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Tax bunching of very high earners. Evidence from Australia's Division 293 tax

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Abstract

We examine the bunching behaviour of individuals in Australia in response to an extra 15 per cent tax on compulsory retirement contributions imposed on those earning more than $250,000. We find almost no bunching by wage and salary earners. There is extensive bunching by those with business or trust income. For this group, we estimate an elasticity of taxable income of 0.032. Females and older workers are more likely to bunch. The results suggest that the tax induces a substantial tax planning response but little labour supply response.

Keywords: Retirement saving, Division 293 tax, tax planning

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1 Introduction

Australia maintains a compulsory retirement savings program which mandates that employers place 10.5 per cent of an employee's 'ordinary time earnings' into a retirement fund of the employee's choice. The first $27,500 per year of these contributions are taxed at a flat, concessional rate of 15 per cent. For individuals earning more than $180,000 per year, this tax concession represents a substantial discount to the 45 per cent marginal rate that they pay on most other income.

Division 293 tax was introduced to reduce this large tax concession with the intention of making the system more fair. The tax was introduced on 1 July 2012 and initially applied to those with annual 'Division 293 income' (see section 3 below) in excess of $300,000. This income threshold was reduced to $250,000 from 1 July 2017. Division 293 tax levies a 15 per cent tax on concessional contributions, in addition to the flat 15 per cent rate that ordinarily applies. Division 293 tax is payable as part of the current year's tax liability.

The design of Division 293 tax introduced a 'kink' in the income tax schedule, lifting the marginal tax rate for individuals from 45 per cent to 60 per cent. In this paper, we examine the behavioural response to this new tax using the 'bunching' approach developed by Saez (2010) and extended by Chetty et al. (2011) to estimate the 'excess mass' in the distribution of taxable income that appears in response to the Division 293 tax. We use this excess mass to estimate the compensated elasticity of Division 293 income. The elasticity of taxable income (ETI) was first examined by Feldstein (1999) in an attempt to generate a behavioural response parameter to inform tax policy design. In our case, the ETI provides an estimate of the response of 'Division 293 income' to a 1 per cent increase in the marginal net-of-tax rate.

We show that the excess mass and elasticity estimates increase in the years following the introduction of Division 293 tax. It may have taken time for knowledge of the tax to spread and for tax filers (and tax preparers) to respond. In 2017-18, when the threshold was reduced to $250,000, we confirm that the bunching moves to the new threshold with similar excess mass and elasticity estimates. In all cases, the bunching window is quite wide. This may be due to the difficulty of targeting Division 293 income which is different, and more complicated, than taxable income.

For all resident tax filers, the excess mass (and elasticity) estimates gradually grow from 1.55 (and 0.002) in the first year before peaking at 3.511 (and 0.007) in 2015-16. By 2018-19, our last year of data, we find an excess mass estimate of 2.957 (and 0.007). For the subgroup with business and trust income, the bunching (and elasticity) estimates peaked at 11.292 (and 0.032) in 2018-19.

Similar to other studies, we find that salary and wage earners have limited ability to manipulate their earnings to avoid the tax. We find that almost all of the bunching is accounted for by those who receive business or trust income. Females are more likely to bunch and older individuals are more likely to bunch than younger tax filers. Bunching and elasticity estimates are slightly higher if we restrict to individuals who use tax agents to file their return.

The paper makes four contributions. First, we provide new insight on the behaviour of very high earners (i.e. those in the top 2 per cent) in response to the introduction of a new tax. Second, we demonstrate that, for this group in Australia, bunching is driven by tax planning, not by labour supply responses. Third, we document that bunching increases as people learn about the system. Fourth, we provide new, country-specific evidence for Australia. Overall the results provide further evidence that taxpayer responsiveness and the elasticity of taxable income are functions of country-specific tax system design features. Such features can incentivize and facilitate taxpayer behaviour which, in this case, undermines attempts to increase horizontal equity.

The rest of the paper proceeds as follows. We provide some background about Australia's compulsory retirements system and the Division 293 tax. We summarise some of the related literature. We then discuss our data and identification strategy. We then present our results and some discussion of these results before providing a short conclusion.

2 Background

Australia's universal compulsory retirement income system, known as superannuation, was introduced in the early 1990s with the goal of reducing reliance on publicly funded age pensions and increasing national savings; see Commonwealth of Australia (2020). The system requires employers to make contributions to an employee's personal superannuation account. The minimum contribution, known as the Superannuation Guarantee, is legislated as a percentage of an individual's 'ordinary time earnings'. The Superannuation Guarantee was introduced at 3 per cent in the early 1990s before gradually increasing to the current rate of 10.5 per cent. A superannuation fund invests an individual's contributions in line with the individual's instructions to build savings for retirement. An individual is unable to access their superannuation savings until they satisfy the 'conditions of release'[1]. Individuals aged over 64 years are free to access their superannuation irrespective of their working status. Individuals over aged 60 can access their superannuation only if they are retired.

Australia's progressive income tax schedule has had five marginal rate tiers since 1991-92. An individual is subject to higher marginal tax rates as she earns more. In contrast, superannuation is taxed identically for all individuals. Superannuation contributions and earnings attract a flat 15 per cent rate. Withdrawals from a superannuation account became tax free for individuals aged over 60 year from 2007-08. These concessions intended to encourage and boost private savings in superannuation and compensate individuals for the compulsory 'lock-in' effect of the saving scheme.

[1]Early access to superannuation can be provided in rare and exceptional circumstances, including severe financial hardship, on compassionate grounds, or for people with terminal medical conditions.

A consequence of the flat contributions and fund earnings tax rates is that they disproportionately benefit higher earners. Using the income tax schedule as the benchmark, a worker benefits from the difference between her marginal tax rate and the flat 15 per cent rate. At the extreme, an individual earning above the highest income tax threshold of $180,000 per year can benefit from a 30 per cent tax discount on her superannuation contributions income. This 30 per cent differential is calculated as the difference between highest marginal tax rate (45 per cent) and the flat superannuation contributions tax (15 per cent). In contrast, low income workers earning within the tax free threshold are still required to pay the 15 per cent contributions tax, although they are assisted by other programs as described below. Table 1 presents the tax differential for other tiers in the 2015-16 income tax schedule.

Table 1: Individuals' income tax schedule, 2015-16

Taxable income	Tax on this income[1]	Tax rate differential
0 – $18,200	Nil	-15 (0 minus 15)
$18,201 – $37,000	19c for each $1 over $18,200	4 (19 minus 15)
$37,001 – $80,000	$3,572 plus 32.5c for each $1 over $37,000	17.5 (32.5 minus 15)
$80,001 – $180,000	$17,547 plus 37c for each $1 over $80,000	22 (37 minus 15)
$180,001 and over	$54,547 plus 45c for each $1 over $180,000	30 (45 minus 15)

[1]This table does not include the Medicare Levy and or the Temporary Budget repair levy which is payable for individuals with taxable incomes over $180,000

The distributional effects of the superannuation system have been closely examined. Commonwealth of Australia (2023) estimate that the top 10 per cent of the income distribution benefits from 30 per cent of the total superannuation contribution concessions. These concessions, however, use a comprehensive income tax benchmark rather than an expenditure tax benchmark and may thus overestimate the amount of tax concessions; see Pincus (2022). The Commonwealth of Australia (2020) report that 'the cost of superannuation tax concessions is projected to grow as a proportion of GDP such that by around 2050 it exceeds the cost of Age Pension expenditure as a per cent of GDP' (p.51). However, this needs to be considered in the context of a decreasing amount of Age Pension paid as the superannuation system matures.

A number of superannuation policy changes, including Division 293 tax, have been implemented to address issues of fairness and sustainability. For example, concessional contributions caps were introduced in 2007-08. The caps limit the contributions that are eligible for the discounted 15 per cent rate. The caps were introduced at a relatively generous level of $100,000 before trending down in subsequent years to $25,000 in 2017-18. The cap is currently set at $27,500 for 2022-23. In addition, a government contributions matching scheme has been available since 2003-04 to encourage savings and boost contributions for lower earners. Recent studies, however, found that this matching scheme has not been very effective (see Chan et al. (2020) and Sobeck and Breunig (2020)). Further, a superannuation tax offset, known as the Low Income Super Tax Offset, for lower earners is also available; see Australian Taxation Office (2022). For a broad overview of Australia's superannuation system, its design and issues, see Productivity Commission (2015) and Commonwealth of Australia (2020).

3 Division 293 tax

Division 293 tax was introduced on 1 July 2012 and remains in force. The tax is payable for those who have 'Division 293 income' in excess of an income threshold which was initially set at $300,000. In 2017-18 the threshold was reduced to $250,000 in order to move closer to the highest threshold of the income tax schedule ($180,000). The definition of Division 293 income includes any pre-tax employer superannuation contributions. These are not included in most other definitions of taxable income in Australia. The components of Division 293 income include[2]:

+ taxable income (assessable income minus allowable deductions)
+ total reportable fringe benefits amounts
+ net financial investment loss

[2]See `https://www.ato.gov.au/Individuals/Super/In-detail/Growing-your-super/Division-293-tax---information-for-individuals/` (accessed 9 March 2023) for further information.

+ net rental property loss
+ net amount on which family trust distribution tax has been paid
+ total concessionally taxed superannuation contributions
− super lump sum taxed elements with a zero tax rate
− assessable first home super saver released amount

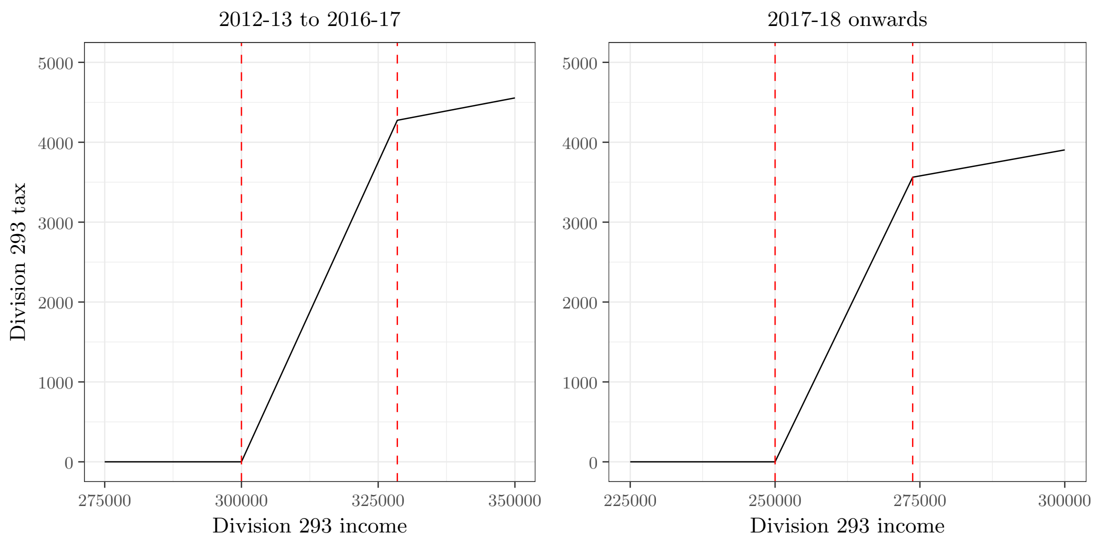
Division 293 tax is payable on either an individual's excess income over the Division 293 threshold *or* on the total concessionally taxed superannuation contributions in a given year – the lesser of the two. Concessionally taxed superannuation contributions are defined as those that are subject to the 15 per cent tax rate. These include:

+ employer contributed amounts
+ other family and friend contributions
+ assessable foreign fund amounts
+ assessable amounts transferred from reserves
+ personal contributions for which you have been allowed a deduction
+ defined benefit contributions

This design provides a phase-in zone before an individual is liable for the 15 per cent tax on their *entire* concessionally taxed superannuation contributions. As such, Division 293 tax introduces a 'kink' (as opposed to a 'notch') in the income tax schedule. A notch is a discrete change in the level of an individual's choice set, which is less commonly observed practice (e.g. a change in the average tax rate, rather than marginal, in an income tax schedule). Figure 1 shows how the amount of Division 293 tax payable increases as an individual progresses along the Division 293 income schedule.

Figure 2 shows the change in the marginal tax rate for each additional dollar earned. The 47 per cent rate refers to the maximum marginal rate in the income tax schedule plus the 2 per cent Medicare Levy. Throughout the Division 293 phase-in range the marginal rate increases to 62 per cent (i.e. 47 per cent plus 15 per cent) when excess income over the Division 293 threshold is taxable. This drops to a marginal rate of 48.3 per cent

Figure 1: Division 293 tax payable



when a tax filer's entire concessional contributions becomes the tax base. The marginal rates are the same for 2017-18 except they apply from the $250,000 threshold.

Figure 3 shows the Division 293 kink in 2016-17 and in 2017-18. The calculations underpinning Figures 1 to 3 assume Division 293 income equals taxable income plus, for simplicity, employer superannuation contributions where employer contributions are 9.5 per cent (i.e. the Superannuation Guarantee rate in these years) of taxable income. The parallel dashed lines in Figure 3 are provided as a visual aid to show that in the absence of the phase-in zone, Division 293 tax would have had a 'notch' design, rather than a 'kink'.

The ATO automatically assesses whether an individual is liable for Division 293 tax. This occurs after a tax filer has lodged her tax return and when the ATO has received account-level contributions information from superannuation funds. For those liable, the ATO will issue a Notice of Assessment that includes the calculated tax liability with the date that the payment is due. Individuals can not defer payment and may pay using their own funds or by releasing savings from the superannuation account.

Figure 2: Marginal tax rates on Division 293 income

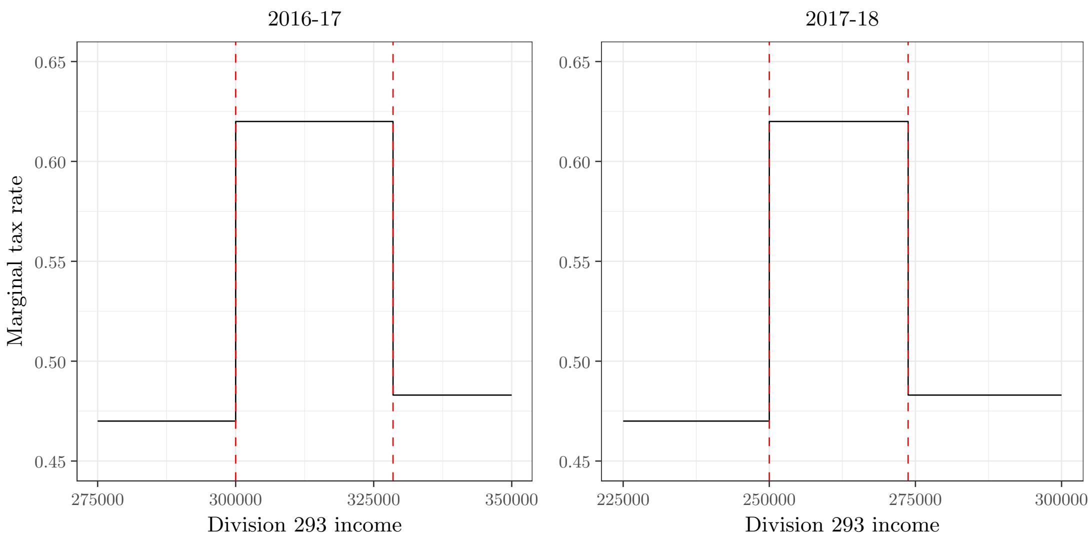
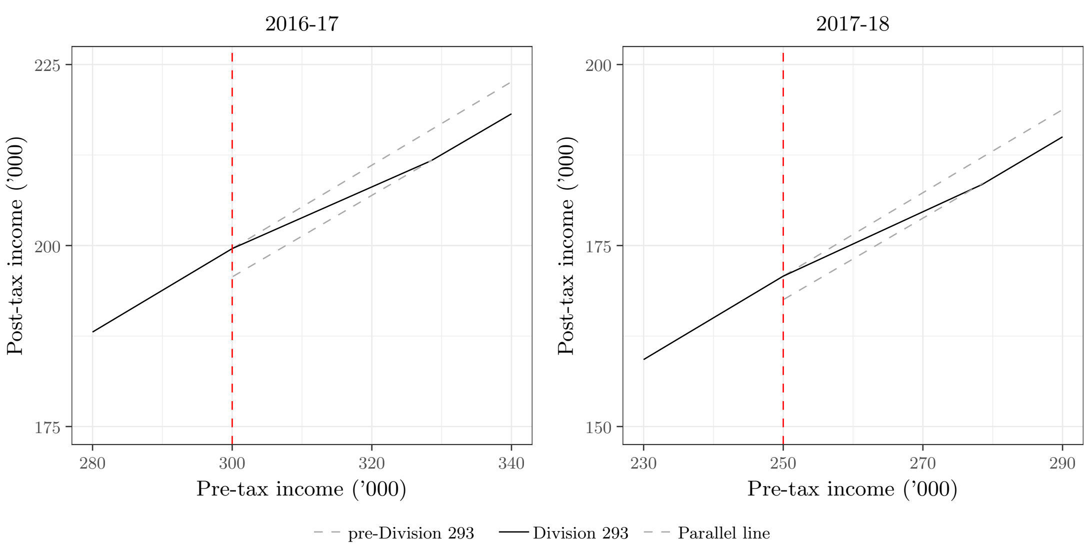


Figure 3: Division 293 kink



Department of the Treasury (2012) estimated that Division 293 tax would save the Australian Government almost \$1 billion over the three forward estimate years at the time of the 2012-13 Budget. At the time, Treasury expected that it would affect around 128,000 people in 2012-13, or around 1.2 per cent of those who make superannuation contributions. Department of the Treasury (2016) reported that the reduction of the threshold to \$250,000 was expected to attract and additional \$2.5 billion of the three forward estimate years from 2017-18. The reduction in the income threshold meant that just under two per cent of tax filers are liable for the tax.

4 Related Literature

The elasticity of taxable income (ETI) is a behavioural parameter that can provide insight into how individuals respond to tax policy. The ETI aims to estimate the sensitivity of taxable income to a change in marginal tax rates. Specifically, the ETI provides an estimate for the decrease in reportable taxable income in response to a 1 per cent increase in a marginal net-of-tax rate. The ETI was proposed by Feldstein (1995) who applied the method to a panel of tax return data in the United States. This involved examining the effect of a change in marginal rates on the same individuals before and after the policy change (a component of the 1986 Tax Reform Act in the United States). The author later used the ETI to provide new insight on the magnitude of deadweight losses of taxation (see Feldstein (1999)). Saez et al. (2012) provided a critical review of the ETI literature with respect to marginal tax rates.

A standard labour supply model is often used to explain the ETI. In this model, taxpayers respond to a discontinuity in the tax schedule by adjusting their taxable income. This occurs through the taxpayer moving to a new optimal leisure and consumption combination that maximises her utility, subject to her budget constraint. Varying one's working hours is one example of how an individual may respond. The ETI, however, includes all factors that influence taxable income beyond labour earnings alone. Feldstein (1999) lists deductible expenses, forms of untaxed compensation, and the tax treatment of investment income as examples. Taxpayers, therefore, face different frictions in their ability to target their income which depend on their circumstances.

Many subsequent studies have estimated the ETI using the 'bunching approach'. This method was developed by Saez (2010), and was extended by Chetty et al. (2011), who applied the approach to repeated cross-sections of Danish tax return data. The bunching approach seeks to estimate the 'excess mass' in the taxable income distribution prior to a salient change in the taxable income schedule. The bunching approach has two distinct designs. The first design examines a 'kink' in a tax schedule. This captures a change in the slope of an individual's choice set. A common example of a kink is a change in a marginal tax rate. The second design accommodates 'notch' analysis. The bunching approach was extended to accommodate notches by Kleven and Waseem (2013).

Studies that use the 'bunching approach' have increased over the past 15 years. This has coincided with the increased availability of high quality administrative data that are ideally suited for this analysis. Large sample sizes with precise income information are essential to observe precisely where individuals locate within the income distribution. Further, repeated cross-sections provide insight into how responses change over time, including as tax system knowledge improves and when the tax schedule settings change. It is, therefore, no coincidence that countries where such data are available have attracted studies that use this method. These include Saez (2010), Chetty et al. (2011), Kleven and Waseem (2013), Johnson and Breunig (2016), Paetzold (2019) Adam et al. (2021) who examine tax system bunching in the United States, Denmark, Pakistan, Australia, the United Kingdom, and Austria respectively.

Kleven (2016) reviewed the bunching literature and the main lessons that have emerged. A challenge of interpreting an ETI is in disentangling the drivers of observed response.

While behavioural responses can be clearly identified, making the additional step to estimate structural parameters that are useful to inform tax policy is difficult. Bunching estimates are found to be limited by local institutional settings and optimisation frictions that tend to suppress the behavioural response. An emerging theme across the literature is that it is the self-employed that account for the majority of the bunching. The self-employed tend to have more discretion over how they manage their finances and greater ability to employ tax planning strategies. In contrast, salary and wage earners are less able to choose the hours they work, have much of their income reported to tax authorities through third party reporting systems (hence may have more difficultly misreporting income), and are much more limited in their ability to claim deductible expenses[3]. This highlights the importance of understanding the drivers of the ETI estimates and the need to understand the broader institutional settings.

Le Maire and Schjerning (2013) proposed an extension to the Saez (2010) approach to separate out the bunching response that can be attributed to tax planning versus a labour supply response using Danish tax records. This analysis revealed that more than half of the bunching of the self-employed can be attributed to income smoothing practices. In Denmark, this is achieved by utilising retained earnings to lower taxable income in a targeted way. At the top bracket, the author finds that around 95 per cent of the self-employed are using retained earnings to bunch. Similarly, Paetzold (2019) examined bunching at large kink in the Austrian tax schedule. The author reports that the self-employed are less constrained by third party reporting systems and have additional tax adjustment channels available for tax planning. In contrast, the ability of wage earners to target income appears to be constrained by deductions being their only adjustment channel.

In a Finnish study, Harju and Matikka (2016) decomposed the bunching response into its sources to gain insight on the real economic responses, such as labour supply responses,

[3]See Saez (2010) and Paetzold (2019) for further discussion.

versus the share due to tax planning practices. Similarly to our paper, the authors confirm that most of the bunching, and corresponding ETI estimates, are accounted for by business owners. The study further highlights the importance of distinguishing between the drivers of the bunching, and the need to understand the implications for tax policy design.

In an Australian study, Johnson and Breunig (2016) found that the observed bunching at kink points in Australia's income tax schedule is almost entirely attributable to individuals who use discretionary trusts to distribute business income to trustees. The ability to distribute business income to other individuals through trusts helps to facilitate strikingly sharp bunching at kink points in Australia's tax schedule.

5 Data

We use the Australian Taxation Office Longitudinal Information File (ALife)[4]. The ALife is a de-identified, ATO curated and maintained administrative dataset that is accessible for public interest research. The ALife includes data sourced from Australia's individual income tax return and superannuation systems. In addition to the official website (see footnote 4) Polidano et al. (2020) and Abhayaratna et al. (2021) provide information about ALife.

We analyse repeated cross-sections of the full resident population who have Division 293 income between \$200,000 and \$400,000 from 2011-12 to 2018-19. We examine 2011-12 to confirm that there was no bunching at the threshold in the year prior to the introduction of the tax. We present summary statistics in Table 2 for the full sample of tax filers with Division 293 income between \$200,000 and \$400,000 (Column 5), and the two main sub-samples of interest within the 'inner bunching window'. The first sub-sample pools tax filers in the 2012-13 to 2016-17 income years with Division 293 just under the \$300,000

[4]Specifically, we use the latest release, ALife 2019; see `https://alife-research.app`.

threshold (Column 1). The second sub-sample pools tax filers in the 2017-18 to 2018-19 income years who earned just under the Division 293 $250,000 threshold (Column 3). As a point of reference, we also provide summary statistics for individuals just above the bunching window for both threshold sub-samples (Columns 2 and 4).

Table 2 reveals that the average age is around 49 years, 25 per cent of the sample are female, 77 per cent report a spouse and 80 per cent reside in major cities. 23 per cent have a self-managed superannuation fund, and 29 per cent have substantial business or trust income ("Business/trust income"). In what follows, we refer to these individuals as 'self-employed', following the definition used in Johnson and Breunig (2016). In the ALife data, there is no easy way to observe if people are self-employed. This definition classifies tax filers as 'self-employed' if the sum of their net business income, net trust partnership income and dividend income is greater than 20 per cent of their salary and wage income.

When comparing the groups that are above and below the Division 293 threshold who are within $6,600 of the threshold, we see a few important differences. Those located in the bunching region (below the Division 293 threshold) are more likely to have self-managed superannuation funds, more likely to have substantial business/trust income, less likely to be salary & wage earners and are more likely to receive trust distributions.

The percentage of people who prepare their own tax returns is very small, consistent with evidence from the broad population. Overall in Australia, 74 per cent of entities use a tax professional to prepare their return; see Australian Taxation Office (2017). Of individuals not in business, 68 per cent of tax-filers use a tax agent. We find that 82 to 84 per cent of our sample use tax agents, consistent with this being a wealthier population and one where the use of businesses and trusts is quite common. In the robustness checks below we examine whether our results differ if we separately consider those who use tax agents and those who don't.

Table 2: Summary statistics

	$300,000 – $6,600		$300,000 + $6,600		$250,000 – $6,600		$250,000 + $6,600		Full sample	
	2012-13 to 2016-17		2012-13 to 2016-17		2017-18 to 2018-19		2017-18 to 2018-19		2011-12 to 2018-19	
	Mean	Std. dev	Mean	Std. dev	Mean	Std. dev	Mean	Std. dev	Mean	Std. dev
	(1)		(2)		(3)		(4)		(5)	
Income year	2015.14	1.39	2015.12	1.40	2018.52	0.50	2018.52	0.50	2015.85	2.26
Age at 30 June	49.62	11.30	49.56	11.30	48.86	11.33	48.86	11.32	48.74	11.43
Female	0.25	0.44	0.24	0.42	0.28	0.45	0.27	0.44	0.25	0.43
Reported spouse	0.80	0.40	0.79	0.41	0.79	0.41	0.79	0.41	0.77	0.42
Self-prepared tax return	0.16	0.36	0.16	0.37	0.17	0.37	0.18	0.38	0.17	0.38
SMSF	0.29	0.45	0.25	0.44	0.23	0.42	0.20	0.40	0.23	0.42
Business/trust income	0.35	0.48	0.31	0.46	0.31	0.46	0.27	0.44	0.29	0.45
Remoteness										
– Major cities	0.80	0.40	0.81	0.39	0.79	0.41	0.79	0.40	0.79	0.41
– Inner regional	0.09	0.29	0.09	0.29	0.10	0.29	0.10	0.29	0.10	0.30
– Outer regional	0.04	0.20	0.04	0.19	0.04	0.20	0.04	0.20	0.04	0.20
– Remote & very remote	0.01	0.11	0.01	0.10	0.01	0.11	0.01	0.11	0.01	0.12
– Not available	0.05	0.22	0.05	0.22	0.06	0.24	0.06	0.23	0.05	0.22
Income (binary)										
– Division 293 income	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
– Salary & wage income	0.81	0.39	0.84	0.37	0.84	0.37	0.86	0.34	0.85	0.36
– PSI income	0.01	0.10	0.01	0.10	0.01	0.10	0.01	0.10	0.01	0.10
– Dividend income	0.50	0.50	0.49	0.50	0.44	0.50	0.44	0.50	0.46	0.50
– Trust income	0.34	0.47	0.31	0.46	0.33	0.47	0.29	0.45	0.30	0.46
– Net rental income	0.39	0.49	0.39	0.49	0.37	0.48	0.38	0.48	0.38	0.48
– Total deductions	0.93	0.25	0.93	0.25	0.93	0.26	0.93	0.26	0.93	0.25
Income (dollars)										
– Division 293 income	296,711	1,921	303,256	1,907	246,720	1,917	253,229	1,905	258,495	50,958
– Salary & wage income	207,741	94,465	216,845	83,866	181,823	65,003	189,992	63,824	189,249	77,511
– PSI income	131,245	115,193	143,051	118,151	98,725	89,899	105,781	95,268	111,148	102,980
– Dividend income	33,756	60,068	31,440	59,158	25,691	49,423	23,250	46,507	25,733	53,099
– Trust income	108,131	122,386	92,339	121,420	93,912	160,282	76,315	100,526	84,478	241,586
– Net rental income	-6,896	32,011	-7,300	33,276	-6,444	25,658	-6,205	25,991	-6,913	28,853
– Total deductions	11,141	45,581	11,535	92,105	9,886	150,373	8,474	14,085	9,735	129,383
Observations (no.)	45,292		38,705		44,988		36,943		2,914,229	

Note: The ‘Income (dollars)’ figures show the mean and standard deviation for those with the given income source only. The number of individuals that have ‘Income (dollars)’ can be calculated by multiplying the corresponding ‘Income (binary)’ figures by the number of observations.
PSI stands for Personal Services Income

6 Identification strategy

6.1 Recap of bunching theory

Bunching is often motivated with reference to a standard labour supply model, although the resulting estimates reflect all responses to the tax system, not just labour supply ones. In the absence of a kink, a population of taxpayers face a linear budget constraint with a constant marginal tax rate (t_0). Taxpayers locate at the tangency point where their indifference curve meets the constraint. The optimal location where utility (u) is maximised is determined by and individual's 'ability' (n). Ability is the only heterogeneous parameter in the model. Higher ability corresponds to higher combinations of earnings (z) and consumption (c). The linear constraint results in a smooth income density function ($h_0(z)$), given the variation of ability within the population. Saez (2010) presents the constrained optimisation problem as:

$$\max u(c, z), \textbf{ s.t. } c = (1 - t)z + R \tag{1}$$

The first order conditions can be arranged to show:

$$z = n(1 - t)^e \tag{2}$$

We now consider the case whereby a small increase in the marginal tax rate ($dt = t_1 - t_0$) is introduced at z^*. This change introduces a convex kink in budget constraint at z^*; the point where the marginal rate increase becomes effective. The now piecewise budget constraint means that taxpayers earning above the kink point are no longer located at their optimal combination of earnings and consumption. Taxpayers in this region respond by reducing their earnings and consumption to the point where their indifference curve meets the tangency point of the budget constraint from z^*. A subset of taxpayers who are relatively close to the kink point find that their new tangency point is precisely z^* (as opposed to some income level above z^*). These individuals are known as 'marginal bunchers'. A marginal buncher is defined as taxpayers who earn in the range from z^* to $z^* + dz^*$ under the linear constraint but now cluster at z^* when the kink is introduced. The bunching mass can be shown as:

$$B = \int_{z^*}^{z^*+dz^*} h_0(z)dz \tag{3}$$

The clustering of taxpayers at z^* means that the income density function is no longer smooth. The aim of the bunching approach is, therefore, to estimate the 'excess mass' in the income density for those who cluster at the kink point. In other words, to provide an estimate for the taxpayers in the z^* to $z^* + dz^*$ range who respond by changing their earnings to locate at the kink point. This can be estimated by calculating the difference between the observed density function and a smooth counterfactual density estimate $h_0(z^*)$ that is assumed to run through the bunching region.

The standard model, however, assumes that no optimisation frictions exist. This means that taxpayers in the marginal buncher's income region (z^* to $z^* + dz^*$) are able to perfectly target z^*. In practice, however, taxpayers face frictions. One example could be a salaried worker who cannot reduce hours worked easily. Another example is a less engaged taxpayer who lacks awareness of the kink and is therefore unresponsive. Optimisation frictions also include taxpayers who imperfectly bunch by locating a little further below z^*.

The 'excess mass' estimate can be used to back out an elasticity estimate. The elasticity is of interest because it provides a estimate for the earnings (or other) response to the increase in the marginal tax rate. For example, an elasticity of 0.02 implies that a 10 per cent increase in the net of tax rate $(1 - t_0)$ decreases taxable earnings by 2 per cent.

For small kinks, where the change in the marginal tax rate (dt) is small, the elasticity can be defined as:

$$\hat{e} = \frac{dz^* \; / \; z^*}{dt \; / \; (1 - t_0)} \tag{4}$$

Equation 4 overstates the compensated elasticity for larger kinks. Kleven (2016) shows how an alternative estimation approach can be derived in this case by parameterising the utility function.

This brief section intends to convey the intuition that underpins the bunching approach, overlooking much of the detail which is well documented elsewhere. For further information, including theoretical diagrams, please see Saez (2010), Chetty et al. (2011) and Kleven (2016). Blomquist et al. (2021) show that the taxable income elasticity cannot be identified when the distribution of preference heterogeneity is unknown. In our paper, we view the elasticity as a summary statistic which captures taxpayer response to the system. As we discuss below, it can not be interpreted in our context as telling us about preference over consumption and leisure.

6.2 Model specification

One drawback of bunching analysis is that the choice of model parameters is subjective and can materially affect the results. We experiment with numerous model specifications to settle on our preferred set of parameters. We show the effect of deviating from our preferred parameters in section 7.1.

The bin size is the most sensitive parameter in our analysis. An overly large bin size creates downward bias in the bunching estimates[5]. A bin size that is too small, however, generates a counter-factual distribution which is insufficiently smooth. This is

[5] In an online appendix, Weber (2016) re-evaluates Saez (2010) analysis of the Earned Income Tax Credit in the United States. The author show that the selected bin size of $500 resulted in biased bunching estimates.

the standard bias-variance trade-off that appears in many non-parametric econometric applications.

Johnson and Breunig (2016), who examine kinks in Australia's income tax schedule, selected a bin size of \$100. In Division 293 analysis, however, a bin size of \$100 results in too much variation between bins. This leads to a high variance in the counterfactual density estimates when fitting a polynomial. A slightly larger bin size helps provide smoother distributions. We settled on a bin size of \$200 which seems to work well for all groups of interest in our analysis.

Following the approach of Weber (2016), presented in an online appendix, we employed an automatic bin size selection algorithm to provide some validation for our bin size choice. The author argues that the choice should not be important as long as the bin size is small relative to the bandwidth. The algorithm returns an 'optimal' bin size of \$160 for all resident tax filers in 2018-19 (our largest group) and \$316 for those with substantial amounts of business or trust income in the same year. Our preferred \$200 bin size seems reasonable given our desire to employ a uniform bin size throughout our analysis.

We find a relatively wide bandwidth range seems appropriate to provide more data points in order to fit a smooth counterfactual distributions. For the bunching analysis at the \$300,000 threshold we choose a $\pm\$50,000$ range for the analysis and we move to a $\pm\$40,000$ range for the analysis at the \$250,000 threshold, given that the income distribution is denser at this point. The observed bunching is diffuse compared with Johnson and Breunig (2016), which results in a wider inner exclusion zone of \$6,600. These are the points in the income distribution around the kink that are not used in forming the counterfactual distribution.

Visual inspection led us to prefer a third order polynomial for the counterfactual distribution. To check this, we followed the approach of Johnson and Breunig (2016) and use

Table 3: Preferred bunching parameters

	2013-14 to 2016-17 (1)	2017-18 to 2018-19 (2)
Lower range ($)	−50,000	−40,000
Division 293 threshold ($)	300,000	250,000
Upper range ($)	+50,000	+40,000
Bin size ($)	200	200
Lower exclusion zone[1] ($)	−6,600	−6,600
Upper exclusion zone ($)	0	0
Polynomial order	3	3

[1]We vary the lower exclusion zone accordingly, based on visual inspection. $6,600 is reported in this table as a reasonable starting point that worked well in most situations.

the Akaike information criterion (AIC) as a 'goodness-of-fit' measure to help consider our polynomial order choice. This analysis reveals that the AIC is minimised for order 4 polynomial for the full resident population. For subgroup analysis, including those with substantial business and trust income and women, a 5th order polynomial fits best. We decided to maintain the 3rd order polynomial given it provides a smooth counterfactual distribution. Higher order polynomials, even when preferred by AIC, produced counterfactual distributions with excessive volatility. According to our robustness checks, presented in section 7.1 below, this choice has very little effect on our results.

Our preferred parameters are summarised in Table 3. We use the R software package 'bunching' in this analysis[6]. The package is available at `https://CRAN.R-project.org/package=bunching`. Please see Mavrokonstantis (2019) for further information.

7 Empirical results

We begin by examining the distribution of Division 293 income for tax filers in the year prior to the policy's introduction (2011-12). This is to confirm our expectation of no observed bunching before the tax was introduced. Figure A.2 confirms this to be the

[6]Specifically, we use R version 4.0.4 and 'bunching' package version 0.8.4. The elasticity estimates we report use the parametric approach. For reproducibility, we use 100 bootstrapped samples for standard error calculations with the 'seed' parameter set to a value of 1.

case. The distribution is smooth at $300,000, with no observable excess mass.

If we estimate bunching at $300,000 in 2011-2012, the estimator returns a value that is not statistically different from zero. Next we individually examine each subsequent year that the policy was in force. We present the income distribution around the threshold and the bunching for the most recent four years in Figure 4.

It appears that it took some time for tax filers to understand and respond to Division 293 tax. In the first two years, we observe bunching effects, and corresponding elasticity estimates, that are small and subsequently increase. The bunching estimator is 1.155 in 2012-13 and a slightly larger 2.668 in 2013-14. The elasticity estimates are 0.002 and 0.005 in those years.

Table 4: Bunching estimator and elasticity results, resident tax filers

	Excess mass (b)		Elasticity (e)	
Year prior to introduction				
2011-12	0.265	[0.414]	0.001	[0.001]
$300,000 threshold				
2012-13	1.155	[0.361]	0.002	[0.001]
2013-14	2.668	[0.406]	0.005	[0.001]
2014-15	3.055	[0.334]	0.006	[0.001]
2015-16	3.511	[0.303]	0.007	[0.001]
2016-17	3.737	[0.380]	0.007	[0.001]
$250,000 threshold				
2017-18	3.339	[0.247]	0.008	[0.001]
2018-19	2.957	[0.217]	0.007	[0.001]

Notes: Standard errors are presented in brackets.

We observe larger effects from 2014-15, the third year after the tax's introduction. The bunching estimator increased to 3.055, 3.511 and 3.737 in 2014-15, 2015-16, and 2016-17 respectively. It seems that it took time for people to understand and respond to the policy, particularly given the complicated concept of Division 293 income. Some may have been surprised to receive a Division 293 tax bill and, in response, located below the threshold in in future years. The elasticity estimate increases to 0.007 by 2016-17.

We examine the Division 293 income distribution at the $250,000 income threshold. Similarly, we can confirm that there was no bunching at the Division 293 income threshold in the years prior to 2017-18. We report a statistically insignificant bunching estimator and elasticity estimates of around zero in 2016-17 (see Figure A.1), the year before the threshold moved to $250,000. In the following years, however, we observe a positive response of 3.339 in 2017-18 and 2.957 in 2018-19. The corresponding elasticity estimates in these years are 0.008 and 0.007.

Next, we examine subgroups to identify who is most likely to bunch. To streamline the discussion, we focus on reporting bunching effects for the last two years of available data (2017-18 and 2018-19)[7]. We find women are around twice as likely as men to bunch, despite women only accounting for around a quarter of the population in this income range (as shown in Table 2). The bunching estimator for women is 6.046 and 5.216 in 2017-18 and 2018-19 respectively. The response for men is 2.521 and 2.454, shown in Figure 5. For women, the elasticity estimates increase to 0.015 and 0.013 in these years; more than double the estimates for men.

To examine the effect of age on bunching, we split the sample into those above and below the mean age of 48 years. The older group is more likely to bunch. Figure 6 shows the bunching estimator of 3.844 and 3.794 for the older group and 3.016 and 2.453 for the younger group in the 2017-18 and 2018-19 income years. The elasticity estimates for the older group are 0.009 in both 2017-18 and 2018-19.

[7] Bunching results for other years can be made available upon request.

Figure 4: Division 293 bunching, \$200 bin size, all resident tax filers

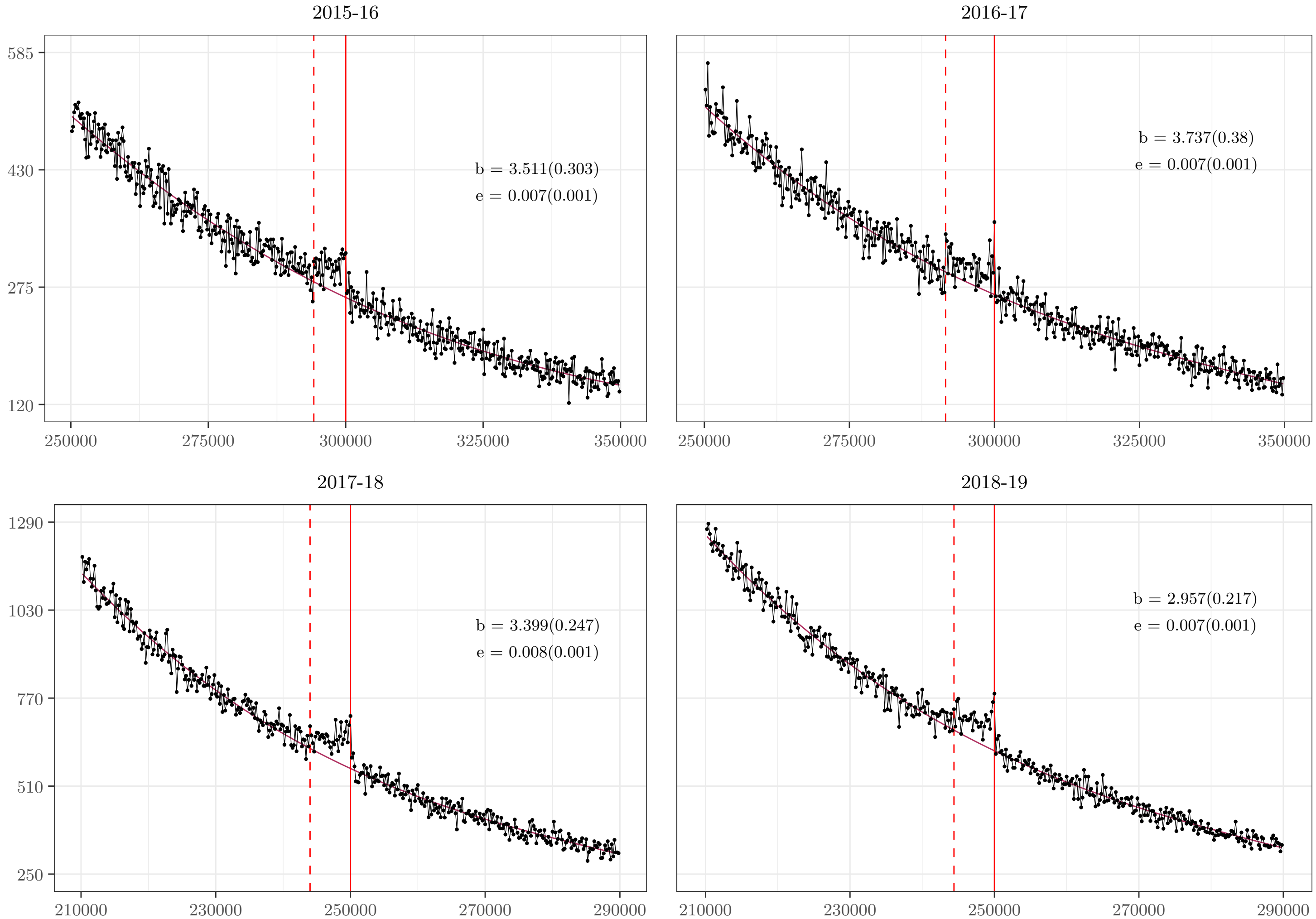


Figure 5: Division 293 bunching, $250,000 threshold, $200 bin size, by sex

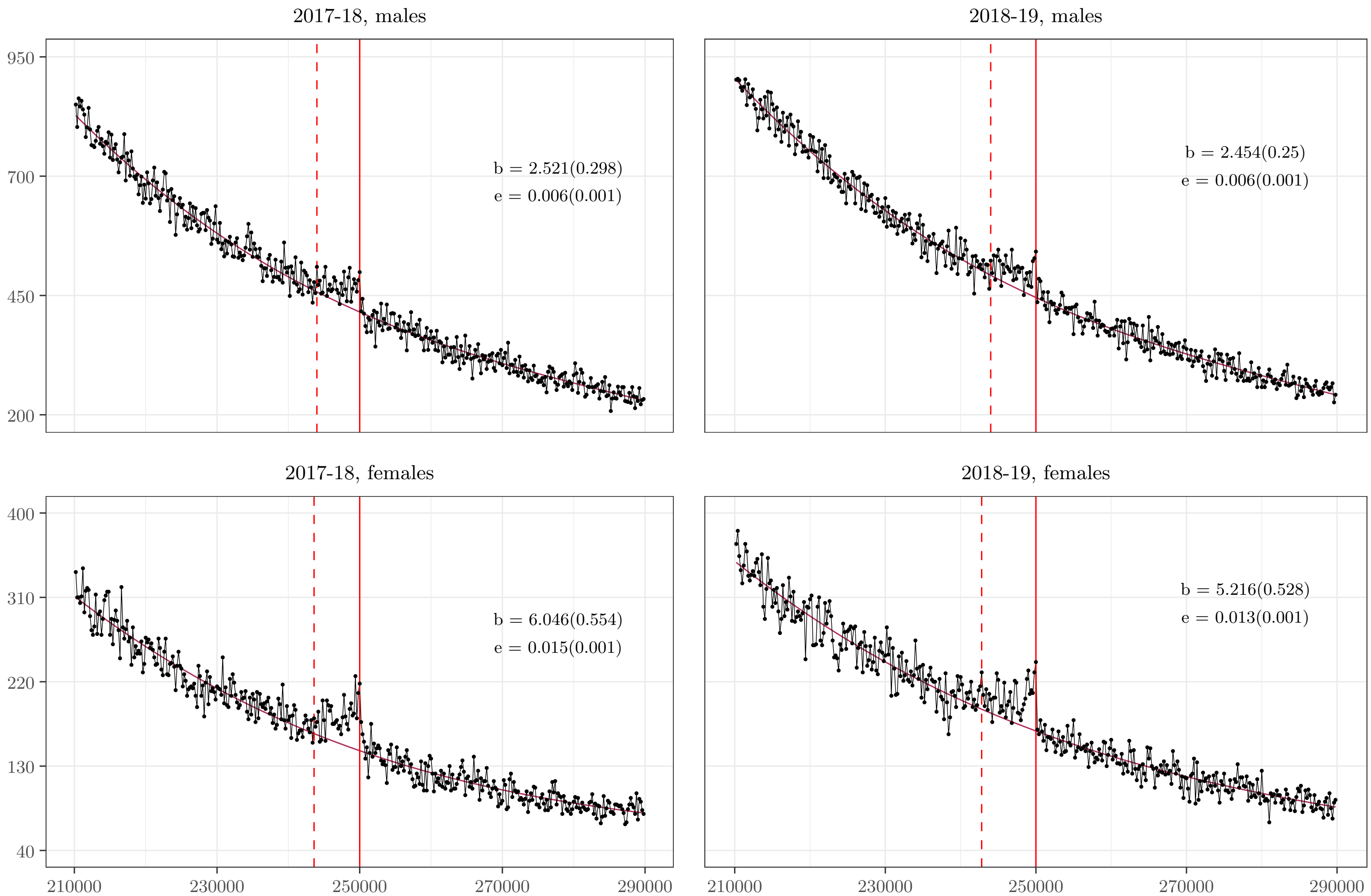


Figure 6: Division 293 bunching, \$250,000 threshold, \$200 bin size, age subgroups

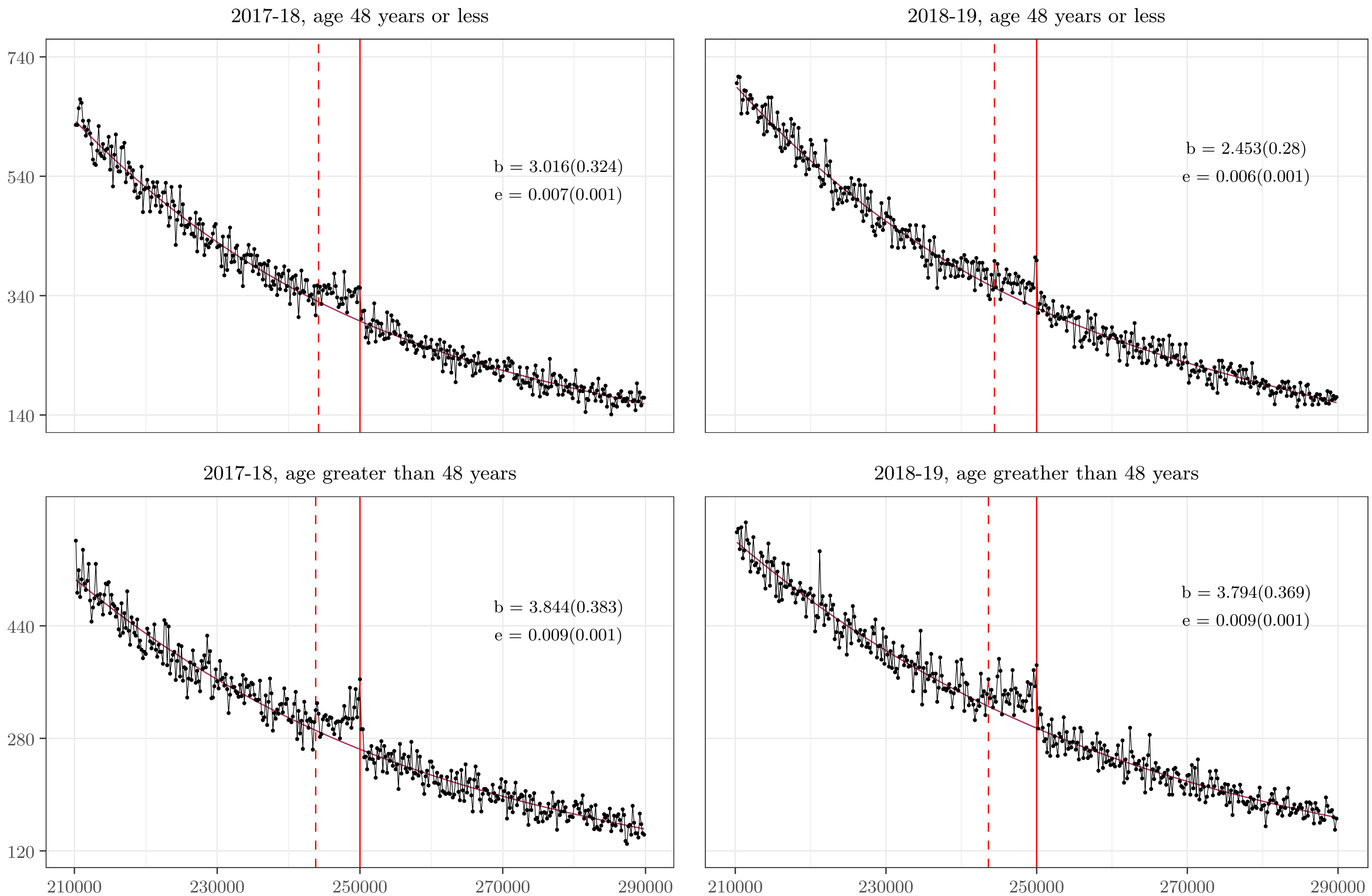


Figure 7: Division 293 bunching, $250,000 threshold, $200 bin size, trust income

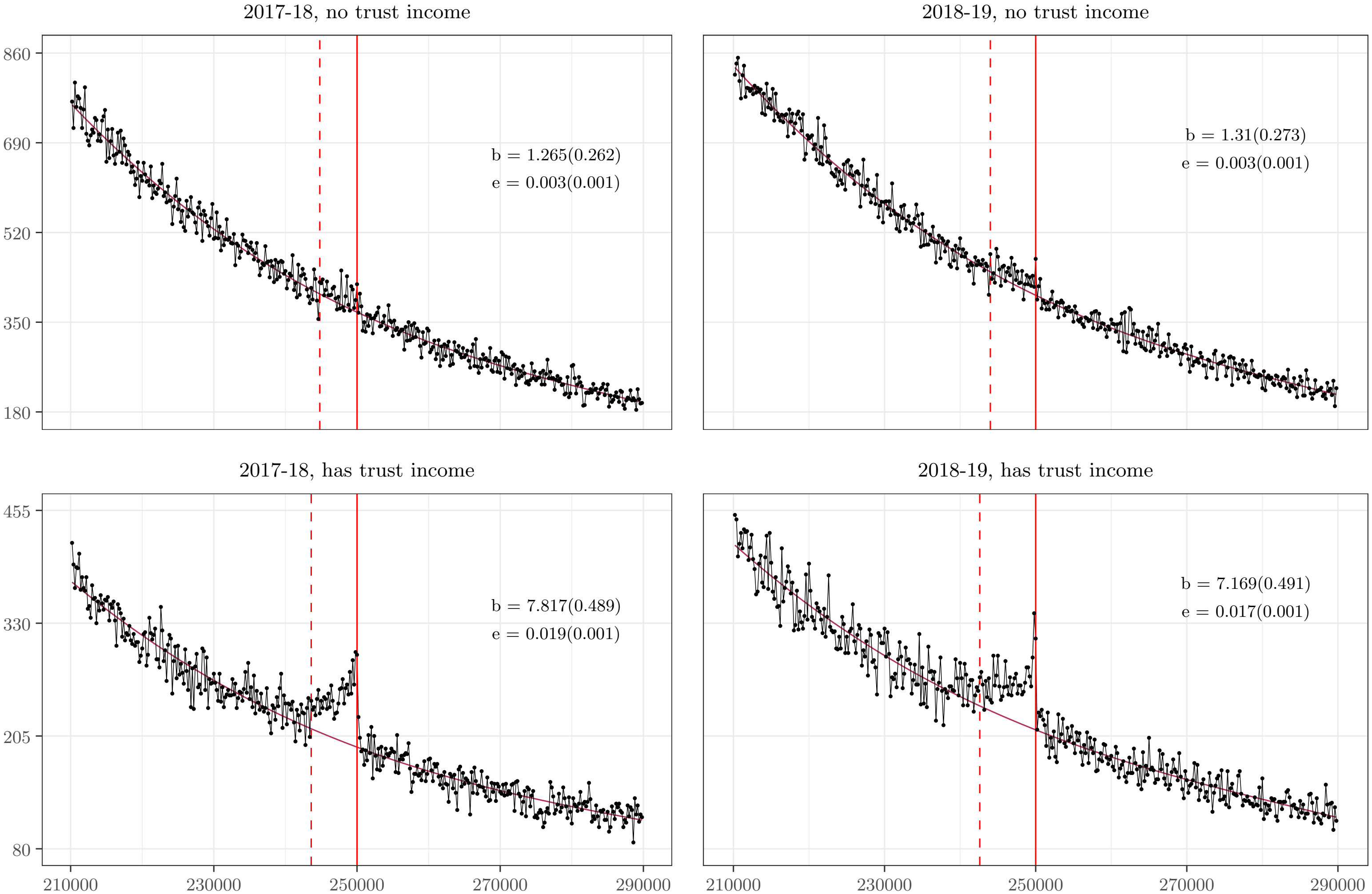
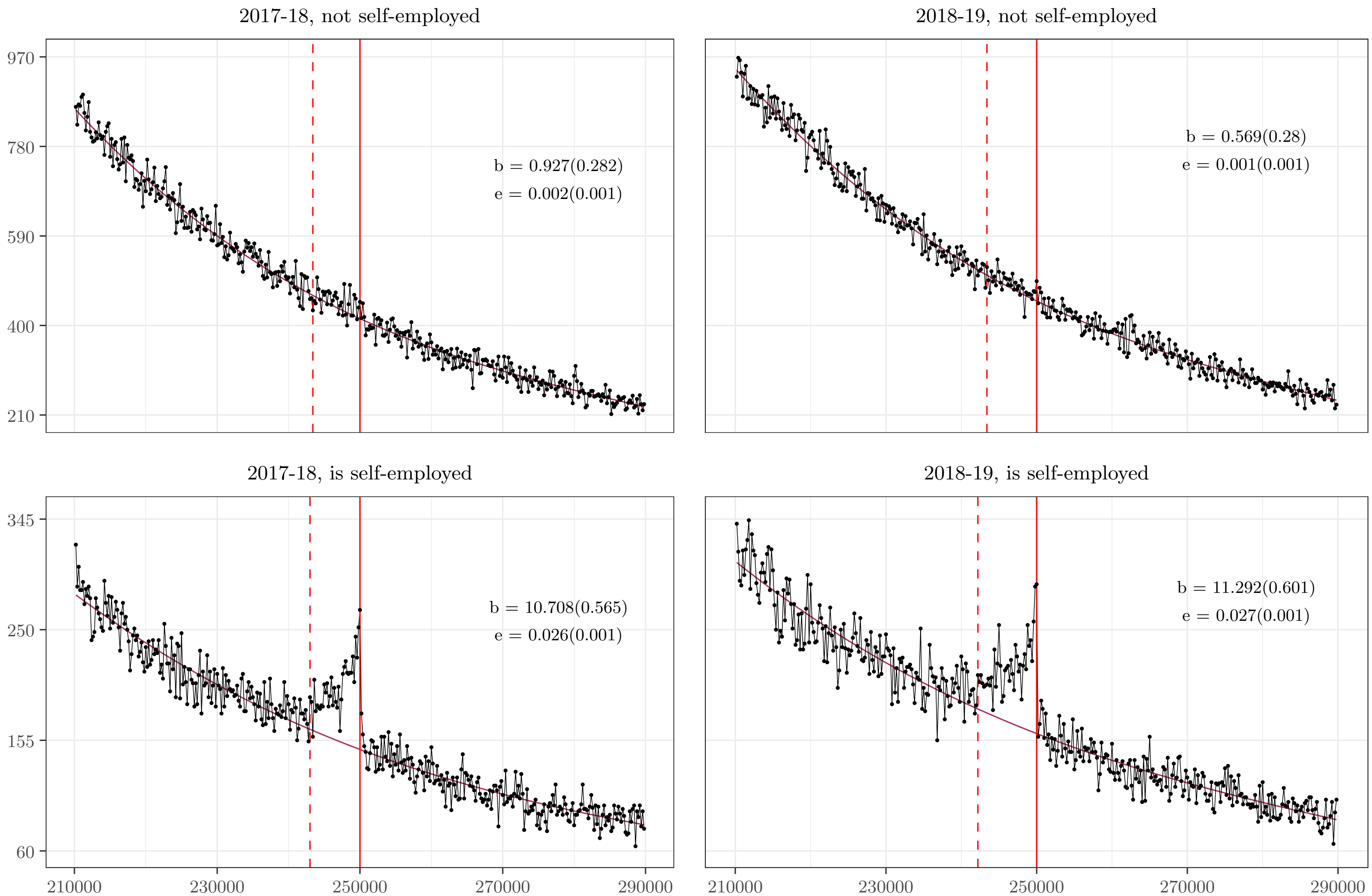


Figure 8: Division 293 bunching, \$250,000 threshold, \$200 bin size, self-employed



Previous studies have shown that individuals who have more flexibility in how they report their income are more likely to bunch. To examine the degree this occurs for Division 293 bunching we examine those who receive trust income versus those who do not. In Australia, trusts are commonly used for tax planning purposes for those with business income. Here we show that a large share of the bunching is accounted by those who receive trust income. Figure 7 reveals that the bunching estimator increases to 7.817 and 7.169 in 2017-18 and 2018-19 respectively. We still detect a small degree of bunching for those without trust income. The corresponding bunching estimator is 1.265 and 1.310 in the same years. The elasticity estimates for those with trust income increase to 0.019 and 0.017 in 2017-18 and 2018-19.

We further examine the question of flexibility in reportable income by examining the 'self-employed'. We adopt the 'self-employed' definition that Johnson and Breunig (2016) used. This definition classified tax filers as self-employed if the sum of their business income (or losses), net trust partnership income and dividend income is greater than 20 per cent of their salary and wage income. We find that the self-employed account for almost all of the bunching when we apply this rule. Figure 8 shows that the bunching estimator increases to 10.708 and 11.292 in 2017-18 and 2018-19 respectively. We estimate a very small response for the individuals who do not meet this definition of 0.927 and 0.569 in the same years. Given the self-employed account for almost all of the bunching, we present a summary of our estimates in Table 5 which includes estimates for earlier years at the $300,000 threshold. The earlier estimates, which are similar, are also presented graphically in Figure A.3. For the estimates at the $300,000 threshold, we pool tax filers into two-year groupings given the self-employed subgroup at the $300,000 threshold is not densely populated.

Table 5: Bunching estimator and elasticity results, self-employed

	Excess mass (b)		Elasticity (e)	
Two years pooled, $300,000 threshold				
2013-14 & 2014-15	10.570	[0.733]	0.021	[0.001]
2015-16 & 2016-17	9.787	[0.613]	0.020	[0.001]
Single years, $250,000 threshold				
2017-18	10.708	[0.565]	0.026	[0.001]
2018-19	11.292	[0.601]	0.027	[0.001]

Notes: Standard errors are presented in brackets.

7.1 Robustness checks

We examine the sensitivity of our results to our choice of bunching parameters. The intention is to provide a sense of the degree that our results change when we vary the parameters. Tables 6 and 7 show the effects on the bunching estimator and elasticity estimates on the full resident population in 2018-19 and on the 'self-employed' subset. Specifically, we vary the bin size, the polynomial order, the outer bandwidth range, and the inner bandwidth exclusion region which defines the bunching region. For most checks, we find the bunching estimates do change much and have little effect on our reported elasticity estimates.

Consistent with Weber (2016), we find that the choice of bin size has the largest effect on the bunching estimates. In an online appendix, Weber (2016) finds that the a bin size of $500 that was used in Saez (2010) analysis of the Earned Income Tax Credit in the USA was too large. It over-smoothed the density estimates and resulted in downward bias of the bunching estimates. She finds that the estimates in Saez (2010) are biased by more than 10 per cent.

As a point of reference, Johnson and Breunig (2016) selected a bin size of $100 in their bunching analysis that examined kinks in Australia's income tax schedule. For Division 293 income, a bin size of $100 results in quite a lot of variation between bins. This makes the visual identification of a smooth counterfactual income density difficult. A slight wave is introduced to the counterfactual distribution when fitting a flexible polynomial.

We settled on moving to a bin size of \$200 as a sensible trade off. To the degree that a smaller bin size captures the true distribution, our results may have some downward bias. Table 6 shows that the bunching estimator increases to 5.799 for all resident tax filers and to 22.494 for the self-employed subgroup in 2018-19. The 'optimal bin size' algorithm, discussed in Section 6.2 appeared to support our \$200 bin size choice.

The choice of the remaining bunching parameters seems less important. Changing the polynomial order reduces the bunching estimates slightly. Based on the AIC in Section 6.2, the best fit was a polynomial of order 4 for the entire population and order 5 for the self-employed. The issue we discovered in moving to higher order polynomials is that we, again, begin to pick up a slight wave in the counterfactual distribution. We thought it made more sense to assume a smoother 'true' distribution for the purpose of estimating the counterfactual density. In comparing the polynomial choice between Tables 6 and 7 we see that the estimates for the self-employed are relatively more sensitive.

Reducing the outer bandwidth choice (i.e. data points used to fit the polynomial) attenuates the bunching estimator. Again, we feel that more data points helps to capture a smoother counterfactual distribution when fitting the polynomial. Separately, we also show that varying the inner exclusion region (i.e. the assumed bandwidth for the bunching region) appears to have only modest effects on the bunching results.

Table 6: Robustness checks, resident tax filers, 2018-19

	Bin size ($)	Inner (no. bins)	Outer (no. bins)	Polynomial (order)	b (est.)	Std. Err (est.)	e (est.)	Std. Err (est.)
Bin size, resident tax filers								
(1)	100	65	400	3	5.799	0.419	0.007	0.001
(2)	150	43	267	3	3.906	0.315	0.007	0.001
(3)	**200**	**33**	**200**	**3**	**2.957**	**0.217**	**0.07**	**0.001**
(4)	250	26	160	3	2.357	0.166	0.007	0.000
(5)	300	22	133	3	1.947	0.150	0.007	0.001
(6)	350	19	114	3	1.680	0.118	0.007	0.000
(7)	400	16	100	3	1.459	0.102	0.007	0.000
Order of polynomial, resident tax filers								
(8)	200	33	200	2	2.831	0.222	0.007	0.001
(9)	**200**	**33**	**200**	**3**	**2.957**	**0.217**	**0.007**	**0.001**
(10)	200	33	200	4	2.773	0.232	0.007	0.001
(11)	200	33	200	5	2.757	0.233	0.007	0.001
(12)	200	33	200	6	2.750	0.245	0.007	0.001
(13)	200	33	200	7	2.712	0.245	0.007	0.001
Outer bandwidth range, resident tax filers								
(14)	**200**	**33**	**200**	**3**	**2.957**	**0.217**	**0.007**	**0.001**
(15)	200	33	160	3	2.857	0.220	0.007	0.001
(16)	200	33	140	3	2.776	0.237	0.007	0.001
(17)	200	33	120	3	2.770	0.241	0.007	0.001
(18)	200	33	100	3	2.673	0.225	0.006	0.001
(19)	200	33	80	3	2.508	0.287	0.006	0.001
(20)	200	33	60	3	2.207	0.231	0.005	0.001
Inner bandwidth range, resident tax filers								
(21)	200	27	200	3	2.422	0.216	0.006	0.001
(22)	200	29	200	3	2.487	0.225	0.006	0.001
(23)	200	31	200	3	2.827	0.229	0.007	0.001
(24)	**200**	**33**	**200**	**3**	**2.957**	**0.217**	**0.007**	**0.001**
(25)	200	35	200	3	3.024	0.226	0.007	0.001
(26)	200	37	200	3	3.031	0.237	0.007	0.001
(27)	200	39	200	3	3.086	0.240	0.007	0.001

Table 7: Robustness checks, self-employed, 2018-19

	Bin size ($)	Inner (no. bins)	Outer (no. bins)	Polynomial (order)	b (est.)	Std. Err (est.)	e (est.)	Std. Err (est.)
Bin size, self-employed								
(1)	100	65	400	3	22.494	1.184	0.027	0.001
(2)	150	43	267	3	15.059	0.822	0.027	0.001
(3)	**200**	**33**	**200**	**3**	**11.292**	**0.601**	**0.027**	**0.001**
(4)	250	26	160	3	9.020	0.497	0.027	0.001
(5)	300	22	133	3	7.479	0.438	0.027	0.002
(6)	350	19	114	3	6.389	0.372	0.027	0.002
(7)	400	16	100	3	5.608	0.329	0.027	0.002
Order of polynomial, self-employed								
(8)	200	33	200	2	11.067	0.578	0.026	0.001
(9)	**200**	**33**	**200**	**3**	**11.292**	**0.601**	**0.027**	**0.001**
(10)	200	33	200	4	10.423	0.668	0.025	0.002
(11)	200	33	200	5	9.653	0.628	0.023	0.001
(12)	200	33	200	6	10.007	0.667	0.024	0.002
(13)	200	33	200	7	9.614	0.736	0.023	0.002
Outer bandwidth range, self-employed								
(14)	**200**	**33**	**200**	**3**	**11.292**	**0.601**	**0.027**	**0.001**
(15)	200	33	160	3	10.202	0.677	0.024	0.002
(16)	200	33	140	3	10.074	0.556	0.024	0.001
(17)	200	33	120	3	10.090	0.580	0.024	0.001
(18)	200	33	100	3	9.449	0.748	0.023	0.002
(19)	200	33	80	3	8.682	0.873	0.021	0.002
(20)	200	33	60		8.413	0.982	0.020	0.002
Inner bandwidth range, self-employed								
(21)	200	27	200	3	10.219	0.533	0.024	0.001
(22)	200	29	200	3	10.517	0.535	0.025	0.001
(23)	200	31	200	3	10.903	0.568	0.026	0.001
(24)	**200**	**33**	**200**	**3**	**11.292**	**0.601**	**0.027**	**0.001**
(25)	200	35	200	3	11.235	0.602	0.027	0.001
(26)	200	37	200	3	11.444	0.594	0.027	0.001
(27)	200	39	200	3	11.512	0.605	0.028	0.001

7.1.1 Use of tax agents

As noted above, over 80 per cent of individuals in our data use tax agents to prepare their tax returns.[8] Table 8 presents analogous estimates to Table 4 of the excess bunching mass and resulting elasticities when we consider only those tax filers who use tax agents.

Considering those who use tax agents, we observe slightly larger bunching and slightly

[8]This number is stable across time in our data. There is no evidence that the policy induced greater use of tax agents.

Table 8: Bunching estimator and elasticity results, resident tax filers who use tax agents

	Excess mass (b)		Elasticity (e)	
Year prior to introduction				
2011-12	-0.113	[0.443]	0.000	[0.001]
$300,000 threshold				
2012-13	1.231	[0.391]	0.002	[0.001]
2013-14	3.351	[0.462]	0.007	[0.001]
2014-15	3.388	[0.371]	0.007	[0.001]
2015-16	3.611	[0.332]	0.007	[0.001]
2016-17	4.324	[0.439]	0.009	[0.001]
$250,000 threshold				
2017-18	3.976	[0.297]	0.010	[0.001]
2018-19	3.387	[0.259]	0.008	[0.001]

Notes: Standard errors are presented in brackets.

larger elasticities. Focusing on 2017-18 and 2018-19, we see that the bunching estimates increase from 3.339 and 2.957 to 3.976 and 3.387. The elasticity estimates increase slightly from 0.008 and 0.007 to 0.010 and 0.008. Not presented here, but available from the authors upon request, we also conduct the analysis separately by male and female tax payers for those who use tax agents. For women, we observe bunching estimates of 6.628 and 5.552 in 2017-18 and 2018-19 respectively. These represent increases of ten and six per cent compared to all tax filers. For men, the bunching estimates increase by about 20 per cent to 3.03 and 2.913. Despite the increase in bunching, the elasticity estimates are mostly unchanged or increase by .001 in some cases.

The same general patterns observed above persist when we restrict our analysis to those who use tax agents. In particular, we see an increase in bunching over time, consistent with tax agents also taking some time to learn about the new policy settings and develop responses for their clients. The fact that results change more for men than for women suggests that the results we see for women are a result of household tax planning that is strongly linked to the use of tax agents.

7.2 Bunching persistence

While our main analysis focusses on repeated cross-sections of ALife, we can exploit the longitudinal nature of the data to examine the persistence of bunchers across years. While this analysis is fundamentally descriptive, it is interesting to see how the trends in 'bunching persistence' change in 2017-18 when the Division 293 income threshold was reduced from $300,000 to $250,000.

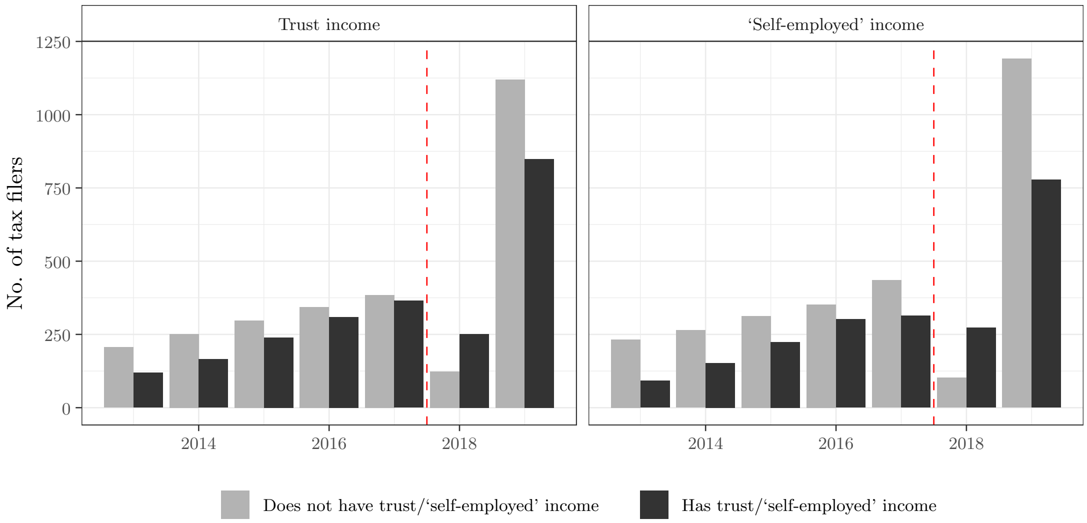
Figure 9 shows the number of individuals who appear in both the current year bunching window and the previous year's bunching window. Individuals are split by whether they have trust income or not on the left-hand side of the graph and by whether or not they meet our 'self-employed' definition on the right-hand side.

Both tell similar stories. In 2012-13 we observe persistence despite Division 293 tax not being in force in the prior year (2011-12). This provides a sense of the baseline for taxpayers who have stable incomes from year to year. Consistent with income growth over this time, the bars grow in subsequent years to 2016-17, the final year where the Division 293 income threshold was set at $300,000. The grey bars are higher than the black bars, reflecting the much larger number of taxpayers who do not have trust income and who do not meet our definition of self-employed. Both bars are much larger in 2018-19 when the threshold is at $250,000 as the income distribution is much denser at this point than at $300,000.

Of particular interest is the threshold change in 2017-18. This provides some insight into the number of individuals that appear to have the ability to target Division 293 income. The black bars, in both graphs, are now much higher than the grey bars. So individuals with trust income, or who meet our 'self-employed' definition, clearly have much great ability to move themselves from the bunching area just below $300,000 to the bunching area just below $250,000.

To examine this further, we estimate simple regressions to gain insight on the groups who

Figure 9: Tax filers located in prior year bunching region



may have increased ability to target certain income amounts. For this analysis, we use the data in the 2016-17 and 2017-18 income years as we are interested in learning about the persistence of bunchers when the Division 293 income threshold moved from $300,000 in 2016-17 to $250,000 in 2017-18. We restrict the sample to individuals who have Division 293 income between $243,400 and $250,600 in 2017-18 and estimate the effect on those with trust income and those with self-employment income separately.

All variables are binary in the regressions. In regression 1, the dependent variable takes value one if the taxpayer has Division 293 income in the bunching region (between $243,400 and $250,000). The explanatory variables take a value of 1 if the taxpayer is female and 1 if the taxpayer receives trust income. The third explanatory variable is an interaction between the previous two explanatory variables. Regression 1 in Table 9 shows small positive effects for females and individuals with trust income. The only difference for Regression 2 is that we set the dependent variable to individuals with 'self-employment' income instead of only trust income. The results are similar for the two different types of income.

The first set of regressions set a benchmark. In the second set, the dependent variable is now conditional on the tax filer being located in *both* the 2017-18 bunching region *and* the 2016-17 bunching region. The 2016-18 bunching region is defined as individuals with Division income between \$293,400 and \$300,000 for this year. The regressions now reveal a different story. We see that being female alone returns a response that is now not statistically different from zero, but being female with trust income (female · trust) has a slightly positive response. This response is statistically significant at the five per cent level. This differs to the 'self-employed' regression where the interaction term (female · self-employed) is not statistically different from zero. This regression analysis provides some evidence that females who receive trust distributions are more likely to target their income in order to avoid Division 293 tax.

Table 9: Descriptive regression – tax filers located in the 2017-18 bunching window

	Has trust income (1)		Is self-employed (2)	
Located in the 2017-18 bunching window				
Intercept	0.5334***	[0.0036]	0.5316***	[0.0034]
Female	0.0133*	[0.0078]	0.0146**	[0.0073]
Trust | self-employed	0.0353***	[0.0063]	0.0556***	[0.0069]
Interaction (female · trust | self-employed)	-0.0002	[0.0115]	-0.0151	[0.0118]
Located in the 2017-18 and the 2016-17 bunching windows				
Intercept	0.0049***	[0.0005]	0.0036***	[0.0004]
Female	0.0002	[0.0011]	0.0001	[0.0009]
Trust | self-employed	0.0101***	[0.0014]	0.0194***	[0.0019]
Interaction (female · trust | self-employed)	0.0059**	[0.0026]	0.0018	[0.0030]

Notes: Robust standard errors are presented in brackets. ***, ** and * denote statistical significance at the 0.01, 0.05 and 0.1 levels respectively.

7.3 Optimisation frictions

It was no longer optimal for tax filers to bunch at the \$300,000 Division 293 income threshold from the 2017-18 income year, yet some people still did. Some individuals appear to face adjustment costs, or optimisation frictions, when policy rules change. In a recent paper, Zaresani (2020) examined a policy change to Canada's Disability

Insurance program. Her analysis revealed that some individuals continued to bunch at the former income exemption threshold. The adjustment cost could be attributed to difficulty individuals face in changing their labour supply, or perhaps simply a lack of awareness of the change in program rules. The presence of optimisation frictions have an attenuating effect on the response to a policy change.

We examine bunching at the $300,000 income threshold in 2017-18 and 2018-19; the years when the threshold had moved to $250,000. We find only a small degree of precise bunching at the kink point remains in these years. We estimate a bunching estimator of 0.153 in 2017-18 and 0.139 in 2018-19 (Table 10). The slightly lower figure in the latter year may indicate that some individuals moved after they realised that the policy had changed. The subgroups who account for most of this bunching are those who *do not* have trust income, and those who *are not* self-employed. These groups have less ability to control their income. We show the bunching plot for all resident tax-filers in Figure A.1 in 2017-18 only. Other plots are similar.

Table 10: Precise non-optimal bunching at the $300,000 threshold

	Excess mass (b)		Elasticity (e)	
Resident tax filers				
2017-18	0.153	[0.058]	0.000	[0.000]
2018-19	0.139	[0.057]	0.000	[0.000]
No trust income				
2017-18	0.235	[0.075]	0.000	[0.000]
2018-19	0.150	[0.073]	0.000	[0.000]
Not self-employed				
2017-18	0.171	[0.074]	0.000	[0.000]
2018-19	0.187	[0.086]	0.000	[0.000]

Notes: Standard errors are presented in brackets.

8 Discussion

The bunching that is concentrated in the self-employed, including those receiving trust income, highlights that the bunching approach measures all responses to the tax system. The persistence of bunching and the substantial number of tax payers who move from the \$300,000 threshold to the \$250,000 threshold when the rules change suggest that the theory of section 6.1 which relates bunching behaviour to labour supply responses of marginal bunchers is not a good description of the behavioural response that is being induced by the Division 293 tax rules.

Consider a household with a primary and secondary earner who use a discretionary trust to distribute business income for tax planning purposes. If the household uses the trust to 'top up' the secondary earner's income to the kink point, then this response does not sit neatly within the theory of section 6.1. It is quite difficult to ascertain where the secondary earner would have located in the absence of the kink.

Nonetheless, the bunching estimates and the associated elasticity estimates are indicating that individuals are responding to the rules of the tax system and we can use them to see how that responsiveness changes over time and differs across groups. It would be unwise to associate the estimates with labour supply elasticities in this context.

9 Conclusion

Consistent with other studies, our analysis confirms that almost all of the bunching response is accounted for by those with substantial amounts of business, trust or investment income. Further, we see the value of trust income for tax planning purposes. Women are more likely to be located in the bunching region despite accounting for only a quarter of tax filers in these regions. This is likely explained by household tax optimisation strategies.

We confirm that there is no bunching at the relevant income thresholds in years prior to the introduction of the tax. This provides evidence that the counterfactual distribution is smooth when there is no kink. When the policy is in force, bunching appears in the first year and increases in subsequent years. Similar to Saez (2010), there appears to be learning effect as knowledge of Division 293 tax spreads. By 2017-18 and 2018-19, the bunching estimator increases to 3.339 and 2.957.

We clearly see that when the Division 293 threshold moves, so does (almost all of) the bunching. In 2017, the reduction in the income threshold to $250,000 resulted in similar bunching estimates despite moving to a denser region of the income distribution. We observe a small degree of persistent bunching at the former kink after the income threshold moved to $250,000. Those who continue to bunch at the old threshold are those who have lower ability to adjust their income or shift income across years (e.g. salary and wage earners).

Division 293 tax is targeted at high earners and employs a complicated income definition. This results in diffuse bunching below the kink. The median bunching window below the kink is $6,200 with a range from $5,200 to $11,200. This compares with tighter bunching windows observed at marginal tax rate kinks in Australia–Johnson and Breunig (2016) show that the bunching window ranges from around $1,000 to $1,500. This is, presumably, because taxable income is a simpler and better understood income definition and taxpayers are better able to target taxable income than 'Division 293 income'.

Our bunching and elasticity estimates demonstrate that people respond to incentives created within the tax system. Our analysis of who bunches and the persistence of bunching suggests that these responses are not well-described by theory that relates bunching to the marginal labour supply behaviour of individuals near the kink. Rather, those who are able to adjust their income readily use that ability to target the Division 293 thresholds. The elasticity estimates should not be interpreted as labour supply elasticities but the estimates are useful to examine who responds to Division 293 tax and how that response changes over time and differs across population sub-groups.

The ability of some individuals to avoid the tax while others pay it undermines the tax system design principle of horizontal equity, given some groups are more able to bunch than others. Further, if the goal of the tax is to reduce the concessional treatment of superannuation contributions, the gap between the highest threshold in the tax schedule (currently \$180,000) and the Division 293 income threshold is an odd feature. Aligning the Division 293 income threshold with the highest threshold in the tax schedule would seem more consistent. Grant and De Zwaan (2018) conclude that, given the differences between taxable income and 'Division 293 income', lowering the Division 293 income threshold to \$200,000 would achieve this. This would also move closer to a system where taxpayers, rather than paying a flat tax on superannuation contributions, pay their marginal tax rate less a flat discount.

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A Appendix

The first graph in Figure A.1 confirms no visible bunching at $250,000 in the year prior to the reduction of the threshold (2016-17). The second graph shows a small degree of persistent bunching at the (no longer relevant) $300,000 threshold in 2016-17. This could be evidence that some taxpayers face optimisation frictions which prevent their moving to the new threshold.

Figure A.1: Division 293 bunching checks

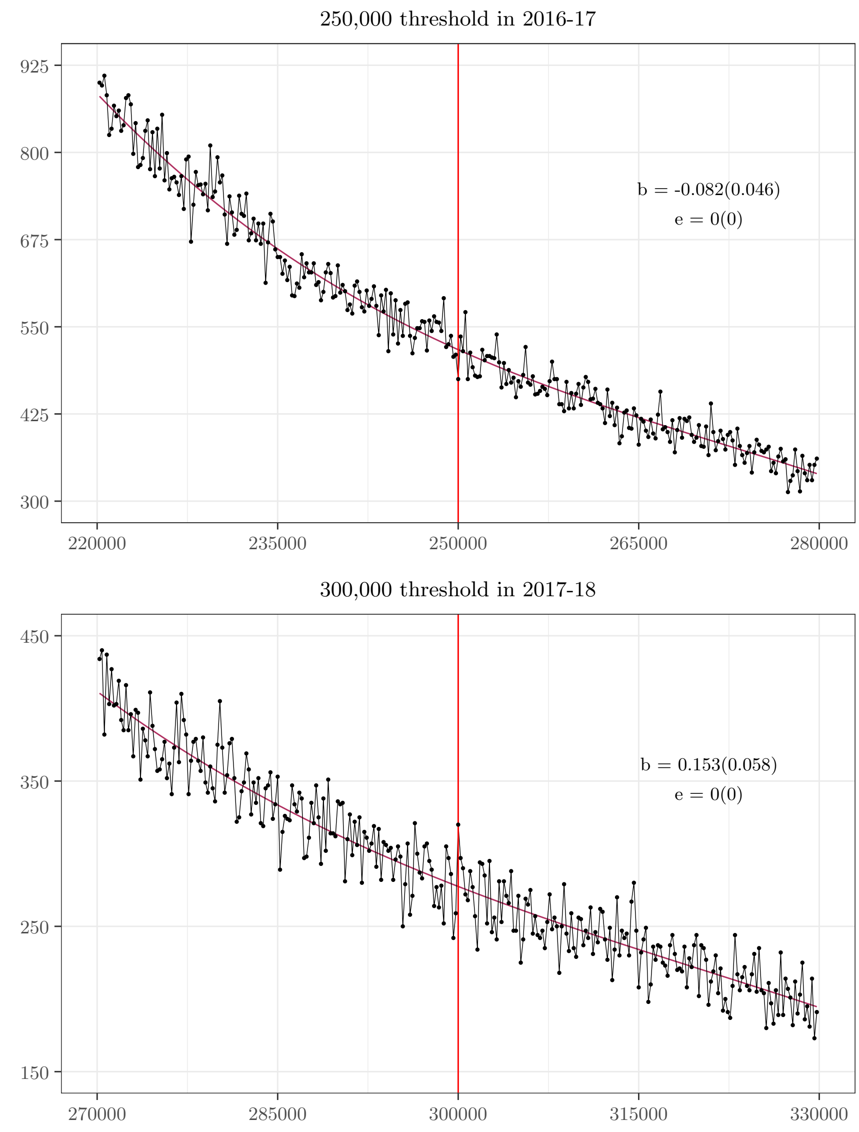

Figure A.2: Division 293 bunching, $300,000 threshold, $200 bin size, resident tax filers

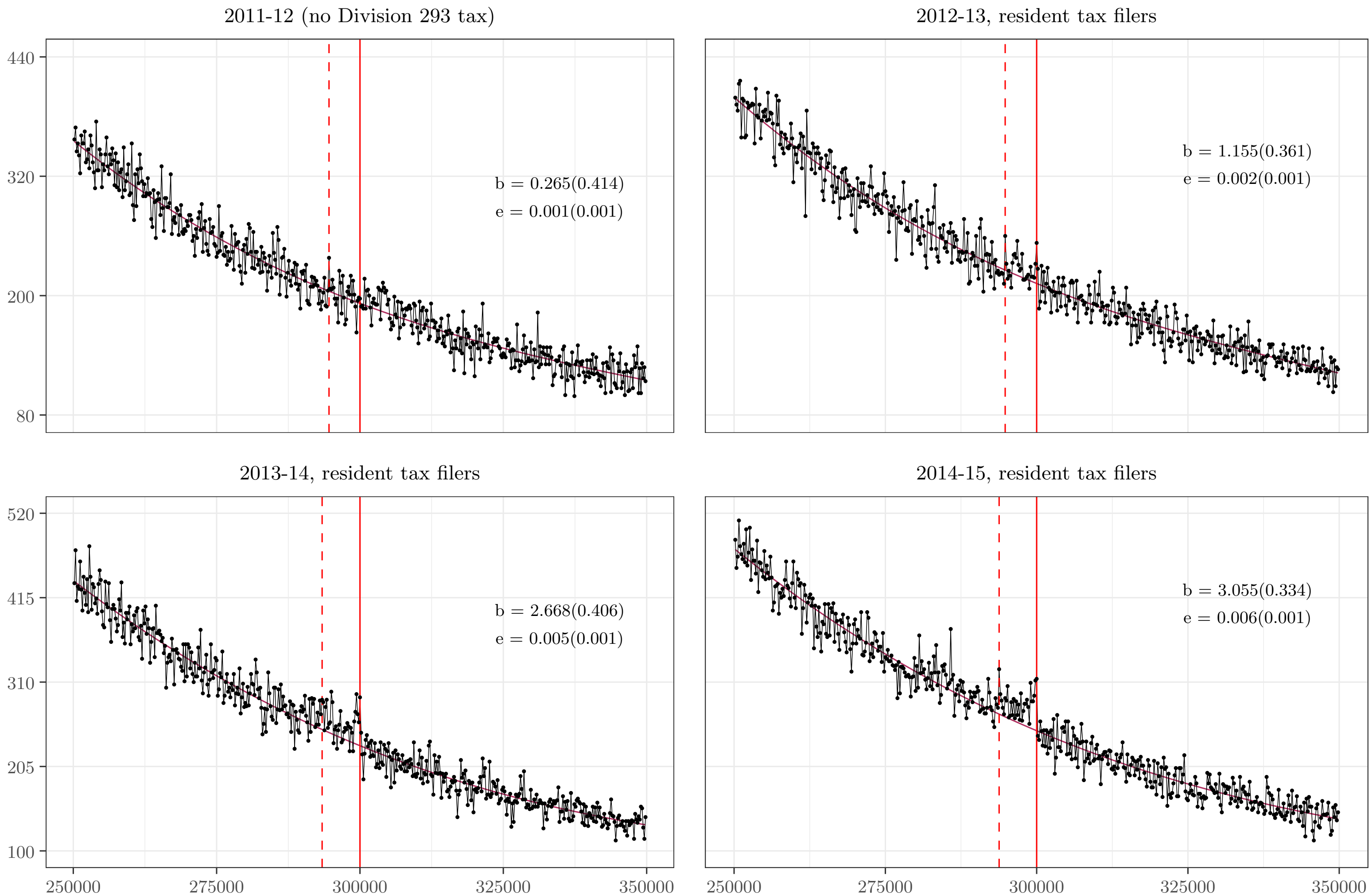

Figure A.3: Division 293 bunching, $300,000 threshold, $200 bin size, self-employed