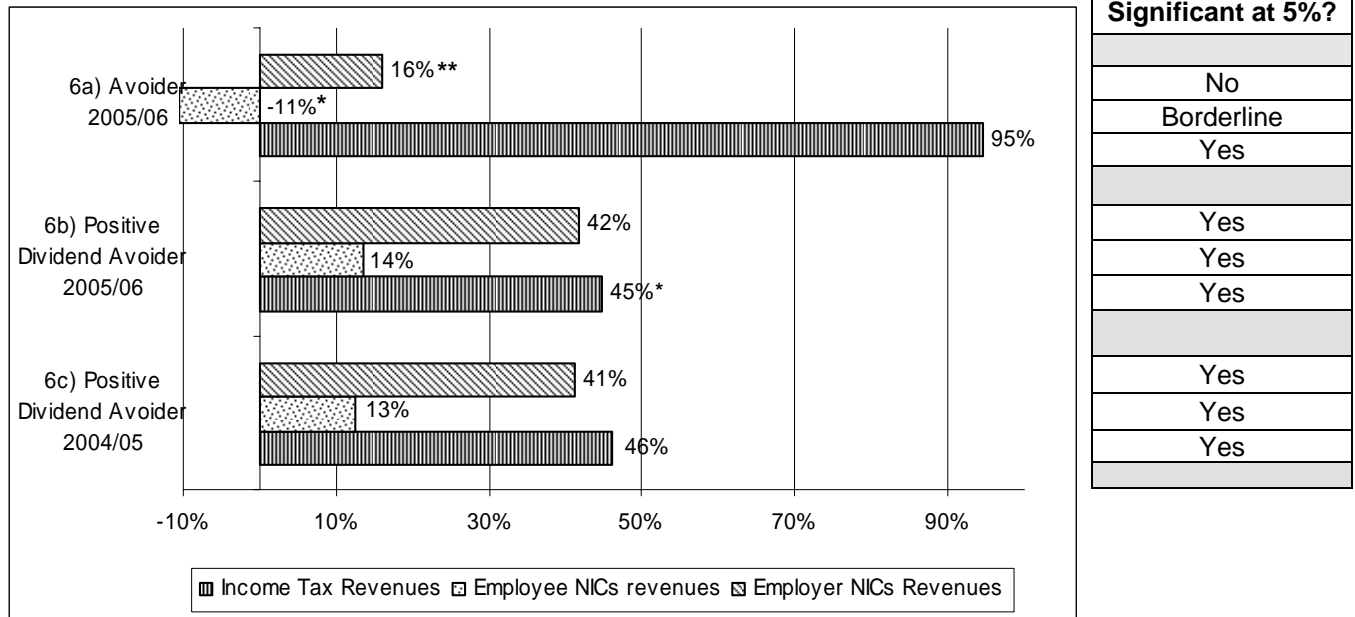


2.8.9 In the first (partial) post announcement year, 2004/05, we only find a statistically significant treatment effect for the positive-dividend avoider group raising an estimated £110 million; the wider avoider group shows no treatment impact. This could be down to this group taking a wait-and-see approach, delaying changing their avoidance behaviour in the first year until the announcement has established its credibility. Also, as discussed in the section above, the positive dividend avoider group were targeted by earlier anti-avoidance measures and in the pre-programme test results this group appears to have responded to these in 2003/04 by increasing effective tax rates by 4.9 percentage points having an estimated revenue impact of £122 million in 2003/04. One interpretation is that this behavioural response was sustained and increased by the December 2004 announcement, prompting a quicker behavioural response for positive-dividend avoiders than for general avoiders.

2.8.10 In the second post announcement year Figure 5 shows that the revenue raised from positive dividend avoiders is sustained at the same level but the announcement also has an impact on the wider avoider group. In total, we estimate that announcement raises £210 million in 2005/06 as a central estimate, with just over half of this raised from increased tax payments by the positive dividend avoider sub-group.

2.8.11 Figure 6 below shows the proportion of each revenue figure that is raised from the component parts of income tax, employer NICs and Employee NICs.

**Figure 6: Proportion of Revenue Estimate raised by Income Tax, Employee NICs and Employer NICs (Statistical Significance of estimates shown on left)**



NB: All statistically significant at 1% except those marked with a \* which are only significant at the 5% level and \*\* which are only significant at the 10% level

2.8.12 For the estimated avoider revenue in 2005/06 (6a), nearly all revenue comes from avoiders paying higher income tax rates, accounting for 95% of the revenue effect. A proportion of the estimated revenue is also raised through employer NICs highlighting the fact that these individuals were selected through identifying employer-based avoidance, so some impact on employer NICs might be expected. However, this is partially counteracted by a small reduction in revenue raised from employee NICs. This translates to an estimated revenue loss of approximately £20 million in 2005/06. This suggests that some tax planning to mitigate employee NICs payments may be ongoing. However the lower end of the 95% confidence interval for the NICs revenue estimates

are both less than a £1 million suggesting that we cannot place too much emphasis on these results, they are only just statistically significant at the 5% or 10% level.

2.8.13 For the positive-dividend avoider revenue in both years (6b and 6c), over half is raised from NICs with over 40% from employer NICs. This is expected as avoidance through dividends avoids all employer NICs (12.8% tax rate) and employee NICs (only 1% tax rate above upper earnings limit), and 15% of the top marginal income tax rate, so a large proportion of the increased revenue would be expected to be raised through employer NICs receipts.

## 2.9 Comparison with the Forecast Revenue

2.9.1 To compare the revenue estimates to the original forecast revenue estimates that were made at Pre Budget Report 2004<sup>6</sup> we need to make some adjustments to the figuring to put them on a comparable basis.

2.9.2 The evaluation results calculate the revenue raised from PAYE on an accruals basis (i.e. the year in which the tax is due). However, the original forecast estimated the revenue on a mixed accruals and receipts basis (i.e. the year in which the tax is collected). The PBR costings also included revenues that would be collected through retrospective payments and investigation settlements that are not captured in the evaluation data. These need to be removed from the original costings to make the amounts comparable and the figuring needs to be put on an accruals basis (see explanation below).

2.9.3 Table 5 compares the central revenue estimates for effective tax rates and the composition of tax rates to the original forecast revenue estimates on a comparable basis once these adjustments have been made.

**Table 5: Forecast Yield Compared to Evaluation Estimates and 95% Confidence Intervals ( 95% C.I.) for Estimates**

	2004/05				2005/06			
	Forecast	Estimated	95% C.I.		Forecast	Estimated	95% C.I.	
Total Revenue	180	110	65	150	325	210	100	315
Income Tax	95	50	15	90	170	200	105	290
Employer NICs	80	45	30	60	145	35	0	65
Employee NICs	5	15	5	20	10	-20	-44	0

*NB: The 95% confidence interval is the range for which we can be 95% sure the true revenue effect falls; this shows that both NICs estimates are borderline significant at the 5% level as the upper/lower end of both their confidence intervals is zero.*

2.9.4 On first inspection, our results may seem disappointing compared to the forecast yield. However, given the difficulty of estimating the true impact of the announcement, in particular in identifying the treatment group, the estimates are a very good indication that the announcement has raised a substantial proportion of the forecast revenue. The central estimate shows that we estimate we have raised around two thirds of the forecast revenue. In examining how the original costing were made there are several reasons why we might find that the evaluation estimate and revenue costing differ.

2.9.5 The original costings had to rely on far from complete evidence about the extent to which remuneration-based avoidance schemes were being employed to reduce tax liabilities.

<sup>6</sup> [http://www.hm-treasury.gov.uk/pre\\_budget\\_report/prebud\\_pbr04/report/prebud\\_pbr04\\_repindex.cfm](http://www.hm-treasury.gov.uk/pre_budget_report/prebud_pbr04/report/prebud_pbr04_repindex.cfm)

Table 1.2: Estimated costs of Pre-Budget Report policy decisions and others announced since Budget 2004; Section 'Protecting revenues', Measure 'Remuneration based avoidance'

While they were probably the best estimates feasible at the time, they were based on imperfect information and may have overstated the use of such schemes.

- 2.9.6 The costings were based on an up-rated estimate of known avoidance from 2002, up-rated by the growth in bonuses to 2004/05, 25%. This figure was £1.875 billion for 2004/05 and was thereafter up-rated by inflation each year. Based on disclosures evidence that most avoidance schemes operated through using dividends it was assumed that the marginal tax rate for this avoidance income would increase from the dividends higher rate of 25% to the income tax and NICs higher rate of 54%; with a 15 percent points increase in income tax, a 1 per cent increase employee NICs and a 12.8 per cent increase in employer NICs. Based on this methodology the estimated accruals for this measure were £540 million for 2004/05 and £554 million for 2005/06.
- 2.9.7 Table 5 shows that there are differences between the proportion of revenue raised through Tax and NICs receipts and what was forecast. In particular, in 2005/06 we appear to have succeeded in raising more than what was estimated for the income tax yield but very little of the NICs yield. By contrast, in 2004/05 it appears that the Income Tax/NICs split in the revenue forecast is observed – approximately half the estimated revenue is raised through NICs and half is raised through Income Tax, consistent with the forecast assumptions. This suggests that while the forecast assumptions in terms of the change in behaviour operating through dividends-based avoidance were appropriate for 2004/05, this was not the case for the change in avoidance behaviour for the general avoiders in 2005/06.
- 2.9.8 The revenue forecast made at PBR 2004 also made some assumptions about revenue lost through ongoing avoidance and tax planning activities. For 2004/05 it was assumed that only 70% of the estimated accruals would be collected in total (due to continued avoidance). For 2005/06 it was assumed that 75% of the total accruals would be collected in total. This is illustrated in Table 6 below. Once retrospective payments and investigation settlements have also been deducted we arrive at the comparable PAYE figures on an accruals basis for the forecast revenue used in Table 5.

**Table 6: Putting the forecast revenue on a comparable basis**

Accrual year	Total Accrual (£m)	% of accrual collected	Accrual Collected (£m)	Of which:		
				Retrospective payments (£m)	Investigation settlements (£m)	Regular PAYE Yield (£m)
2004-05	540	70%	378	85	115	180
2005-06	554	75%	415	0	90	325

- 2.9.9 It is possible that the behavioural responses underpinning these assumptions about the percentage of accruals collected could have been more marked reducing receipts further in the first few years – for example if the announcement has simply not changed individuals' behaviour so they continue to avoid or shift to using tax planning arrangements, a greater proportion of revenues may have been lost so the per cent of accruals collected in total may be lower.
- 2.9.10 Backdated tax and NICs payments were collected outside of PAYE and therefore would not be picked up in the data used in this analysis so they are excluded from the figure used in Table 5 for comparison. However, it is possible that a greater proportion of revenues than expected has been collected through retrospective payments (and may still be coming in for these years). For tax closed years employers are required to submit



- a P35 (RL)<sup>7</sup> return where there is a backdated liability. Furthermore, the regulations that require employers to pay the backdated NICs only came into force on 6 April 2007. This could have exaggerated the 'wait and see' behavioural response to the announcement, encouraging individuals not to change their behaviour until after the legislation was brought into effect.
- 2.9.11 Some data is available on backdated payments collected through P35(RL) returns. For 2004/05 only £150,000 has been collected through backdated payments from a single employer (£110,000 Income tax, £40,000 NICs). There have been a much larger number of backdated payments made relating to 2005/06, totalling approximately £20 million with £4 million identified as NICs payments. Data is still being collected on backdated payments through the P35 (RL) returns and we will continue to monitor this.
- 2.9.12 In considering our results it is also important to note that our treatment group is approximate. As section 2.4 describes, avoiders are identified as individuals paid under PAYE schemes run by employers who have been known to provide their employees with avoidance products. As this focuses on employer-based avoidance our approximate treatment groups may be missing some individuals employed by 'compliant' employers seeking out their own avoidance products. Although employer-based avoidance may account for a large proportion of total avoidance, this necessary approximation for the treatment group could mean the overall estimated treatment effect is underestimated and is the lower bound of the true effect.

## 2.10 Summary and Interim Conclusions

- 2.10.1 This element of the evaluation uses individual tax payer data to estimate what impact the anti-avoidance evaluation has had on affected individuals' avoidance behaviour through changing their effective tax rates and the form of their remuneration. We then use these estimates to make a revenue estimate of this impact.
- 2.10.2 The main results from this element of the evaluation estimate that the December 2004 anti-avoidance announcement raised approximately £110 million in 2004/05 and £210 million in 2005/06. These are central estimates; the range for which we can be 95% sure the true revenue effect falls is £65 million to £150 million in 2004/05 and £100 million to £315 million in 2005/06.
- 2.10.3 In 2004/05 we find that the impact of the announcement falls entirely on avoiders with positive dividend income in the first year with these individuals facing a 5.6 percentage point increase total effective tax rates on average. In 2005/06 the treatment effect is on the wider avoider group with these individuals facing a 2.8 percentage point increase in total effective tax rates on average. Within this group, the positive dividend avoider group continue to face a higher increase in effective tax rates in 2005/06 of 5.5 percentage points on average, accounting for just over half of the total estimated revenue effect.
- 2.10.4 These results have been estimated using the difference-in-differences methodology, comparing the outcomes for a group affected by the announcement (avoiders and the positive dividend avoider sub-group) and a group not affected by the announcement (non-avoiders) at least one point before and after the announcement. For the difference-in-differences methodology to estimate the *true effect* the announcement it is necessary we assume that:

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<sup>7</sup> Form found at: <http://www.hmrc.gov.uk/forms/p35rl.pdf>

- i. The main treatment group 'avoiders' and treatment sub-group 'avoiders with positive dividends income' are the only groups affected by the announcement.
- ii. The avoider and non-avoider groups are comparable such that in the absence of the anti-avoidance announcement they would have followed the same time trends in their effective tax rates, i.e. the anti-avoidance announcement is the only thing that would cause differences in outcomes between these groups once common time trends have been removed (known as the common time trends assumption).

There are problems with both of these assumptions which affect the reliability of the results.

- 2.10.5 Firstly, our treatment group is approximate. As the anti-avoidance announcement potentially affects all tax payers and the targeted individuals (avoiders) are not readily identifiable, defining an exact target group for the announcement is not possible. We have therefore used our institutional knowledge, in particular using details of employers who provide their employees with avoidance products to identify likely avoiders for our treatment group and then further refined this to those with positive dividend income who may be using dividend-based avoidance. As this focuses on employer-based avoidance our approximate treatment groups may be missing some individuals employed by 'compliant' employers seeking out their own avoidance products. Although employer-based avoidance may account for a large proportion of total avoidance, this necessary approximation for the treatment group could mean the overall estimated treatment effect is slightly underestimated and is the lower bound of the true effect.
- 2.10.6 Secondly, we have seen that the other anti-avoidance policies may have caused differences between the avoider and non-avoider groups before the announcement (the common time trends assumption is violated). This is not really surprising in changing policy environment; the anti-avoidance announcement is one in a long line of anti-avoidance policies. In 2003/04 we find that the positive dividend avoider group increase their effective tax rates by 4.96 percentage points on average. This is likely to be due to the Employee Benefit Trusts PBR 2002 anti-avoidance measure, targeting dividends-based avoidance schemes. The effect of this measure in the pre-announcement period casts doubt over whether the full effect found in 2004/05 is all due to the anti-avoidance announcement. This concern is further highlighted by the results of the random growth model, controlling for pre-existing time trends in the estimation results in no treatment effect being found for the announcement in 2004/05 or 2005/06, although pre-existing trends are sustained.
- 2.10.7 These findings are reconciled with the main results by acknowledging that there were pre-existing differences between the avoider and non-avoider groups due to previous anti-avoidance measures. However, the objective of the anti-avoidance announcement in introducing the prospect of retrospectively implemented legislation was to prevent individuals from moving from one avoidance scheme to another and to cause a permanent change in avoidance behaviour. In the absence of the announcement it is likely that these pre-existing increases in the effective tax rate would have disappeared as individuals sought out new avoidance opportunities. This could be interpreted as sustaining and reinforcing previous successes in reducing avoidance and increasing effective tax rates as found in 2003/04. Hence the overall approach is to be aware of and acknowledge the impact of previous anti-avoidance measures on the treatment group, but still have confidence in our results for the estimated treatment effect of the announcement.
- 2.10.8 Working with external academic support from Westminster Business School, this element of the evaluation has developed a robust understanding of impact of the anti-avoidance announcement in a changing policy environment and quantified this impact. Although

there are potential avenues that could be explored for methodological improvement these would be highly resource-intensive and we expect they would add little value to the existing results. Technical issues that have not been covered in the main text are addressed in 'Technical Appendix H: Other Technical Issues considered'.

## Section 3: Small Sample Analysis

This section considers the available qualitative evidence to evaluate the impact of the December 2004 anti-avoidance announcement. First we look in-depth at the change in avoidance and tax planning behaviour for a small sample of taxpayers who were likely to be affected by the announcement. We then consider relevant evidence of ongoing avoidance from a recent report compiled by the City Bonus Project.

### 3.1 Small Sample Analysis: Aim & Methodology

- 3.1.1 This element of the evaluation examines evidence of changes in avoidance behaviour from a detailed analysis of a small sample of taxpayers' returns from 2001/02 to 2005/06. This element of the evaluation was carried out working with the National Teams Special Civil Investigations teams and the City Bonus Project (CBP) group (see section 3.3 below).
- 3.1.2 The small sample comprises 50 individuals whose records are held by the Chapel Wharf Complex Personal Tax Team which predominantly deals with returns from high net worth individuals who are City of London employees. The 50 individuals were sampled from 7 companies that were chosen based on their level of apparent employer-based avoidance activity, type and size of company. A non-disclosive description of the type of companies used is given below:

**Table 7: Sampling Strategy**

Company	Size (No. employees)	Description	Number sampled
Company 1	Large (500+)	Non-compliant employer	11
Company 2	Large (500+)	Fairly compliant employer	10
Company 3	Large (500+)	Fairly compliant employer	2
Company 4	Large (500+)	Non-Compliant employer	10
Company 5	Medium (250-499)	Non-Compliant employer	10
Company 6	Small (less than 250)	Fairly compliant employer	3
Company 7	Small (less than 250)	Smaller relatively compliant employer	4

*NB: Small, medium and large are based on EU definitions for number of employees, and with no reference to turnover*

- 3.1.3 From within each company we selected individuals with a range of incomes and apparent levels of avoidance behaviour based on a summary of their 2003/04 return. As it was necessary to select individuals who were Complex Personal Return cases for the analysis, there was minimum income threshold of £300,000 in 2003/04.
- 3.1.4 For companies that appeared to have a history of non-compliance we tried to sample at least 10 individuals to get a bigger picture of avoidance activity within the company. Possibly due to economies of scale in providing schemes these were often larger companies. For some small companies it was difficult to find individuals with returns in all 5 years and fewer individuals were sampled. The aim of this selection process was to

select a cross-section of city employees with various degrees of apparent avoidance behaviour which was both employer- and employee- based.

- 3.1.5 Although this is not necessarily a representative sample from which we can extrapolate general population trends, the objective of this element of the evaluation was to gain a better understanding of the type of avoidance and tax planning activities individuals targeted by the announcement might have been engaged in and how this has changed over the pre- and post-announcement period, 2001/02 to 2005/06. Whilst the large-scale taxpayer data analysis in the previous section gives an indication of by what magnitude avoiders' tax rates and remuneration packages were changing over the period, this small sample analysis attempts to investigate what changes in avoidance behaviour these changes might represent in terms of the schemes being used.
- 3.1.6 To collect the relevant information, a data collection template was completed for each individual to collate details of avoidance and tax planning behaviour over the 2001/02 to 2005/06 period, in particular if any notable changes have occurred after the December 2004 announcement. The data collection was carried out by the Chapel Wharf Complex Personal Tax Team, taking particular note of any information that may indicate avoidance in the 'white space' of the Self Assessment return where the taxpayer can add additional comments. The data template that was used is reproduced in 'Appendix I: Small Sample Analysis Template'.

## 3.2 Small Sample Analysis Results

- 3.2.1 This section reviews the evidence from the small sample analysis, first looking at general findings across the whole group of 50, then conducting more detailed analysis of sub-groups of the 50, examining schemes used and then looking at groups of individuals within companies to establish any patterns in employer-based avoidance within the sample.
- 3.2.2 Overview:
- 3.2.3 As expected, we find that nearly all individuals in the sample have been involved in avoidance of some kind over the period of enquiry (2001/02 to 2005/06). Only six individuals appear to have not been involved in avoidance at all. The majority of individuals in the sample (44) have experienced an enquiry into at least one of their tax returns. As noted in the analysing individual taxpayer data element of the evaluation, being under enquiry could impact on avoidance behaviour independently of the anti-avoidance announcement, and we acknowledge this when examining changes in avoidance behaviour. Unfortunately, due to the population we were sampling from (Complex Personal Return cases) it would have been very difficult to find individuals who have not been under enquiry at some point.
- 3.2.4 Of the individuals in the sample that appear to have engaged in avoidance at some point, 34 exhibited some change in avoidance behaviour over the 2001/02 to 2005/06 period. Of these, 3 actually started engaging in tax-mitigation activities in the post-announcement period when they had not previously engaged in such activities prior to 2004/05. A further 15 individuals that changed their avoidance or tax planning behaviour changed the schemes they used rather than stopping avoidance altogether. Although ongoing avoidance and tax planning is still problematic in some cases, the way in which avoidance behaviour has changed for many of these individuals is revealing in terms of potentially showing a behavioural response to policy changes. Finally, 16 individuals appear to have stopped engaging in avoidance in the post-announcement period (from 2004/05 onwards). Although these groups do not necessarily translate into wider trends in the population, they provide groupings for further investigation of these behaviours.

3.2.5 Detailed Analysis:

- 3.2.6 First we examine the behaviour of persistent avoiders with no shift in avoidance behaviour in terms of methods used over the period of enquiry. Nearly all of these individuals have ongoing involvement in Film partnerships starting before the December 2004 announcement and continuing after. This is most often a marketed avoidance scheme to individuals involving using partnership losses to reduce tax liability. Other schemes used by these individuals include Energy partnerships and trading in financial instruments. Although the majority appear to be using employee-based avoidance a couple are also involved in tax mitigation through Dual Contract arrangements which can be set up either individually or through the employer (more details on this arrangement below).
- 3.2.7 This evidence of employee-based avoidance throughout the 2001/02-2005/06 period adds weight to concerns in section 2 that using employer-based avoidance to identify 'avoiders' may be missing out behavioural changes amongst individuals work for a 'compliant' employer but purchase their own schemes.
- 3.2.8 There appears to be a common pattern of behaviour amongst individuals that have continued to avoid or engage in tax mitigation activities throughout the period but have switched methods. These changes in behaviour appear to be predominantly influenced by policy changes also supported enquiries. A common pattern is for an individual to be involved in avoidance through an employer-based scheme such as Employee Benefit Trust (EBT) conditional share schemes or adjustable share options and then for this scheme to stop and a film or energy partnership scheme to arise in its place. A similar pattern exists with the one-off use of Gilt Strips schemes in 2003/04 to reduce tax liability and then the use of partnership losses thereafter. Most individuals change their behaviour in this way in 2003/04 for the Employee Benefit Trusts and in 2004/05 for the Gilt Strip schemes, most likely in response to policy changes to combat these schemes.
- 3.2.9 This observed change in avoidance methods used is interesting as it shows individuals reacting directly to policy changes (such as the Employee Benefits trust measure). Unfortunately this shows that the announcement has not been successful in fully reducing all tax mitigation behaviour for these individuals. However, many of these individuals no longer appear to be in employer-based avoidance which may be some improvement. Employer-based schemes may have structural advantages such as economies of scale in provision and offer shared risk that may result in more individuals being covered by schemes at reduced personal cost whereas individually acquired schemes may not have these advantages. Furthermore employer-based schemes may be more likely to involve tax mitigation in employer NICs than individual schemes.
- 3.2.10 Individuals in our sample that appear to have stopped avoiding also seem to have also reacted to policy changes supported by enquiries into their tax returns. Apart from one or two individuals who were involved in Gilt Strip schemes only as a one-off, the majority of individuals who stop avoiding appear to have been involved in an employer-based schemes such as EBT co-investment schemes, conditional share schemes or adjustable share options which all used dividend income payments to avoid tax and NICs. Several were also involved in Dual contract arrangements that appear to be employer-based. The extent of these employer-based schemes is discussed when we look at the company-based avoidance behaviour in our sample below.
- 3.2.11 Many of the individuals that were previously using EBTs but then stopped avoiding also used Gilt Strip schemes in 2003/04 and their avoidance behaviour appears to come to an end from 2004/05, after the date of the anti-avoidance announcement. It is most likely that these individuals stopped using EBTs and Gilt strips as a result of the policy changes specific to these schemes, however, the fact that they did not take up additional

avoidance schemes could possibly be due to the impact of the announcement in sustaining previous changes in avoidance behaviour and discouraging individuals from taking up further schemes.

- 3.2.12 There is also one example of an individual stopping avoidance in 2005/06 that supports the hypothesis that although employer-based avoidance which often operated through dividends came to an end in 2004/05, some individuals may have pursued other methods before changing their behaviour in the second post-announcement year. This particular individual engaged in the Company co-investment scheme in 2001/02 and the Company conditional share scheme in 2003/04. They also used a Gilt Strip loss scheme in 2003/04. Although employer-based avoidance appears to stop in 2004/05, the individual engaged in a Qualifying Corporate Bonds avoidance scheme (QCB, involves securities which are exempt from capital gains tax) in 2004/05 which they seem to have acquired themselves. No avoidance is apparent in the 2005/06 return.
- 3.2.13 There is no clear pattern of behaviour for the few individuals that only started engaging in tax planning activities after the December 2004 announcement other these activities being individual rather than employer-based. Two individuals engaged in partnerships, one in a film partnership and one in an Energy partnership. One individual with no previous avoidance became involved in a QCB scheme in 2005/06. Although this is the only individual involved in this particular QCB scheme in our sample, in the wider population we know that there are 300 users of this scheme with £140 million at risk and it is under enquiry by HMRC so it is an ongoing problem.
- 3.2.14 Schemes:
- 3.2.15 The overview of behaviours above gave some indication of the pattern of usage of certain avoidance schemes in the sample we have taken; however the following focuses on the schemes used more directly.
- 3.2.16 Partnerships were by far the most popular method of tax mitigation in our sample with various schemes in use both before and after the December 2004 announcement. Film partnerships were the most popular but there is also involvement in energy, games and property partnerships in the sample. These partnerships are in part a desired feature of the tax system to encourage financing in these industries, however in many cases they have been developed into highly contrived avoidance schemes which are then marketed to individuals. Most operate in a similar way by using reliefs and partnership losses to reduce tax liability. Individuals appear to be largely undeterred from using partnerships as a method of tax mitigation in the post-announcement period.
- 3.2.17 Various schemes coming under Employee Benefit Trusts were also frequently used by individuals in the sample as were Gilt strip schemes. However, as noted above these schemes were abandoned after specific anti-avoidance measures were brought against them.
- 3.2.18 The use of dual contracts amongst the sample is quite high. These are nearly always employer-based and are market-led being expected or negotiated as part of an employment package. An employer would most likely only offer this arrangement to high earners as it is expensive to set up. Minimisation of tax and NIC liabilities is achieved by an individual having two contracts issued to them: one in the UK subject to UK PAYE tax and NICs for their UK duties and another paid offshore for their 'non-UK' duties. This second contract is paid tax free and if the income is not remitted to the UK then it remains this way. This arrangement is only effective for non-domiciled individuals.
- 3.2.19 Use of dual contract arrangements is found in the sample throughout the period under consideration and usage appears to be undeterred by the anti-avoidance announcement.

However, since these arrangements are not necessarily avoidance we may not expect the announcement to have a deterrent effect on users.

- 3.2.20 As well as these more popular schemes, a few individuals were found to be using Qualifying Corporate Bonds schemes in the post-announcement period and a couple of individuals were also under enquiry for their participation in schemes involving gifts to charity and with regard to pension contributions which offer tax reliefs. Furthermore, it has come to light through enquiries that some individuals appear to have simply not declared or under-declared certain income. A few individuals are also under enquiry for abuse of foreign tax credit relief and many are under enquiry regarding their non-domicile status.
- 3.2.21 Company-Based Avoidance:
- 3.2.22 Only one company showed no strong evidence of employer-based avoidance or tax mitigation activities at any point in the period under enquiry. This was despite the sampling strategy attempting to select several 'compliant' companies which were not thought to be using employer-based avoidance schemes. This highlights the prevalence of such schemes which act both to provide the employer with tax savings and attract employees.
- 3.2.23 Altogether, five companies appear to have provided at least one of their employees with an Employee Benefit Trusts tax mitigation scheme at some point. For several of the companies, nearly all of their employees sampled were engaged in Employee Benefit Trusts schemes while they were in use.
- 3.2.24 However, there does appear to be reduction in employer-based avoidance schemes of this kind after 2004/05. These are most likely to be due to specific anti-avoidance measures aimed at the abuse of EBTs and the impact of company-wide enquiries. However, the fact that in many cases employer based avoidance has not re-emerged in our sample is encouraging and could imply some impact of the anti-avoidance announcement in sustaining previous anti-avoidance successes.
- 3.2.25 Dual contract arrangements were found to be in use by individuals sampled from 2 companies. As stated above, these arrangements nearly always employer-based and coverage was complete for all individuals sampled in one of the smaller companies. These arrangements appear to be resilient to the effects of the announcement as they are tax planning rather than avoidance so we would not necessarily expect this type of arrangement to be affected. Some particular cases are under enquiry but avoidance activities are difficult to prove – this is demonstrated by an employer compliance case brought against one Company where there was insufficient evidence to completely overturn the arrangement.
- 3.2.26 Within our sample we see that some commonly individually acquired schemes within a company may have been suggested by the employer, promoting a culture of avoidance. This appears to be the case with the use of Gilt Strips by employees of one non-compliant company in the sample. However, although many individuals in same company may use Film or Energy partnership schemes, there are rarely more than one or two using identical schemes, suggesting that this is more likely to be an individual-based form of tax mitigation.

### **3.3 City Bonus Project Interim Report**

- 3.3.1 The City Bonus Project (CBP) is a cross directorate project set up to look at the level of compliance in relation to City Bonuses, by employers and employees. Their aim is to establish the "facts and risks in relation to the arrangements that had been used in



- respect of 2006 City bonuses". This project is complementary to this evaluation although the main focus of the CBP is to identify ongoing compliance risks for operational purposes rather than evaluate and quantify the effect of past policy changes as in this evaluation. The CBP have recently released an interim report on their findings and plan to complete their final report in Mid-2008.
- 3.3.2 The interim report of the CBP was completed in December 2007. The employer compliance element of this report highlighted one particular area of ongoing tax arrangements which is of interest for this evaluation; Limited Liability Structures (LLP).
- 3.3.3 These LLP structures often make use of offshore service companies set up in tax havens. These service companies provide the basic services to the LLP and also act as the General Partner to the LLP. All staff employed in the UK are transferred to these offshore companies and then seconded back to the UK. Avoidance devices are then placed through the haven company in an attempt to get round UK anti-avoidance legislation
- 3.3.4 The employer compliance review found that in recent years both private equity and hedge fund managers have been moving into LLP structures. These give an immediate advantage in NIC terms, no more Employers' NIC, and overall lead to a reduction in Tax and NICs take of around 16%.
- 3.3.5 The interim report provides two illustrations of individuals/employers using LLP structures the following figures have been extracted from two ongoing enquiries:-
- Company X: The total sums drawn as partnership profits by *individual* members of the LLP for the year ended 31 August 2006 amounted to £36.8million. The employer's Class 1 NICs due on that figure would have amounted to approximately £4.7million. This excluded the partnership profits paid to the directors' own investment companies and a separate entity X Ltd.
  - Company Y: The payment of substantial performance-related sums to the company's directors and leading fund managers out of the LLP – as opposed to being paid in the form of cash or readily convertible assets – gives rise to a loss of Class 1 NICs. It is calculated that the partnership profit shares allocated to the individual members for the year ended 30 November 2005 amounted to £4.4million. The employer's Class 1 NICs on that sum would amount to approximately £568,000.
- 3.3.6 These two examples show that large amounts of employer NICs revenues may be lost through these LLP structures. This ongoing avoidance could be a contributing factor in explaining the shortfall in estimated revenues collected in the preceding individual taxpayer analysis element of the evaluation, particular the shortfall in employer NICs revenues.
- 3.3.7 Other possible areas for tax mitigation highlighted in the interim report are the use of charities by City entities in disguised remuneration schemes and International Pension Plans (IPP's). Use of both these methods was also found in our small sample analysis.

#### **3.4 Summary and Interim Conclusions**

- 3.4.1 This section considers what the evidence above can tell us about the impact of the December 2004 announcement on individuals' avoidance behaviour.
- 3.4.2 The small sample analysis provides strong evidence that for the majority of individuals in our sample, there has been some change in avoidance behaviour over the period of 2001/02-2005/06. Although these changes cannot be extrapolated as general population

trends, this is informative with regards to the types of schemes that are commonly used and how this usage changes with in response to anti-avoidance measures.

- 3.4.3 Within the sample, there are shifts in behaviour that suggest individuals and employers have often changed their behaviour in response to specific anti-avoidance measures. For example, many individuals were engaged in Employee Benefit Trust (EBT) schemes prior to 2003/04 and after this date these schemes appear to have ceased, although in some cases they continued to 2004/05 before being brought to an end. Presumably this was an employer-based change in behaviour caused by the EBT anti-avoidance measure and in many cases supported by company-wide enquiries to detect this type of avoidance. Furthermore, many individuals used the Gilt Strip avoidance scheme in 2003/04 but then abandoned it when an anti-avoidance measure was brought against this scheme in 2004.
- 3.4.4 Avoidance in EBT schemes often operated through paying individuals in dividends. Our evidence in Section 2 is suggestive of some impact on effective tax rates of dividend-based avoidance schemes coming to an end in 2003/04 and also in 2004/05 as we find in our small sample. Furthermore, inspection of a longitudinal sample of individuals present in all five years of the individual tax payer data used in Section 2 finds that individual changes in income payments and dividend payments and resulting changes in effective tax rates are consistent with these small sample findings. For example, looking in the avoider group, there are several clear cut incidences of the proportion of income paid as dividends falling substantially and effective tax rates increasing by 5 or 6 percentage points as a consequence in most cases and in some as much as 10 percentage points. This happens in 2004/05 and 2003/04, consistent with dividends-based avoidance schemes such as EBTs being abandoned from this point onwards.
- 3.4.5 After the EBT and gilt strip schemes were brought to an end, encouragingly some individuals in the small sample appear to have ceased avoiding altogether from 2004/05. This change in avoidance behaviour, although likely to be initially prompted by specific anti-avoidance measures and enquiries, may have been sustained by the impact of the anti-avoidance announcement in deterring further avoidance through the prospect of retrospective legislation.
- 3.4.6 Also, some individuals in the sample who ceased involvement in EBTs from 2003/04 or 2004/05 persisted in avoiding through individual-based schemes in 2005/06 but then also appeared to abandon these in 2005/06. This could potentially be attributed to a delayed impact of the anti avoidance announcement after the prospect of retrospection in the announcement was legislated for and the announcement potentially gained increased credibility for these individuals causing them to change their behaviour.
- 3.4.7 Despite these apparent success stories of individuals stopping avoidance in 2004/05 and 2005/06, many individuals in the sample appear to have continued tax-mitigation activities in these years. However, once employer-based schemes such as EBTs were largely brought to an end, this ongoing tax-mitigation was often through individual-based schemes such as Film Partnerships rather than by using employer-based methods. These methods could potentially result in smaller revenue losses if they have smaller coverage than employer-based methods (which may also be acquired at smaller personal cost and risk to the individual due to economies of scale in provision and risk sharing) and if they do not make such big savings in employer NICs. However, ongoing avoidance is still highly undesirable and does not appear to be deterred by the anti-avoidance announcement.
- 3.4.8 There is also an element of ongoing employer-based tax-mitigation in the post announcement-period, in particular through use of Dual Contract arrangements. This arrangement often makes use of the non-domicile status of employees so no tax is payable on income paid through a contract to provide 'non-UK' duties. Employer

compliance work has also found that found some companies reducing their Tax and NICs bills substantially through use of Limited Liability Partnerships. Although Dual Contract arrangements do not appear to be as popular as previous employer-based schemes in our sample, it is concerning that the anti-avoidance announcement has not impacted on the use of these schemes, many of which were in place prior to December 2004.

- 3.4.9 Overall, the small sample analysis indicates that there appears to be some positive changes in avoidance behaviour in the post-announcement period. There appears to be some move away from employer-based avoidance with some individuals stopping avoidance in the post-announcement period altogether. The abandonment of specific schemes often appears to follow the introduction of an anti-avoidance measure specific to that scheme. However, the fact that most employers in the sample appear to have not provided alternatives and many individuals do not pursue their own schemes may be testament to the effect of the announcement in deterring new avoidance behaviour due to the prospect of retrospective legislation.
- 3.4.10 Ongoing avoidance is in evidence on an individual basis and, although it appears to be less popular in our sample on a company basis. This is concerning and demonstrates where the anti-avoidance measure has failed to impact on avoidance behaviour resulting in ongoing revenue losses. Ongoing usage of these schemes may explain why our revenue estimates in Section 2 fall short of what was originally forecast, particularly in employer NICs.
- 3.4.11 The positive changes in avoidance behaviour found in the small sample analysis highlight the difficulty of attributing changes in behaviour to any one measure and in identifying a clean break in behaviour attributable to a single anti-avoidance measure. As well as a variety of anti-avoidance measures impacting on changing behaviour, they also illustrate that enquiries can have a considerable impact. Although the impact of pre-announcement anti-avoidance measures is already indicated by the failure of the pre-programme test for 2003/04 in Section 2, this reinforced by the small sample analysis.

## Section 4: Conclusions

- 4.1 There are inevitably many difficulties with evaluating the impact of a single policy in a changing policy environment when taxpayers have been subject to a number of previous and subsequent policy measures in the area of the evaluation. This is further complicated in the area of tax-avoidance where it is difficult to identify the group targeted by the policy – as individuals engaging in avoidance, they do not want to be readily identified.
- 4.2 Additionally, there is the question of the credibility of the announcement. If individuals viewed the announcement as credible, then avoidance behaviour should have changed in the 2004/05 tax year as the bonus period followed directly after the announcement. However, if individuals did not believe the announcement was credible without legislation such that their response was delayed, then this could further complicate the evaluation.
- 4.3 It is important to note that whilst the anti-avoidance announcement was one in long-line of anti-avoidance measures it was qualitatively different. Whilst previous anti-avoidance measures were targeted at specific schemes, the announcement that legislation to close down schemes would have retrospective effect was designed to engineer a permanent change in behaviour. So although this evaluation has found evidence of behaviour changing prior to the announcement as a result of targeted anti-avoidance measures, it is possible that without the prospect of future legislation being retrospectively implemented, these changes would not be sustained and individuals would seek out new avoidance opportunities. As such, the anti-avoidance announcement had an impact on avoidance behaviour that was different to previous, more specific, measures.
- 4.4 This evaluation has employed a dual strategy of quantitatively analysing a large sample of individual taxpayer data and qualitatively analysing a small sample of taxpayers' avoidance behaviour in more detail to establish the impact of the anti-avoidance announcement. This has enabled us to quantify the impact of the announcement on the effective tax rate of avoiders and the implied revenue effect and additionally understand how avoidance behaviour has changed in terms of the schemes used and how different anti-avoidance measures may have interacted to affect behaviour.
- 4.5 The dual evaluation approach has underpinned the robustness of the evaluation findings. Whilst tax mitigation arrangements and some avoidance schemes are clearly still in use by some individuals and some are employer-based arrangements, the evaluation finds that there have been some substantive changes in avoidance behaviour, particular in the use of employer-based avoidance schemes.
- 4.6 Evidence from both elements of the evaluation shows that individuals using dividends-based avoidance clearly started to reduce their avoidance behaviour in 2003/04. However the impact of the announcement has been to sustain and reinforce these changes in avoidance behaviour, deter increased avoidance and potentially further decrease use of avoidance schemes. This is particularly evident for the general avoider group who show a shift in increased effective tax rates implying reduced avoidance behaviour only in the second post announcement year, 2005/06. The delayed response of the general avoider group suggests that maybe it was not until supporting legislation was introduced that they viewed the announcement as credible and reduced avoidance behaviour.
- 4.7 To summarise the effect of the announcement on the effective tax rates and remuneration packages of avoiders and positive dividends avoiders, the individual tax payer element of the evaluation has estimated that:
  - Avoiders with positive dividends income show an earlier response to the anti-avoidance announcement, increasing effective tax rates by an estimated 5.6 percentage points in

- 2004/05. This increase in effective tax rates was sustained in 2005/06 (5.5 percentage points). In each year nearly half of the increase was through employer NICs.
- Positive-dividends avoiders also change in the form of their remuneration over this period, receiving a smaller proportion of their total income through dividends and a greater proportion through employment income.
  - The general avoider group increase their effective tax rates by an estimated 2.8 percentage points in 2005/06, most coming through increased Income Tax as a percentage of total income.
- 4.8 In terms of revenue, our central estimate of the impact of the anti-avoidance announcement is that it raised at least £110 million in 2004/05 and £210 million in 2005/06. The figures represent around two thirds of the forecast revenue. Although falling short of the total forecast revenue, this yield is included in the baseline for our fiscal arithmetic and will therefore have no effect on revenue forecasts.
- 4.9 Given the difficulties associated with this evaluation these figures are very encouraging. These results are indicative of the success of the anti-avoidance announcement in changing some types of avoidance behaviour on a more permanent basis than previous anti-avoidance measures and deterring future avoidance; however, it is important to note that there are some still areas of ongoing remuneration-based avoidance indicated by this evaluation where the announcement has been less successful.
- 4.10 While some of the difference in the estimated revenue collected compared to the forecast may be due to ongoing tax mitigation activities (as demonstrated in the small sample analysis) some forms of decreased avoidance behaviour may not be captured by these figures such that they underestimate the true change in behaviour.
- 4.11 There may be some areas of changed avoidance behaviour for which we have been unable to make a revenue estimate. As we identified avoiders through known employer-based avoidance we were unable to capture the change in behaviour for individual-based avoiders working for 'compliant' employers. To the extent that these individuals may have reduced their avoidance behaviour in the post-announcement period, our estimates will understate impact of the anti-avoidance announcement on avoidance behaviour and revenues.
- 4.12 With the data currently available we have only been able to evaluate the impact of the anti-avoidance announcement in 2004/05 and 2005/06 so we cannot say these changes in behaviour are 'permanent' or indeed that all behaviours have fully evolved in response to the announcement and retrospective legislation yet. Further evaluation may be beneficial in the future. Unfortunately it has not been possible to examine changes in attitudes to avoidance explicitly.

## Technical Appendix A: Data Descriptives

**Table A1: Summary Statistics for the whole data sample after data cleaning**

Variable	Year	N	Mean	Median	Maximum	25th Percentile	75th Percentile	Variance
Effective Tax Rate	2001/02	31,214	25.96%	28.42%	62.57%	15.83%	36.21%	1.71%
	2002/03	30,863	25.40%	27.72%	57.56%	14.85%	35.94%	1.78%
	2003/04	30,883	25.45%	27.37%	64.86%	13.81%	37.15%	2.05%
	2004/05	30,616	24.36%	25.60%	64.41%	12.40%	36.23%	2.11%
	2005/06	30,607	23.95%	25.07%	64.14%	11.77%	35.83%	2.15%
Income tax after tax credits rate	2001/02	31,214	16.51%	16.45%	39.86%	10.46%	23.05%	0.89%
	2002/03	30,863	16.23%	16.31%	39.71%	9.82%	22.92%	0.92%
	2003/04	30,883	15.82%	16.18%	39.81%	8.94%	22.36%	0.94%
	2004/05	30,616	15.17%	15.52%	39.80%	7.69%	21.37%	0.98%
	2005/06	30,607	14.91%	15.29%	39.91%	7.20%	20.86%	0.98%
Employer NICs tax rate	2001/02	31,214	5.89%	6.75%	32.05%	2.11%	9.22%	0.15%
	2002/03	30,863	5.69%	6.40%	29.49%	1.77%	9.10%	0.15%
	2003/04	30,883	5.87%	6.38%	31.92%	1.40%	9.76%	0.18%
	2004/05	30,616	5.59%	5.78%	31.48%	1.05%	9.49%	0.18%
	2005/06	30,607	5.49%	5.68%	34.10%	0.85%	9.43%	0.19%
Employee NICs tax rate	2001/02	31,214	3.56%	3.68%	13.07%	1.15%	5.75%	0.06%
	2002/03	30,863	3.48%	3.54%	18.99%	0.97%	5.69%	0.07%
	2003/04	30,883	3.76%	3.82%	20.49%	0.79%	6.24%	0.08%
	2004/05	30,616	3.59%	3.46%	21.37%	0.56%	6.11%	0.08%
	2005/06	30,607	3.55%	3.36%	24.13%	0.38%	6.18%	0.09%
Proportion Employment Income	2001/02	31,214	70.96%	90.11%	100%	44.79%	99.88%	12.27%
	2002/03	30,863	69.67%	88.51%	100%	40.90%	99.86%	12.62%
	2003/04	30,883	66.72%	82.89%	100%	33.99%	99.70%	12.99%
	2004/05	30,616	66.14%	81.14%	100%	33.53%	99.63%	12.79%
	2005/06	30,607	65.84%	81.13%	100%	31.98%	99.63%	12.97%
Proportion Dividend Income	2001/02	11,280	13.07%	1.03%	90.00%	0.21%	16.54%	4.71%
	2002/03	11,469	15.21%	1.29%	90.00%	0.22%	24.10%	5.45%
	2003/04	12,227	20.70%	2.89%	90.10%	0.29%	41.14%	7.15%
	2004/05	11,847	23.20%	4.82%	90.01%	0.38%	48.26%	7.85%
	2005/06	11,615	25.78%	9.38%	90.13%	0.49%	53.54%	8.37%

*NB: All minimum values are zero apart from the proportion of dividend income where the summary variables are for positive dividend income only.*

For the tax rates the median rate is usually slightly higher than the mean rate, suggesting a slightly positively skewed distribution. The average effective tax rates are relatively high (around 25%), reflecting the fact these are SA employees often with high incomes and high tax rates. The three components of the effective tax rate are as we would expect. The average tax rates are relatively steady from 2001-02 to 2003-04 but then on average they drop by 1 percentage point. This is most likely due to slightly incomplete data for these years.

In terms of employment income, the distribution is highly skewed – most individuals are paid the majority of their income as employment income with a few individuals being paid large proportions in non-employment income. Approximately 12,000 individuals in each year have positive dividend income and this is also a skewed distribution with most individuals receiving very little of their income as dividends and a few receiving a very large proportion as dividends.

## Technical Appendix B: The Econometric Model

The basic econometric model is shown in specification (1) below. Here we show the effective tax rate (ETR) as the dependent variable, indexed for individuals,  $i$  and time,  $t$ . This is regressed on a constant  $\alpha$ , an indicator for being in the treatment group  $avoider_i$ , an indicator for the post announcement periods 2004/05 and 2005/06,  $after_t$ , an interaction term for being an avoider in the post announcement years  $avoider_i * after_t$  and a vector of control variables,  $X_{it}$ .

The error term,  $\varepsilon_{it}$ , term picks up any unexplained variation in effective tax rates not captured by the model.

### Specification (1):

$$ETR_{it} = \alpha + \beta_1 avoider_i + \beta_2 after_t + \beta_3 avoider_i * after_t + \delta X_{it} + \varepsilon_{it}$$

This equation is estimated using ordinary least squares regression. The coefficients are interpreted as follows:

- $\alpha$ : constant term for all observations.
- $\beta_1$ : constant effect of being in the avoider group.
- $\beta_2$ : time trend effect on the ETR common to control and treatment groups.
- $\beta_3$ : average effect of the announcement on the ETR of avoiders – this is the treatment effect and the quantity of interest for the evaluation. This will tell us the average percentage point increase in effective tax rates that avoiders face as a result of changing their avoidance behaviour.
- $\delta$ : this is a vector of coefficients that measure the impact of the control variables on the ETR.

The simple model above allows us to estimate the effect of the announcement on the effective tax rate (or one of the other variables of interest) for the avoider treatment group. We can develop this analysis by refining the treatment group to estimate sub-group specific effects which may tell us more about the specific impact of the policy on the treatment group. In this case the treatment sub-group is avoiders with an indicator for having positive dividends income<sup>8</sup> as we might expect this group to have a slightly different response to the anti-avoidance announcement compared to the general avoider group.

This sub-group specific effects model is estimated using specification (2) below. The first line is interpreted as in specification (1). The second line shows how the subgroup-specific effects are added by interacting the dividends indicator with the avoider indicator  $avoider_i * div_i$ , interacting dividends indicator with the post treatment indicator  $div_i * after_t$  and interacting all three together  $avoider_i * div_i * after_t$  to obtain the additional treatment effect for an individual who is an avoider and has positive dividend income.

<sup>8</sup> Note that we do not use the amount of dividends income; the dividends indicator equals zero or one, equalling 1 if the individual is paid some positive amount of dividend income.

**Specification (2):**

$$\begin{aligned}
ETR_{it} = & \alpha + \beta_1 \text{avoider}_i + \beta_2 \text{after}_t + \beta_3 \text{avoider}_i * \text{after}_t \\
& + \beta_4 \text{avoider}_i * \text{div}_i + \beta_5 \text{div}_i * \text{after}_t + \beta_6 \text{avoider}_i * \text{div}_i * \text{after}_t \\
& + \delta X_{it} + \varepsilon_{it}
\end{aligned}$$

The interpretation of these new coefficients is similar to before:

- $\beta_4$ : constant additional effect of being in the avoider dividends group compared to the just the avoiders group
- $\beta_5$ : time trend effect on the ETR for individuals with positive dividend income.
- $\beta_6$ : additional average effect of the announcement on the ETR of avoiders with positive dividend income compared to the effect for just being in the avoider treatment group.

Although  $\beta_6$  estimates the average *additional* effect of the announcement on the ETR of avoiders with positive dividend income compared to the effect for just being in the avoider treatment group, to obtain the total average increase in effective tax rates for avoiders with positive dividend income we need to add the effect of just being in the avoider treatment group and sum coefficients  $\beta_3$  and  $\beta_6$ . This will tell us the total average percentage point increase in effective tax rates that avoiders with positive dividend income face as a result of changing their avoidance behaviour.<sup>9</sup>

To summarise the sub-group specific treatment effect model, specification (2), will return two treatment effects:

- 1) The average change in effective tax rates as a result of the announcement for avoiders ( $\beta_3$ )
- 2) The average change in effective tax rates as a result of the announcement for avoiders with positive dividend income ( $\beta_3 + \beta_6$ ).

The sub-group specific effects model shown in specification (2) still requires the constant time trends assumption to hold for the avoider and control group, but it additionally introduces more flexibility into the specification by allowing there to be a separate time trend for individuals with dividends income. Modelling this time trend then enables us to separately identify the sub-group specific treatment effect of being in the avoider treatment group and having positive dividend income.

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<sup>9</sup>

An F-test will obtain the joint statistical significance of this summed treatment effect and the variance is calculated as follows:  $\text{Var}(\beta_3 + \beta_6) = \text{Var}(\beta_3) + \text{Var}(\beta_6) + 2 \text{Covar}(\beta_3, \beta_6)$



## Technical Appendix C: Main Results

This Appendix provides an overview of the results obtained from estimating Specifications (1) and (2) as described above. The results are obtained by running an ordinary least squares regression.

The regression output is shown in three tables that follow:

- Table C1 showing the results from combining both the treatment years into one 'after' period
- Table C2 showing the results for 2004/05 only
- Table C3 showing the results for 2005/06 only

The first section of each table describes the regression specification, the next two sections summarise the avoider and positive dividend avoider treatment effects and their statistical significance and the full regression output is shown below this. Please note that as described above the positive dividend avoider total effect is the sum of the `avoid_after` and `avoid_div_after` coefficients and the statistical significance is obtained by a joint F-test of these coefficients and the standard error by the formula in footnote 8. Each column is headed with a regression number which is referred to in the main text of the paper (Section 2.5).

In each table the first column shows the basic specification (1) using the effective tax rate as the dependent variable and just with the avoider treatment group. We then introduce control variables and the sub-group specific treatment effects for the positive dividend avoider sub-group using specification (2). All regressions are run with the 'robust' option in STATA which can deal with a collection of minor concerns about failure to meet assumptions

The best specified model that is quoted in the main results Section 2.5 is specification (2) including control variables and robust option. The analysis shows that the model is best specified when both the main avoider treatment group is used and the positive dividend avoider sub-group is also included. This specification provides the best indication of the true incidence of the effect of the announcement on the general avoider group and also on the more concentrated positive dividends avoider sub-group. Also including the control variables greatly improves the fit of the model and inspection suggests the model is better specified when control variables are included.

The results tables show the best-specified model estimated for the effective tax rate dependent variable and then disaggregated for the components of the effective tax rate, Income tax Rate, Employer and Employee NICs rate and lastly for the employment income and dividend income ratios.

**Table C1: Main Regression Results (Average effect over 2004/05 and 2005/06)**

Regression Specification	Regression No.	1	2	3	4	5	6	7	8	9
	Robust	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Sub group			Y	Y	Y	Y	Y	Y	Y
	Financial Only	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Control Variables		Y		Y	Y	Y	Y	Y	Y
DEPENDENT variable	ETR	ETR	ETR	ETR	TOTTAX	EMPEE_NICS	EMPER_NICS	DIV	EMP	
Avoider	Avoider Treatment	4.15%	3.22%	1.37%	1.63%	1.72%	-0.29%	0.21%	3.43%	-2.49%
	T-Stat	7.40	6.27	2.02	2.69	3.27	-2.35	1.08	20.66	-2.01
	P value	0.00	0.00	0.04	0.01	0.00	0.02	0.28	0.00	0.04
	Standard Error	0.00561	0.00513	0.00676	0.00609	0.00525	0.00124	0.00191	0.00166	0.01239
	Treatment 95% C.I.	5.25% 3.05%	4.22% 2.21%	2.70% 0.04%	2.83% 0.44%	2.7% 0.7%	0.0% -0.5%	0.58% -0.17%	3.76% 3.11%	0.0 0.0
Avoider Dividends	Avoid_div Treatment	-	-	8.15%	5.54%	2.52%	0.72%	2.30%	-12.0%	14.7%
	F-Stat			41.25	22.52	10.62	13.32	37.10	322.49	31.04
	P value			0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Standard Error			0.00911	0.00887	0.00743	0.00163	0.00270	0.01042	0.01969
	Treatment 95% C.I.			9.94% 6.37%	7.28% 3.81%	3.98% 1.06%	1.04% 0.40%	2.83% 1.77%	-9.99% -14.1%	18.60% 10.88%
Regression output	Observations	10,472	10,472	10,472	10,472	10,472	10,472	10,472	10,472	10,472
	R-squared	0.1	0.32	0.11	0.33	0.22	0.26	0.41	0.1	0.46
	avoider	0.098	0.055	0.104	0.06	0.054	-0.008	0.014	-0.032	0.061
	t-stat	(29.68) **	(17.54) **	(27.19) **	(16.20) **	(16.63) **	(10.90) **	(12.10) **	(17.45) **	(7.98) *
	after	-0.009	-0.005	0.01	0.006	-0.002	0.004	0.005	-0.034	0.022
	t-stat	(2.97) *	-1.79	(2.78) *	-1.95	-0.86	(5.72) *	(5.11) *	(21.47) **	(3.05) *
	avoid_after	0.0415	0.0322	0.0137	0.0163	0.0172	-0.0029	0.0021	0.0343	-0.0249
	t-stat	(7.40) *	(6.27) *	(2.02) *	(2.69) *	(3.27) *	(2.35) *	-1.08	(20.66) **	(2.01) *
	avoid_div			-0.015	-0.011	-0.001	-0.002	-0.007	0.057	-0.054
	t-stat			(2.72) *	(1.99) *	-0.31	(2.33) *	(3.68) *	(8.14) *	(4.23) *
	div_after			-0.043	-0.024	-0.003	-0.009	-0.012	0.117	-0.126
	t-stat			(8.69) *	(5.50) *	-1.03	(11.96) **	(9.16) *	(22.45) **	(12.64) **
	avoid_div_after			0.0678	0.0391	0.0080	0.0101	0.0210	-0.1547	0.1723
	t-stat			(6.16) *	(3.73) *	-0.9	(5.10) *	(6.49) *	(15.01) **	(7.62) *
	Female		-0.062		-0.062	-0.051	0.002	-0.013	0.007	-0.025
	t-stat		(23.68) **		(23.59) **	(25.50) **	(4.47) *	(17.09) **	(2.45) *	(4.32) *
	apr2004_age		0.009		0.009	0.006	0.001	0.002	0.001	0.028
	t-stat		(12.78) **		(13.27) **	(12.27) **	(7.06) *	(11.78) **	-1.24	(16.12) **
	enq		0.025		0.025	0.026	-0.004	0.004	0.015	0.012
	t-stat		(8.88) *		(8.92) *	(11.09) **	(8.41) *	(4.60) *	(4.58) *	-1.88
	apr2004_agesq		0		0	0	0	0	0	0
	t-stat		(19.00) **		(19.41) **	(15.64) **	(16.01) **	(20.69) **	-0.48	(25.45) **
	Constant	0.332	0.197	0.332	0.188	0.107	0.033	0.048	0.006	0.381
t-stat	(244.34) **	(13.59) **	(244.32) **	(12.94) **	(10.23) **	(13.71) **	(11.56) **	-0.6	(10.78) **	
Robust t statistics in parentheses										
* significant at 5%; ** significant at 1%										

**Table C2: Main Regression Results (2004/05 effect only)**

Regression Specification	Regression No.	10	11	12	13	14	15	16	17	18	
	Robust	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Sub group			Y	Y	Y	Y	Y	Y	Y	Y
	Financial Only	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Control Variables		Y		Y	Y	Y	Y	Y	Y	Y
DEPENDENT variable	ETR	ETR	ETR	ETR	TOTTAX	EMPEE_NICS	EMPER_NICS	DIV	EMP		
Avoider Treatment	<b>2.77%</b>	<b>2.34%</b>	<b>-0.49%</b>	<b>0.23%</b>	<b>0.62%</b>	<b>-0.30%</b>	<b>-0.09%</b>	<b>3.37%</b>	<b>-4.20%</b>		
T-Stat	3.72	3.44	-0.54	0.28	0.88	-1.83	-0.34	19.21	-2.70		
P value	0.00	0.00	0.59	0.78	0.38	0.07	0.73	0.00	0.01		
Standard Error	0.00744	0.00681	0.00910	0.00824	0.00707	0.00163	0.00255	0.00176	0.01554		
Treatment 95% C.I.	0.0	0.04	1.30%	1.85%	2.0%	0.0%	0.41%	3.72%	-1.2%		
	0.0	0.01	-2.27%	-1.38%	-0.8%	-0.6%	-0.59%	3.03%	-7.3%		
Avoider Dividends											
Avoid_div Treatment	-	-	<b>7.54%</b>	<b>5.62%</b>	<b>2.60%</b>	<b>0.71%</b>	<b>2.32%</b>	<b>11.43%</b>	<b>14.29%</b>		
F-Stat			20.46	12.27	3.89	7.36	22.02	252.18	18.79		
P value			0.000	0.000	0.020	0.001	0.000	0.000	0.000		
Standard Error			0.01189	0.01138	0.00976	0.00211	0.00350	0.01209	0.02640		
Treatment 95% C.I.			9.87%	7.85%	4.51%	1.12%	3.01%	-9.06%	19.46%		
			5.21%	3.39%	0.68%	0.29%	1.63%	13.80%	9.11%		
Regression output											
Observations	8205	8205	8205	8205	8205	8205	8205	8205	8205	8205	
R-squared	0.09	0.32	0.09	0.32	0.21	0.24	0.4	0.07	0.46		
avoider	0.098	0.057	0.104	0.062	0.055	-0.008	0.015	-0.032	0.062		
t-stat	(29.68)**	(17.77)**	(27.19)**	(16.44)**	(16.72)**	(10.39)**	(12.34)**	(16.57)**	(7.91)**		
after	0.001	0.001	0.024	0.015	0.003	0.004	0.007	-0.033	0.044		
t-stat	-0.3	-0.35	(4.75)*	(3.39)*	-0.99	(5.20)*	(5.42)*	(20.97)**	(4.60)**		
avoid_after	0.0277	0.0234	-0.0049	0.0023	0.0062	-0.0030	-0.0009	0.0337	-0.0420		
t-stat	(3.72)*	(3.44)*	-0.54	-0.28	-0.88	-1.83	-0.34	(19.21)**	(2.70)**		
avoid_div			-0.015	-0.011	-0.002	-0.003	-0.007	0.057	-0.055		
t-stat			(2.72)*	(2.16)*	-0.43	(2.46)*	(3.82)*	(8.11)*	(4.34)**		
div_after			-0.05	-0.03	-0.007	-0.01	-0.013	0.109	-0.14		
t-stat			(6.81)*	(4.57)*	-1.37	(8.74)*	(7.05)*	(14.57)**	(9.80)**		
avoid_div_after			0.0803	0.0539	0.0198	0.0100	0.0241	-0.1480	0.1849		
t-stat			(5.46)*	(3.89)*	-1.66	(3.80)*	(5.61)*	(12.31)**	(6.12)**		
Female		-0.062		-0.061	-0.051	0.002	-0.013	0.009	-0.022		
t-stat		(20.79)**		(20.70)**	(22.43)**	(4.53)*	(15.09)**	(2.86)*	(3.37)**		
apr2004_age		0.01		0.01	0.007	0.001	0.003	0	0.031		
t-stat		(12.09)**		(12.44)**	(11.50)**	(6.50)*	(11.24)**	-0.09	(15.11)*		
enq		0.024		0.024	0.025	-0.004	0.003	0.018	0.01		
t-stat		(7.71)*		(7.73)*	(9.74)*	(7.38)*	(3.66)*	(5.07)*	-1.37		
apr2004_agesq		0		0	0	0	0	0	0		
t-stat		(17.37)**		(17.65)**	(14.36)**	(14.23)**	(18.91)**	-0.74	(23.11)*		
Constant	0.307	0.198	0.307	0.189	0.103	0.034	0.052	0.014	0.423		
t-stat	(160.27)**	(10.24)**	(160.24)**	(9.75)*	(7.29)*	(11.29)**	(9.37)*	-0.95	(8.92)**		
Robust t statistics in parentheses; * significant at 5%; ** significant at 1%											

**Table C3: Main Regression Results (2005/06 effect only)**

Regression Specification	Regression No.	19	20	21	22	23	24	25	26	27	
	Robust	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Sub group			Y	Y	Y	Y	Y	Y	Y	Y
	Financial Only	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Control Variables		Y		Y	Y	Y	Y	Y	Y	Y
DEPENDENT variable	ETR	ETR	ETR	ETR	TOTTAX	EMPEE_NICS	EMPER_NICS	DIV	EMP		
Avoider	Avoider Treatment	5.33%	4.04%	2.95%	2.84%	2.69%	-0.30%	0.45%	3.46%	-1.14%	
	T-Stat	7.61	6.33	3.49	3.80	4.19	-1.93	1.90	19.32	-0.70	
	P value	0.00	0.00	0.00	0.00	0.00	0.05	0.06	0.00	0.48	
	Standard Error	0.00700	0.00638	0.00844	0.00748	0.00641	0.00155	0.00237	0.00179	0.01628	
	Treatment 95% C.I.	0.1 0.0	0.05 0.03	4.61% 1.30%	4.31% 1.37%	3.94% 1.43%	0.01% -0.60%	0.92% -0.01%	3.82% 3.11%	2.05% -4.33%	
Avoider Dividends	Avoid_div Treatment	-	-	8.64%	5.51%	2.46%	0.75%	2.31%	-12.4%	15.07%	
	F-Stat			31.49	17.46	11.53	8.62	24.35	252.01	20.69	
	P value			0.000	0.000	0.000	0.000	0.000	0.000	0.000	
	Standard Error			0.01189	0.01187	0.01003	0.00206	0.00341	0.01356	0.02371	
	Treatment 95% C.I.			10.97% 6.31%	7.84% 3.19%	4.43% 0.50%	1.15% 0.34%	2.97% 1.64%	-9.71% 15.02%	19.72% 10.43%	
Regression output	Observations	8578	8578	8578	8578	8578	8578	8578	8578	8578	
	R-squared	0.1	0.33	0.1	0.33	0.22	0.25	0.41	0.09	0.46	
	avoider	0.098	0.056	0.104	0.061	0.054	-0.008	0.015	-0.032	0.061	
	t-stat	(29.68)**	(17.62)**	(27.19)**	(16.17)**	(16.60)**	(10.80)**	(12.09)**	(16.63)**	(7.78)**	
	after	-0.018	-0.01	-0.001	-0.001	-0.007	0.003	0.003	-0.034	0.005	
	t-stat	(4.67)*	(2.97)*	-0.19	-0.13	(2.11)*	(3.63)*	(2.59)*	(21.18)**	-0.49	
	avoid_after	0.0533	0.0404	0.0295	0.0284	0.0269	-0.0030	0.0045	0.0346	-0.0114	
	t-stat	(7.61)*	(6.33)*	(3.49)*	(3.80)*	(4.19)*	-1.93	-1.9	(19.32)**	-0.7	
	avoid_div			-0.015	-0.011	-0.001	-0.002	-0.007	0.057	-0.054	
	t-stat			(2.72)*	(1.99)*	-0.32	(2.33)*	(3.65)*	(8.03)*	(4.19)**	
	div_after			-0.037	-0.02	-0.001	-0.009	-0.011	0.121	-0.114	
	t-stat			(5.56)*	(3.47)*	-0.26	(8.48)*	(6.18)*	(17.01)**	(8.36)**	
	avoid_div_after			0.0569	0.0268	-0.0022	0.0104	0.0185	-0.1583	0.1621	
	t-stat			(3.96)*	-1.94	-0.19	(4.11)*	(4.52)*	(11.75)**	(5.75)**	
	Female		-0.06		-0.06	-0.05	0.002	-0.012	0.007	-0.026	
	t-stat		(20.78)**		(20.78)**	(22.57)**	(4.51)*	(14.98)**	(2.55)*	(3.93)**	
	apr2004_age		0.009		0.009	0.006	0.001	0.002	0.001	0.028	
	t-stat		(11.89)**		(12.17)**	(11.34)**	(6.38)*	(10.67)**	-1.39	(14.42)*	
	enq		0.024		0.025	0.025	-0.004	0.003	0.018	0.01	
	t-stat		(7.91)*		(7.99)*	(10.02)**	(7.31)*	(3.70)*	(5.06)*	-1.41	
apr2004_agesq		0		0	0	0	0	0	0		
t-stat		(17.52)**		(17.73)**	(14.39)**	(14.51)**	(18.73)**	-0.51	(22.85)*		
Constant	0.307	0.213	0.307	0.206	0.112	0.036	0.058	-0.003	0.484		
t-stat	(160.28)**	(11.56)**	(160.25)**	(11.09)**	(8.37)*	(11.99)**	(10.78)**	-0.18	(10.61)*		
Robust t statistics in parentheses; * significant at 5%; ** significant at 1%											

## Technical Appendix D: Pre-Programme Test Results

Table D1: Pre-Programme Test with announcement taking place in *Dec 2002*  
(using 2001/02 and 2002/03 only)

Regression Specification	Regression No.	28	29	30	31	32	33	34
	Robust	Y	Y	Y	Y	Y	Y	Y
	Sub group		Y	Y	Y	Y	Y	Y
	Financial Only	Y	Y	Y	Y	Y	Y	Y
	Control Variables	Y		Y	Y	Y	Y	Y
DEPENDENT variable	ETR	ETR	TOTTAX	EMPEE_NICS	EMPER_NICS	DIV	EMP	
Avoider	<b>Avoider Treatment</b>	<b>0.70%</b>	<b>-0.52%</b>	<b>1.19%</b>	<b>0.19%</b>	<b>-0.18%</b>	<b>2.58%</b>	<b>1.28%</b>
	T-Stat	1	-0.56	1.52	0.71	-0.98	10.29	0.73
	P value	0.318	0.573	0.129	0.477	0.328	0	0.467
	Standard Error	0.006969	0.009254	0.007808	0.002659	0.001820	0.002505	0.017637
	Treatment 95% C.I.	2.06%	1.29%	2.72%	0.71%	0.18%	3.07%	4.74%
	-0.67%	-2.34%	-0.34%	-0.33%	-0.53%	2.09%	-2.17%	
Avoider Dividends	<b>Avoid_div Treatment</b>	<b>-</b>	<b>1.90%</b>	<b>0.12%</b>	<b>-0.14%</b>	<b>-0.11%</b>	<b>0.28%</b>	<b>-2.78%</b>
	F-Stat	-	1.48	1.16	0.33	0.58	53.2	0.72
	P value	-	0.2281	0.3149	0.7158	0.5577	0	0.4855
	Standard Error		0.012062	0.008985	0.003753	0.002110	0.019176	0.030909
	Treatment 95% C.I.		4.26%	1.88%	0.60%	0.31%	4.04%	3.28%
		-0.47%	-1.65%	-0.87%	-0.52%	-3.47%	-8.83%	
Regression output	Observations	4218	4218	4218	4218	4218	4218	4218
	R-squared	0.33	0.08	0.21	0.42	0.24	0.08	0.49
	avoider	0.046	0.092	0.049	0.011	-0.01	-0.028	0.03
	t-stat	(8.74)**	(13.77)*	(8.12)**	(5.52)**	(7.36)**	(9.51)**	(2.23)*
	after	0.001	0.017	-0.005	0.001	0.003	-0.024	0.024
	t-stat	0.32	(3.22)**	-1.28	-0.95	(3.67)**	(11.11)*	(2.15)*
	avoid_after	0.0070	-0.0052	0.0119	0.0019	-0.0018	0.0258	0.0128
	t-stat	1.00	-0.56	-1.52	-0.71	-0.98	(10.29)*	-0.73
	avoid_div		-0.021	-0.006	-0.006	0.001	0.051	-0.028
	t-stat		(2.18)*	-0.7	(2.03)*	-0.57	(4.45)**	-1.23
	div_after		-0.025	0.012	-0.002	-0.006	0.061	-0.043
	t-stat		(3.87)**	(2.54)*	-1.4	(6.00)**	(11.96)*	(3.19)**
	avoid_div_after		0.0242	-0.0107	-0.0033	0.0007	-0.0229	-0.0406
	t-stat		-1.66	-0.93	-0.73	-0.26	-1.2	-1.18
	Female	-0.057		-0.049	-0.012	0.003	0.01	-0.028
	t-stat	(14.77)*		(15.81)*	(10.80)*	(4.02)**	(2.71)**	(3.23)**
	apr2004_age	0.010		0.007	0.002	0.001	-0.002	0.031
	t-stat	(9.1)**		(8.42)**	(8.04)**	(4.92)**	(2.07)*	(10.76)**
	enq	0.018		0.021	0.001	-0.004	0.027	-0.001
	t-stat	(4.66)**		(6.27)**	-1.09	(4.73)**	(5.84)**	-0.14
	apr2004_agesq	0.000		0	0	0	0	0
	t-stat	(12.95)*		(10.59)*	(13.72)*	(10.45)*	(2.55)*	(16.61)**
	Constant	0.193	0.306	0.104	0.054	0.031	0.047	0.442
t-stat	(7.38)**	(96.98)*	(5.28)**	(7.22)**	(7.74)**	(2.46)*	(6.57)**	
Robust t statistics in parentheses								
* significant at 5%; ** significant at 1%								

**Table D2: Pre-Programme Test with announcement taking place in Dec 2003  
(using 2002/03 and 2003/04 only)**

Regression Specification	Regression No.	35	36	37	38	39	40	41	42
	Robust	Y	Y		Y	Y	Y	Y	Y
	Sub group	Y	Y	Y	Y	Y	Y	Y	Y
	Financial Only	Y	Y	Y	Y	Y	Y	Y	
	Control Variables		Y	Y	Y	Y	Y	Y	Y
DEPENDENT variable	ETR	ETR	ETR	TOTAX	EMPEE_NICS	EMPER_NICS	DIV	EMP	
Avoider Treatment	<b>0.48%</b>	<b>1.31%</b>	<b>1.31%</b>	<b>0.69%</b>	<b>0.13%</b>	<b>0.50%</b>	<b>2.89%</b>	<b>-1.37%</b>	
T-Stat	0.49	1.51	1.2	0.91	0.69	1.76	10.82	-0.75	
P value	0.624	0.131	0.228	0.365	0.493	0.079	0	0.454	
Standard Error	0.00971	0.00868	0.01088	0.00760	0.00184	0.00282	0.00267	0.01833	
Treatment 95% C.I.	2.38% -1.43%	3.01% -0.39%	3.44% -0.82%	2.18% -0.80%	0.49% -0.24%	1.05% -0.06%	3.41% 2.37%	2.22% -4.96%	
Avoider Dividends	<b>Avoid_div Treatment</b>	<b>6.11%</b>	<b>4.96%</b>	<b>4.96%</b>	<b>1.86%</b>	<b>0.84%</b>	<b>2.26%</b>	<b>-12.71%</b>	<b>16.94%</b>
F-Stat	11.04	9.4	6.71	2.19	7.92	18.53	95.69	17.98	
P value	0	0.0001	0.0012	0.1118	0.0004	0	0	0	
Standard Error	0.01300	0.01192	0.01405	0.0096	0.0021	0.0038	0.0181	0.0288	
Treatment 95% C.I.	8.66% 3.56%	7.29% 2.62%	7.71% 2.20%	3.73% -0.01%	1.25% 0.43%	3.01% 1.51%	-9.16% -16.26%	22.58% 11.29%	
Regression output	Observations	4111	4111	4111	4111	4111	4111	4111	4111
R-squared	0.1	0.32	0.32	0.21	0.26	0.41	0.11	0.47	
avoider	0.099	0.06	0.06	0.056	-0.009	0.014	-0.028	0.066	
t-stat	(17.09)* *	(11.06)* *	(7.90)**	(11.29)* *	(7.21)**	(7.59)**	(9.98)**	(5.96)**	
after	0.009	-0.001	-0.001	-0.011	0.006	0.004	-0.029	-0.009	
t-stat	-1.54	-0.11	-0.11	(2.81)**	(6.58)**	(2.72)**	(11.56)* *	-0.75	
avoid_after	<b>0.0048</b>	<b>0.0131</b>	<b>0.0131</b>	<b>0.0069</b>	<b>0.0013</b>	<b>0.0050</b>	<b>0.0289</b>	<b>-0.0137</b>	
t-stat	-0.49	-1.51	-1.2	-0.91	-0.69	-1.76	(10.82)* *	-0.75	
avoid_div	-0.022	-0.022	-0.022	-0.006	-0.004	-0.012	0.088	-0.117	
t-stat	(2.42)*	(2.67)**	(1.98)*	-0.81	(2.43)*	(4.04)**	(6.03)**	(5.19)**	
div_after	-0.034	-0.014	-0.014	0.001	-0.008	-0.007	0.1	-0.088	
t-stat	(4.76)**	(2.21)*	(2.52)*	-0.15	(6.97)**	(3.92)**	(14.62)* *	(5.91)**	
avoid_div_after	<b>0.0563</b>	<b>0.0365</b>	<b>0.0365</b>	<b>0.0117</b>	<b>0.0071</b>	<b>0.0176</b>	<b>-0.1560</b>	<b>0.1831</b>	
t-stat	(3.62)**	(2.56)*	(2.10)*	-0.99	(2.62)**	(3.81)**	(8.70)**	(5.56)**	
Female		-0.054	-0.054	-0.047	0.004	-0.011	0.005	-0.006	
t-stat		(13.05)* *	(13.42)* *	(14.89)* *	(5.33)**	(9.27)**	-1.12	-0.68	
apr2004_age		0.011	0.011	0.007	0.001	0.003	0	0.034	
t-stat		(9.58)**	(12.41)* *	(8.53)**	(6.02)**	(9.38)**	-0.21	(11.69)* *	
eng		0.025	0.025	0.024	-0.004	0.004	0.022	0.016	
t-stat		(5.69)**	(5.50)**	(6.85)**	(4.70)**	(3.29)**	(4.40)**	-1.58	
apr2004_agesq		0	0	0	0	0	0	-0.001	
t-stat		(13.02)* *	(17.20)* *	(10.38)* *	(11.34)* *	(14.59)* *	-0.76	(17.25)* *	
Constant	0.311	0.16	0.16	0.095	0.027	0.038	0.017	0.353	
t-stat	(96.08)* *	(5.71)**	(7.21)**	(4.76)**	(6.15)**	(4.78)**	-0.82	(5.15)**	
Robust t statistics in parentheses									
* significant at 5%; ** significant at 1%									

## Technical Appendix E: The Random Growth Model

The failure of the pre-announcement test leads us to explore using a 'random growth model'. This model allows us to model differential pre-programme trends between the treatment and control group and any impact they might have in the post announcement years and then see if the announcement treatment effect still holds. This methodological approach was suggested by Westminster Business School as a generalisation of the CDID model (Heckman/Hotz 1987: 865)

This is done by defining an indicator for the pre-announcement period with a significant treatment effect, 2003/04. This indicator is named 'Pre'. We then add this 'Pre' indicator to the after terms in the previous specifications to create new variables. This allows pre-announcement differences between the treatment and control group to be modelled such that the post-announcement indicators will then hopefully pick up the remaining true announcement effect once pre-existing policy differences between the treatment and non-treatment groups have been controlled for.

The random grown model specification without sub-group specific effects is shown below in specification (3). This introduces two new terms; adding the pre-indicator to the after indicator to create  $(pret+after_t)$  which is equal to 1 when the time period is 2003/04, 2004/05, or 2005/06, and a second term modelling a separate time trend for the avoiders which allows for a different time trend starting in the pre-period prior to the announcement and increasing in the after period;  $avoider_i^*(pret+2*after_t)$ .

Random Growth Model (Specification (3)):

$$ETR_{it} = \alpha + \beta_1 avoider_i + \beta_2 (pret+after_t) + \beta_3 after_t \\ + \beta_4 avoider_i^*(pret+2*after_t) + \beta_5 avoider_i^*after_t \\ + \delta X_{it} + \varepsilon_{it}$$

The two new terms in specification (3) control for the possibility that there could be differential time trends for avoiders and non-avoiders starting in 2003/04 (the 'pre' period) and pick up the effect of these differing time trends on the effective tax rate. Once these have been controlled for, then the coefficient  $\beta_5$  on the treatment indicator  $avoider_i^*after_t$  should pick up the treatment effect free from common and differential time trends of both groups.

Specification (4) extends the random growth model for the sub group specific effects model. This is similar to specification (3) but extended so that the pre indicator is now also added to the subgroup specific effects to allow for different sub-group specific time trends starting in the pre-announcement period, 2003/04. The pre indicator is added to the general dividend group  $div_i^*(pret+after_t)$ , and to the sub-group specific effects modelling a separate time trend for the avoiders with positive dividend income which allows for a different time trend starting in the pre-period prior to the announcement, increasing in the after period  $avoider_i^*div_i^*(pret+2*after_t)$ .

Random Growth Model (Specification (4)):

$$ETR_{it} = \alpha + \beta_1 avoider_i + \beta_2 (pret+after_t) + \beta_3 after_t \\ + \beta_4 avoider_i^*(pret+2*after_t) + \beta_5 avoider_i^*after_t \\ + \beta_6 avoider_i^*div_i + \beta_7 div_i^*(pret+after_t) + \beta_8 div_i^*after_t \\ + \beta_9 avoider_i^*div_i^*(pret+2*after_t) + \beta_{10} avoider_i^*div_i^*after_t$$

$$+ \delta X_{it} + \varepsilon_{it}$$

Specification (4) extends the sub-group specific effects model in specification (2) by adding differential time trends for both avoiders and the positive dividend avoider group starting in 2003/04. By controlling for these differential time trends the treatment effect and additional sub-group specific treatment effect should be picked up in specification (4) by the coefficients  $\beta_5$  and  $\beta_{10}$  on the terms  $avoider_i * after_t$  and  $avoider_i * div_i * after_t$  (respectively) as in specification (2). However, these coefficients should now pick up the treatment effect and additional sub-group specific treatment effect free from common and differential time trends of both groups.

The results of the random growth model are shown in Appendix F. As before we have the choice of pooling the post announcement years 2004/05 and 2005/06 or separating them. We choose to separate the effects as this is more informative for our analysis, Table F1 shows the results of the random growth model for 2004/05 (dropping 2005/06) only and table F2 shows the results for 2005/06 only (dropping 2004/05).

Tables F1 and F2 are presented similarly to previous tables, however as well as summarising the avoider and total avoider positive dividend treatment effects and their statistical significance at the top of the table, we now also do this for the differential avoider pre-announcement time trends (`pre_2after_avoid`) and total positive dividend avoider pre-announcement time trends (`pre_2after_avoid + pre_2after_avoid_div`).



## Technical Appendix F: Random Growth Model Results

Table F1: Random Growth Model Results (2004/05 Effect Only)

Regression Specification		Regression Number	43	44	45	46			
		Robust	Y	Y	Y	Y			
n		Sub_group			Y	Y			
		Financial Only	Y	Y	Y	Y			
Dependent		Control Variables		Y		Y			
		ETR	ETR	ETR	ETR	ETR			
Treatment Effect		Avoider Treatment		<b>-2.58%</b>	<b>-2.82%</b>	<b>-1.25%</b>	<b>-2.64%</b>		
		T-Stat		-1.77	-2.14	-0.69	-1.61		
		P value		0.077	0.032	0.491	0.108		
		s.e.		0.01457	0.01318	0.01821	0.01641		
		Treatment 95% CI				0.28%	-0.24%	2.32%	0.58%
						-5.43%	-5.40%	-4.82%	-5.86%
		Avoider Dividends		Avoid_div Treatment				<b>-3.85%</b>	<b>-2.79%</b>
				F-Stat				1.55	2.1
				P value				0.2114	0.1219
				s.e.				0.0236	0.0216
Treatment 95% CI						0.77%	1.45%		
				-8.47%	-7.03%				
Differential Time Trend		Avoider Time Trend		<b>3.2%</b>	<b>3.1%</b>	<b>0.8%</b>	<b>1.8%</b>		
		T-Stat		4.37	4.68	0.86	2.27		
		P value		0	0	0.39	0.023		
		s.e.		0.0073	0.0066	0.0090	0.0081		
		Trend 95% CI				4.61%	4.37%	2.53%	3.43%
						1.76%	1.79%	-0.99%	0.25%
		Avoider Dividends		Avoid_div Time trend				<b>6.39%</b>	<b>4.85%</b>
				F-Stat				15.28	12.73
				P value				0.00	0.00
				s.e.				0.0116	0.0106
Trend 95% CI						8.67%	6.92%		
				4.10%	2.77%				
Regression output		Observations	11761	8205	8205	8205			
		R-squared	0.06	0.09	0.32	0.1			
		Robust t statistics in parentheses; * significant at 5%; ** significant at 1%							
		avoider	0.088	0.047	0.096	0.054			
			(22.83)**	(12.90)**	(21.76)**	(12.65)**			
		pre_after	-0.004	-0.007	0.011	0			
			-1.03	-1.82	(2.22)*	-0.1			
		after	0.004	0.006	0.011	0.013			
			-0.81	-1.26	-1.73	(2.34)*			
		pre_2after_avoid	<b>0.0318</b>	<b>0.0308</b>	<b>0.0077</b>	<b>0.0184</b>			
			(4.37)**	(4.68)**	-0.86	(2.27)*			
		avoid_after	<b>-0.0258</b>	<b>-0.0282</b>	<b>-0.0125</b>	<b>-0.0264</b>			
			-1.77	(2.14)*	-0.69	-1.61			
		avoid_div			-0.021	-0.016			
					(3.29)**	(2.63)**			
		pre_after_div			-0.034	-0.013			
					(4.77)**	(2.07)*			
		div_after			-0.016	-0.017			
					-1.59	-1.88			
		pre_2after_avoid_div			<b>0.0562</b>	<b>0.0301</b>			
			(3.92)**	(2.30)*					
avoid_div_after			<b>-0.0260</b>	<b>-0.0014</b>					
			-0.88	-0.05					
Female		-0.061		-0.061					
		(20.73)**		(20.55)**					
apr2004_age		0.01		0.01					
		(12.14)**		(12.61)**					
eng			0.024		0.024				

		(7.76)**		(7.79)**
apr2004_agesq		0		0
		(17.41)**		(17.81)**
Constant	0.308	0.199	0.308	0.188
	(136.44)**	(10.29)**	(136.39)**	(9.69)**

Table F2: Random Growth Model Results (2005/06 Effect Only)

Regression Specification	Regression Number				
		47	48	49	50
Robust	Y	Y	Y	Y	
Sub group			Y	Y	
Financial Only	Y	Y	Y	Y	
Control Variables		Y		Y	
Dependent	ETR	ETR	ETR	ETR	
<b>Avoider Treatment</b>	<b>-0.02%</b>	<b>-1.12%</b>	<b>2.18%</b>	<b>-0.07%</b>	
T-Stat	-0.01	-0.86	1.22	-0.05	
P value	0.991	0.388	0.222	0.963	
s.e.	0.01435	0.01296	0.01789	0.01606	
Treatment 95% CI	2.80%	1.42%	5.69%	3.07%	
	-2.83%	-3.66%	-1.32%	-3.22%	
<b>Avoid_div Treatment</b>			<b>-2.76%</b>	<b>-2.84%</b>	
F-Stat			1.44	0.84	
P value			0.2363	0.4311	
s.e.			0.0236	0.0219	
Treatment 95% CI			1.87%	1.45%	
			-7.39%	-7.12%	
Differential Time Trend	<b>Avoider Time Trend</b>	<b>3.2%</b>	<b>3.1%</b>	<b>0.8%</b>	<b>1.9%</b>
	T-Stat	4.37	4.67	0.86	2.29
P value	0	0	0.39	0.022	
s.e.	0.0073	0.0066	0.0090	0.0081	
Trend 95% CI	4.61%	4.37%	2.53%	3.45%	
	1.76%	1.79%	-0.99%	0.27%	
Avoider Dividends	<b>Avoid_div Time trend</b>			<b>6.39%</b>	<b>4.82%</b>
	F-Stat			15.28	12.67
P value			0.00	0.00	
s.e.			0.0116	0.0105	
Trend 95% CI			8.67%	6.88%	
			4.10%	2.76%	
Regression output	Observations	8578	8578	8578	8578
	R-squared	0.1	0.33	0.11	0.33
	Robust t statistics in parentheses; * significant at 5%; ** significant at 1%				
	avoider	0.088	0.046	0.096	0.053
		(22.83)**	(12.75)**	(21.76)**	(12.39)**
	pre_after	-0.004	-0.007	0.011	-0.001
		-1.03	-1.84	(2.22)*	-0.18
	after	-0.015	-0.005	-0.014	-0.002
		(3.09)**	-1.28	(2.17)*	-0.35
	pre_2after_avoid	<b>0.0318</b>	<b>0.0308</b>	<b>0.0077</b>	<b>0.0186</b>
		(4.37)**	(4.67)**	-0.86	(2.29)*
	avoid_after	<b>-0.0002</b>	<b>-0.0112</b>	<b>0.0218</b>	<b>-0.0007</b>
		-0.01	-0.86	-1.22	-0.05
	avoid_div			-0.021	-0.015
				(3.29)**	(2.48)*
	pre_after_div			-0.034	-0.013
			(4.77)**	(1.99)*	
div_after			-0.003	-0.008	
			-0.3	-0.94	
pre_2after_avoid_div			<b>0.0562</b>	<b>0.0296</b>	
			(3.92)**	(2.27)*	
avoid_div_after			<b>-0.0494</b>	<b>-0.0276</b>	

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			-1.68	-1.02
Female		-0.059		-0.059
		(20.71)**		(20.64)**
apr2004_age		0.009		0.01
		(11.93)**		(12.33)**
enq		0.024		0.025
		(7.96)**		(8.04)**
apr2004_agesq		0		0
		(17.56)**		(17.88)**
Constant	0.308	0.215	0.308	0.205
	(136.44)**	(11.62)**	(136.40)**	(11.04)**

## Technical Appendix G: Calculating Revenue Effects

Although the main results shown in tables C1-C3 show some relatively large, highly significant, impacts of the anti-avoidance announcement on the tax rates of avoiding individuals, we want to be able to understand their revenue implications for the purposes of the evaluation.

For the tax rates this is done by multiplying the percentage point change in tax rates by the total income in the treatment group. This gives the estimated additional amount of tax paid by this group in the sample as a result of the announcement. This is then grossed up for the whole population by a factor of 100 as we are working with a 1% sample.

For the change in the income ratios, the estimated revenue effect is calculated by multiplying the change in the income proportion by the total income in the group and then applying an assumed increase in marginal tax rates to this income. This assumes the income is being shifted from paying the higher dividends rate (25%) to the higher employment income rate plus NICs (54%), so the increased marginal tax rate for this income is 29%. Since this assumption is necessarily approximate and may not always be true, this method is more unreliable than that for the tax rates which requires no such assumptions. Also, as seen in the main results, the proportional increase in employment income for the treatment groups after the announcement is greater than the decrease in the proportion of dividend income. This suggests that some of this increased employment income may have previously been in income-streams other than dividends so the assumption regarding the change in marginal tax rates is imprecise but necessary since we cannot separately identify what tax rate this income was previously taxed at for each individual.

Table 6 shows the effects for 2004/05. The table shows the estimated change in the effective tax rates and income ratios for each treatment group as a result of the announcement, the statistical significance of these results and the total income in each of these treatment groups in the sample.

These estimates are then used to calculate the population estimated revenue effect for each treatment group as described above. The central estimates of the population revenue effects are highlighted and the two lines below this show the 95% confidence intervals for these estimates (the range in which we can be 95% sure the true revenue effect falls in).

Since the general avoider treatment effect is not statistically significant from zero in 2004/05 we can ignore the avoider revenue effects and concentrate on the sub-group revenue effects which are statistically significant. The avoider revenue effects are shown in the table below simply for completeness.

As mentioned above, the income proportion estimates are potentially unreliable due to the assumptions made in calculating the revenue effect. The results in Table G1 suggest that this methodology may underestimate the revenue effect relative to using the tax rates.

Table G2 shows the effects for 2005/06. This follows the same format as table G1. The avoider treatment is significant and provides the main revenue estimate; the sub-group effect provides the revenue estimate for this group *within* the avoider revenue since the total income of these individuals is already included in the total income of all avoiders.

As above, the revenue estimates based on the income ratios are much lower than the effective tax rates estimates suggesting the income ratio methodology may underestimate the revenue effect.

Table G1: Estimated Revenue Effects 2004/05

Regression Specification		Regression No.	13	14	15	16	17	18
		Robust	Y	Y	Y	Y	Y	Y
Sub group	Y	Y	Y	Y	Y	Y	Y	Y
Financial Only	Y	Y	Y	Y	Y	Y	Y	Y
Control Variables	Y	Y	Y	Y	Y	Y	Y	Y
<b>DEPENDENT variable</b>		<b>ETR</b>	<b>TOTTAX</b>	<b>EMPEE_NICS</b>	<b>EMPER_NICS</b>	<b>DIV</b>	<b>EMP</b>	
<b>Avoider Treatment</b>		<b>0.23%</b>	<b>0.62%</b>	<b>-0.30%</b>	<b>-0.09%</b>	<b>3.37%</b>	<b>-4.20%</b>	
T-Stat		0.28	0.88	-1.83	-0.34	19.21	-2.70	
P value		0.78	0.38	0.07	0.73	0.00	0.01	
s.e.		0.00824	0.00707	0.00163	0.00255	0.00176	0.01554	
Treatment 95% CI		1.85%	2.0%	0.0%	0.41%	3.72%	-1.2%	
		-1.38%	-0.8%	-0.6%	-0.59%	3.03%	-7.3%	
Total Income Sum		57,385,748	57,385,748	57,385,748	57,385,748	57,385,748	57,385,748	
Total Income Mean		183,341	183,341	183,341	183,341	183,341	183,341	
N Treatment Group		313	313	313	313	313	313	
<b>Population Avoider Revenue</b>		<b>13,456,384</b>	<b>35,553,914</b>	<b>- 17,111,856</b>	<b>- 4,985,674</b>	<b>- 56,141,837</b>	<b>- 69,901,666</b>	
Revenue 95% CI		106,131,039	115,023,879	1,182,376	23,651,857	- 61,870,547	- 19,223,966	
		- 79,218,271	- 45,537,886	- 35,779,440	- 33,623,205	- 50,413,128	-121,613,604	
<b>Avoid_div Treatment</b>		<b>5.62%</b>	<b>2.60%</b>	<b>0.71%</b>	<b>2.32%</b>	<b>-11.43%</b>	<b>14.29%</b>	
F-Stat		12.27	3.89	7.36	22.02	252.18	18.79	
P value		0.000	0.020	0.001	0.000	0.000	0.000	
s.e.		0.01138	0.00976	0.00211	0.00350	0.01209	0.02640	
Treatment 95% CI		7.85%	4.51%	1.12%	3.01%	-9.06%	19.46%	
		3.39%	0.68%	0.29%	1.63%	-13.80%	9.11%	
Total Income Sum		19,405,388	19,405,388	19,405,388	19,405,388	19,405,388	19,405,388	
Total Income Mean		231,017	231,017	231,017	231,017	231,017	231,017	
N Treatment Group		84	84	84	84	84	84	
<b>Population Avoid_Div Revenue</b>		<b>109,127,364</b>	<b>50,397,151</b>	<b>13,698,263</b>	<b>45,031,755</b>	<b>64,328,442</b>	<b>80,393,557</b>	
Revenue 95% CI		152,415,744	87,522,612	21,704,949	58,359,601	50,995,216	109,516,811	
		65,838,984	13,271,690	5,691,577	31,703,909	77,661,668	51,270,303	

Table G2: Estimated Revenue Effects 2005/06

		Regression No.	22	23	24	25	26	27
		Regression Specification		Robust	Y	Y	Y	Y
		Sub group	Y	Y	Y	Y	Y	Y
		Financial Only	Y	Y	Y	Y	Y	Y
		Control Variables	Y	Y	Y	Y	Y	Y
		<b>DEPENDENT variable</b>	<b>ETR</b>	<b>TOTTAX</b>	<b>EMPEE_NICS</b>	<b>EMPER_NICS</b>	<b>DIV</b>	<b>EMP</b>
Calculated treatment & revenue effects		Avoider						
		<b>Avoider Treatment</b>	<b>2.84%</b>	<b>2.69%</b>	<b>-0.30%</b>	<b>0.45%</b>	<b>3.46%</b>	<b>-1.14%</b>
		T-Stat	3.80	4.19	-1.93	1.90	19.32	-0.70
		P value	0.00	0.00	0.05	0.06	0.00	0.48
		s.e.	0.00748	0.00641	0.00155	0.00237	0.00179	0.01628
		Treatment 95% CI	4.31%	3.94%	0.01%	0.92%	3.82%	2.05%
			1.37%	1.43%	-0.60%	-0.01%	3.11%	-4.33%
		Total Income Sum	73,575,300	73,575,300	73,575,300	73,575,300	73,575,300	73,575,300
		Total Income Mean	229,207	229,207	229,207	229,207	229,207	229,207
		N Treatment Group	321	321	321	321	321	321
		<b>Avoider Revenue</b>	<b>208,876,598</b>	<b>197,556,302</b>	<b>- 21,933,533</b>	<b>33,253,828</b>	<b>- 73,927,446</b>	<b>- 24,303,724</b>
		Revenue 95% CI	316,743,874	289,980,388	375,381	67,484,384	- 81,428,735	43,779,144
			101,009,322	105,132,217	- 44,242,447	- 976,727	- 66,426,157	- 92,386,592
		Avoider Dividends						
		<b>Avoid_div Treatment</b>	<b>5.51%</b>	<b>2.46%</b>	<b>0.75%</b>	<b>2.31%</b>	<b>-12.37%</b>	<b>15.07%</b>
		F-Stat	17.46	11.53	8.62	24.35	252.01	20.69
		P value	0.000	0.000	0.000	0.000	0.000	0.000
		s.e.	0.01187	0.01003	0.00206	0.00341	0.01356	0.02371
		Treatment 95% CI	7.84%	4.43%	1.15%	2.97%	-9.71%	19.72%
			3.19%	0.50%	0.34%	1.64%	-15.02%	10.43%
Total Income Sum	19,865,255	19,865,255	19,865,255	19,865,255	19,865,255	19,865,255		
Total Income Mean	248,316	248,316	248,316	248,316	248,316	248,316		
N Treatment Group	80	80	80	80	80	80		
<b>Avoid_Div Revenue</b>	<b>109,551,716</b>	<b>48,936,268</b>	<b>14,818,090</b>	<b>45,797,359</b>	<b>71,242,812</b>	<b>86,839,649</b>		
Revenue 95% CI	155,771,624	87,991,356	22,844,827	59,082,429	55,932,586	113,616,377		
	63,331,808	9,881,180	6,791,352	32,512,288	86,553,037	60,062,921		

## Technical Appendix H: Other technical issues considered

There were a number of other technical issues considered in addition to the basic methodological approach outlined above.

i. Controlling for regional fixed effects:

That is controlling for the impact of region on the effective tax rate. Although these regional fixed effects were significant, they have not been used in the final specification due to a collinearity problem. Since nearly all the avoider group were also in London, the London variable was estimating the same effect as the treatment effect and therefore causing the true treatment effect to be underestimated. Also, controlling for regional fixed effects added nothing to the explanatory power of the model suggesting they were not picking up the desired effects.

ii. Serial correlation:

As we are using a mini time series for the analysis we could potentially have a problem with serial correlation in the error terms which will impact on the validity of the tests for statistical significance. However, since we are essentially pooling our data into a single pre- and post- time period by using the 'after' post-announcement indicator, serial correlation should not be a problem in the specification we use. This approach follows a solution to the problem of serial correlation in differences-in-differences estimation suggested by Bertrand et al (2004).

iii. Propensity Score matching:

Methodological improvements such as propensity score matching were considered in the analysis but unfortunately the data is not rich enough in terms of individual characteristics to support this approach.

iv. Non-Independent observations:

There is potential problem with individuals working for the same employer not acting independently in their avoidance decisions. This could violate the assumption that the error terms are independently distributed leading to incorrect statistical inference. This would normally be corrected for by adding fixed effects for these characteristics or by estimating cluster-robust standard errors and clustering around the employer identifiers. Neither of these options were feasible with the number of employers in the sample and so a more general correction is applied by using robust standard errors as standard.

## Appendix I: Small Sample Analysis Template

<b>CPR &amp; Expatriate Teams – SETTLEMENT/ AVOIDANCE REPORT For all Section 9A Enquiries (both Full &amp; Aspect)</b>	
<b>Name:</b>	<b>UTR:</b>
<b>Year (s)of enquiry:</b>	
<b>Date (s) of opening:</b>	
<b>Date (s) of closure:</b>	
<b>Class of Settlement:</b>	
<b>White note space entries:</b>	<i>Show here the details of white note space entry for 2004/2005/2006 in respect of the risk assessment.</i>
<b>Brief summary of Enquiry:</b>	<i>Show here the aspects covered &amp; the outcome for each enquiry.</i>
<b>Change in behaviour?</b>	<i>Yes/No.</i>
<b>If yes, when?</b>	
<b>Continues to avoid?</b>	<i>Yes/No.</i>
<b>Avoidance methods used:</b> (prior to December 2004)	<i>Show here details of methods used before the December 2004 announcement.</i>
<b>Hidden avoidance methods used:</b> (since December 2004)	<i>Show here details of methods used since the December 2004 announcement (i.e. offshore arrangements/ other undetected methods)</i>
<b>Unexplained reduction in income?:</b> (Over 6 year period)	<i>Yes/No. (This could indicate further tax avoidance).</i>
<b>New partnership/employment:</b>	<i>Show here details of new partnership/ employment (possibly overseas) over the period which could look suspicious.</i>
<b>Involvement in employer based schemes:</b>	<i>Show here details of the employer based schemes &amp; if now ceased, whether the individual has switched to using a scheme that has been identified.</i>
<b>Other remarks/ comments:</b>	
<b>Signature/ Date:</b>	



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